Compute Security
Container Security

Hello!

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Microsoft MVP

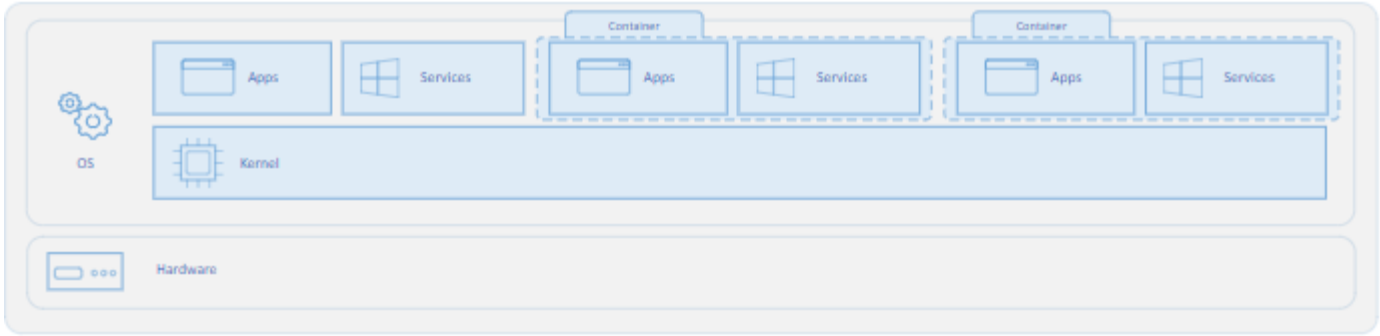
Container Security

Containers

A container is an isolated, lightweight silo for running an application on the host operating system.

Containers build on top of the host operating system's kernel (which can be thought as the buried plumbing of the operating system), and contain only apps and some lightweight operating system APIs and services that run in user mode.

Container


Container
Container
Apps
Services
Apps
Services
Apps
Services
OS
Kernel
Hardware

Azure Container Instances (ACI) Security

- Continuously scan registry images
- Use approved images – chain of custody, signing
- Run with least privileges
- Whitelist files the container can access
- Maintain network segmentation
- Monitor and log activities

Azure Container Instances (ACI)

- PaaS Service
- Custom sizes – fast startup times
- Public IP connectivity and DNS name
- Hypervisor-level security
- Isolation features
- Co-scheduled groups
- Persistent storage
- Linux and Windows containers
- Virtual network deployments

Azure Container Registry (ACR)

- Docker registry service
- Private and hosted in Azure
- Build, store, and manage images
- Push and pull with the Docker CLI or the Azure CLI
- Access with Azure AD
- RBAC to assign permissions
- Automate using DevOps

Azure Container Registry (ACR) Authentication

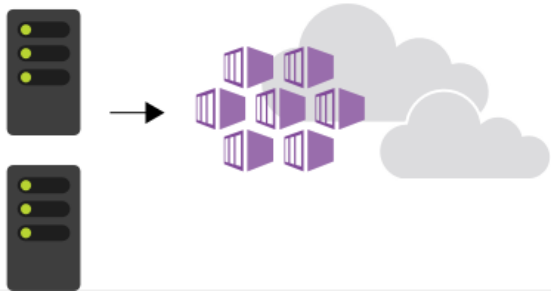
Require authentication for all operations – unauthenticated access is not supported.

Identity	Usage Scenario	Details
Azure AD identities including user and service principals	Unattended push from DevOps, Unattended pull to Azure or external services	Role-based access – Read, Contributor, Owner
Individual AD identity	Interactive push/pull by developers and testers	
Admin user	Interactive push/pull by individual developer or tester	By default, disabled.

Azure Kubernetes Service (AKS)

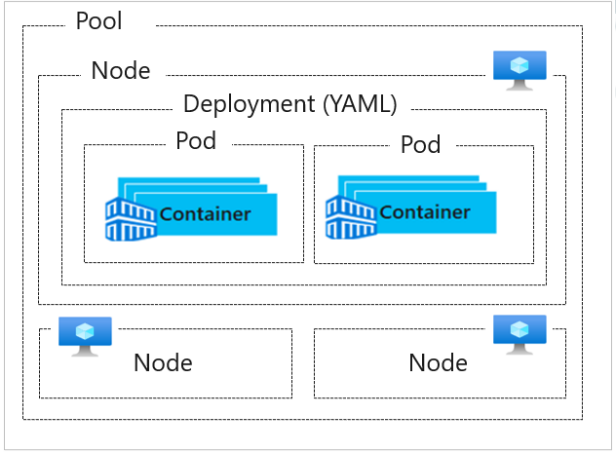
Portable, extensible open-source platform for automating deployment, scaling, and the management of containerized workloads.

- Fully managed
- Public IP and FQDN (Private IP option)
- Accessed with RBAC or Azure AD
- Dynamic scale containers
- Automation of rolling updates and rollbacks of containers
- Management of storage, network traffic, and sensitive information

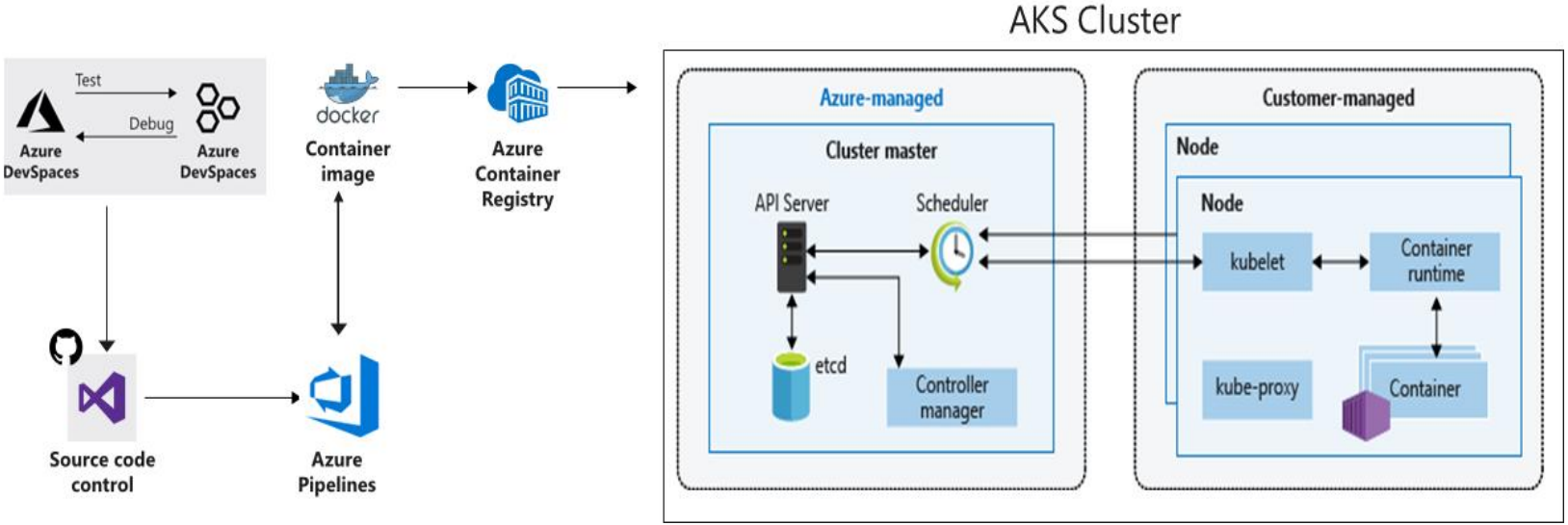


AKS Terminology

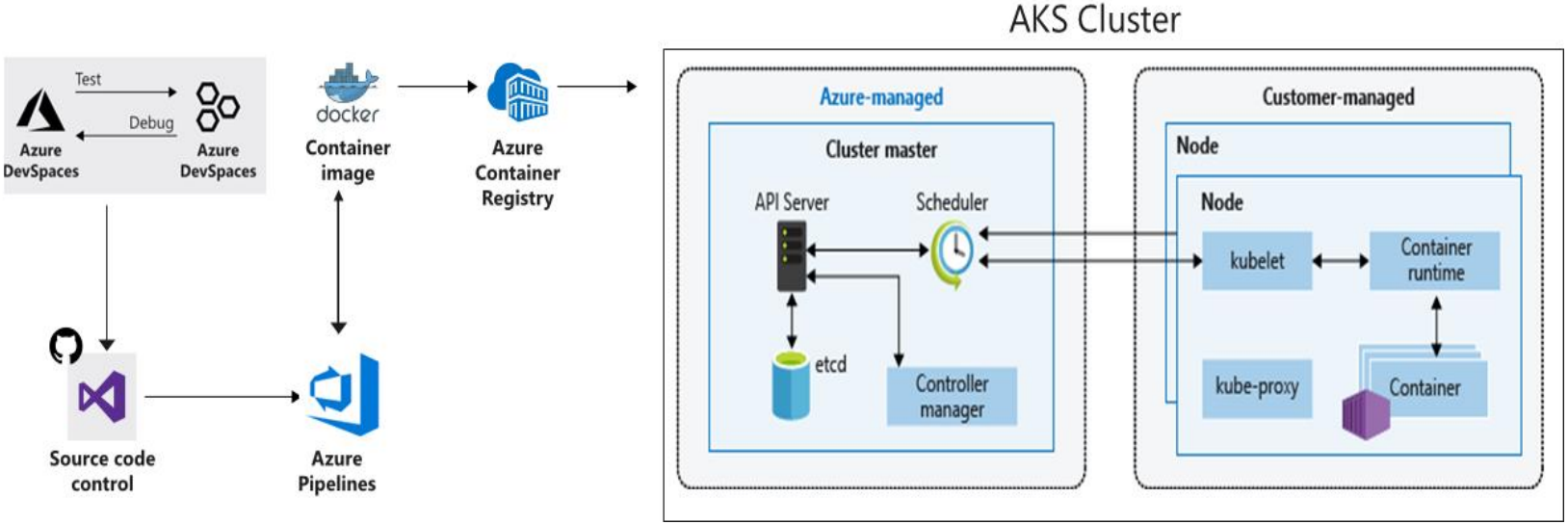
Term	Description
Pools	Groups of nodes with identical configurations.
Nodes	Individual VM running containerized applications.
Pods	Single instance of an application. A pod can contain multiple containers.
Deployment	One or more identical pods managed by Kubernetes.
Manifest	YAML file describing a deployment



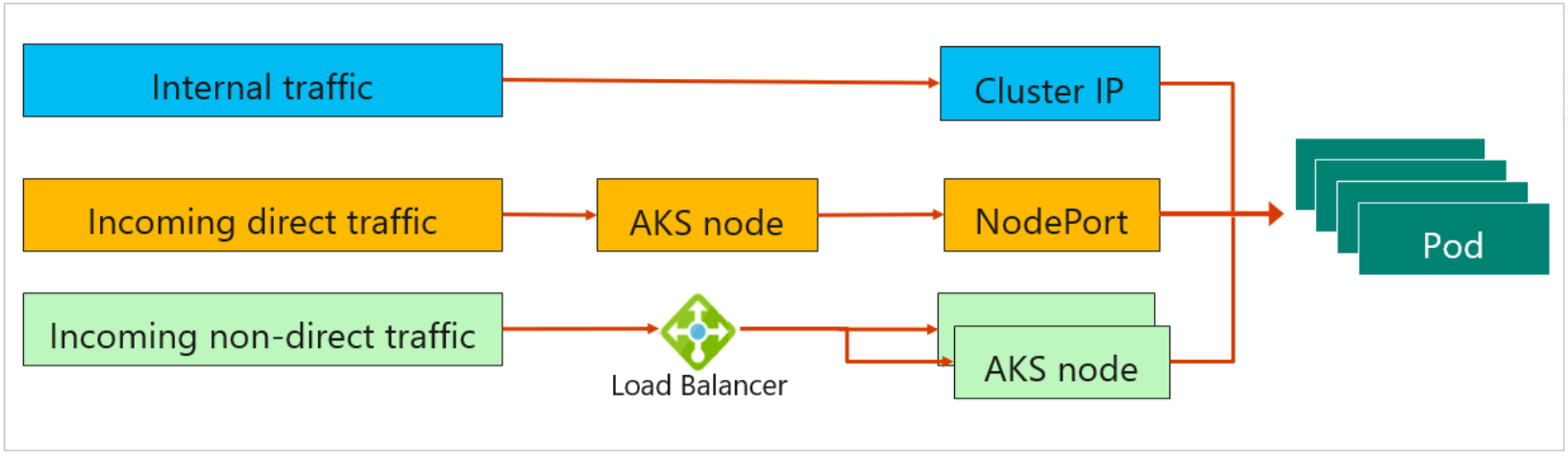
AKS Architecture



AKS Architecture

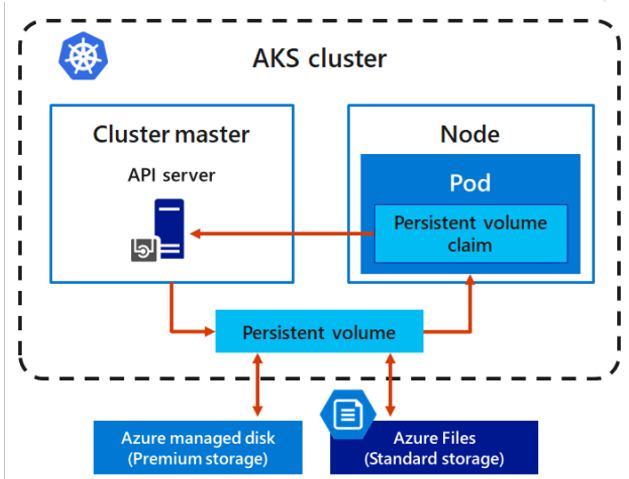


AKS Networking

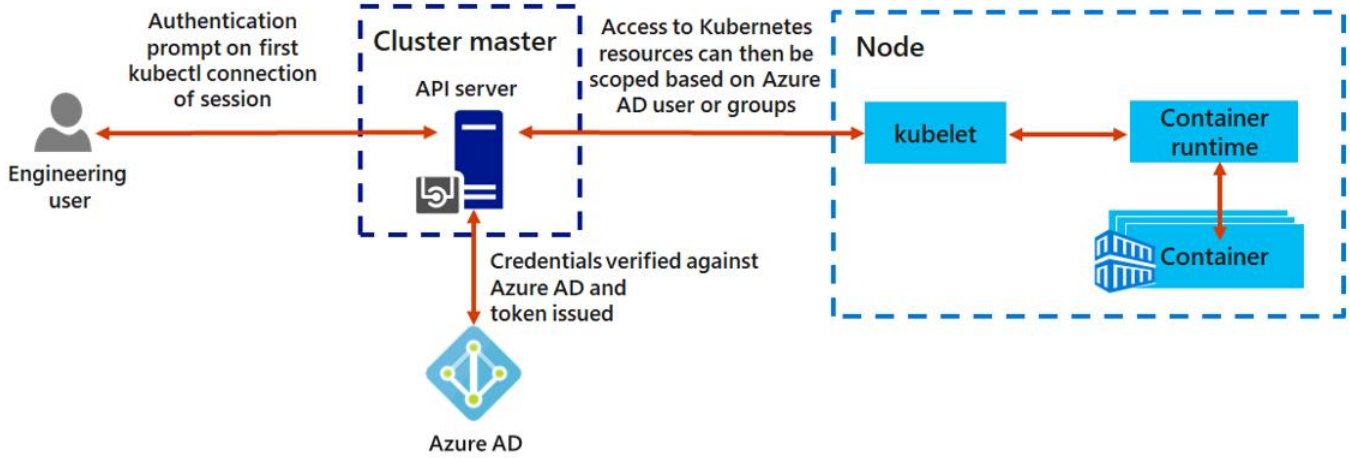


AKS Storage

- Local storage on the node is fast and simple to use
- Local storage might not be available after the pod is deleted
- Multiple pods may share data volumes
- Storage could potentially be reattached to another pod



AKS and Azure Active Directory



Demostrations

Configuring and Securing ACR and AKS

Thanks!

Any questions?

You can find me at:

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References

- https://docs.microsoft.com/en-us/