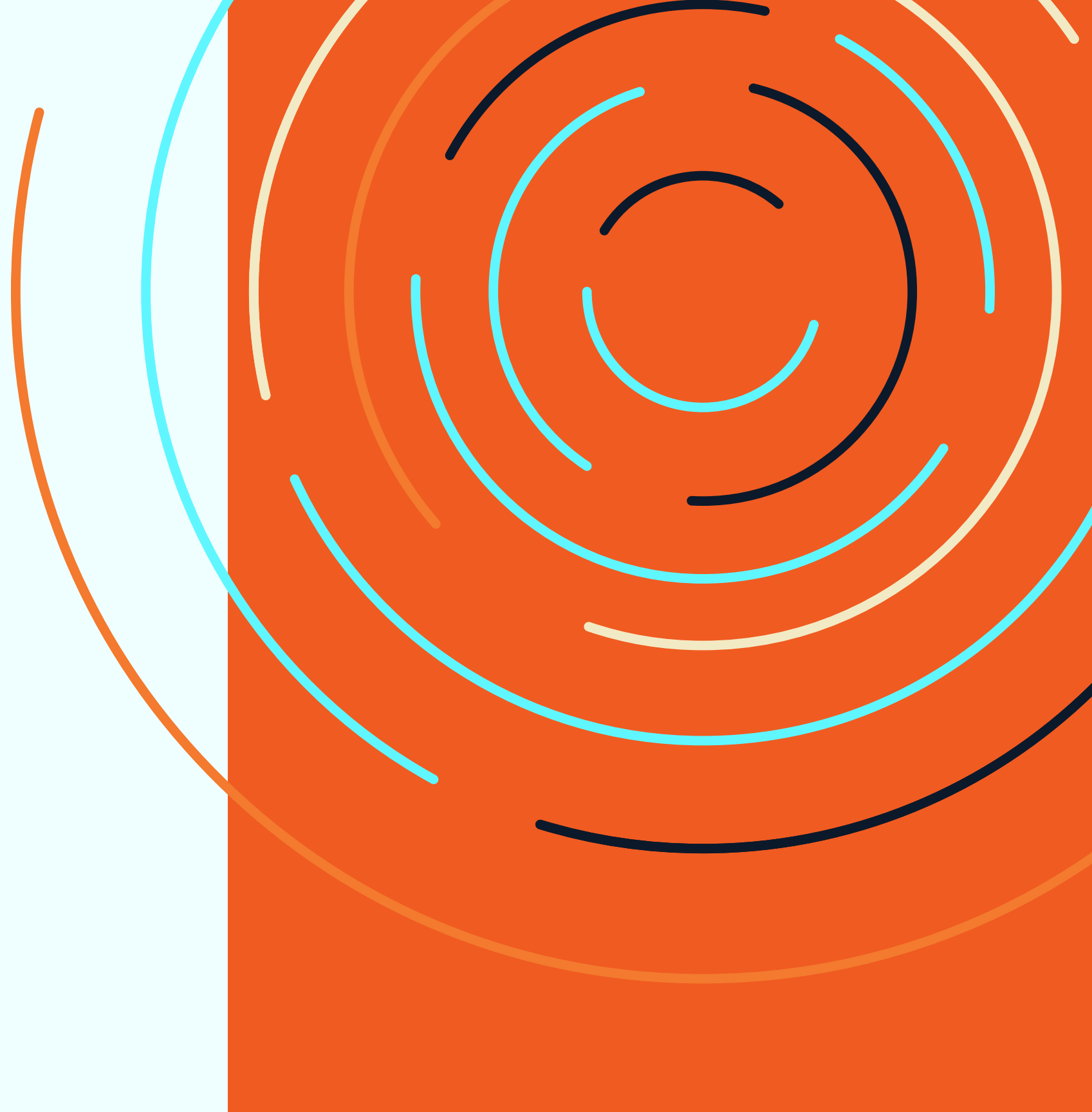


ACCELERATE LEGACY APP INNOVATION WITH LESS RISK

AZURE KUBERNETES SERVICE



DEFINE A CLOUD STRATEGY FOR YOUR LEGACY APPS

Reduce costs. Scale to meet rising and falling traffic. Boost performance. These are a few of the drivers of the cloud computing revolution. Many organizations realize huge upside from offloading the operational tasks associated with managing data centers to cloud service providers. Capital expense budgets go down, and IT has more time to focus on priority business initiatives. But just because the benefits are clear doesn't mean that cloud migration is easy.



IN 2019

just 22% of enterprise primary workload deployments were on the public cloud¹

¹Report: Voice of the Enterprise: Digital Pulse, Workloads & Key Projects - Quarterly Advisory Report.

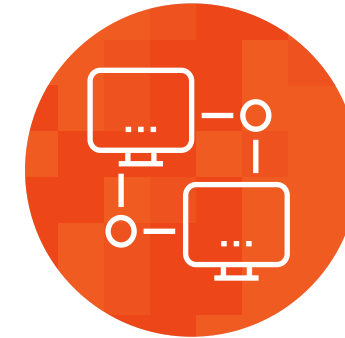


“Lift and shift” or rebuild?

The biggest roadblock to cloud migration: your legacy apps. These apps have a traditional monolithic architecture with tightly coupled services. They are complex, difficult to update, and resistant to modern approaches to software development. If you want to make changes to a single service, the entire application is affected. This eats into schedules and is demanding on resources.

You also must confront aging infrastructure. Legacy apps often run on outdated equipment. Over time, app performance drops, and cybersecurity risks rise.

To address these issues, many IT decision makers consider a “lift and shift” approach to cloud migration. For some apps, this may be the right strategy. You can take advantage of modern infrastructure without a costly rebuild. However, a “lift and shift” may not allow you to embrace all the benefits of the cloud.



Split the difference with microservices

Even if “lift and shift” makes sense today, there are future opportunities to consider. The modern cloud is more than just better-performing servers. Low-code artificial intelligence, data analytics, and other services can infuse innovation into your products, but accessing those services is tough with a monolithic architecture.

So, does that mean you have to tear it down and start over? Not necessarily. A microservices approach combined with the orchestration tools of Azure Kubernetes Service (AKS) lets you evolve your app over time to seize business opportunities while minimizing risk.

MODERNIZE YOUR APP, INCREMENTALLY

Modern software development methods deliver value to customers at a faster clip by breaking large applications into smaller decoupled components. You may already employ a microservices architecture for new apps, but this approach can also help you move your legacy apps to the cloud in a controlled manner. It starts by identifying the services within your monolithic app that are core to your business. You should also know which ones are the easiest to decouple from the rest of the app. This will help you prioritize and define your modernization strategy.



By 2022, Gartner predicts, +75% of organizations will run containerized applications in production



Remove dependencies on underlying infrastructure

Containers make building microservices easier. A container image is an isolated package that includes the microservice, libraries, and other dependencies needed to run the software. The most popular container solution is Docker. By containerizing the app, you can run it anywhere, whether on a local machine, in a test environment, or in production. This gives a lot of flexibility to your engineers. They can select the libraries and frameworks that are best suited for the app without regard for how the production or test environments are configured. Containers also support a hybrid or multi-cloud strategy. You can deploy to on-premises or the cloud and move them as business needs change. Most importantly, containers eliminate the dependency on your existing infrastructure.

Containers are lightweight and portable



Spin them up in seconds



Run them anywhere



Support modern development and architecture



Utilize servers more efficiently

MAXIMIZE YOUR INFRASTRUCTURE INVESTMENT

Containers don't just save time for engineers, they can also reduce your infrastructure spend.

A single server can run only one operating system (OS). To maximize performance and security, IT typically only runs one mission-critical application per server. This often results in a lot of underutilized hardware. Virtual machine (VM) technology was the first innovation to address hardware utilization. Installing a hypervisor allows multiple operating systems on a single server. Each VM is isolated, so IT can confidently run more apps per server. However, VMs take up a lot of server space.

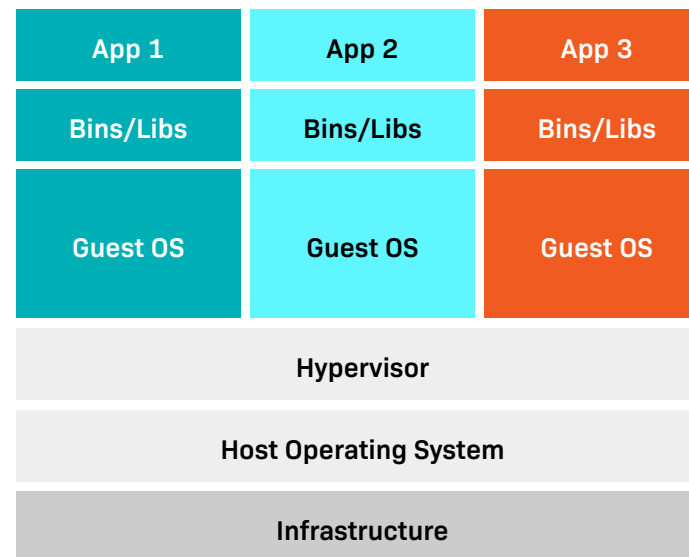
Containers are the next evolution. A container is packaged with a much lighter weight OS, because it shares the OS kernel installed on the server. A single server can host many more containers than VMs. Since only the shared OS must be maintained, it also reduces IT overhead.

Does it scale?

Containers make it easier for your team to split large applications into smaller modules that can be built, tested, and deployed. Modules can be developed by small independent teams using an apropos programming language. This is what makes them so powerful. But eventually they need to communicate with other containers and the outside world. They may need to be scaled up and down to accommodate changes in traffic. Complexity that used to exist within a monolithic app is now managed across containers.

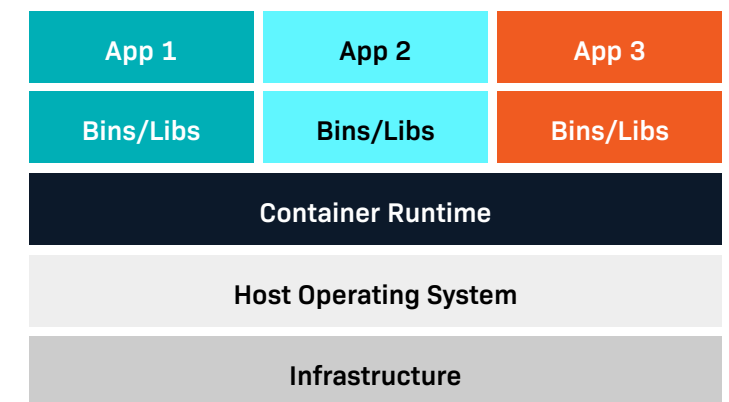
Once deployed, each container needs to be monitored for overall health and traffic. If there are issues, a new container must be deployed. If multiple containers are required, each one must be manually deployed. The work can quickly overwhelm teams that manage large applications. Azure Kubernetes Service (AKS) removes much of this burden by simplifying the deployment and management of your container environment.

VIRTUAL MACHINES



CONTAINERS

A server running three virtual machines would require a hypervisor and three additional operating systems. A server running three containers runs a single operating system that is shared between the containers.



SCALE AS THE BUSINESS DEMANDS

Kubernetes is an open-source orchestration solution for deploying and managing containers. AKS builds on the strength of Kubernetes with enterprise-grade security and a simplified development-to-production experience. With AKS you can operationalize containers at scale.

A large website or application may include hundreds or thousands of microservices, each in its own container. If your application is heavily trafficked, containers need to be deployed across multiple servers. The health of the containers must be monitored over time. AKS automates all these tasks.

Build and store container images in Azure Container Registry and use a declarative approach to define a “desired state” for deployments. Once containers are deployed, AKS helps you optimize your infrastructure resources at scale. AKS automates load balancing and facilitates storage sharing across containers. You can easily scale containers up or down to meet traffic demands.



Protect customer data in your AKS cluster

AKS provides built-in features to apply security controls to your AKS cluster and its components. Network policies let you define how traffic can flow between components and outside resources. AKS also integrates with Azure Active Directory to secure identity and access management.

Support your hybrid environment

Azure Kubernetes Service can connect workloads across any environment, whether in the cloud or on-premises. As you migrate microservices to the cloud, you will need to connect to your external resources, such as managed databases, API management, storage, and other services. No matter where you host these resources, in any cloud or on-premises, AKS can securely communicate with them. You can even set up a private network for workloads that you don't want to connect to the public internet.

Azure Kubernetes Service simplifies management of your containerized apps



Secure your workloads



Scale to meet traffic demands



Automate load balancing and sharing of storage across containers

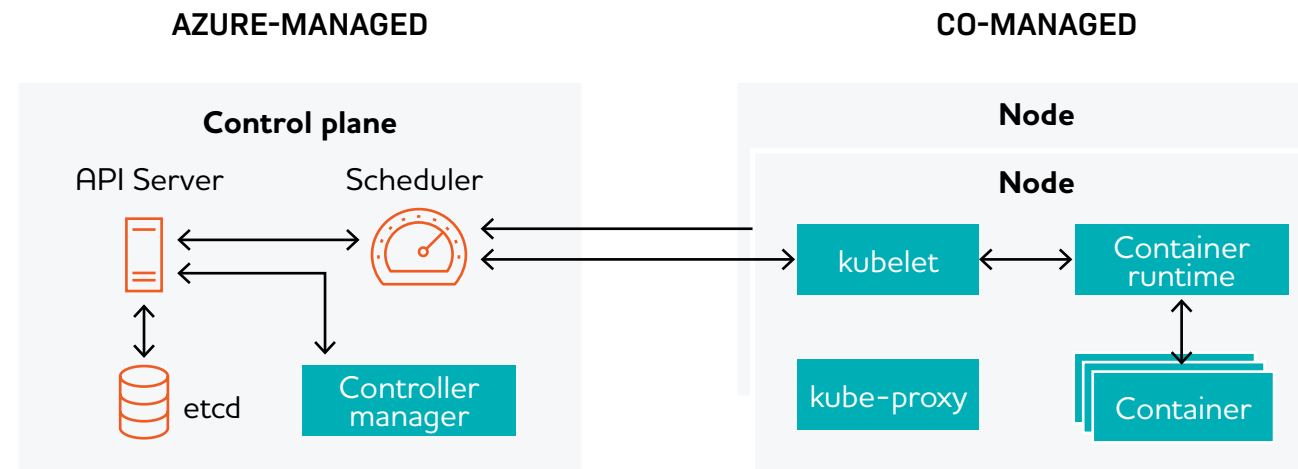


Easily deploy workloads with your preferred DevOps tooling

THE CORE CONCEPTS

The Kubernetes architecture consists of several components: nodes, clusters, pods, and containers. A node is a VM instance that runs your application workloads. Nodes are grouped into clusters and run by the control plane. Each worker node hosts one or more pods. A pod typically contains a single container. If two or more containers are highly dependent on each other, they can be placed in the same pod. A “desired state” is declared for the operations of a container. This “desired state” is deployed to the Kubernetes cluster and persisted in the etcd store. It is the responsibility of the Kubernetes API to ensure that the desired state is maintained.

With Azure Kubernetes Service (AKS) the AKS control plane is managed by the Azure platform. This reduces the complexity of deployment and core management tasks. Customers are responsible for determining the size and quantity of the nodes. Microsoft takes responsibility for OS security fixes or kernel updates.



kube-apiserver:	Exposes the Kubernetes API
kube-scheduler:	Assigns nodes for new pods
kube-controller-manager:	Ensures the nodes are all up running and the correct number of pods are running
etcd:	Stores cluster data in a distributed key-value lightweight database
kubelet:	Communicates with the master to ensure that containers are running and healthy
kube-proxy:	Maintains the distributed network across all the nodes, across all the pods, and across all the containers; also exposes services to the outside world



MEET CLOUD MIGRATION GOALS, WITH LESS RISK

With AKS you don't have to choose between a costly rebuild of your entire legacy app and a "lift and shift" approach that isn't future-proof. Containerize components of your app and move the highest-value, lowest-risk components first. AKS simplifies operations and gives you access to improved security, lower costs, and the innovative potential of the cloud.

Try out AKS with a proof of concept

Contact SNP to test an AKS proof of concept in your organization. SNP is a service provider with expertise in AKS and other Azure services. We can help you narrow your options and accelerate implementation.

[CONTACT SNP](#)