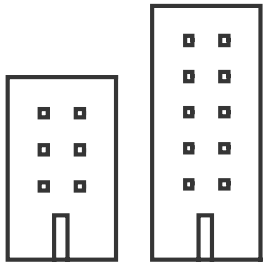
Containers on Azure Overview

Speaker

Widening divide between business and IT

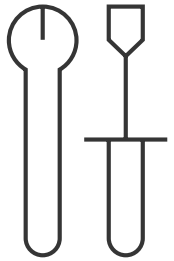


Business needs

Rapid innovation to transform products

Close the gap from data to decision

Connect with customers
and empower employees



IT challenges

72% of IT budgets are dedicated towards maintenance (‘keeping the lights on’).

Only half of all decision makers got help from technologists with their analysis needs

Demand for mobile apps
>5x the capacity of IT

Are your systems ready for these challenges?

Why modernize?

Reasons to modernize

- **Aging infrastructure**
  - Low efficiency and reliability.
  - High operational costs and capital expenditure.
  - Growing security, audit, and compliance requirements.
  - Inflexible and unable to keep up with business growth.
- **Stagnant architecture**
  - Legacy stack and code.
  - Long deployment times and release cycles.
  - Incompatibilities with modern software systems.
  - It's hard or impossible to add new functionality.
  - Innovation is happening outside IT, unmanaged.

Modernization benefits

- **Turn CapEx into OpEx**
- **Increased operational efficiency**
  - Get out of the data center business.
  - Meet security and compliance requirements.
  - Reduce time and budget spent on infrastructure management.
- **Rapid innovation**
  - Ship new capabilities faster.
  - Achieve scalability with confidence.
  - Better collaboration across business, Ops, IT and dev teams.

The benefits of using containers

Agility

Ship apps faster

Portability

Easily move workloads

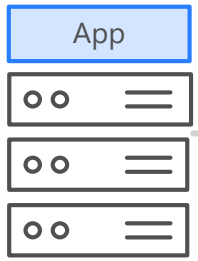
Density

Achieve resource efficiency

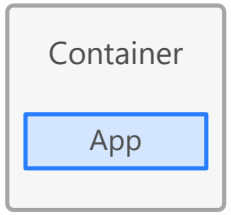
Rapid scale

Scale easily to meet demand

From traditional systems to portfolio of modern apps



Existing/New Applications



Containerize Applications

Each host often runs **8** containers at a time[1]

Microservices

Seconds to deploy, churns **12x** faster[1]

Continuous innovation with DevOps

46x more frequent for code delivery[2]

Source:

1: Datadog Report: 8 Surprising Facts About Real Docker Adoption; 2: 2017 state of DevOps Report

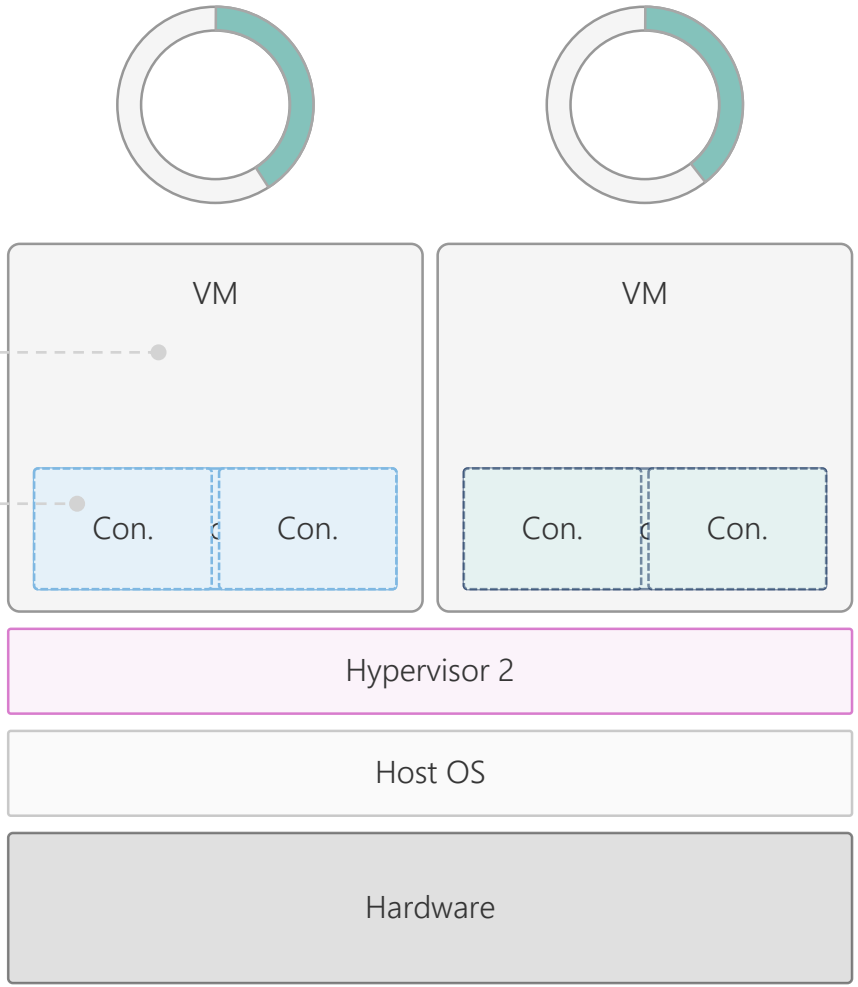
The container **advantage**

Traditional virtualized environment

Low utilization of container resources

Containerization of applications and their dependencies for portability

From dev to production agility across development and operations teams



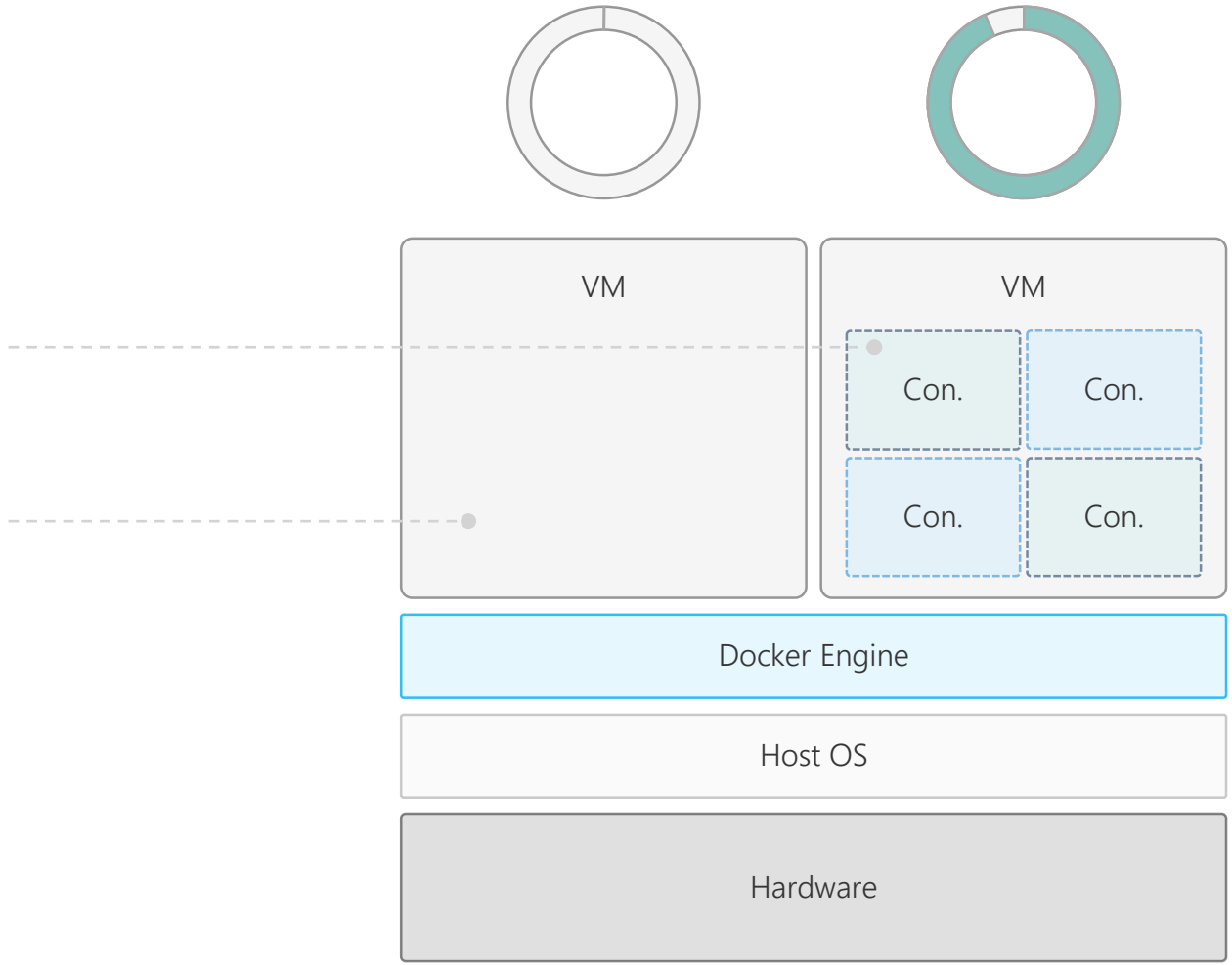
The container **advantage**

Containerized environment

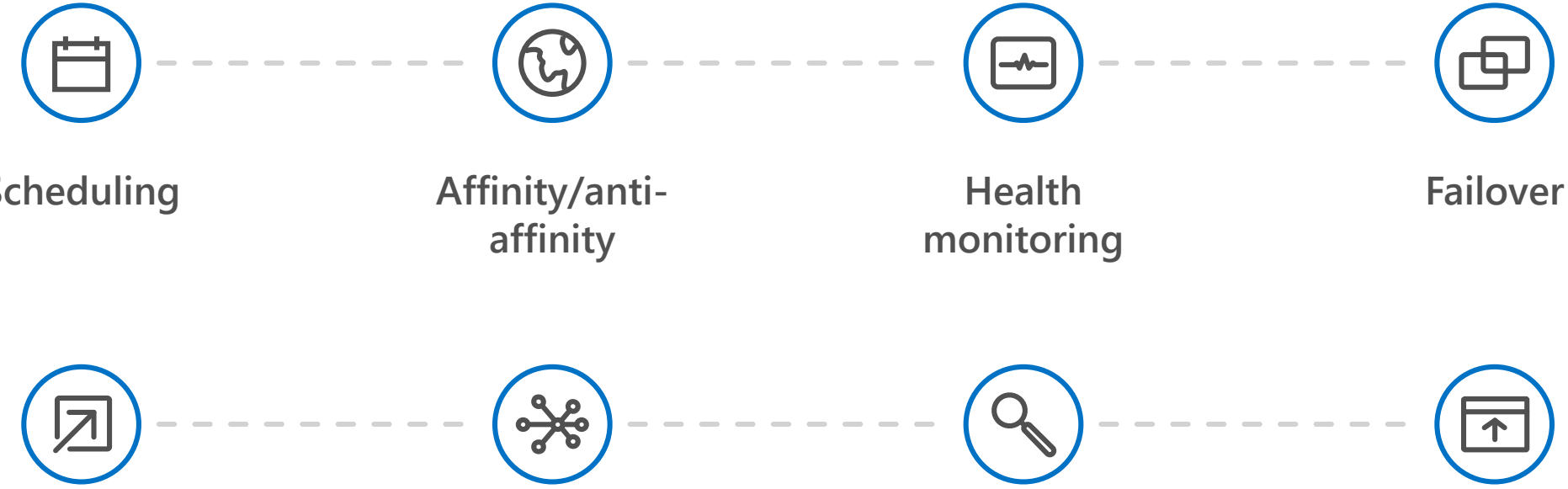
Migrate containers and their dependencies to underutilized VMs for improved density and isolation

Decommission unused resources for efficiency gains and cost savings

Container is lighter weight and faster to scale dynamically



The elements of **orchestration**



Kubernetes: empowering you to do more

Portable

Public, private, hybrid, multi-cloud

Extensible

Modular, pluggable, hookable, composable

Self-healing

Auto-placement, auto-restart, auto-replication, auto-scaling

Deploy your applications quickly and predictably

Scale your applications on the fly

Roll out new features seamlessly

Limit hardware usage to required resources only

Containers in Azure

App Service

Deploy web apps or APIs using containers in a PaaS environment

Service Fabric

Modernize .NET applications to microservices using Windows Server containers

Kubernetes Service

Scale and orchestrate Linux containers using Kubernetes

Container Instance

Elastically burst from your Azure Kubernetes Service (AKS) cluster

Ecosystem

Bring your Partner solutions that run great on Azure

Azure Container Registry

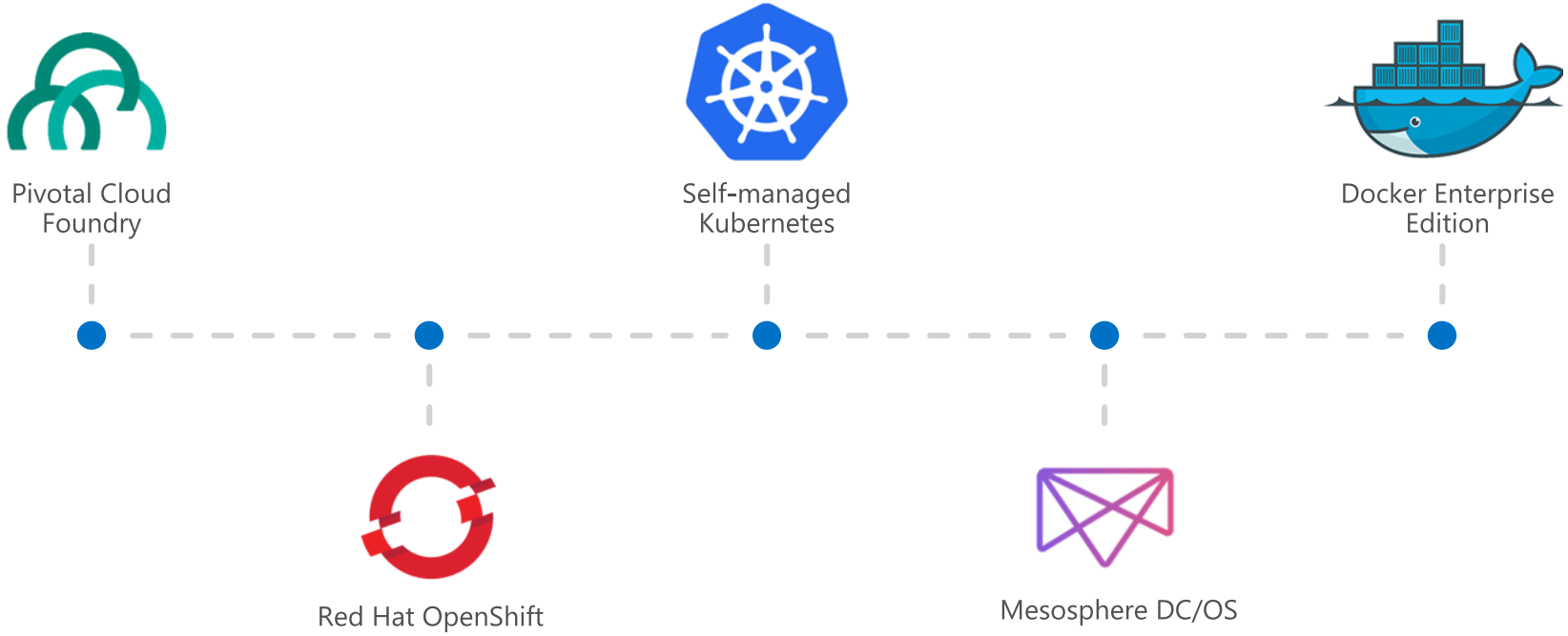
Docker Hub

Choice of developer tools and clients

If you have a preferred container platform

Pivotal Cloud Foundry · Kubernetes · Docker Enterprise Edition

Red Hat OpenShift · Mesosphere DC/OS



You could bring that platform to Azure

Choose the platform that meet your container needs

Flexibility Productivity Trust

Deploy web apps or APIs using Linux containers in a PaaS environment

Azure App Service

Scale and orchestrate Linux containers using Kubernetes

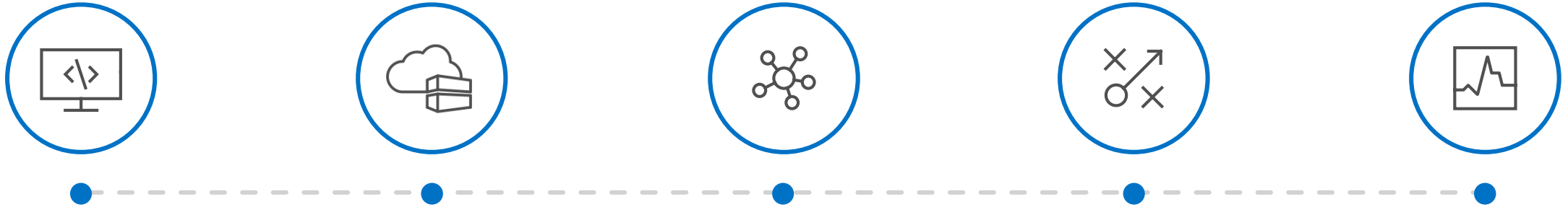
Azure Kubernetes Service (AKS)

Lift, shift and modernize .NET applications to microservices using Windows Server containers

Azure Service Fabric

Productivity

Accelerate containerized application development



Automatically containerize and scaffold any applications directly from IDE

Auto-build to a secure container registry

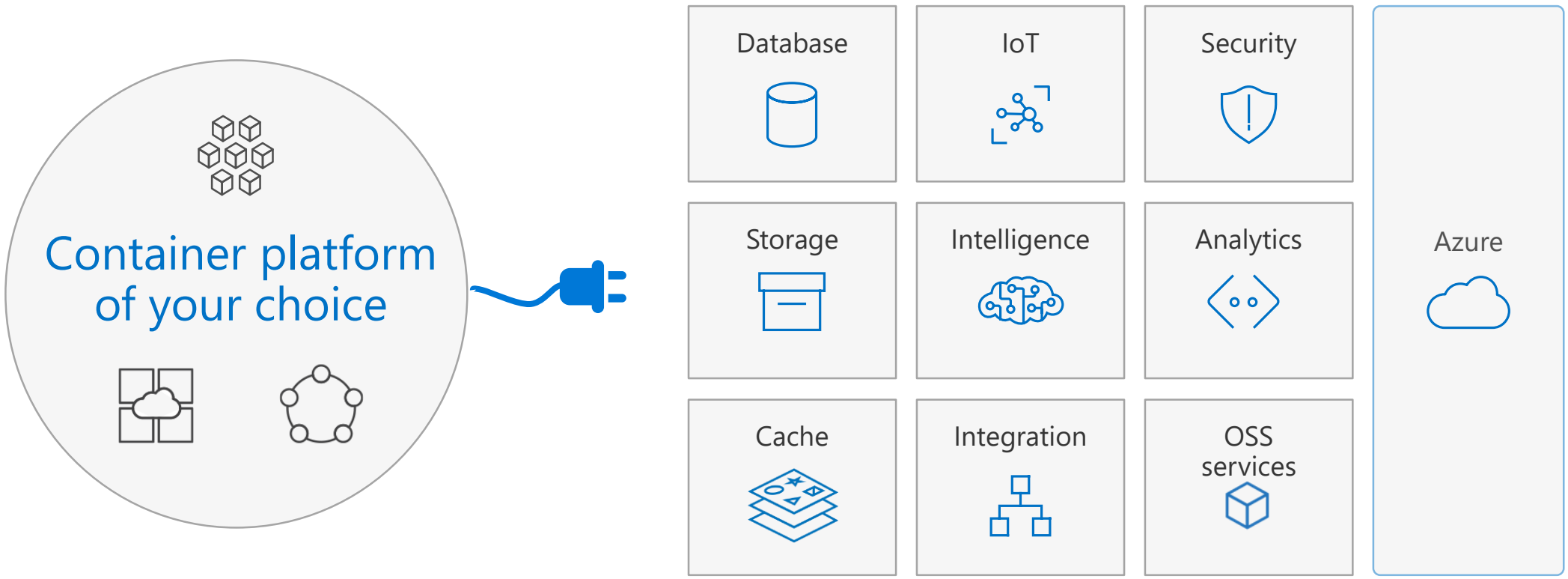
Rapidly iterate, test and debug microservices

A few clicks to receive a full CI/CD pipeline

Built-in monitoring and logging to get full visibility of container health and app telemetry

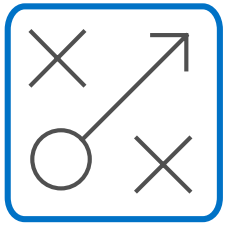
Productivity

Choose from 100+ services from Marketplace



Trust

Manage, monitor, and secure your containers

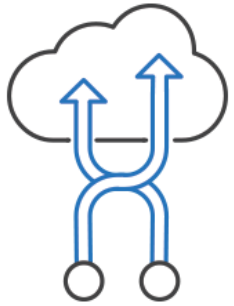


Efficiently manage container images

Manage a Docker private registry as a first-class Azure resource with Container Registry. Manage container images with familiar, open-source Docker command-line interface (CLI) tools.

Gain visibility into your containers

Get a full view of your container deployment. View centralized CPU, memory, storage, and network and performance information with tools like Application Insights and Log Analytics.



Integrate security with container applications

Provide full-stack security for your containers including vulnerability scanning, run-time protection, and compliance. Add single sign-on with Azure Active Directory.

Azure Kubernetes Service (AKS)

App Service

Azure Container Instances (ACI)

Service Fabric

Azure Batch

Azure Container Registry (ACR)

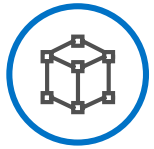
Azure Kubernetes Service (AKS)

Simplify the deployment, management, and operations of Kubernetes

Deploy and manage Kubernetes with ease

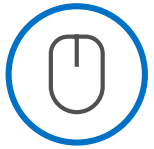
Scale and run applications with confidence

Secure your Kubernetes environment



Accelerate containerized application development

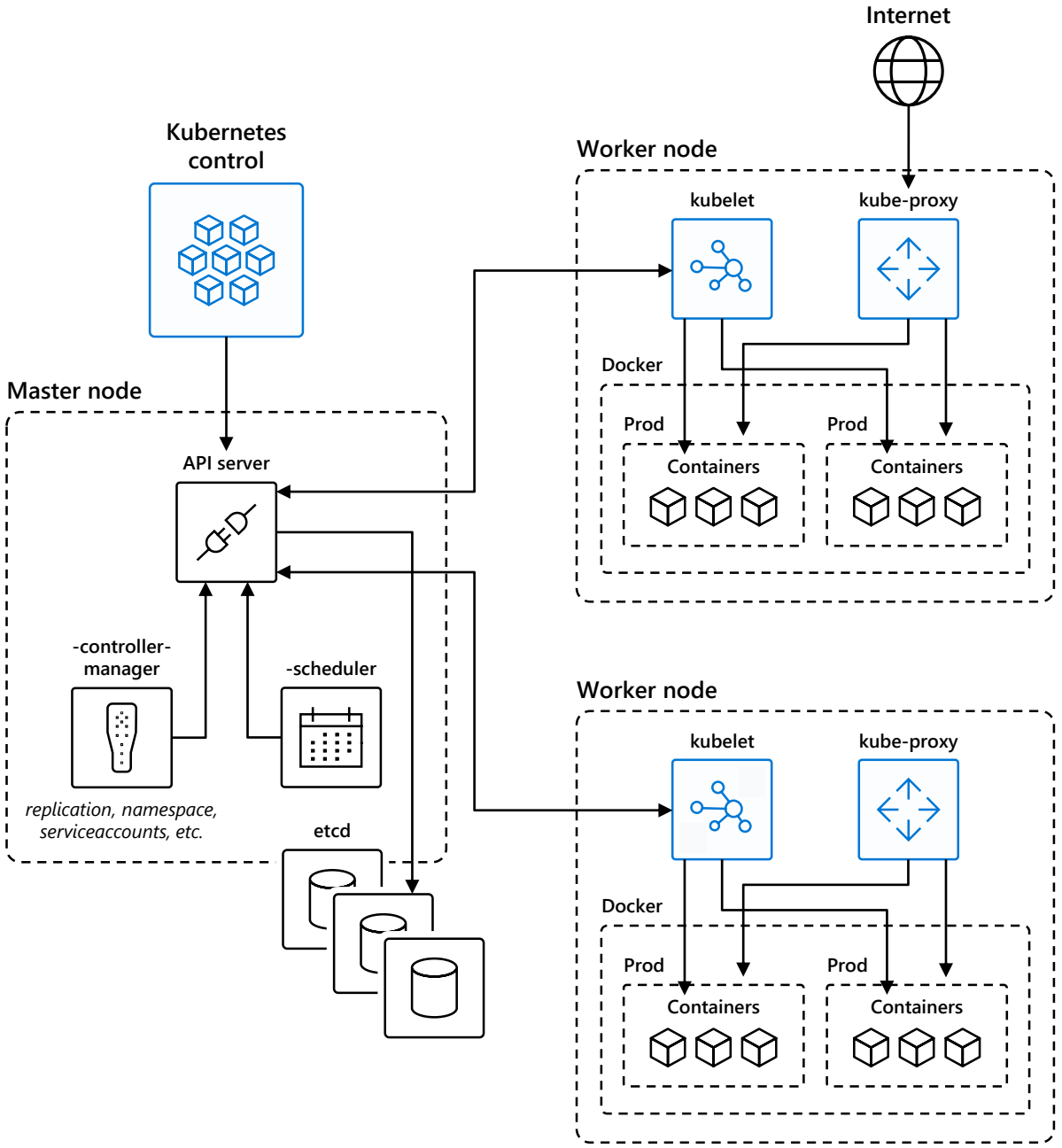
Work how you want with open-source tools & APIs



Set up CI/CD in a few clicks

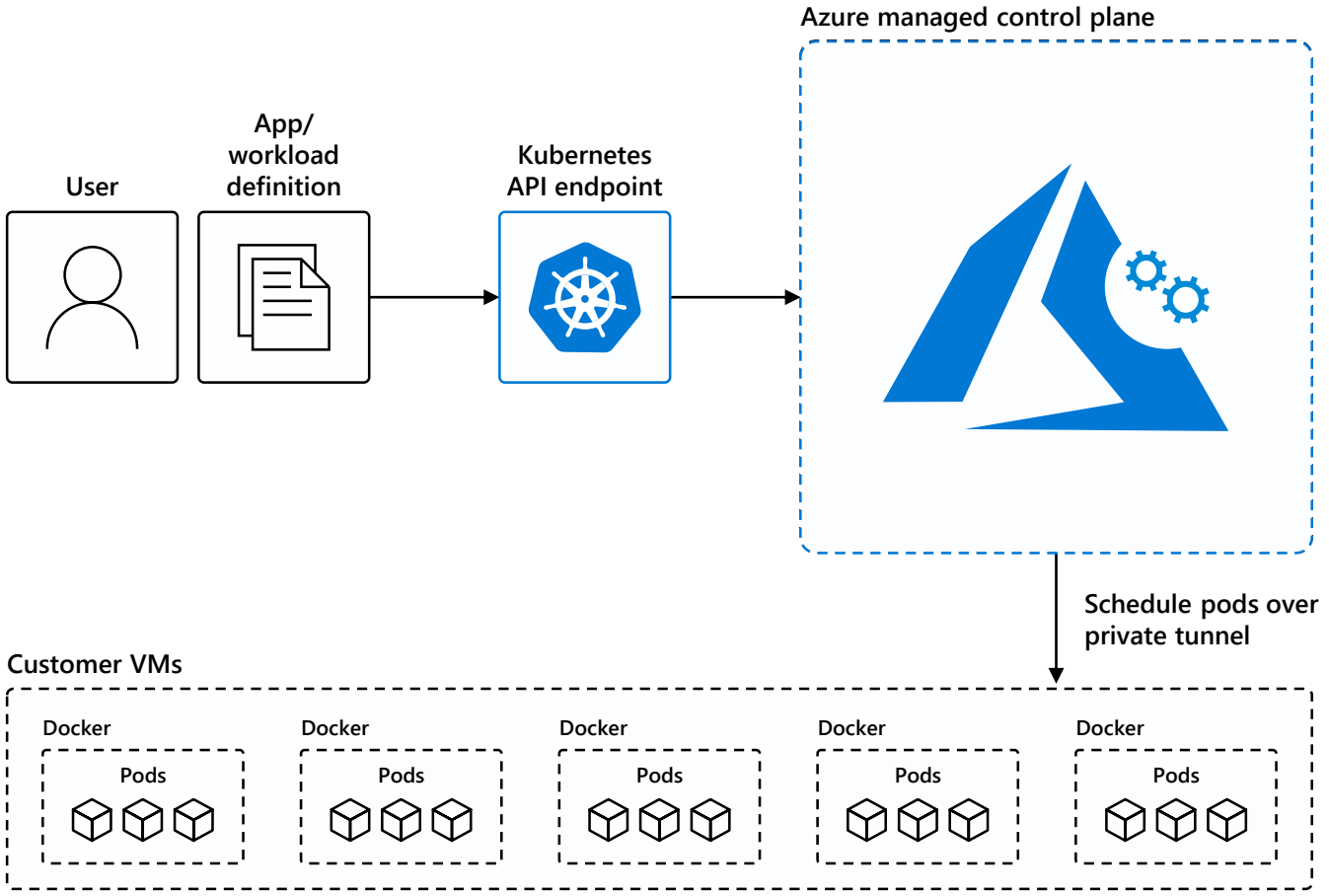
Kubernetes 101

1. Kubernetes users communicate with API server and apply desired state
2. Master nodes actively enforce desired state on worker nodes
3. Worker nodes support communication between containers
4. Worker nodes support communication from the Internet



How managed Kubernetes on Azure works

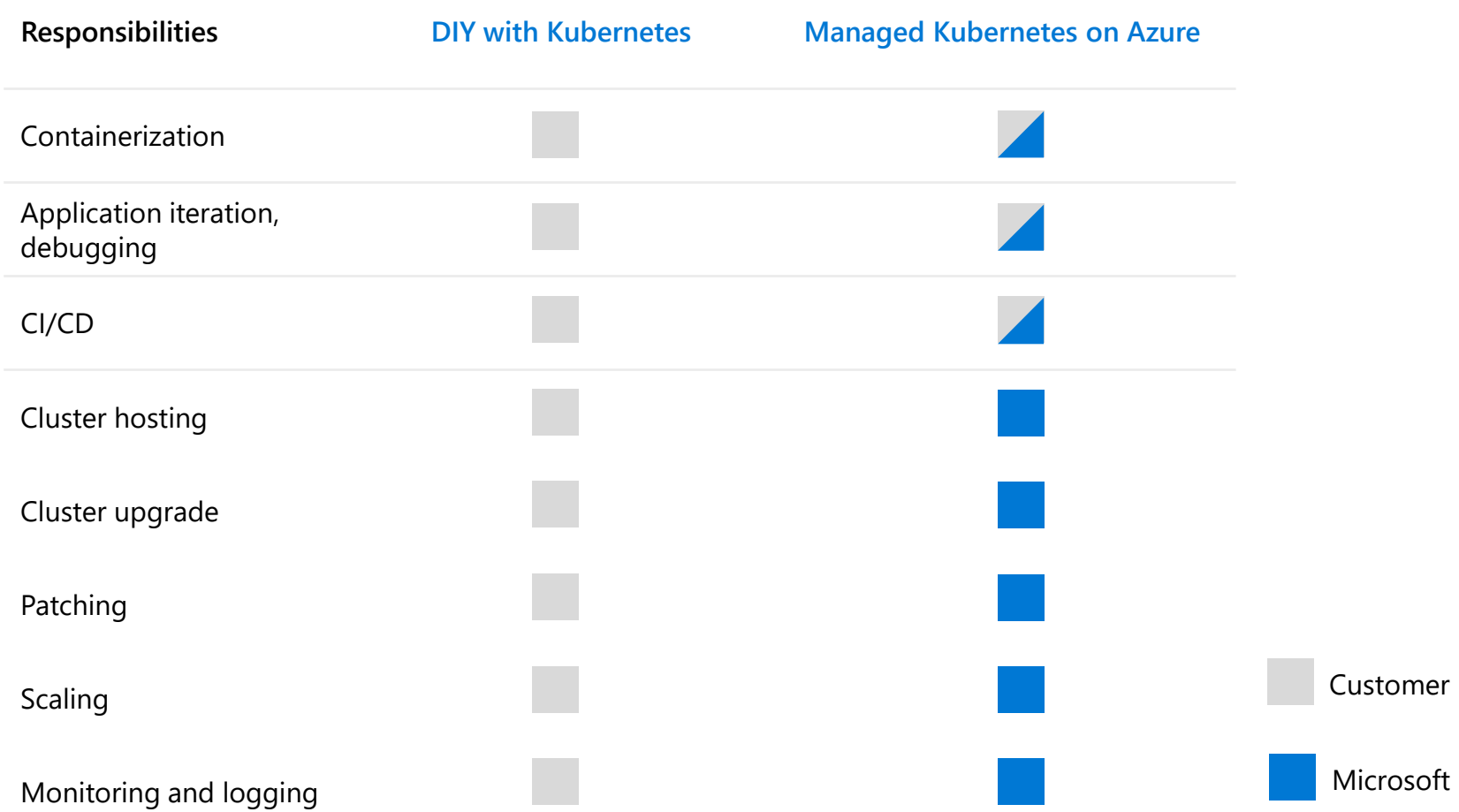
- Automated upgrades, patches
- High reliability, availability
- Easy, secure cluster scaling
- Self-healing
- API server monitoring
- At no charge



From infrastructure to **innovation**

Managed Kubernetes empowers you to do more

Focus on your containers and code, not the plumbing of them



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App Service

Easily deploy and run container-based web apps at scale

Accelerated outer loop

Tight integration w/ Docker Hub, Azure Container Registry

Built-in CI/CD w/ Deployment Slots

Intelligent diagnostics & troubleshooting, remote debugging

Fully managed platform

Automatic scaling and load balancing

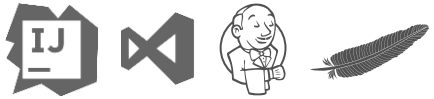
High availability w/ auto-patching

Backup & recovery

Flexibility & choices

From CLI, portal, or ARM template

Single Docker image, multi container w/ Docker Compose



IntelliJ, , Jenkin, Maven Visual Studio family

THE NOBEL PRIZE

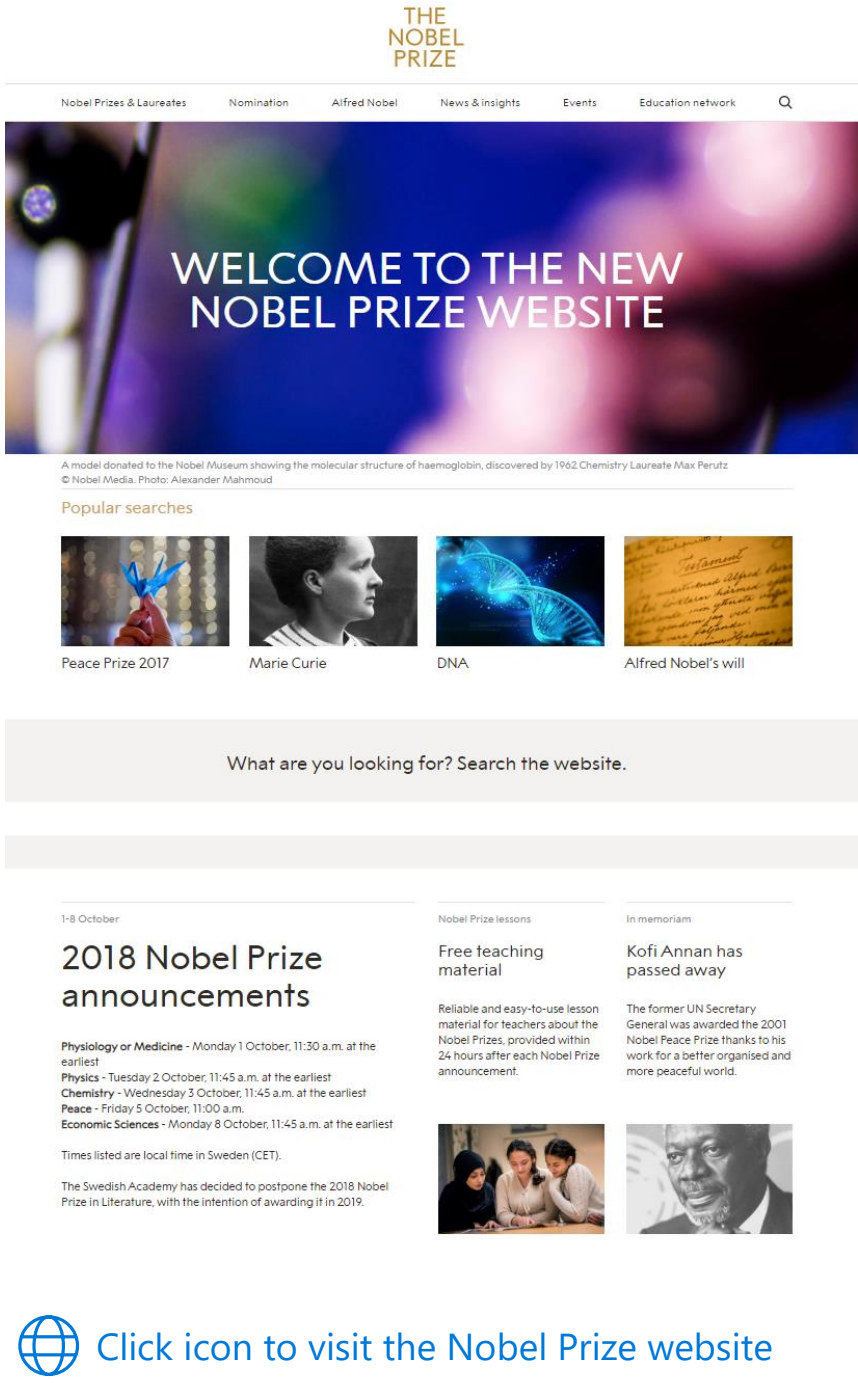
Relaunching the home of Nobel Prize awarded laureates and their discoveries

Challenge: For the NobelPrize.org relaunch, Nobel needed simplicity at scale to modernize their 10,000+ page worldwide site ahead of the quickly-approaching Nobel Prize announcements, bringing millions of visits each year.

Solution: To leverage the scalability and ease of PaaS, Nobel brought their containerized Linux application to Azure App Service Environment to ensure that their popular site can handle high traffic loads and meets their security requirements.

Outcome: Because the Linux on ASE PaaS offering abstracts away the complications of maintaining infrastructure, it was simple for Nobel to quickly shift their traditional application to a modern, flexible app in time for announcement week. Simple to get started, but can seamlessly handle scale with little maintenance.

> The use of [Azure App Service] allows us to rapidly test and implement new ideas with the mission to inform, inspire and engage our global audience on the Nobel Prize."
>
> — *Hans Mehlin, Chief Technology Office, Nobel Media*



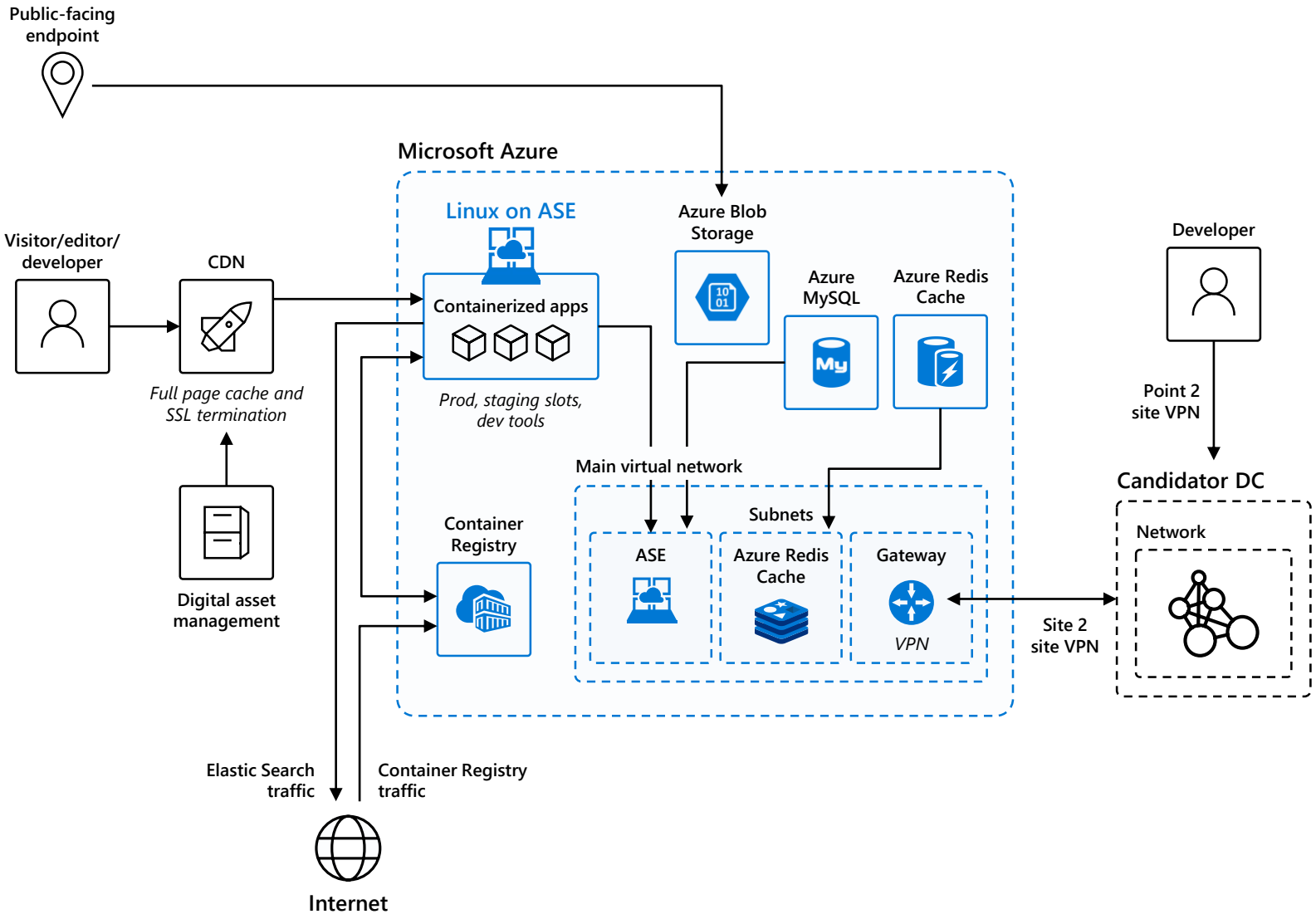
Click icon to visit the Nobel Prize website

Nobel Prize website

Deploy a global website using Linux containers in a PaaS environment

- Run containerized applications without worrying about the infrastructure
- Leave the scaling orchestration to our PaaS platform for hassle-free scaling for higher traffic loads
- Secure your applications in an Azure Virtual Network to meet security requirements

Simple to get started, but also robust to handle global scale with little maintenance



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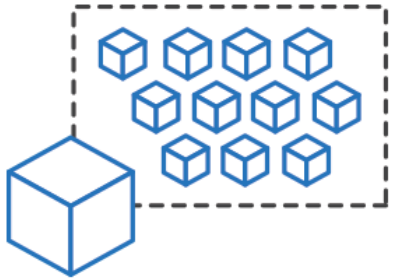
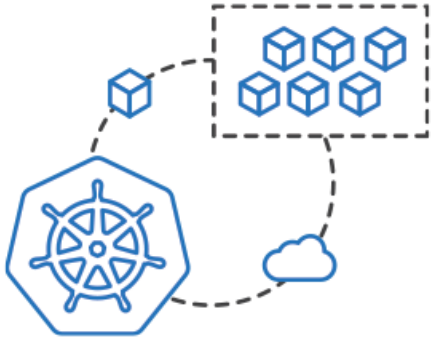
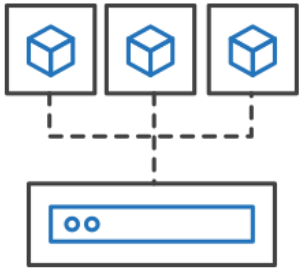
Easily run containers on Azure without managing servers



Run containers without managing servers



Increase agility with containers on demand



Secure applications with hypervisor isolation

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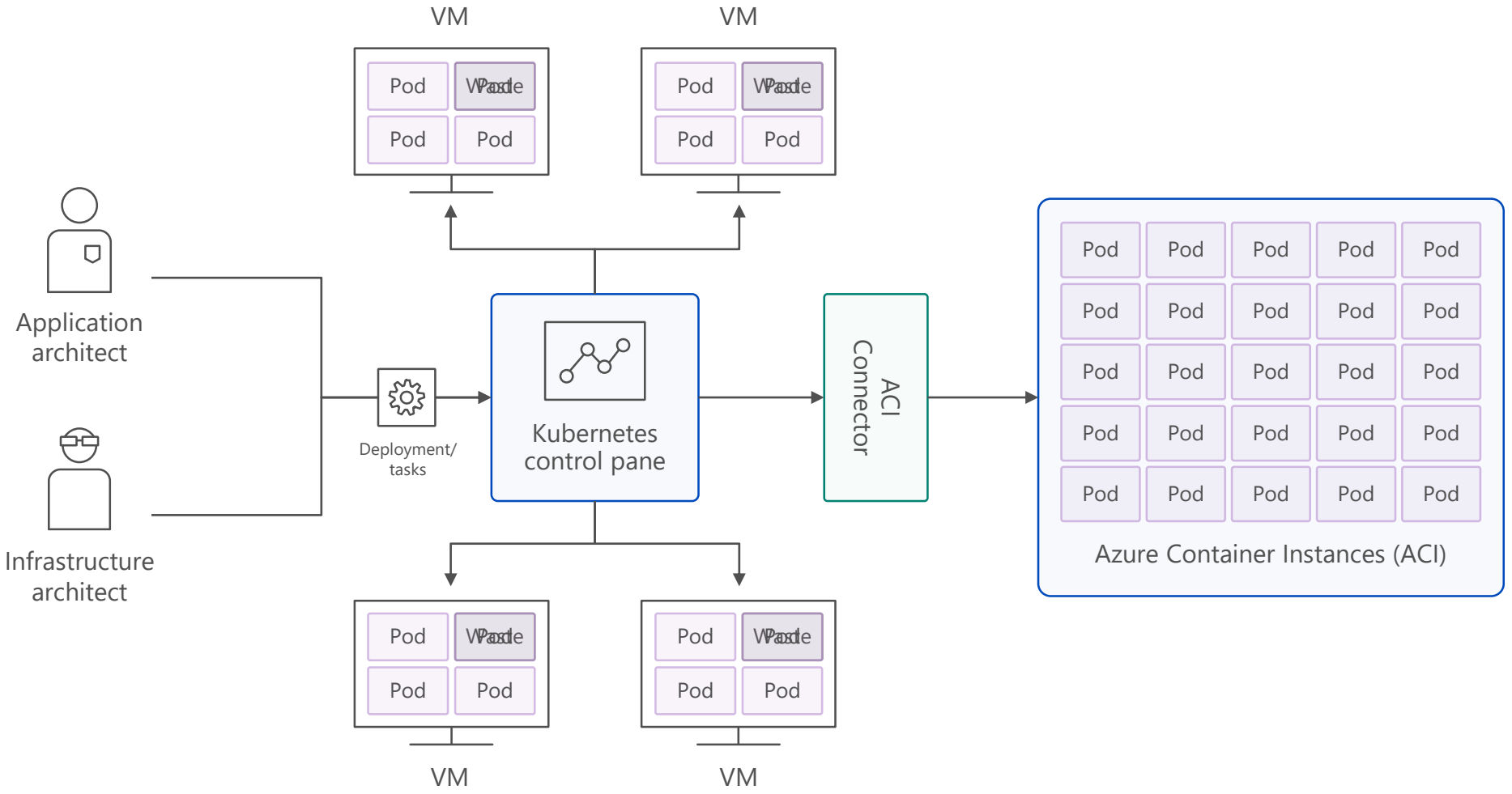
Bursting with the ACI Connector



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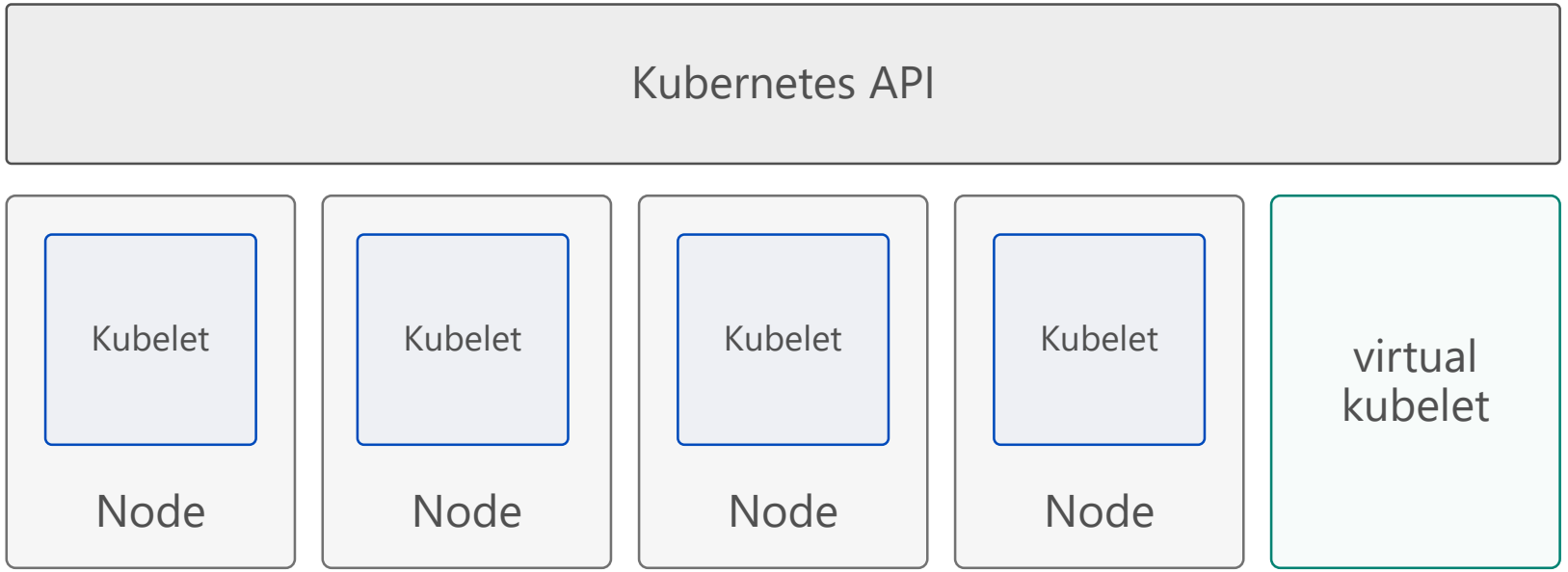
Virtual Kubelet



Typical kubelets implement the pod and container operations for each node as usual.

Virtual kublet registers itself as a “node” and allows developers to program their own behaviors for operations on pods and containers.

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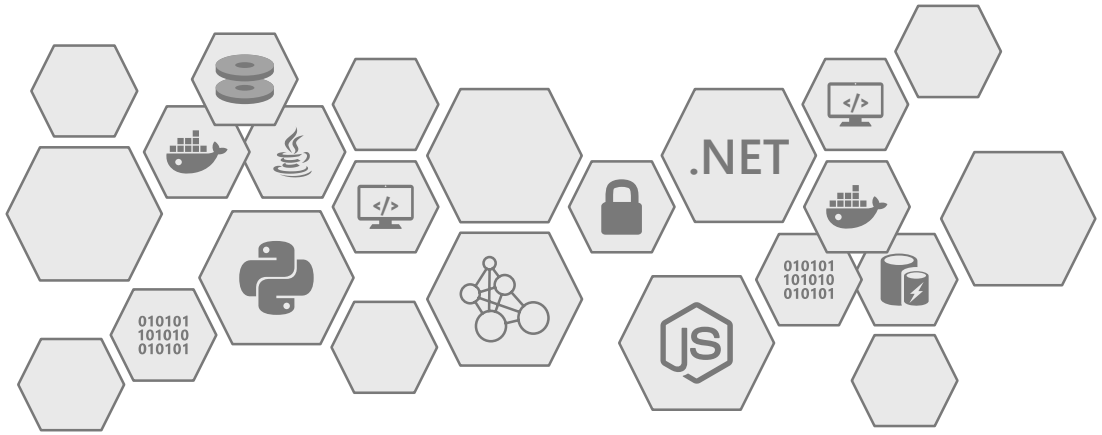
Azure Service Fabric

A microservices platform for business critical applications

Build **Deploy** **Operate**

always-on, highly scalable microservice apps



Flexible infrastructure

Lifecycle management

24/7 availability & performance

Elastic scalability

Microservice and container orchestration

Security & compliance

Health & monitoring

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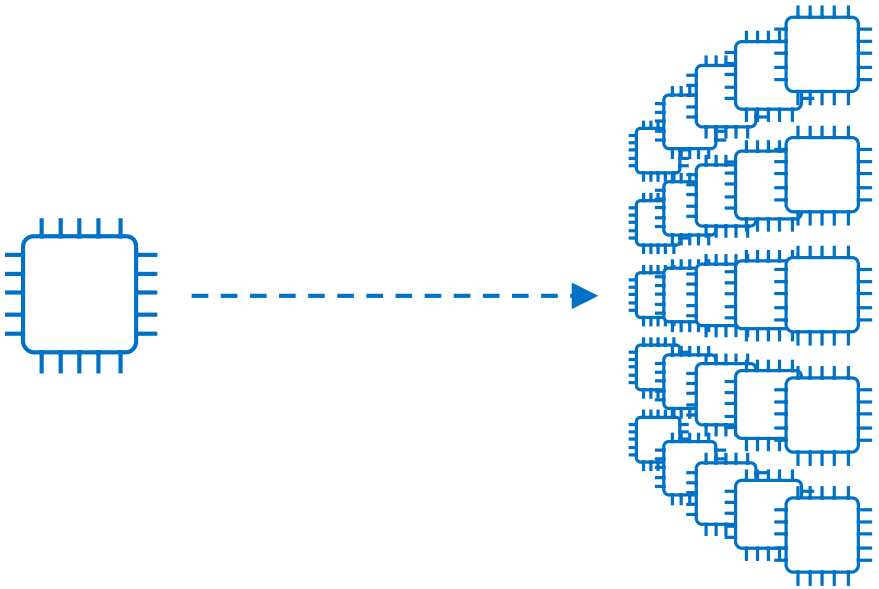
Azure Container Registry (ACR)

Azure Batch

Run repetitive compute jobs using containers



Enable applications and algorithms to easily and efficiently run in parallel at scale.

Run Batch tasks without having to manage an environment and dependencies.

Package, execute, and scale your High Performance Computing applications and batch workloads in a consistent, reproducible manner.

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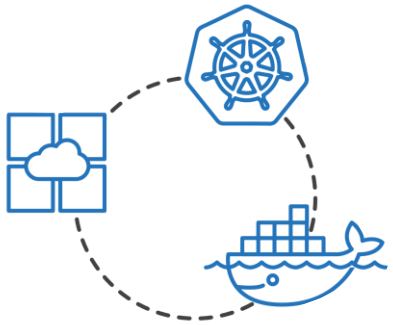
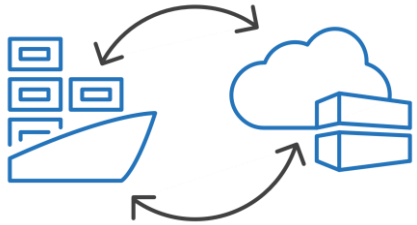
Manage a Docker private registry as a first-class Azure resource



Manage images for all types of containers



Use familiar, open-source Docker CLI tools

Azure Container Registry geo-replication

Microsoft