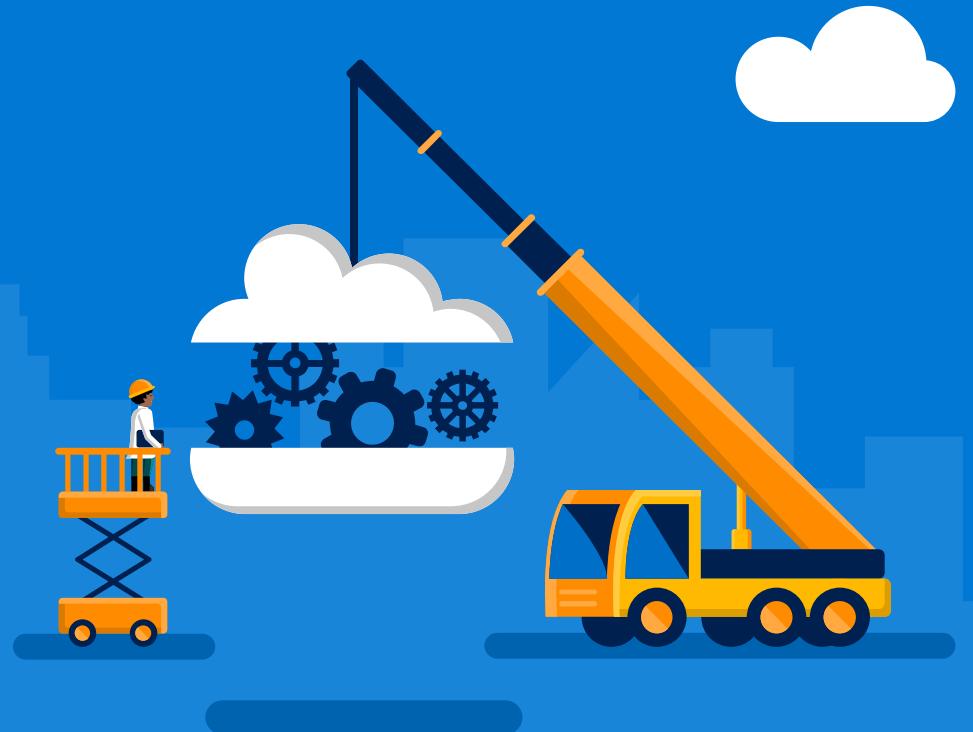


# Angelbeat

Shawn Weisfeld  
Cloud Solution Architect  
Microsoft



# About Me



**Shawn Weisfeld**

Cloud Solution Architect

Microsoft – One Commercial Partner Technical Team

[sweisfel@microsoft.com](mailto:sweisfel@microsoft.com)

Austin, TX

# Interested in attending other regional groups/events?

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<https://SouthCentralCommunity.com>

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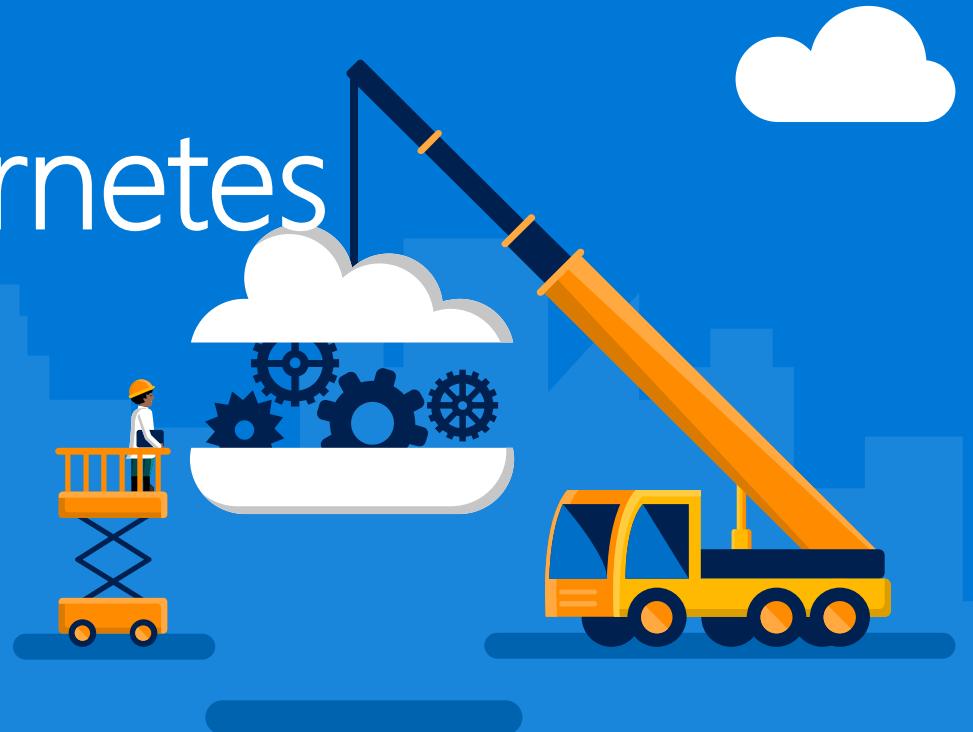
<http://www.UserGroup.tv>



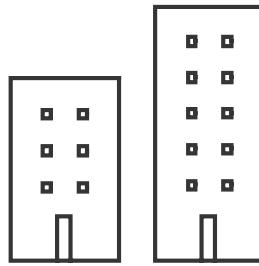
# Topics for Today

- Containers
- DevOps
- AI & Cognitive Services

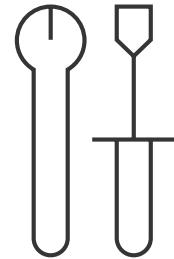
# Container Architecture, Security and Deployment Recommendations, Kubernetes Capabilities



# Widening divide between business and IT



Business needs



IT challenges

Rapid innovation to transform products

Close the gap from data to decision

Connect with customers  
and empower employees

**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

# 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

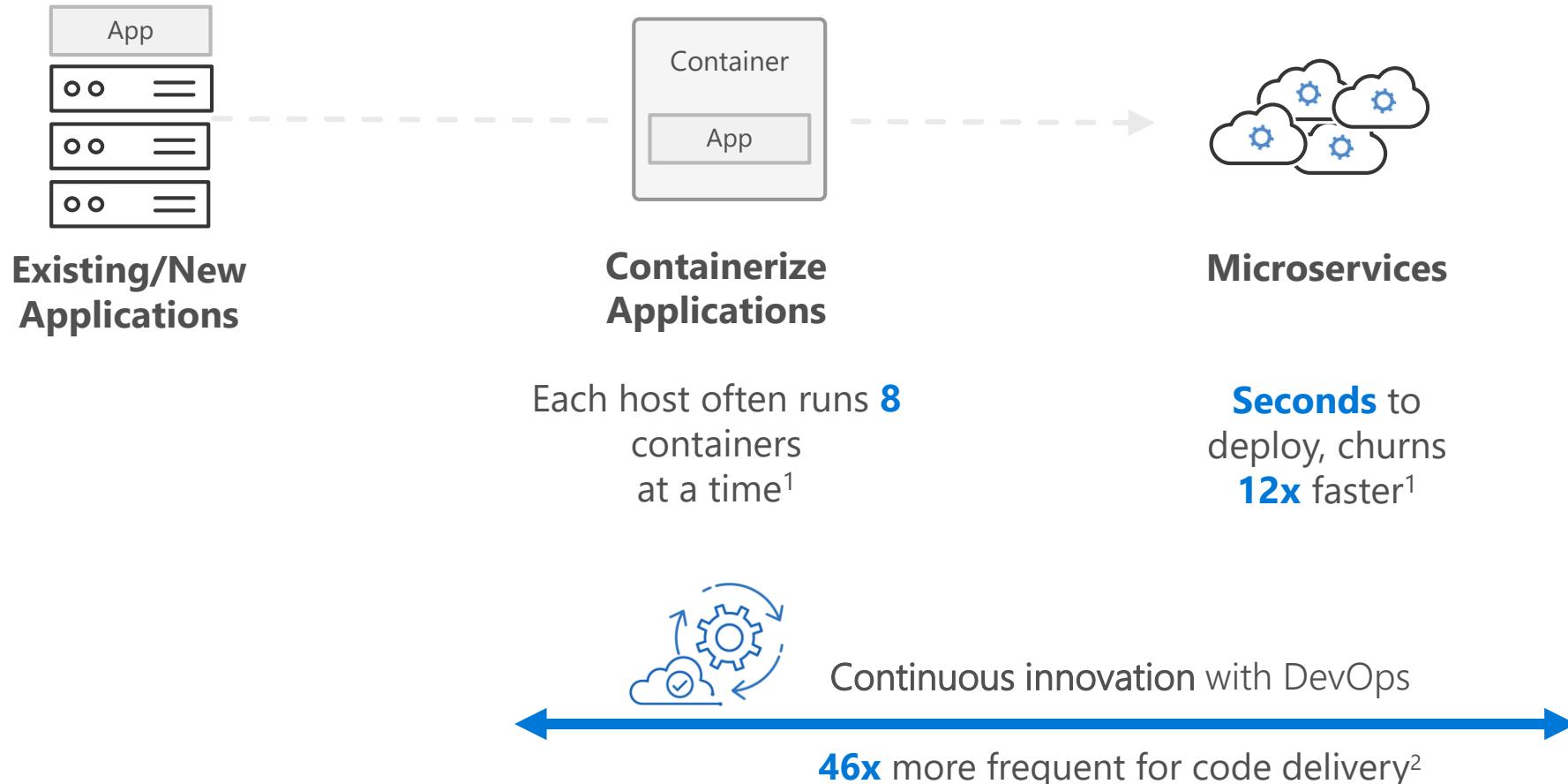
Achieve  
resource  
efficiency



Rapid scale

Scale easily  
to meet  
demand

# From traditional systems to portfolio of modern apps



Source:

1: Datadog [Report](#): 8 Surprising Facts About Real Docker Adoption; 2: 2017 state of DevOps [Report](#)

# Customer momentum



Connect medical devices  
to the cloud

## Success

Speed of product  
development significantly  
increased



Faster demo  
environment releases

## Success

Demo environments  
in **10** minutes instead  
of **24** hours



Modernize the digital  
home of the Nobel Prize

## Success

Greatly reduced management  
overhead of infrastructure



Deliver an industry  
leading customer service

## Success

**100%** automated  
deployment, potentially  
saving **33%** on run cost



Improve mobile service delivery  
of online shopping cart

## Success

**10** seconds to deploy  
API vs **20** minutes



Consolidate data from disparate  
systems to understand customers

## Success

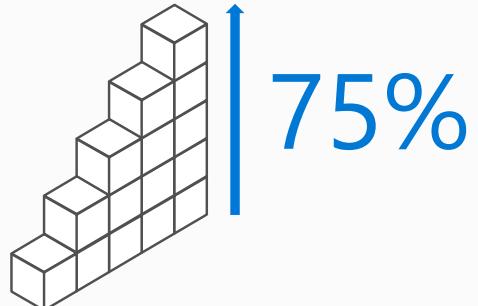
**50%** reduction in time  
for data management  
and analysis

# Containers **momentum**

"By 2020, more than **50%** of enterprises will run **mission-critical, containerized cloud-native applications** in production."

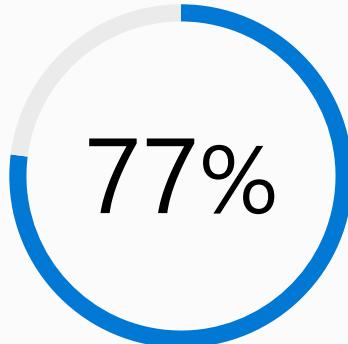
**Gartner**

The average size of a container deployment has grown 75% in one year.<sup>1</sup>



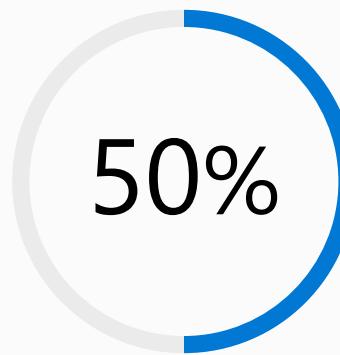
Half of container environment is orchestrated.<sup>1</sup>

77% of companies<sup>2</sup> who use container orchestrators choose Kubernetes.



Larger companies are leading the adoption.<sup>1</sup>

Nearly 50% of organizations<sup>1</sup> running 1000 or more hosts have adopted containers.



<sup>1</sup> Datadog [report](#): 8 Surprising Facts About Real Docker Adoption

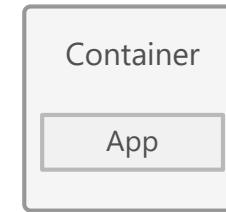
<sup>2</sup> CNCF [survey](#): cloud-native-technologies-scaling-production-applications

# What is a **container**?



**Virtual machines**

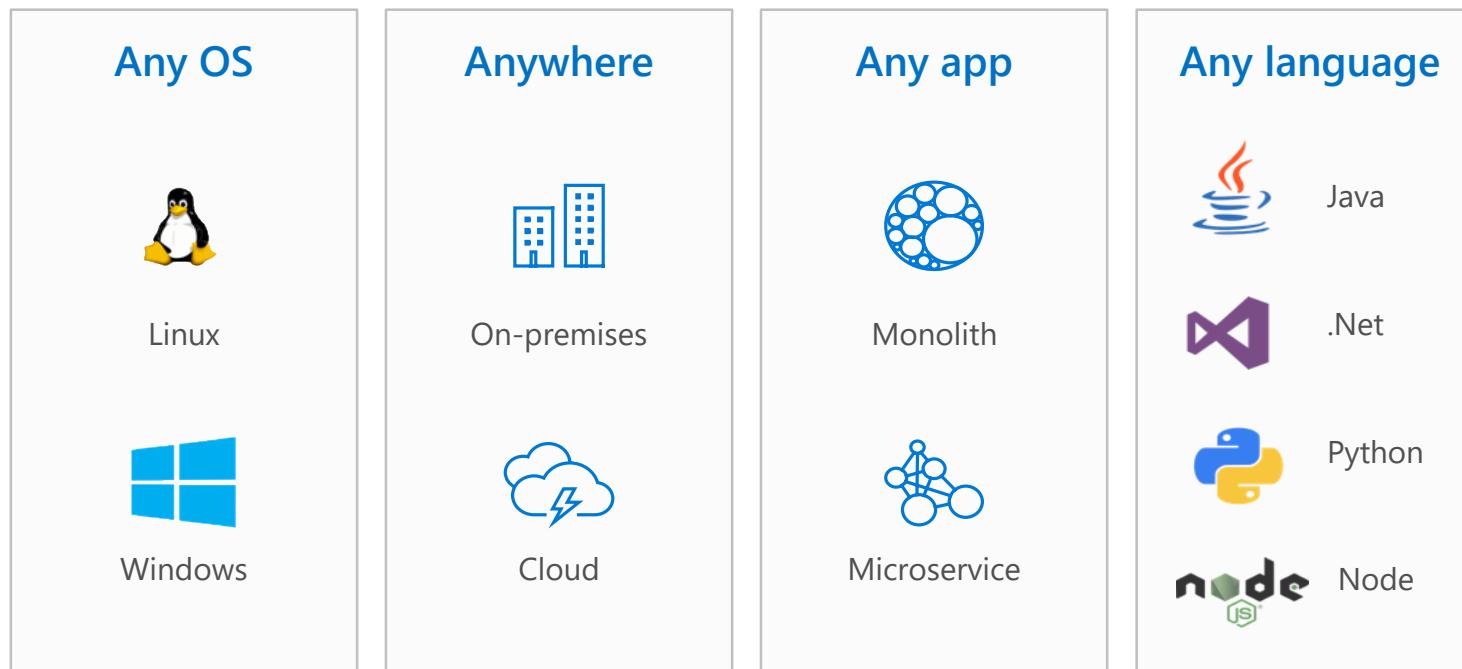
- Virtualize the hardware
- VMs as units of scaling



**Containers**

- Virtualize the operating system
- Applications as units of scaling

# The **benefits** of using containers



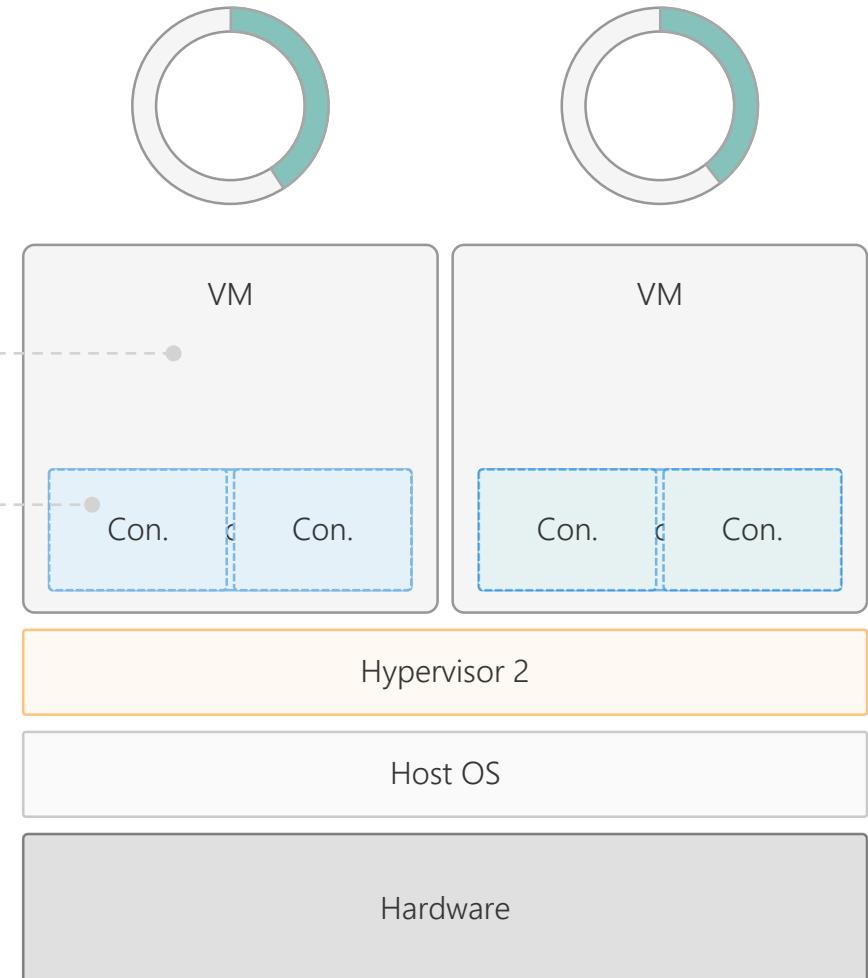
# The container **advantage**

## 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



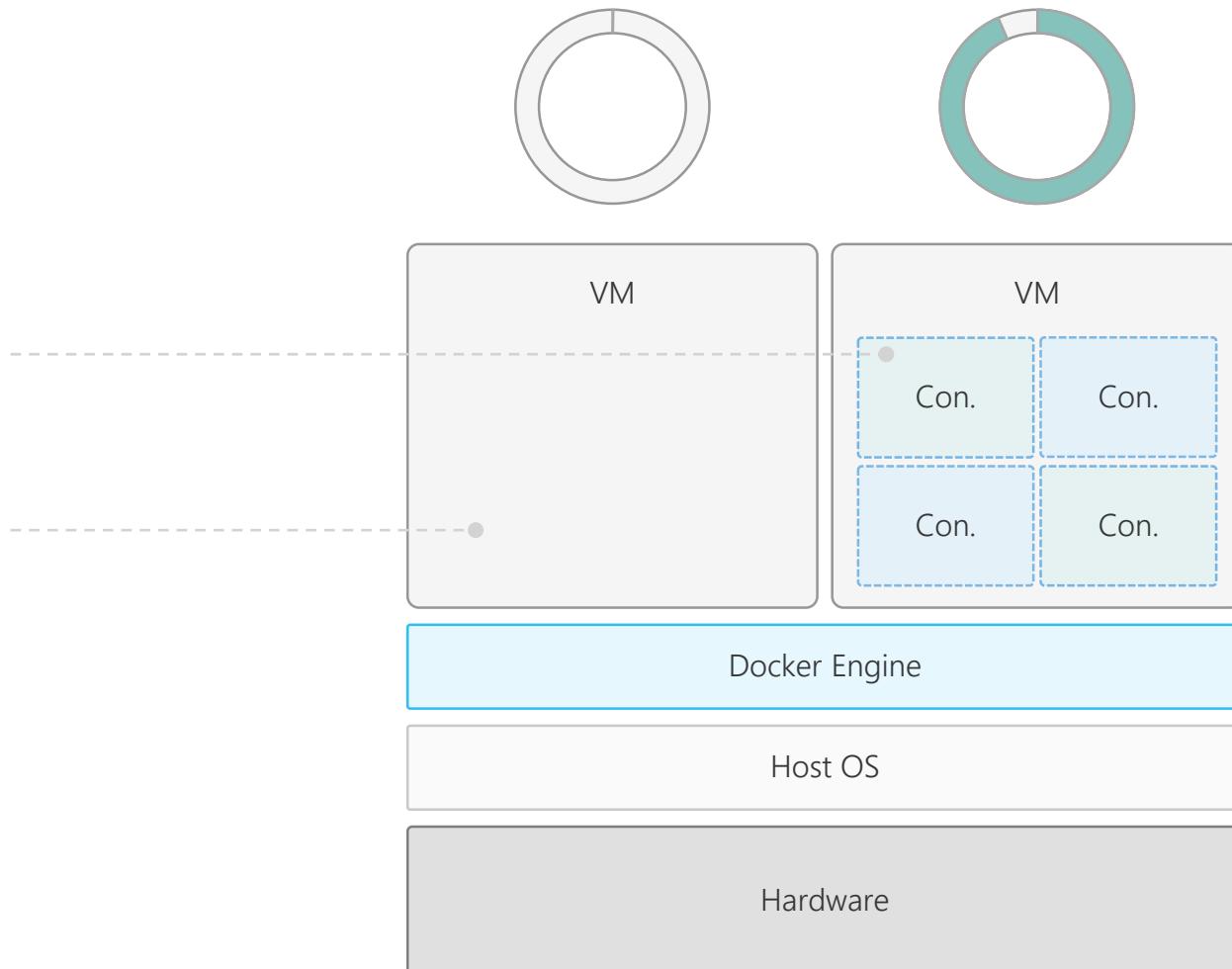
# The container **advantage**

## 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



# What is docker?

An open source container runtime  
Mac, Windows and Linux support

```
# The world's simplest Dockerfile
$ cat Dockerfile
FROM scratch
COPY hello /
CMD ["/hello"]

# Let's create a docker image "tagged" hello-world
$ docker build -t hello-world .

# And run it...
$ docker run hello-world
```

# The elements of **orchestration**



Scheduling



Affinity/anti-affinity



Health monitoring



Failover



Scaling



Networking



Service discovery



Coordinated app upgrades

# Kubernetes: empowering you to do more

## Portable

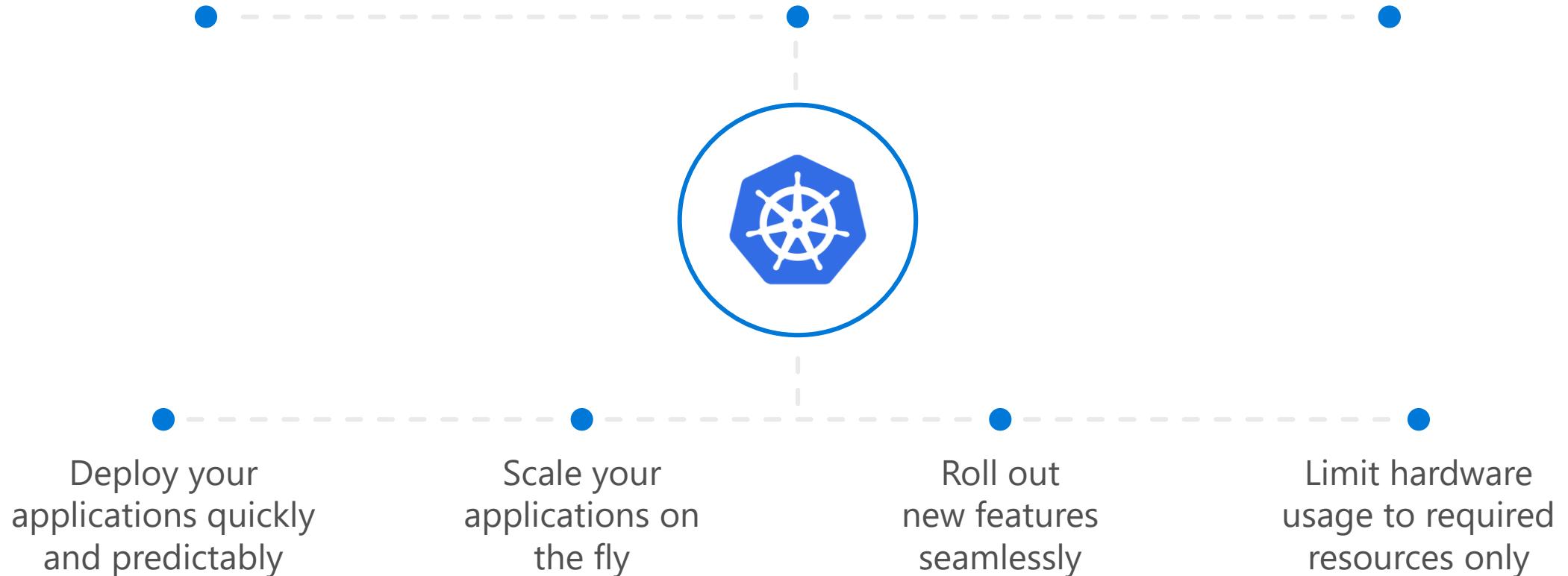
Public, private, hybrid,  
multi-cloud

## Extensible

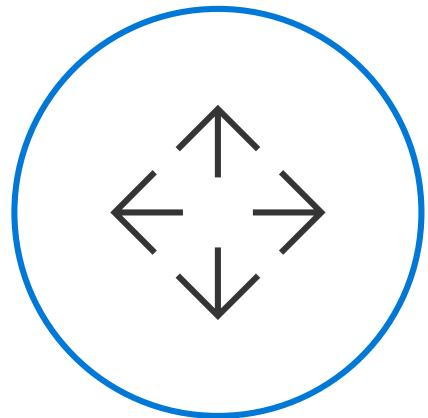
Modular, pluggable,  
hookable, composable

## Self-healing

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

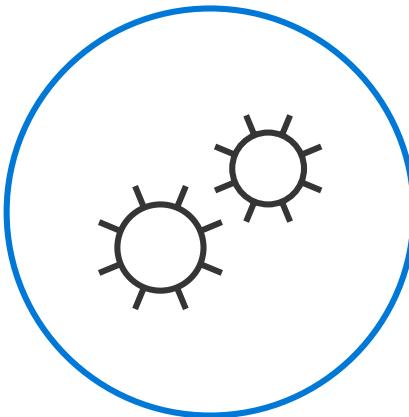


# Containers on Azure



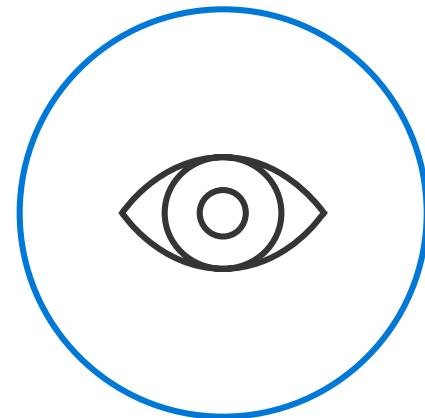
## Flexibility

Deploy containerized applications in your preferred environment



## Productivity

Accelerate containerized application development



## Trust

Manage, monitor, and help secure your containers

# Containers in Azure



App Service



Service Fabric



Kubernetes Service



Container Instance



Ecosystem

Deploy web apps or APIs using containers in a PaaS environment

Modernize .NET applications to microservices using Windows Server containers

Scale and orchestrate Linux containers using Kubernetes

Elastically burst from your Azure Kubernetes Service (AKS) cluster

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**



Pivotal Cloud Foundry



Self-managed  
Kubernetes



Docker Enterprise  
Edition



Red Hat OpenShift

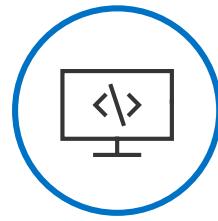


Mesosphere DC/OS

**You could bring that platform to Azure**

# Productivity

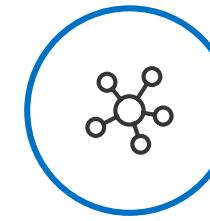
## Accelerate containerized application development



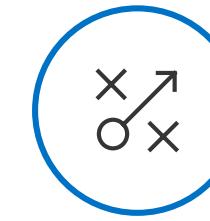
Automatically  
containerize and  
scaffold any  
applications  
directly from IDE



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



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



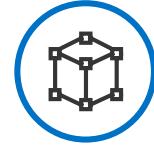
Deploy and  
manage Kubernetes  
with ease



Scale and run  
applications with  
confidence



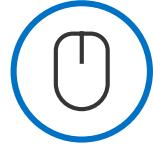
Secure your  
Kubernetes  
environment



Accelerate  
containerized application  
development



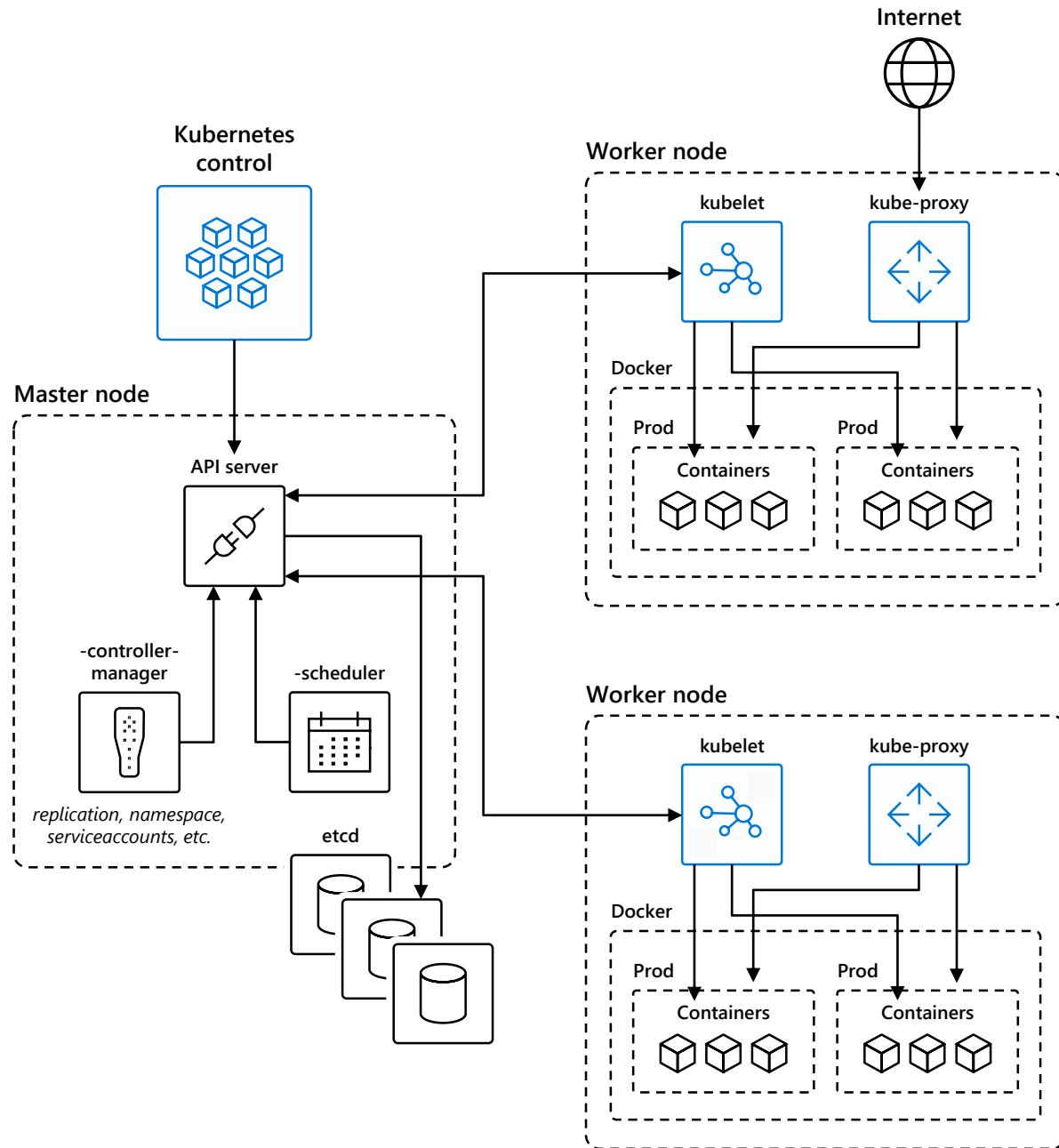
Work how you want  
with open-source  
tools & APIs



Set up  
CI/CD in a  
few clicks

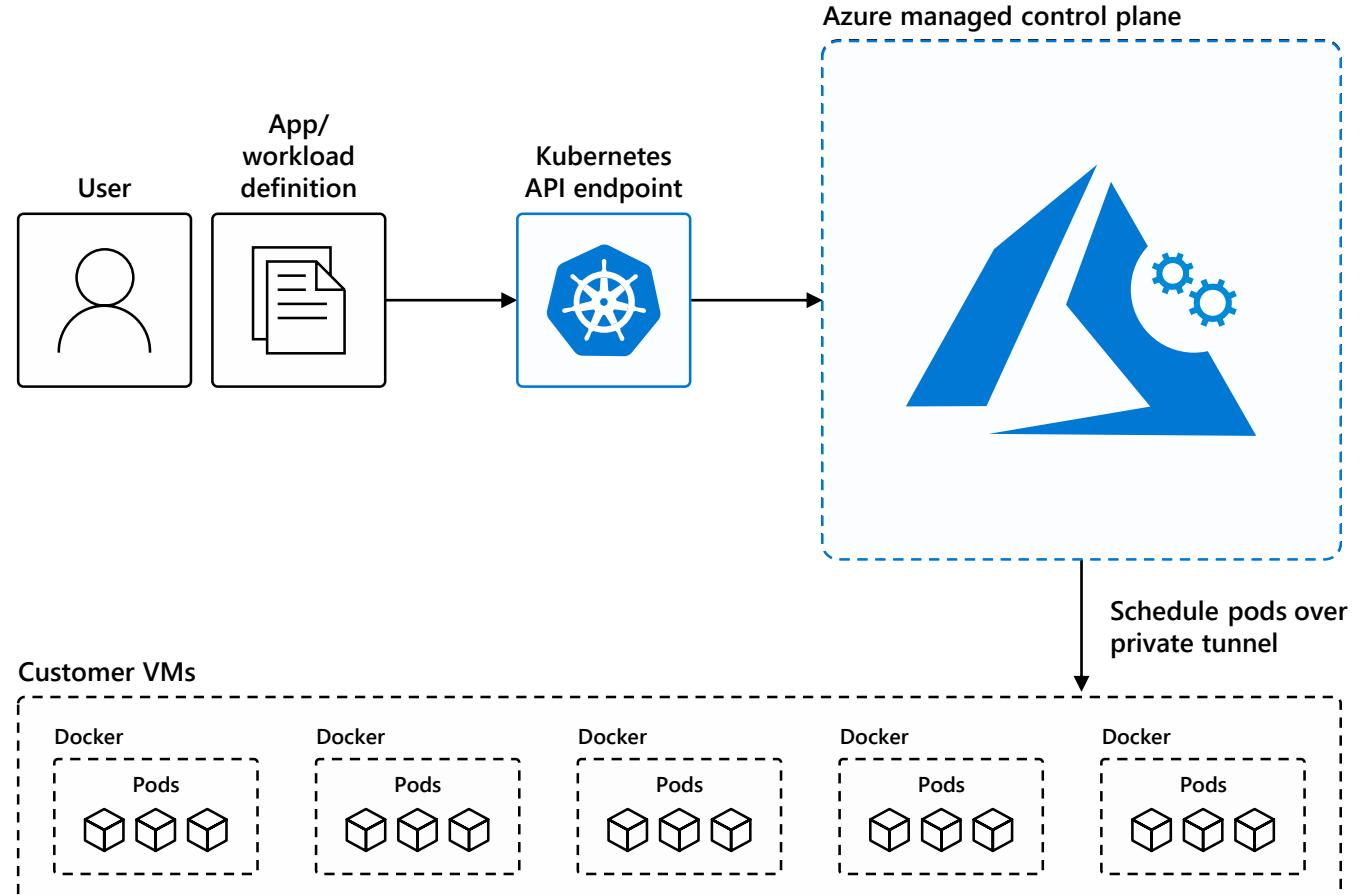
# Kubernetes 101

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

Responsibilities	DIY with Kubernetes	Managed Kubernetes on Azure
Containerization		
Application iteration, debugging		
CI/CD		
Cluster hosting		
Cluster upgrade		
Patching		
Scaling		
Monitoring and logging		

 Customer  
 Microsoft

# Siemens Health leverages technology to connect medical devices to the cloud through AKS

**Challenge:** Siemens needed to speed up their development process to make the transition from value-added services provider to platform provider.

**Solution:** Siemens adopted Azure Kubernetes Service (AKS) to speed up application development and run their microservices-based apps.

**Outcome:** With AKS, Siemens has driven newfound product development agility. AKS enables them to use an applicant gateway and API management to manage exposure, control, and to meter the access continuously.

“ The managed Azure Kubernetes Service puts us really into a position to not only deploy our business logic in Docker containers, including the orchestration, but it's also really easy through application gateway and API management to manage that exposure and control and meter the access continuously.

Thomas Gossler, Lead Architect - Digital Ecosystem Platform, Siemens



Click here to learn more



Azure Kubernetes  
Service (AKS)



**App Service**



Azure Container  
Instances (ACI)



Service Fabric



Azure Batch



Azure Container  
Registry (ACR)

# 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, Jenkins, Maven  
Visual Studio family

# Relaunching the home of Nobel Prize awarded laureates and their discoveries

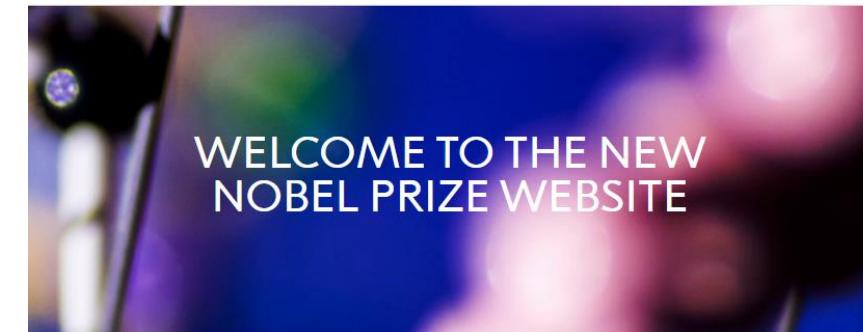
**Challenge:** For the NobelPrize.org relaunch, Nobel needed simplicity at scale to modernize their 10,000+ page worldwide site ahead of the quickly-approaching Nobel Prize announcements, bringing millions of visits each year.

**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



## Popular searches



Peace Prize 2017



Marie Curie



DNA



Alfred Nobel's will

What are you looking for? Search the website.

1-8 October

## 2018 Nobel Prize announcements

Physiology or Medicine - Monday 1 October, 11:30 a.m. at the earliest  
Physics - Tuesday 2 October, 11:45 a.m. at the earliest  
Chemistry - Wednesday 3 October, 11:45 a.m. at the earliest  
Peace - Friday 5 October, 11:00 a.m.  
Economic Sciences - Monday 8 October, 11:45 a.m. at the earliest

Times listed are local time in Sweden (CET).

The Swedish Academy has decided to postpone the 2018 Nobel Prize in Literature, with the intention of awarding it in 2019.

Nobel Prize lessons

Free teaching material

Kofi Annan has passed away

The former UN Secretary General was awarded the 2001 Nobel Peace Prize thanks to his work for a better organised and more peaceful world.



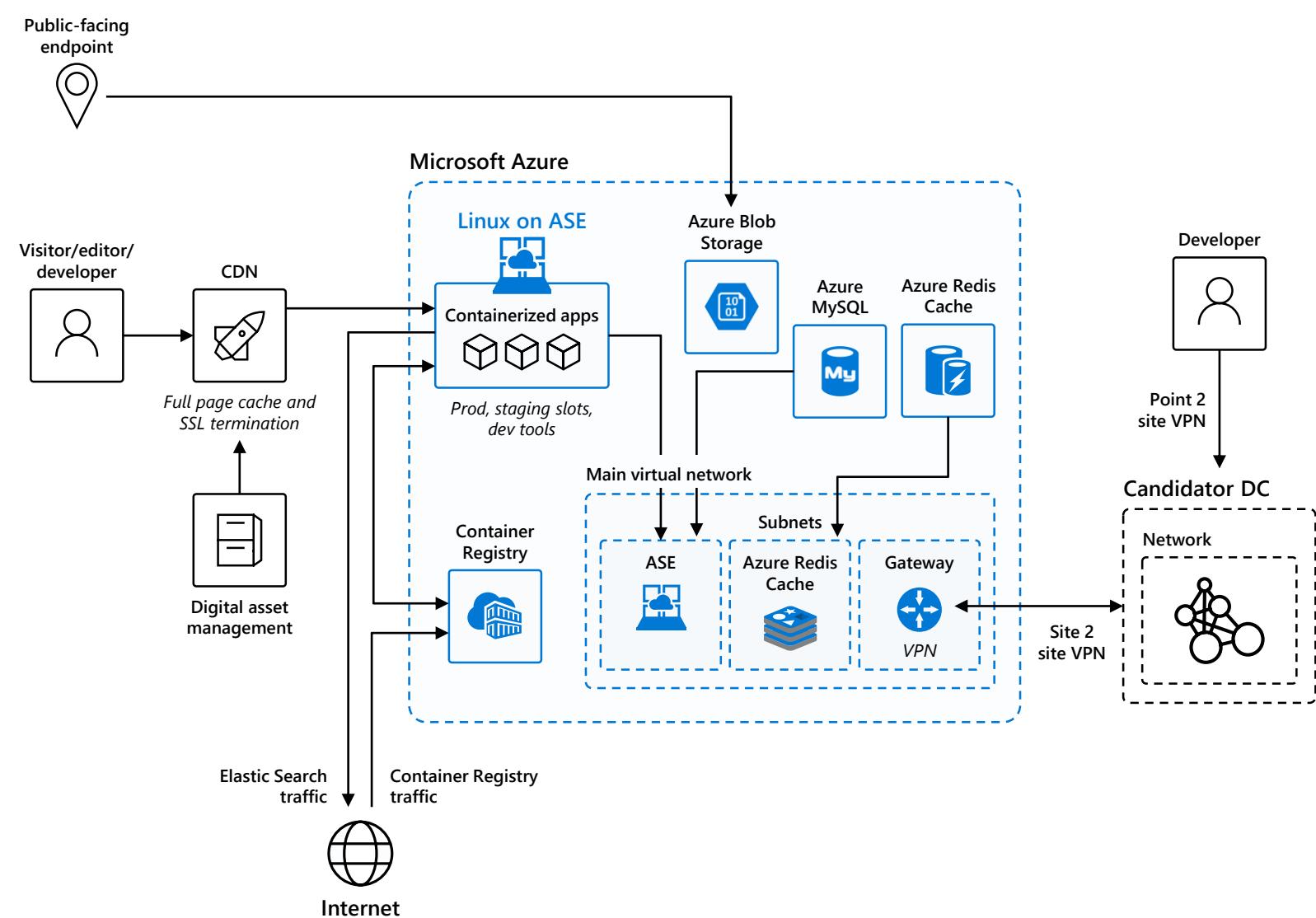
Click icon to visit the Nobel Prize website

# 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





Azure Kubernetes  
Service (AKS)



App Service



Azure Container  
Instances (ACI)



Service Fabric



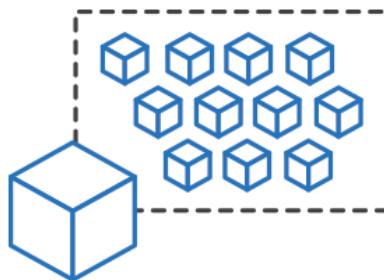
Azure Batch



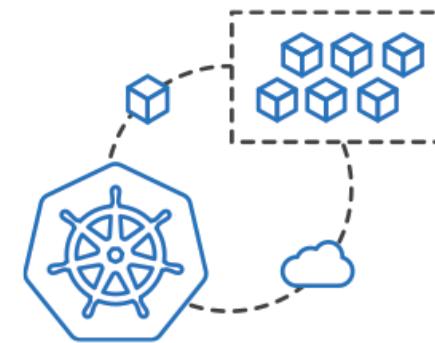
Azure Container  
Registry (ACR)

# Azure Container Instances (ACI)

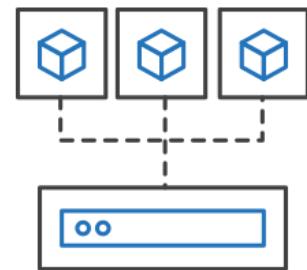
Easily run containers on Azure without managing servers



Run containers  
without managing  
servers



Increase agility  
with containers on  
demand



Secure applications  
with hypervisor  
isolation

# Rapidly growing software company attracts customers with seamless cloud demo experience

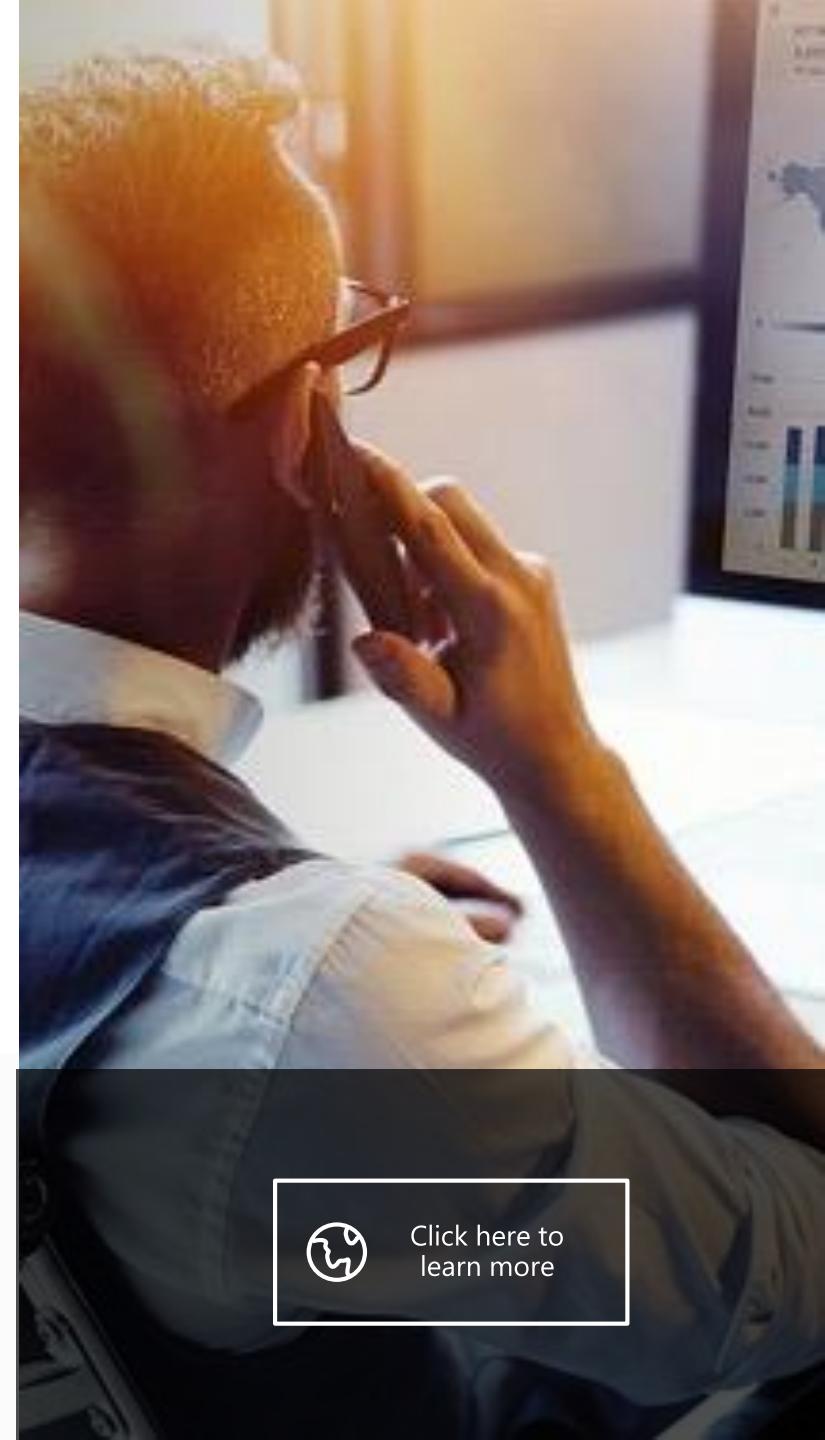
**Challenge:** Jedox needed a more lightweight compute unit than virtual machines to power its website demos and provide a good customer experience.

**Solution:** The company used Microsoft Azure Container Instances to support the Jedox Marketplace and power its demos.

**Outcome:** With ACI, Jedox is able to spin up customer demos on demand, improve provisioning speed, build confidence in the cloud, and lower IT costs.

“ We are far more responsive to customer needs since adding Azure Container Instances. Our Marketplace demos are powerful marketing tools for Jedox, and we've used Azure to improve the customer experience significantly. ”

Vladislav Malicevic , Vice President Development and Support, Jedox



Click here to learn more



Azure Kubernetes  
Service (AKS)



App Service



Azure Container  
Instances (ACI)



Service Fabric



Azure Batch



Azure Container  
Registry (ACR)

# Azure Service Fabric

A microservices platform for business critical applications



Build

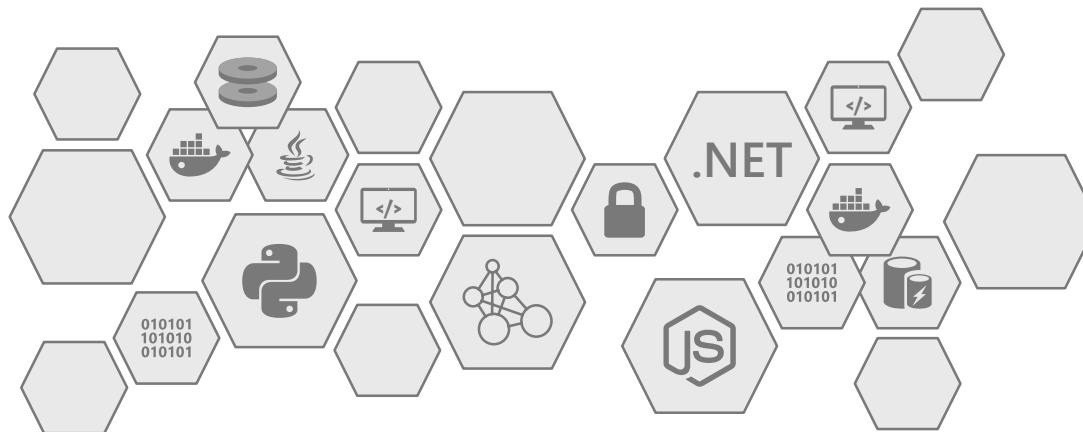


Deploy



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

## Zeiss creates smart devices by connecting field devices with back-end systems

- Benefits:**
- Run Windows containers with existing code & new microservices together
  - Securely expose business applications using REST APIs
  - Improved agility makes it easier for developers to update container applications and services
  - Scalable microservices-based platform for stateless/stateful workloads



“ With Service Fabric we rely on a robust and scalable platform which host our digital integration scenarios – stateful integrations in Reliable Services and stateless integrations in containers can be hosted side by side on one platform. ”

Kai Walter, Lead IT Solution Architect ZEISS Group



Azure Kubernetes  
Service (AKS)



App Service



Azure Container  
Instances (ACI)



Service Fabric



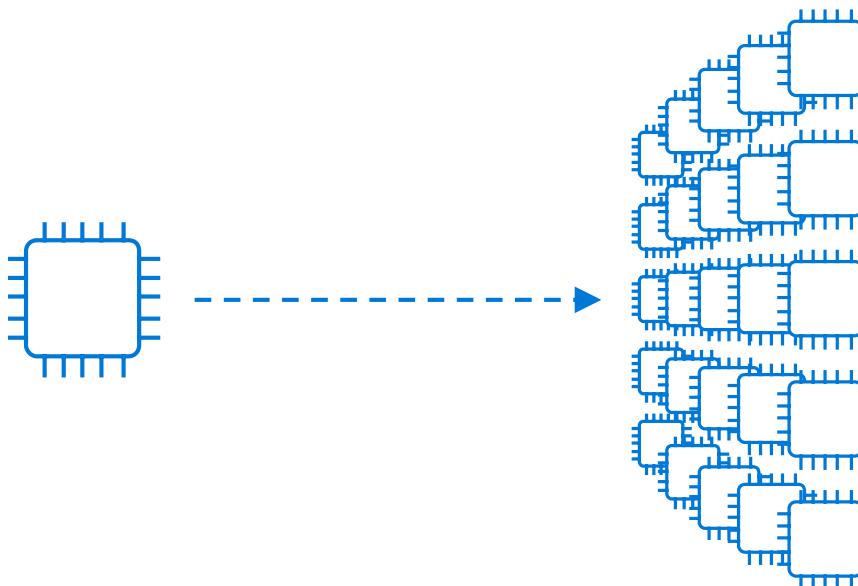
Azure Batch



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.



Azure Kubernetes  
Service (AKS)



App Service



Azure Container  
Instances (ACI)



Service Fabric



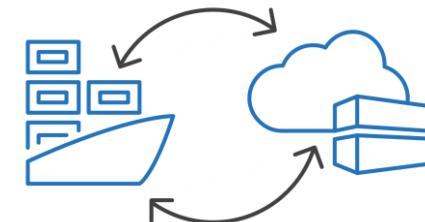
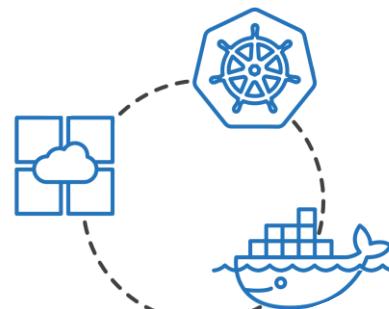
Azure Batch



Azure Container  
Registry (ACR)

# Azure Container Registry (ACR)

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

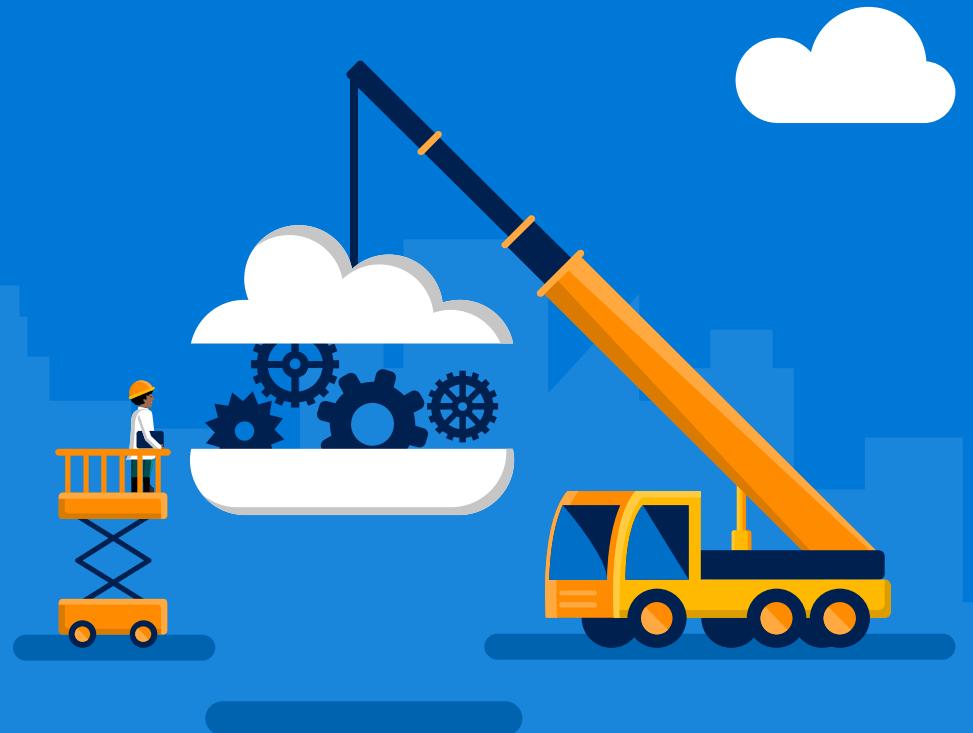


Manage images for all  
types of containers

Use familiar, open-  
source Docker CLI tools

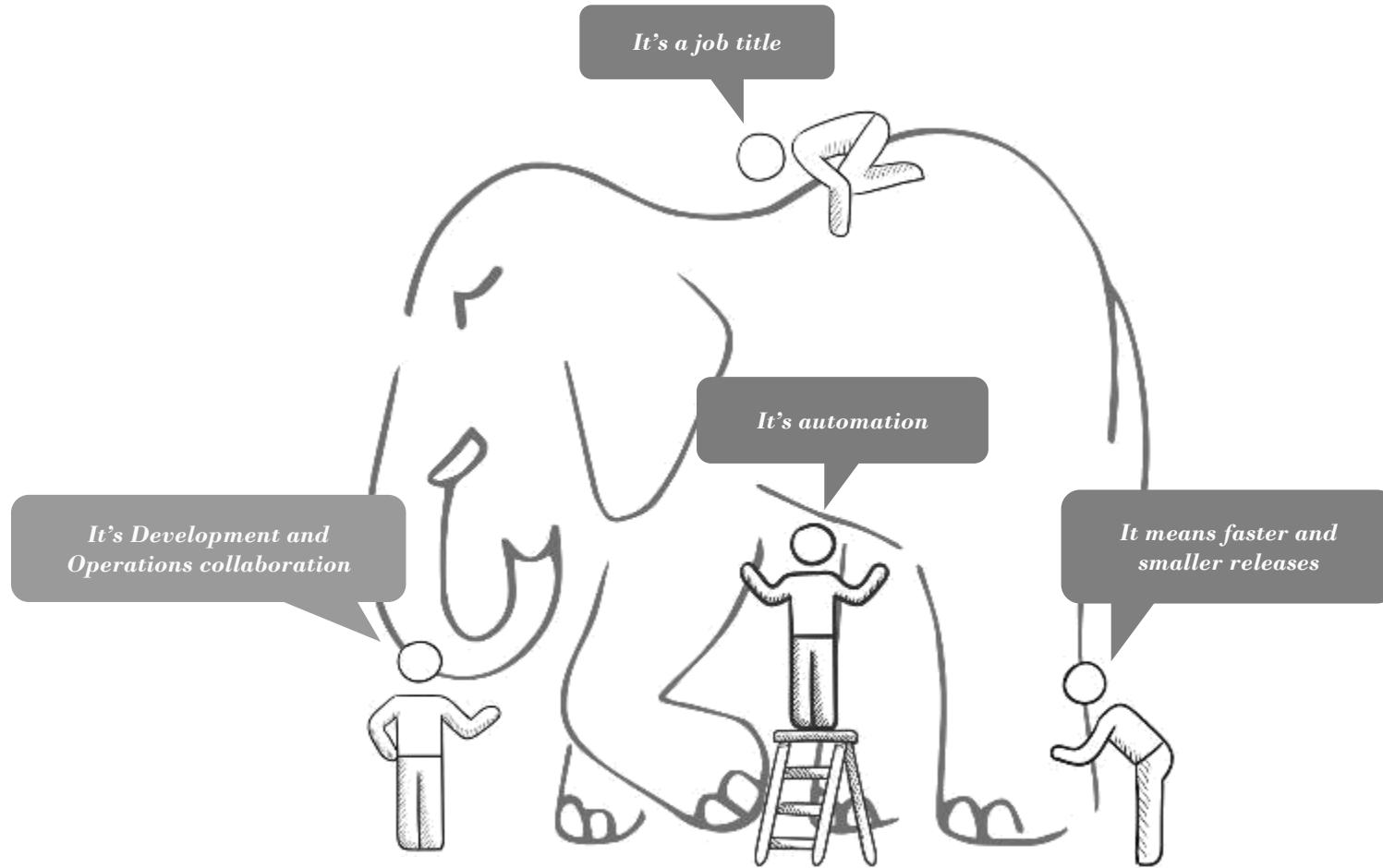
Azure Container Registry  
geo-replication

# DevOps in a Cloud World



# WHAT IS DEVOPS?

## WHAT IS DEVOPS?

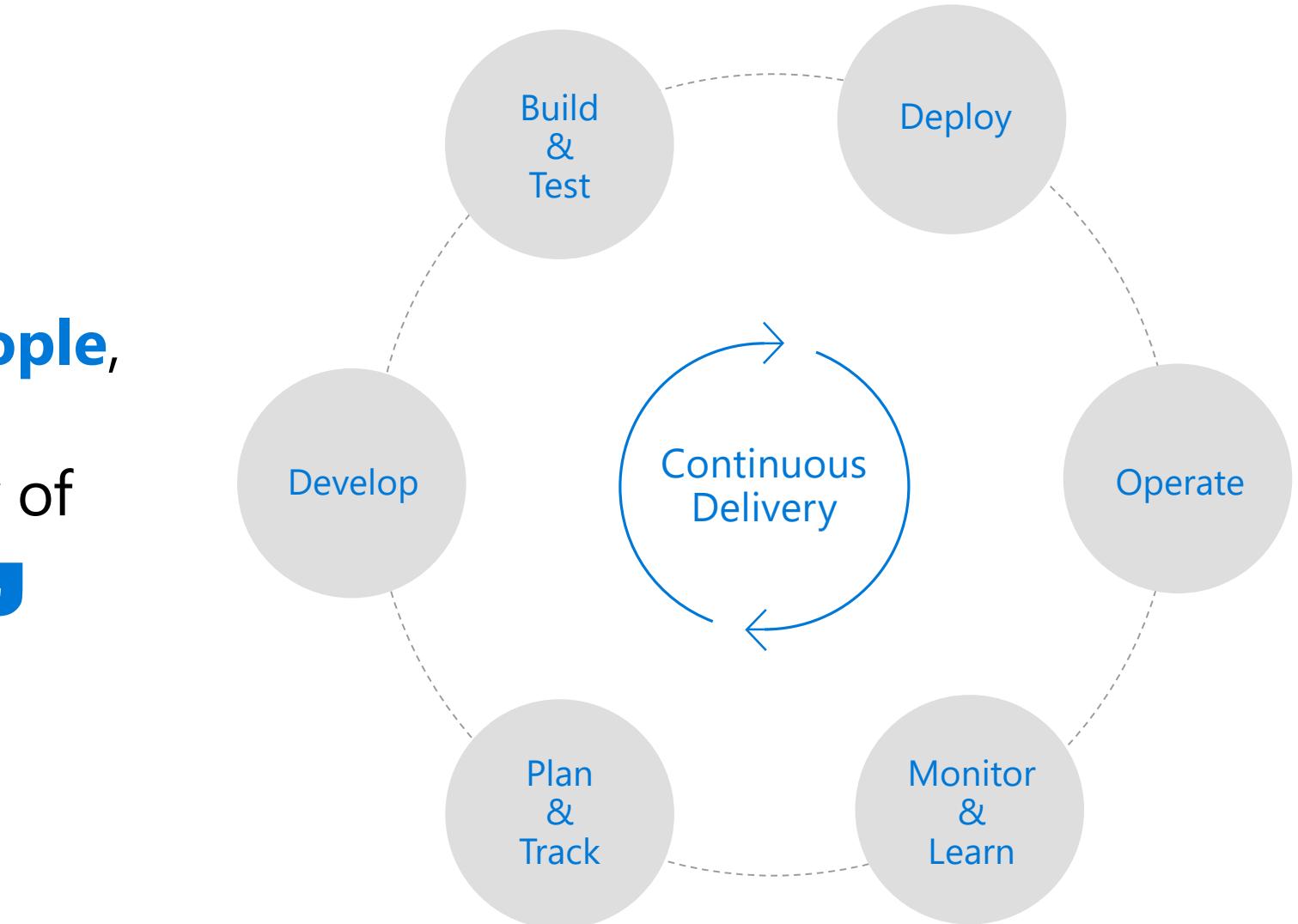


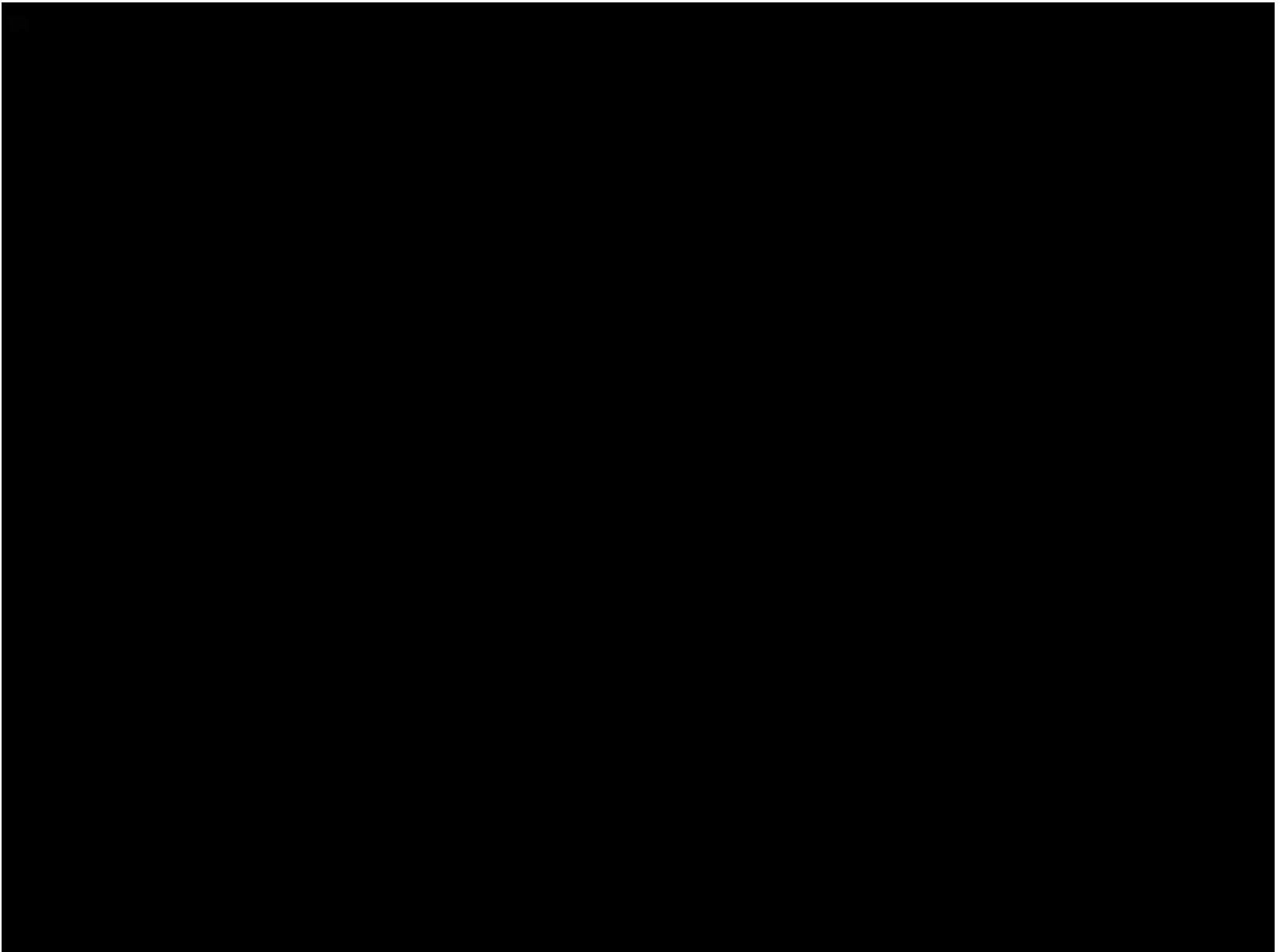
# What is DevOps?

People. Process. Products.

“

DevOps is the union of **people**, **process**, and **products** to enable continuous delivery of **value** to your end users.”

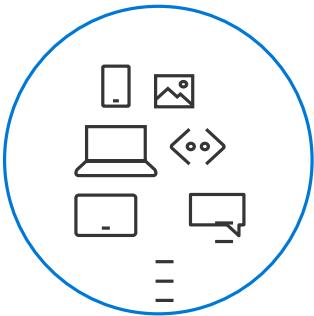




<https://www.youtube.com/watch?v=LOJbM0aXZp0>

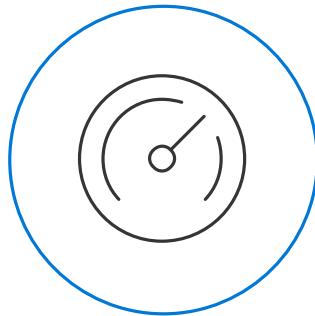
# How Microsoft can help

Microsoft Azure is a powerful and flexible foundation for past, present, and future apps – easily build, manage, and deploy any application and any stack on a massive, global network using your favorite tools and frameworks.



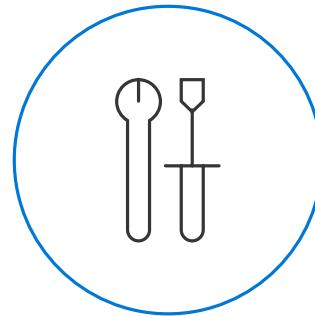
## Flexible

Choice of IaaS, PaaS, public cloud or hybrid.  
Mirror or modernize app infrastructure with VMs, containers, microservices or serverless.  
Supports all stages of the app modernization journey – from lift-and-shift to Cloud-Native.



## Powerful

Instantly improve the performance, scalability and resiliency of your apps by moving them to the cloud.  
Increase business agility with Cloud-Native capabilities and built-in DevOps for continuous innovation.

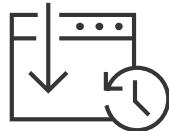


## Open

Bring your stack, we bring a cloud that runs any app, on any platform, and any language.  
Build applications using the language and tools of your choice - Azure supports what you already use and love so you can get up and running fast – just bring code.

# What technologies do I need to support DevOps?

DevOps brings together people, processes, and products, automating software delivery to provide continuous value to your users. Using Azure DevOps, you can deliver software faster and more reliably - no matter how big your IT department or what tools you're using.



## Continuous integration (CI)

- Improve software development quality and speed.
- When you use Azure Pipelines or Jenkins to build apps in the cloud and deploy to Azure, each time you commit code, it's automatically built and tested and bugs are detected faster.

101010  
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101010

## Continuous Deployment (CD)

- By combining continuous integration and infrastructure as code (IaC), you'll achieve identical deployments and the confidence to deploy to production at any time.
- With continuous deployment, you can automate the entire process from code commit to production if your CI/CD tests are successful.



## Continuous Learning & Monitoring

- With Azure Application Insights you can identify how your applications are performing and test if the recent deployment made things better or worse.
- Using CI/CD practices, paired with monitoring tools, you'll be able to safely deliver features to your customers as soon as they're ready.

# Introducing Azure DevOps



## Azure Boards

Deliver value to your users faster using proven agile tools to plan, track, and discuss work across your teams.



## Azure Test Plans

Test and ship with confidence using manual and exploratory testing tools.



## Azure Pipelines

Build, test, and deploy with CI/CD that works with any language, platform, and cloud. Connect to GitHub or any other Git provider and deploy continuously.



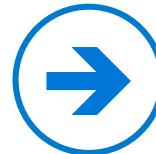
## Azure Artifacts

Create, host, and share packages with your team, and add artifacts to your CI/CD pipelines with a single click.



## Azure Repos

Get unlimited, cloud-hosted private Git repos and collaborate to build better code with pull requests and advanced file management.



<https://azure.com/devops>

# Azure DevOps

Better together



Azure Boards



Azure Repos



Azure Pipelines



Azure Test Plans



Azure Artifacts

An end-to-end solution for organizations looking for an enterprise-grade toolchain

Fully Integrated  
with end  
to end  
traceability

Scalable to  
any team  
and project  
size

Highly  
available,  
multi region,  
hybrid  
cloud &  
on-prem

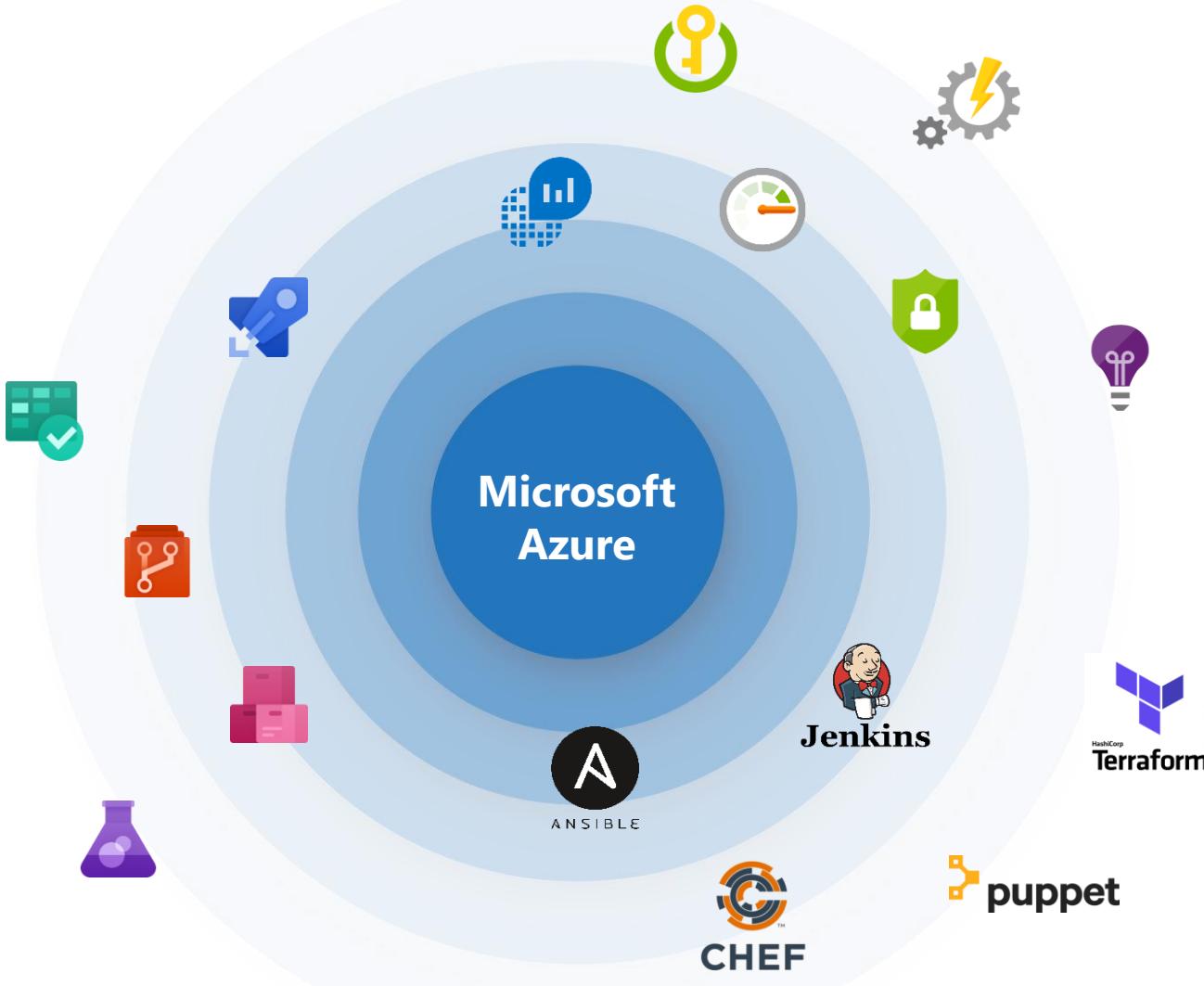
Customer  
Support

Consistent  
admin  
and access  
control



<https://azure.com/devops>

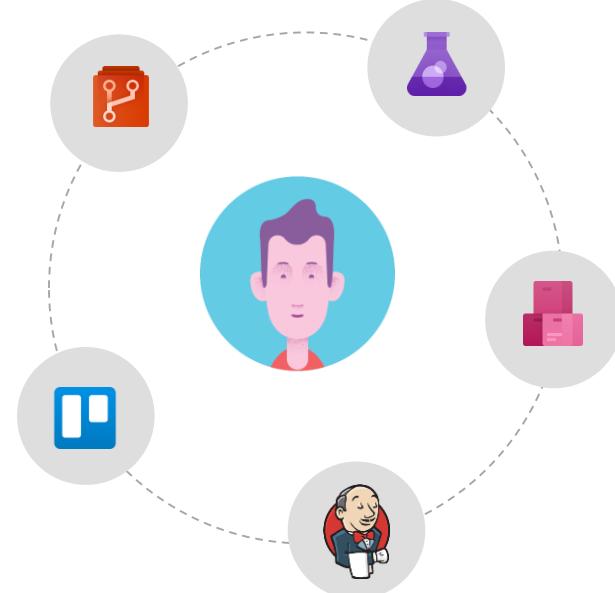
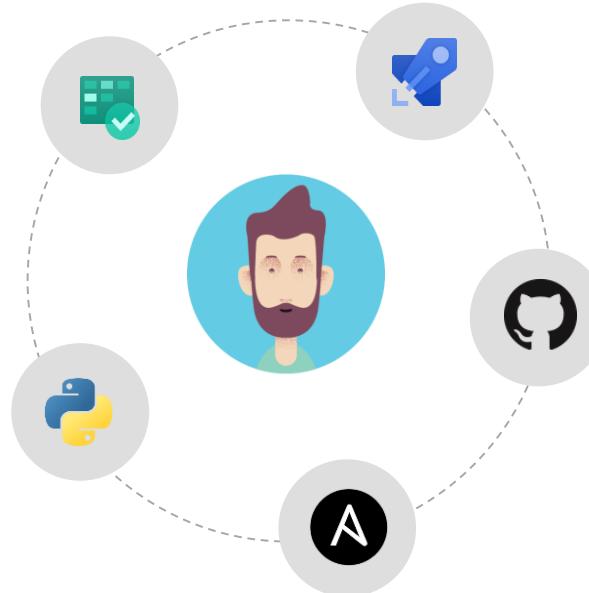
# Broadening the Azure Ecosystem



# Azure DevOps: Choose what you love

Any Language, Any Platform

Azure DevOps lets developers choose the tools and languages that are right for them



Mix and match to create workflows with tools from Microsoft, open source or your favorite 3rd party tools

Target any cloud, on-prem or both and deploy to the servers you need



# Azure Boards

Track work with Kanban boards, backlogs, team dashboards, and custom reporting



## Connected from idea to release

Track all your ideas at every development stage and keep your team aligned with all code changes linked directly to work items.



## Scrum ready

Use built-in scrum boards and planning tools to help your teams run sprints, stand-ups, and planning meetings.



## Project insights

Gain new insights into the health and status of your project with powerful analytics tools and dashboard widgets.

The screenshot shows the Azure DevOps interface with the 'FabrikamFiber' project selected. The left sidebar includes links for 'Overview', 'Boards', 'Work items', 'Backlogs', 'Sprints', 'Queries', 'Plans', 'Repos', 'Pipelines', 'Test Plans', and 'Artifacts'. The main area is titled 'FabrikamFiber Board' and displays a Kanban board with columns for 'New', 'Active', '5/5', 'Staging', '15/5', and 'Deployed'. The 'Active' column contains several cards representing work items, each with a title, description, assignee, and labels like 'Design', 'Xamarin', 'Spike', 'ML', 'General', and 'Blocked'. The 'New' column has a card for 'New item'. The 'Deployed' column has a card for 'Mobile (Spike)'. The 'Staging' column has a card for 'Mobile (Code of Cond...)'. The 'Backlogs' and 'Sprints' sections are also visible on the board.



<https://azure.com/devops>

@DonovanBrown

# Azure Pipelines

Cloud-hosted pipelines for Linux, Windows and macOS.



## Any language, any platform, any cloud

Build, test, and deploy Node.js, Python, Java, PHP, Ruby, C/C++, .NET, Android, and iOS apps. Run in parallel on Linux, macOS, and Windows. Deploy to Azure, AWS, GCP or on-premises



## Extensible

Explore and implement a wide range of community-built build, test, and deployment tasks, along with hundreds of extensions from Slack to SonarCloud. Support for YAML, reporting and more



## Containers and Kubernetes

Easily build and push images to container registries like Docker Hub and Azure Container Registry. Deploy containers to individual hosts or Kubernetes.

The screenshot shows the Azure DevOps Pipelines interface for a project named "AdventureWorks Mobile". The pipeline is titled "Enabling feature flags for Preview Attachment and Grid Views". It includes three parallel jobs: a Windows Job (Running, 1m 53s), a Linux Job (Running, 3m 29s), and a macOS Job (Running, 3m 07s). The Linux Job details are shown on the right, listing steps: Prepare job, Initialize job, Get sources, Cmdline, Nodetool, and Install dependencies. The log output for the Linux job shows the command "yarn install v1.7.0" followed by several npm package resolution and linking steps, concluding with "Done in 4.89s".



<https://azure.com/pipelines>

# Azure Pipelines

Cloud-hosted pipelines for Linux, Windows and macOS, with unlimited minutes for open source



## Any language, any platform, any cloud

Build, test, and deploy Node.js, Python, Java, PHP, Ruby, C/C++, .NET, Android, and iOS apps. Run in parallel on Linux, macOS, and Windows. Deploy to Azure, AWS, GCP or on-premises



## Extensible

Explore and implement a wide range of community-built build, test, and deployment tasks, along with hundreds of extensions from Slack to SonarCloud. Support for YAML, reporting and more



## Containers and Kubernetes

Easily build and push images to container registries like Docker Hub and Azure Container Registry. Deploy containers to individual hosts or Kubernetes.



## Best-in-class for open source

Ensure fast continuous integration/continuous delivery (CI/CD) pipelines for every open source project. Get unlimited build minutes for all open source projects with up to 10 free parallel jobs across Linux, macOS and Windows

Enabling feature flags for Preview Attachment and Grid Views

AdventureWorks/PackageFramework master #889

Windows Job  
Running 1m 53s

Linux Job  
Running 3m 29s

macOS Job  
Running 3m 07s

Linux Job  
Agent: Hosted Linux

- Prepare job
- Initialize job
- Get sources
- Cmdline
- Nodetool
- Install dependencies

```
yarn install v1.7.0
$ node build/npm/preinstall.js
[1/4] Resolving packages...
[2/4] Fetching packages...
[3/4] Linking dependencies...
[4/4] Building fresh packages...
$ npm run compile
#####
> code-oss-dev-build@1.0.0 compile ./adventureworks/build
> tsc -p tsconfig.build.json

✖ Done in 4.89s.
$ node ./postinstall
[#1] 2/2 removed './adventureworks/extensions/node_modules/typescript/lib/tsc.js'
removed './adventureworks/extensions/node_modules/typescript/lib/tsserverlibrary.d.ts'
removed './adventureworks/extensions/node_modules/typescript/lib/tsserverlibrary.js'
removed './adventureworks/extensions/node_modules/typescript/lib/typescriptServices.d.ts'
removed './adventureworks/extensions/node_modules/typescript/lib/typescriptServices.js'
```



<https://azure.com/pipelines>

# Deploy Repeatedly & Reliably

Azure Resource Manager & DevOps Tool Integrations

Infrastructure as Code, built-in with Azure Resource Manager

Use Azure Automation & Config to automate repetitive tasks

Support for DevOps tool integrations and OSS tooling such as Terraform, Ansible & Chef



ANSIBLE



A screenshot of the Microsoft Azure portal interface. On the left, there's a sidebar with various service icons like Create a resource, All services, Favorites, Dashboard, Resource groups, Virtual machines, All resources, DevOps Projects, Recent, DevTest Labs, Recovery Services vaults, Log Analytics, Automation Accounts, Security Center, Container services, Container registries, DNS zones, Storage accounts, App Services, Virtual networks, Availability sets, and Route tables. The main area shows a 'Resource groups' blade for the 'AustraliaSEProduction - Automation script' resource group. It lists six items: AustraliaSEDevelopment, AustraliaSEProduction, autoShutdown, cloud-shell-storage-westus, DefaultResourceGroup-EUS, and securitydata. To the right of the blade, there's a detailed view of an 'Automation script' template. The template code is shown in JSON format, defining parameters, variables, and resources. The code includes sections for 'parameters', 'variables', and 'resources', with specific details for DNS zones, SOA records, and other automation parameters.

# Azure Repos

Unlimited private Git repo hosting and support for TFVC that scales from a hobby project to the world's largest Git repositories



## Works with your Git client

Securely connect with and push code into your Git repos from any IDE, editor, or Git client.



## Web hooks and API integration

Add validations and extensions from the marketplace or build your own using web hooks and REST APIs.



## Semantic code search

Quickly find what you're looking for with code-aware search that understands classes and variables.

The screenshot shows the Azure DevOps interface for the 'AdventureWorks Mobile' project under 'Contoso'. The left sidebar includes links for Overview, Boards, Repos (selected), Files, Commits, Pushes, Branches, Tags, and Pull requests (also selected). The main content area is titled 'Pull requests' and shows a list of pull requests categorized by assignee: 'Created by me', 'Assigned to me', and 'Assigned to my team'. Each pull request card displays the requester's name, the title of the PR, and the target branch. The interface uses a clean, modern design with dark mode options.

Category	Pull Request Title	Requester	Target Branch	Comments
Created by me	Initialize client with .client.init	Kat Larsson	master	6
	Testing configuration settings	Kat Larsson	features/config	0
Assigned to me	Check returned identity for null status	Colin Ballinger	master	0
	[WIP] Add tests for deployment mapping	Robin Counts	master	3
Assigned to my team	Add exception on disconnect	Colin Ballinger	master	0
	Maintain structure when converting isomorphs	Robin Counts	master	1
	Hotfix payload to releases/99	Robin Counts	releases/99	99+



<https://azure.com/devops>

# Azure Test Plans

Get end-to-end traceability. Run tests and log defects from your browser. Track and assess quality throughout your testing lifecycle.



## Capture rich data

Capture rich scenario data as you execute tests to make discovered defects actionable. Explore user stories without test cases or test steps. You can create test cases directly from your exploratory test sessions.



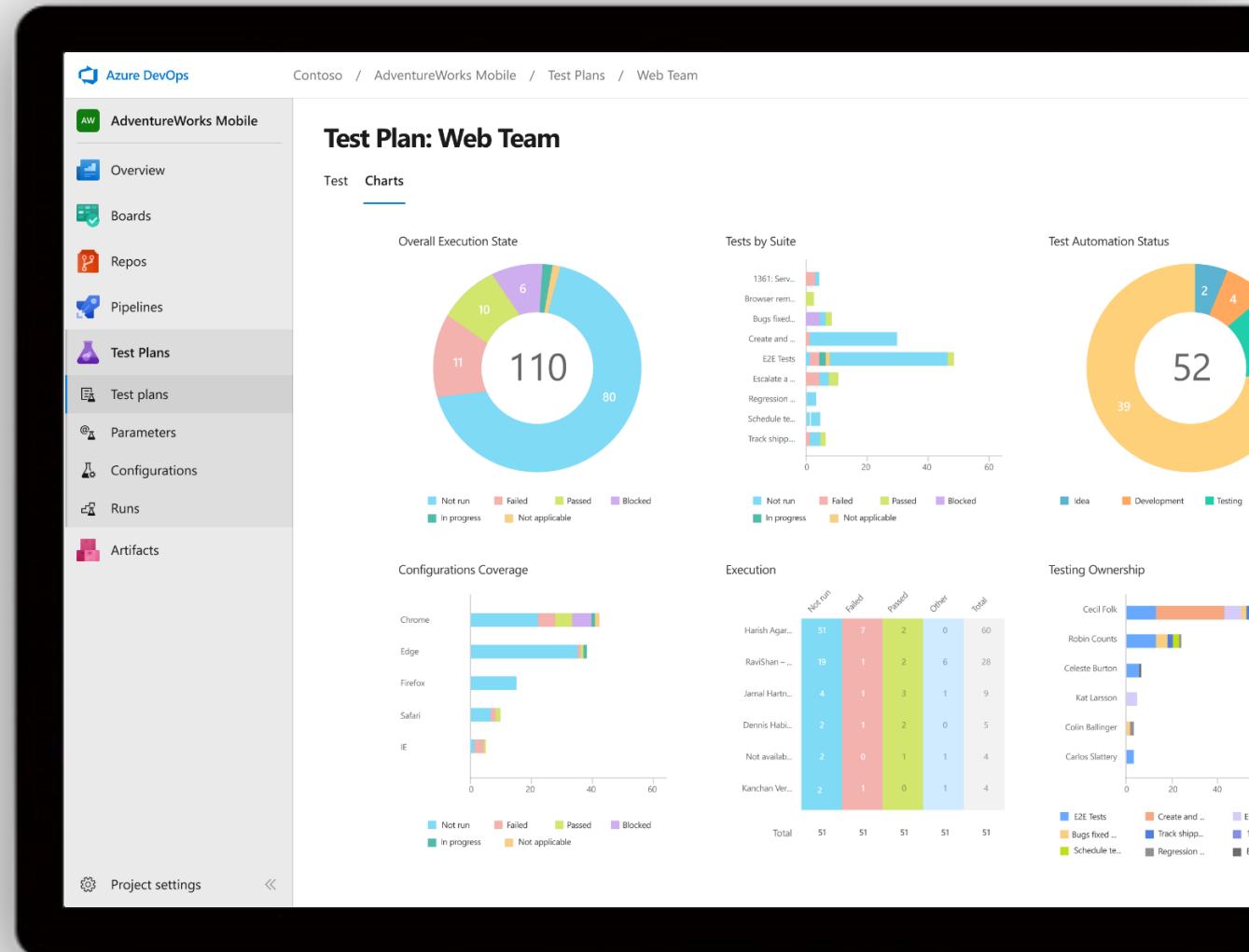
## Test across web and desktop

Test your application where it lives. Complete scripted tests across desktop or web scenarios. Test on-premises application from the cloud and vice-versa.



## Get end-to-end traceability

Leverage the same test tools across your engineers and user acceptance testing stakeholders. Pay for the tools only when you need them.



<https://azure.com/devops>

# Azure Artifacts

Create and share Maven, npm, and NuGet package feeds from public and private sources – fully integrated into CI/CD pipelines



## Manage all package types

Get universal artifact management for Maven, npm, and NuGet.



## Add packages to any pipeline

Share packages, and use built-in CI/CD, versioning, and testing.



## Share code efficiently

Easily share code across small teams and large enterprises.

The screenshot shows the Azure DevOps interface for managing artifacts. On the left, there's a sidebar with links for Overview, Boards, Repos, Pipelines, Test Plans, and Artifacts. The Artifacts link is highlighted. The main area is titled "Artifacts" and shows a list of packages. Each package entry includes the name, version, source (NuGet, npmjs, MyFeed, Maven), the time it was last pushed, and a brief description. The packages listed are abbrev (Version 1.1.0, NuGet), accepts (Version 1.3.3, npmjs), acorn (Version 5.0.3, MyFeed), acorn-dynamic-import (Version 2.0.2, Maven), aclr-jsx (Version 3.0.1, NuGet), acorn-object-spread (Version 1.0.0, Maven), ajv (Version 4.11.7, npmjs), ajv-keywords (Version 1.5.1, NuGet), and alphanum-sort (Version 1.4.0, npmjs).

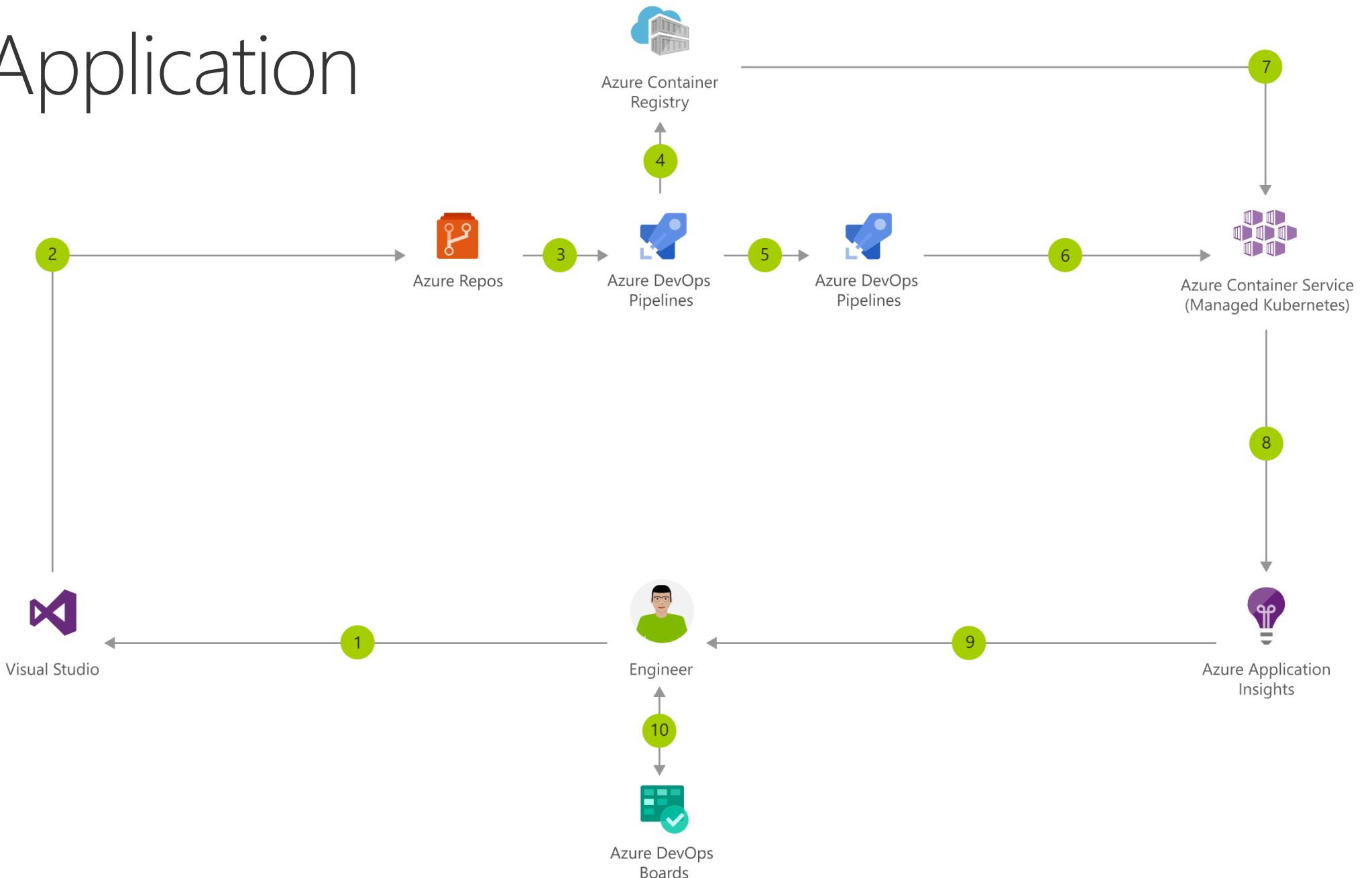
Package	Views	Source	Last pushed	Description
abbrev Version 1.1.0		nuget	a year ago	Like ruby's abbrev module, but in js
accepts Version 1.3.3		npmjs	a year ago	Higher-level content negotiation
acorn Version 5.0.3		MyFeed	a year ago	ECMAScript parser
acorn-dynamic-import Version 2.0.2		maven	a year ago	Support dynamic imports in acorn
aclr-jsx Version 3.0.1		nuget	a year ago	Alternative, faster React.js JSX parser
acorn-object-spread Version 1.0.0		maven	a year ago	Custom JSON-Schema keywords for ajv validator
ajv Version 4.11.7		npmjs	a year ago	Alphanumeric sorting algorithm
ajv-keywords Version 1.5.1		nuget	a year ago	ANSI escape codes for manipulating the terminal
alphanum-sort Version 1.4.0		npmjs	a year ago	An elegant lib that converts the chalked (ANSI) text to HTML



<https://azure.com/devops>

# Demo

# Demo Application



# DevOps at Microsoft

## DevOps at Scale

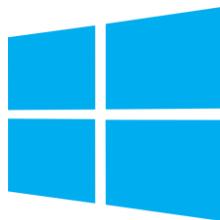
Visual Studio Team Services is the toolchain of choice for Microsoft engineering

+85,000

Engineers at Microsoft  
are using VSTS

## Windows Engineering Team

VSTS scales to host the world's largest Git repo



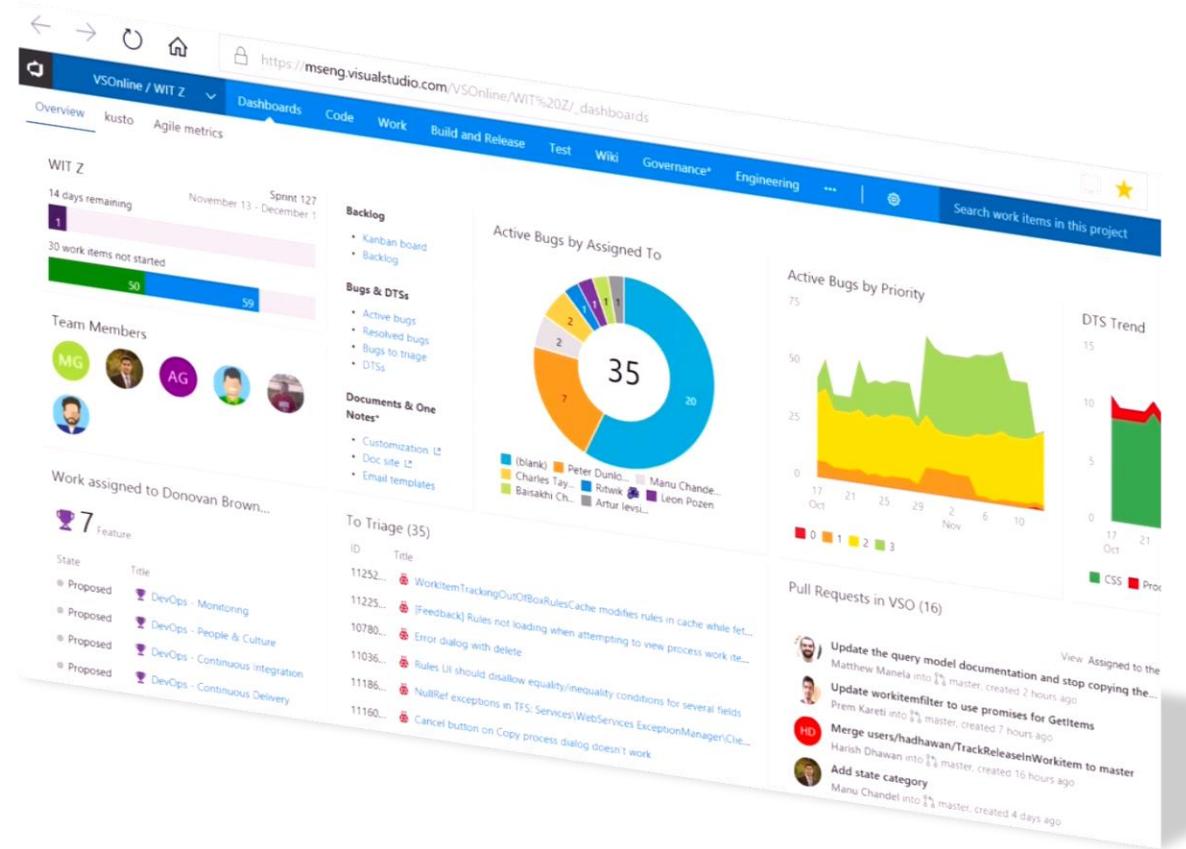
- 300GB Source code
- 3.5M Files
- 4,000+ Devs



## VSTS Engineering Team

Embracing DevOps practices = More value to customers

More features delivered to  
customers in 2016 than in  
previous 4 years combined



<http://aka.ms/devopsatmicrosoft>

# Azure DevOps



Azure Boards



Azure Repos



Azure Pipelines



Azure Test Plans



Azure Artifacts



Plan smarter, collaborate better, and ship faster with a set of modern dev services



Any developer, any platform, any cloud. Full support for hybrid cloud, on-premises & containers.



Use all the Azure DevOps services or choose just what you need to complement your existing workflows



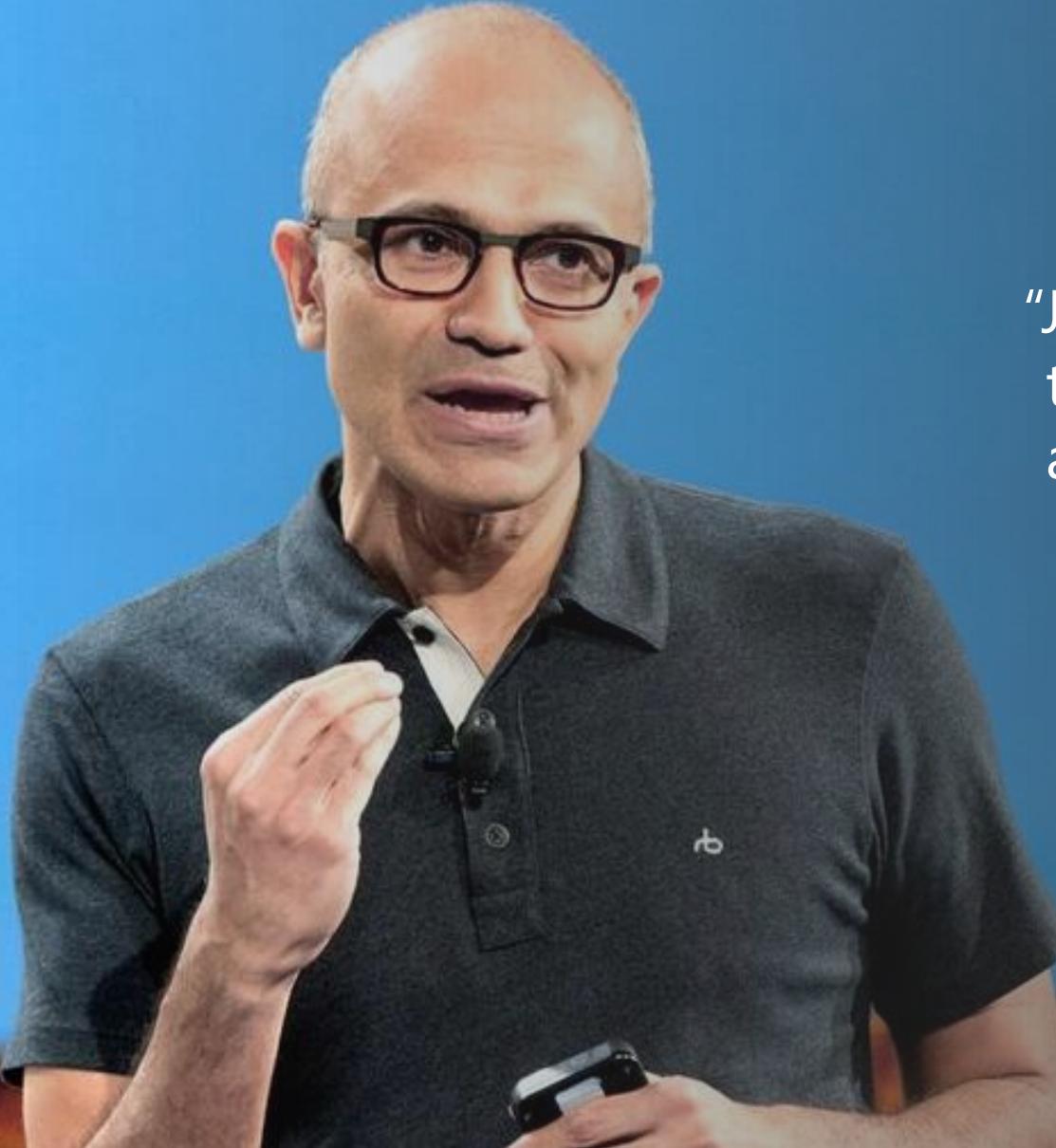
Best in class builds for open source. Free unlimited build minutes for public projects and up to 10 free concurrent pipelines across Windows, Linux and macOS



Get started for free for small teams, scales to support the largest enterprises



<https://azure.com/devops>

A photograph of Satya Nadella, CEO of Microsoft. He is a middle-aged man with short, light-colored hair and glasses, wearing a dark grey polo shirt. He is gesturing with his right hand while speaking. The background is a solid blue.

"Judge us by the actions we have  
taken in the recent past, our  
actions today and in the future"

—Satya Nadella, CEO  
Microsoft

# Resources

- Azure DevOps YouTube Channel – See It
  - <https://www.youtube.com/channel/UC-ikyViYMM69jolAv7dIMsA>
- Azure DevOps Hands-On Labs – Do It
  - <https://www.azuredevopslabs.com/>
- Azure DevOps Documentation – Read about It
  - <https://docs.microsoft.com/en-us/azure/devops>
- Azure DevOps Projects- Get Started Fast
  - <https://azure.microsoft.com/en-us/features/devops-projects/>



# Infuse your Apps, Website & Bots with AI-Powered Cognitive Services and Natural Communications



# Comprehensive AI Platform



Productive



Hybrid



Intelligent



Trusted



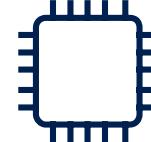
**Customizable services**

VS, ML STUB, Tensor, Caffe



**Tools**

Bots, Cognitive, ML



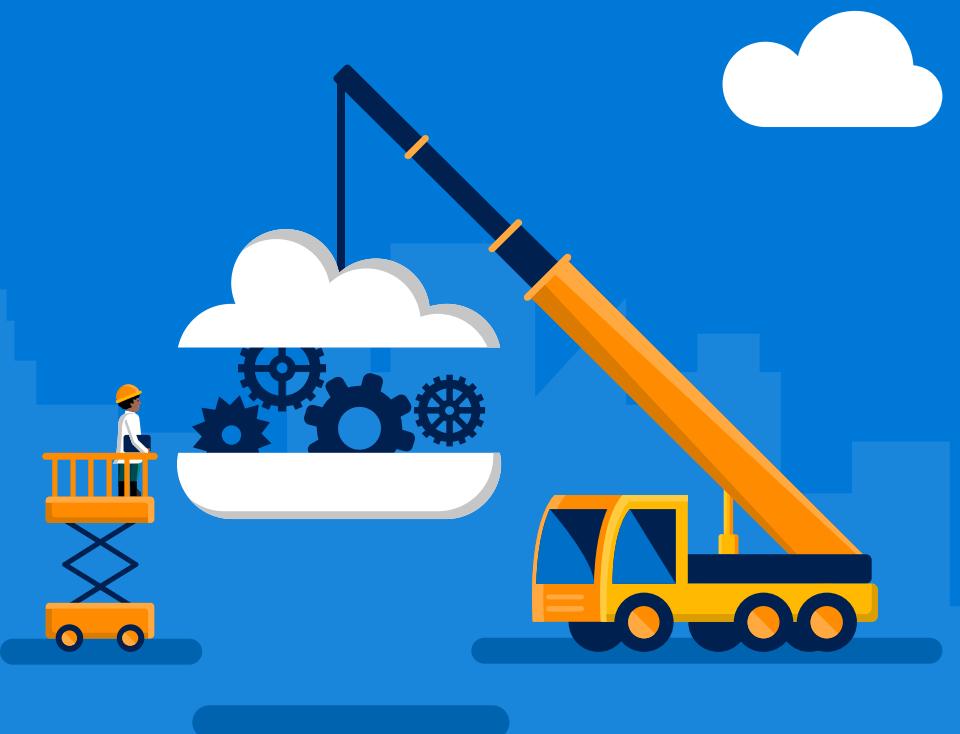
**Infrastructure and compute**

CPU, GPU, FPGA



Azure

# What are Cognitive Services?



# Cognitive Services Directory

- <https://azure.microsoft.com/en-us/services/cognitive-services/directory/>



# Demos!



# Car ID Demo - Custom Vision Service

- Identify if a picture of a car is a sedan or an SUV
- <https://www.customvision.ai/>

# Video Indexer Demo

- Enrich videos with meta data including, transcription, translation, people, brands, sentiment analysis, keywords, labels
- <https://vi.microsoft.com>

<http://aka.ms/jfkfiles>

T H E  F I L E S

The truth is in there



Automatic Photo Capture



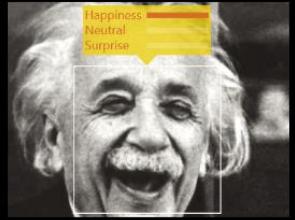
Bing News Analytics



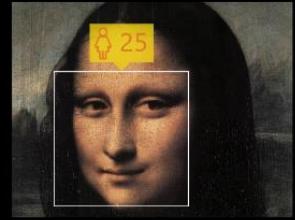
Bing Visual Search



Custom Vision Explorer



Emotion API Explorer



Face API Explorer



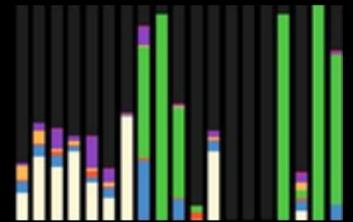
Greeting Kiosk



Image Collection Insights



Mall Kiosk



Realtime Crowd Insights



Realtime Driver Monitoring



Realtime Video Insights

# Cognitive Services Kiosk

<https://github.com/Microsoft/Cognitive-Samples-IntelligentKiosk>



# Is it Trending? News Analytics

Look at recent news articles on a topic, extract keywords & perform sentiment analysis.

# Customer interaction - Crowd Insights

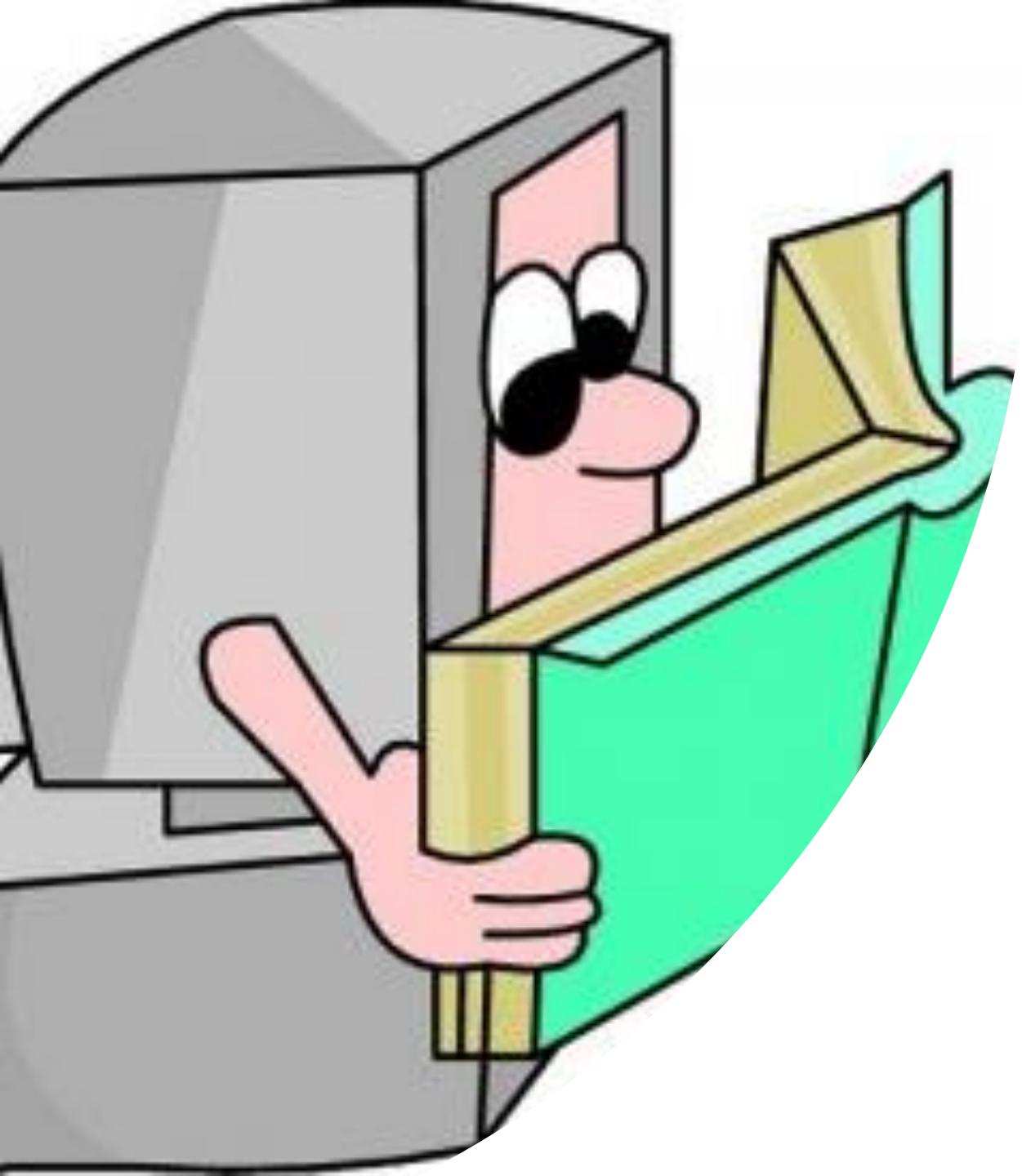
- What if you could monitor the facial expressions of your staff to ensure that they were providing “service with a smile”



# Identify yourself – Greeting Kiosk

- Do you require employees to swipe badges when they enter the building? But how do you know that they are using their own badges?





# OCR – Vision API

What if you could extract the text from a picture?

# Thank You

ευχαριστώ Salamat Po متشرّم شكرًا Grazie

благодаря ありがとうございます Kiitos Teşekkürler 谢谢

ឧបម្ពុណមរំបែក Obrigado شكريه Terima Kasih Dziękuję

Hvala Köszönöm Tak Dank u wel дякую Tack

Mulțumesc спасибо Danke Cám ơn Gracias

多謝晒 Ďakujem הודה තෝරු Děkuji 감사합니다

