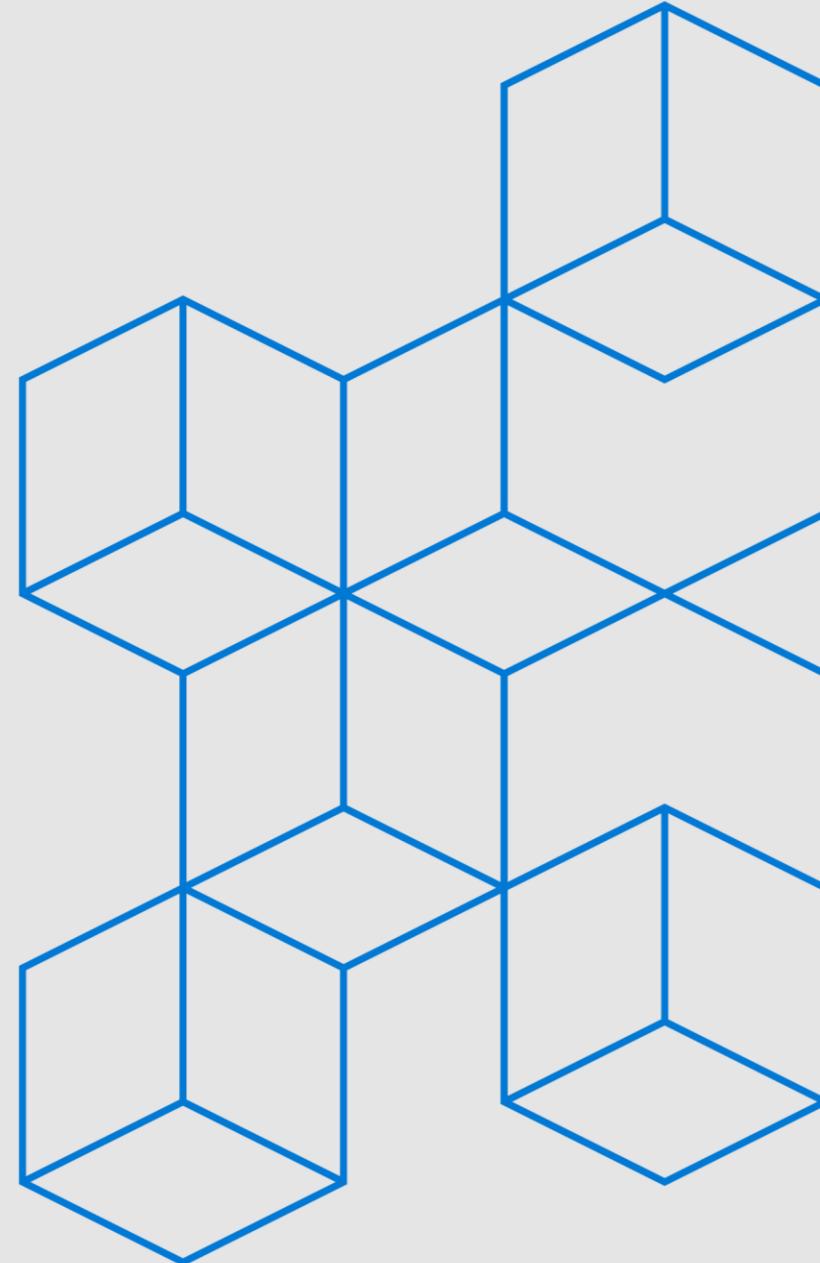




Discovering Microsoft Azure

Introducing core concepts and fundamentals



Velin Georgiev



Microsoft MVP- Office Dev, Expert in Azure, .NET and Front End Dev

Technical Architect – Pramerica

📢 @velingeorgiev

🔗 blog.velingeorgiev.com



Nithin Mohan T K

Technology Evangelist/Expert - Azure, .NET and Mobile (*Passion*)

Senior Specialist – Pramerica (*Bread*)

📢 @nithinmohantk

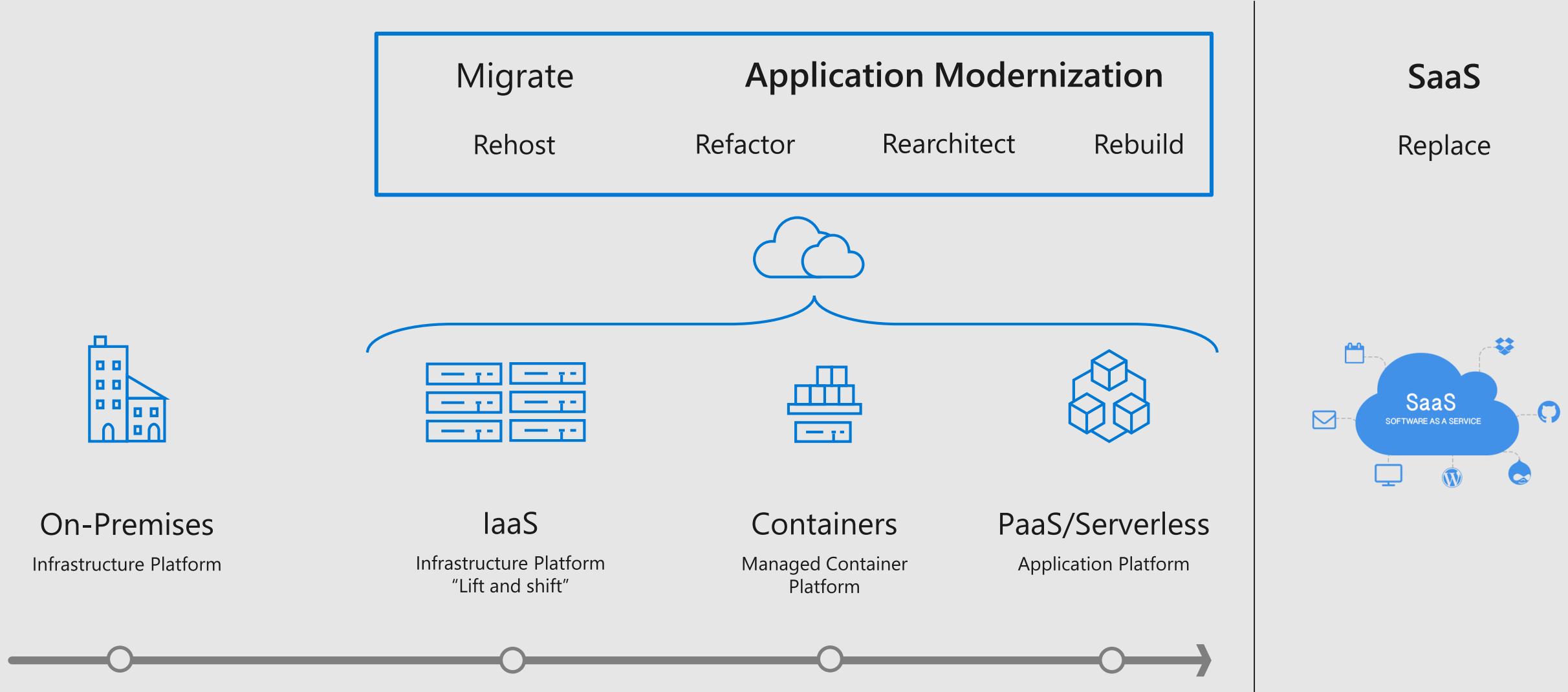
🔗 www.thingx.cloud



What is Azure?



The journey to the cloud



Why move to the cloud?

Cost effective

Pay-as-you-go pricing

Pay only for the resources you use

Scalable

Vertically scale resources

- Adding a faster CPU
- Adding memory

Horizontally scale

- Add more servers

Elastic

Automatically add or remove resources

Add resources when your application is most-heavily used

Remove resources when unnecessary



Why move to the cloud?

Current

Focus on building and deploying applications

Maintenance is done for you

- No more software patching, hardware setup, upgrades and IT management

Reliable

Your data is safe

Azure provides:

- Data backups
- Disaster recovery
- Data replication

Secure

Physical security

Digital security



Styles of cloud computing





Public

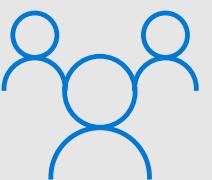
- Most common
- No local hardware to manage
- Save costs by sharing resources with other cloud users
- Advantages:
 - Highly scalable
 - Pay-as-you-go
 - No hardware maintenance

Private

- Cloud environment in your data center
- Self-service access to users in your organization
- Disadvantages:
 - Must purchase and maintain hardware
 - Requires skilled IT personnel

Hybrid

- Combines public and private clouds
- Run applications in the most appropriate location
 - Web applications can run on a public cloud
 - Secure databases can be hosted on your private cloud (or on-premises data center)
- Advantages:
 - You can keep systems running on out-of-date hardware
 - Flexibility on running locally vs. in the cloud
- Disadvantages:
 - May be more expensive
 - More complicated to set up and manage



Cloud computing categories



Infrastructure as a Service (IaaS)

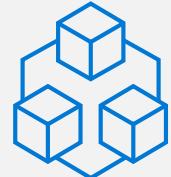
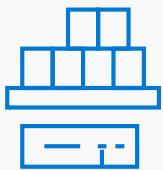
- ✓ Extremely flexible
- ✓ Aims to give you control over hardware
- ✓ Instead of buying hardware, you rent it

Platform as a Service (PaaS)

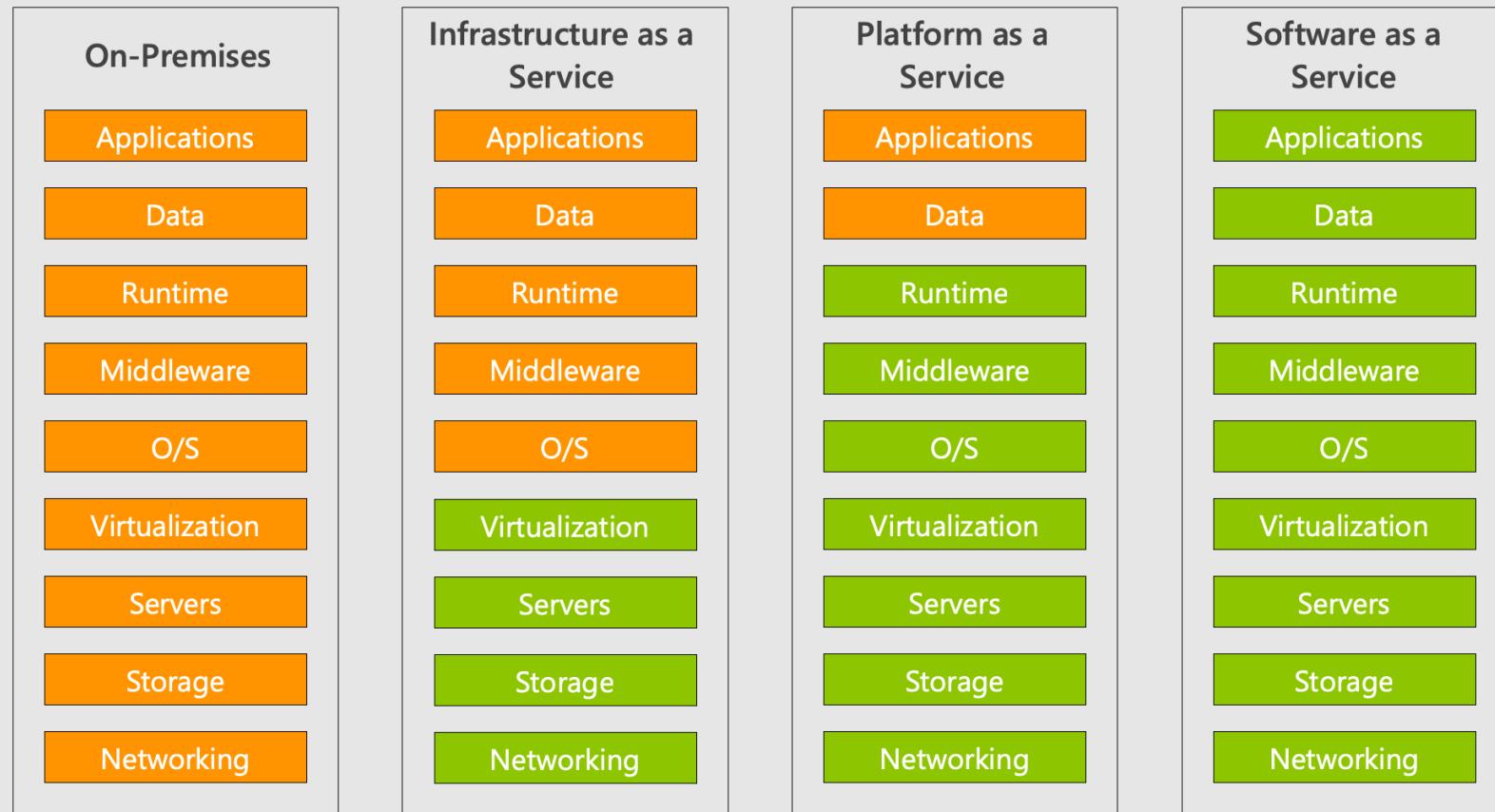
- ✓ Build, test, and deploy software
- ✓ Don't worry about infrastructure
- ✓ No installing an OS, web server or updates

Software as a Service (SaaS)

- ✓ Software that is centrally hosted and managed
- ✓ Licensed through a monthly or annual subscription
- ✓ Office 365 is an example of SaaS



Cloud computing categories overview

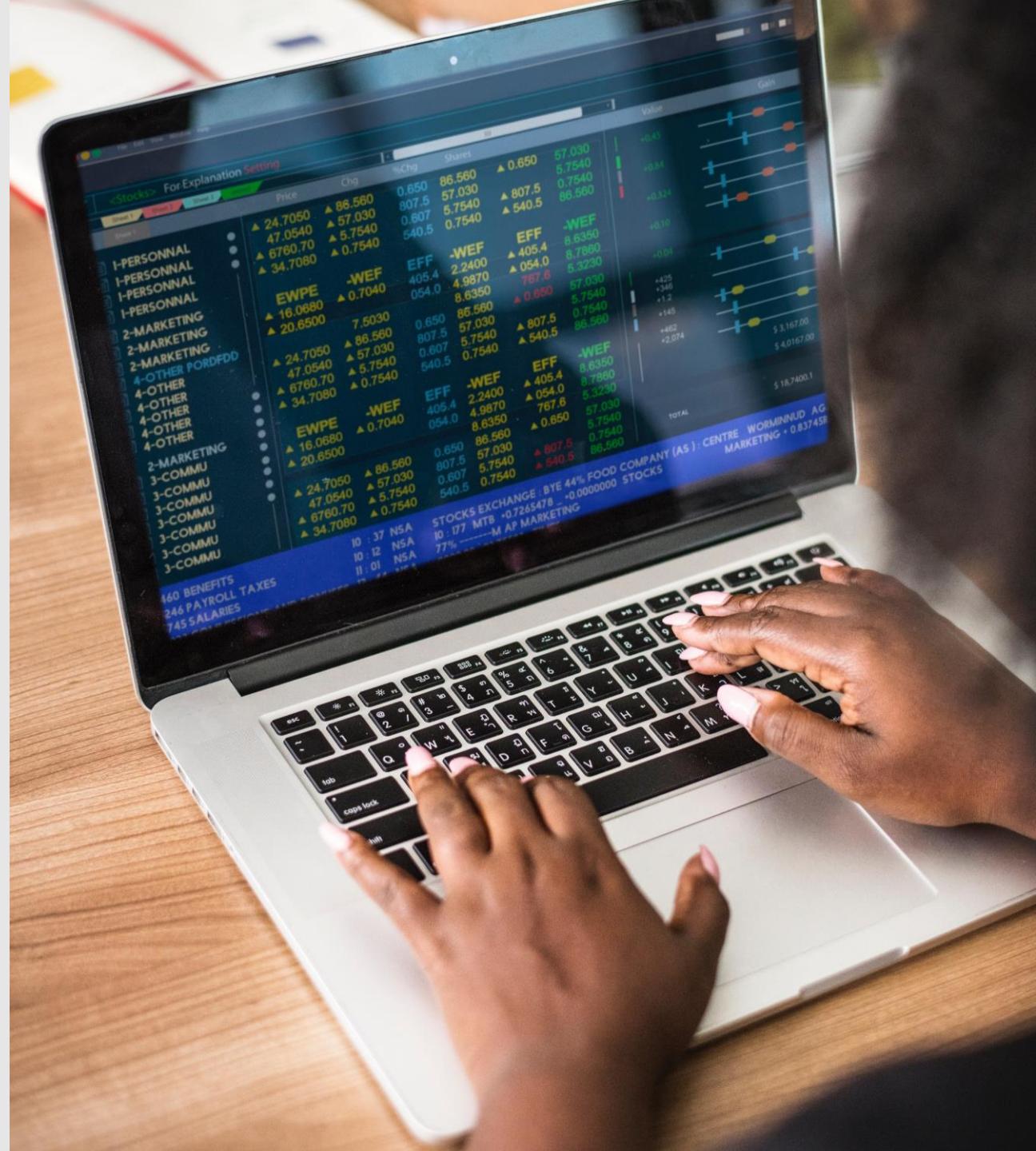


You Manage



Provider Manages

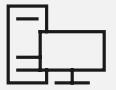
Cloud computing services



Cloud computing services

Compute power

Windows and Linux virtual machines



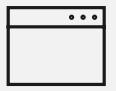
Storage

Object storage



Applications

NoSQL and SQL database applications



Networking

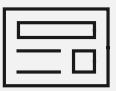
Setting up virtual networks



Analytics

Visualizing telemetry

Performance data



What is Azure?



Security & Management



Portal



Azure Active Directory



Multi-Factor Authentication



Automation



Key Vault



Store / Marketplace



VM Image Gallery & VM Depot

Platform Services

Compute



Cloud Services



Service Fabric



Batch



Remote App

Web and Mobile



Web Apps



API Apps



API Management



Mobile Apps



Logic Apps



Notification Hubs

Developer Services



Visual Studio



Azure SDK



Team Project



Application Insights

Integration



Storage Queues



Biztalk Services



Hybrid Connections



Service Bus

Media & CDN



Media Services



Content Delivery Network (CDN)

Analytics & IoT



HDInsight



Machine Learning



Data Factory



Event Hubs



Stream Analytics



Mobile Engagement

Data



SQL Database



SQL Data Warehouse



Redis Cache



Search



DocumentDB



Tables

Hybrid Operations



Azure AD Connect Health



Azure AD Privileged Identity Management



Backup



Operations Management Suite



Import/Export



Site Recovery



StorSimple

Infrastructure Services

Compute



Storage



BLOB Storage



Azure Files



Premium Storage



Virtual Network



Load Balancer



DNS

Networking



Express Route



Traffic Manager



VPN Gateway

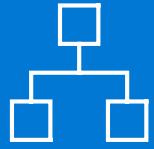


Application Gateway

Azure is secure, cost-effective, and ubiquitous



Compute



Networking



Storage



Security and
management

Getting started with Azure

<https://aka.ms/azure-portal>



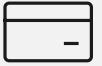
Azure account types

Free

\$200 credit for first 30 days

Popular Azure products free for 12 months

Credit card is required (used only for verification)



Pay-as-you-go

Bills monthly for services used

Appropriate for a wide range of users



Enterprise

Flexibility to buy cloud services under one agreement

Designed for enterprise-scale companies



What is Azure Active Directory?

Azure AD is a multi-tenant, cloud-based directory and identity management service

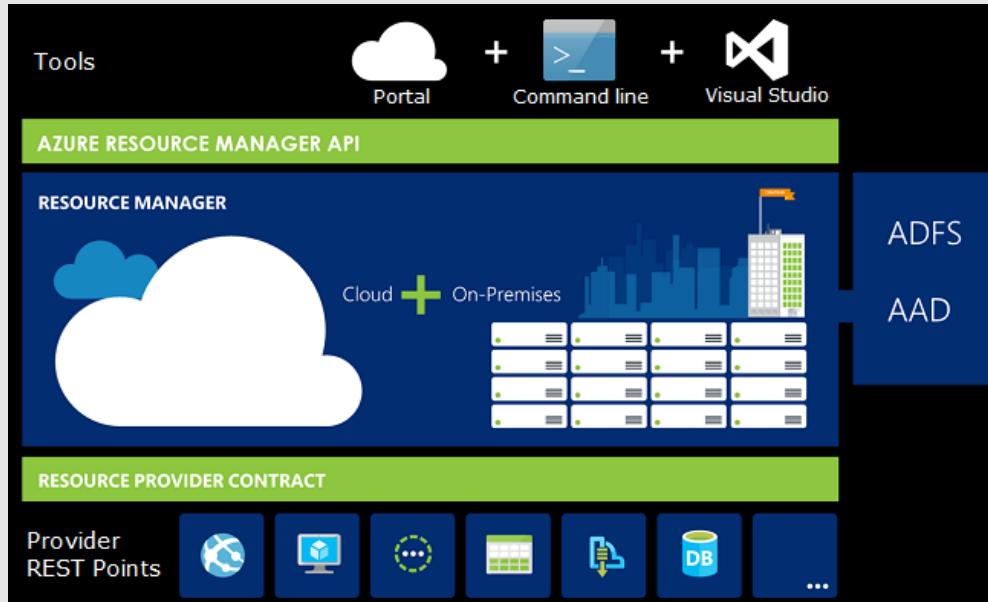
Centralized directory store

Used by Azure and Office 365

Contains all the identities of users in your organization



Azure Resource Manager



- ✓ Consistent management layer
- ✓ See components as related and independent parts of your network
- ✓ Deploy, manage, and monitor resources as a group
- ✓ Provides security, auditing, and tagging

Resource

A manageable item available through Azure. VMs, web apps, databases, etc.

Resource group

A container that holds related resources

You decide how to allocate resources to groups

Resource provider

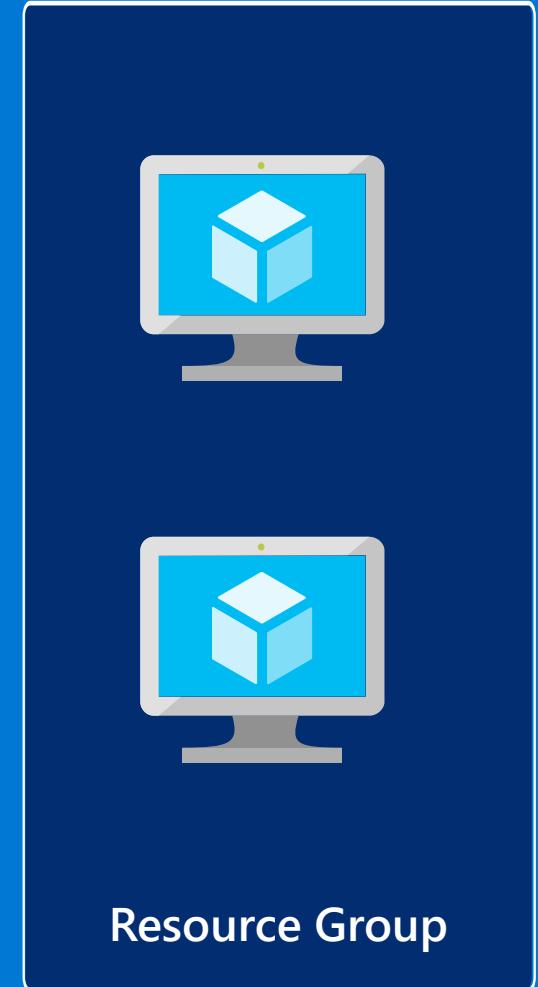
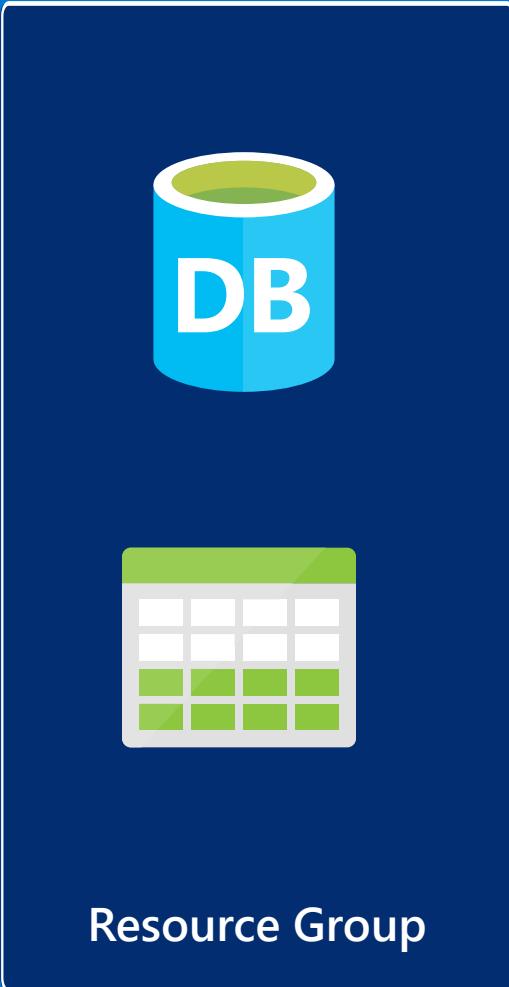
A service that supplies the resources you can deploy and manage

Resource manager template

A JSON file that defines resources to deploy to a resource group

Defines dependencies between resources

Subscriptions, resource groups, and resources



Subscription

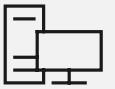
Azure compute options

- Virtual machines
- Containers
- Serverless



What's a Virtual Machine (VM)?

Software emulation of a physical computer



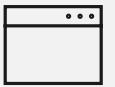
Includes:

Virtual processor



Memory

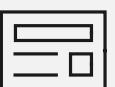
Storage



Networking resources

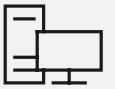


Unlike containers, VMs host an OS



VM in Azure

Takes 5 minutes

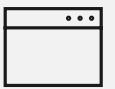


Select a pre-configured VM image

A template used to create a VM



Includes an OS and usually some other software



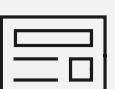
Regions

Examples: west US, north Europe, southeast Asia



Create VMs closest to your users

Provide redundancy and availability



Network

VMs must use a Virtual Network (VNet)

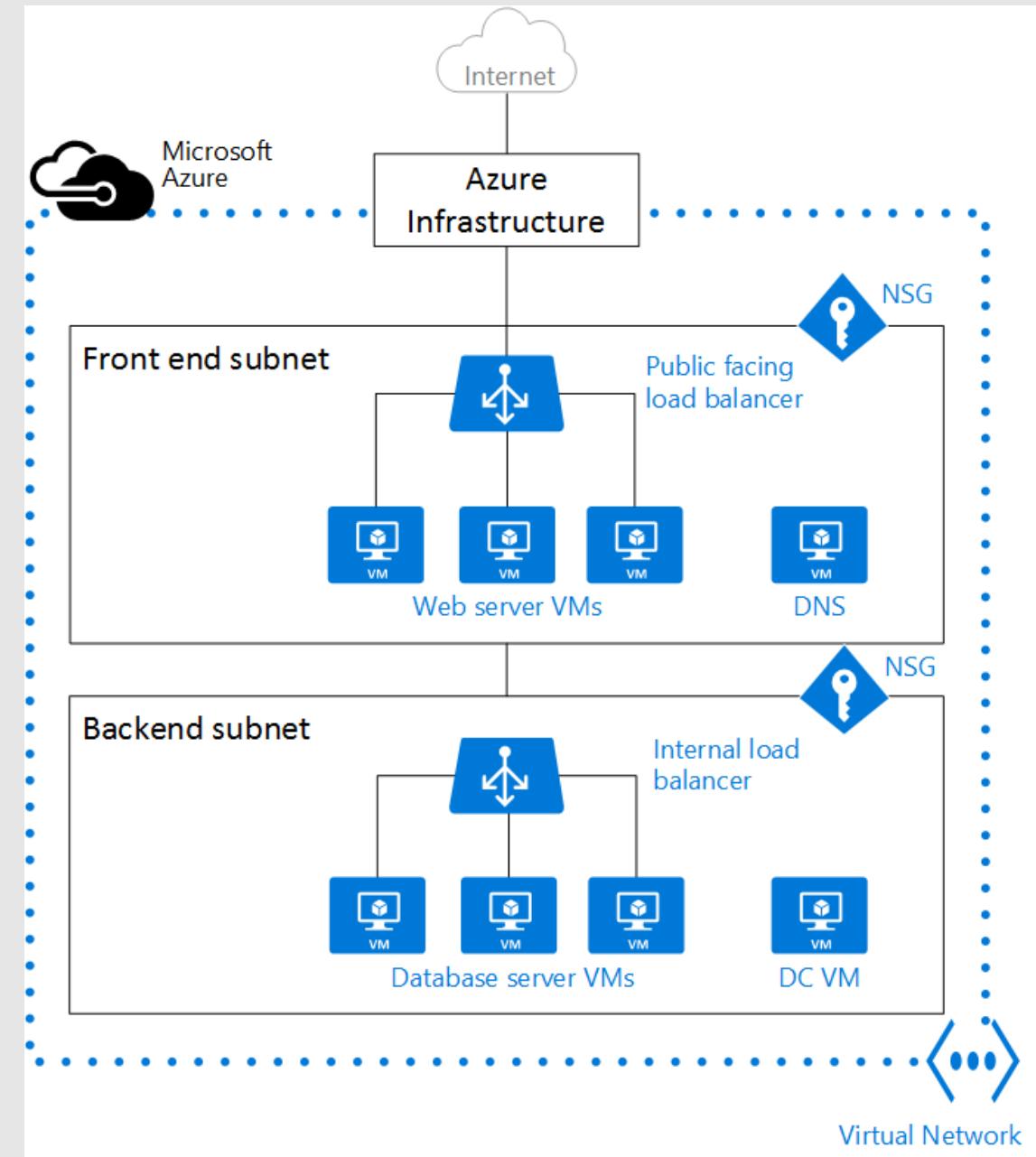
Virtual Machines (VMs)

Required resources

- Network interfaces
- IP addresses
- Virtual network and subnets

Additional resources

- Network security groups
- Load balancers



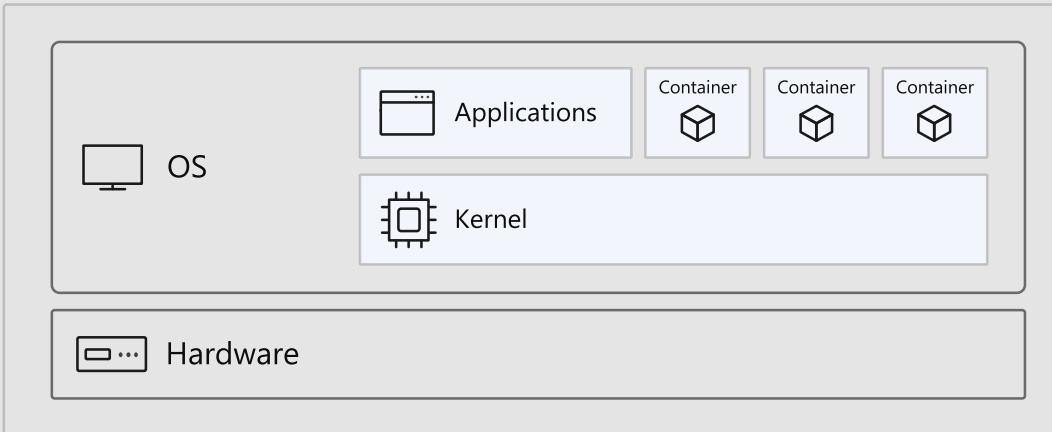
Azure compute options

Containers

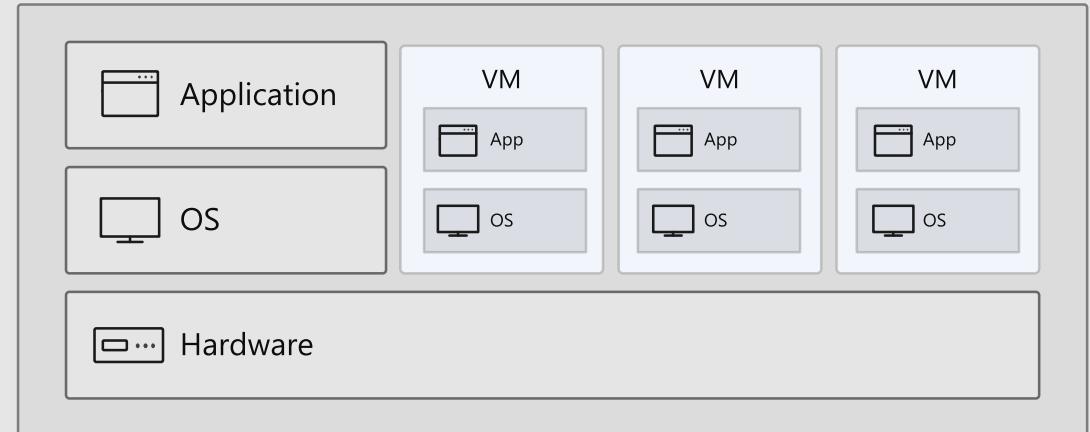


Container?

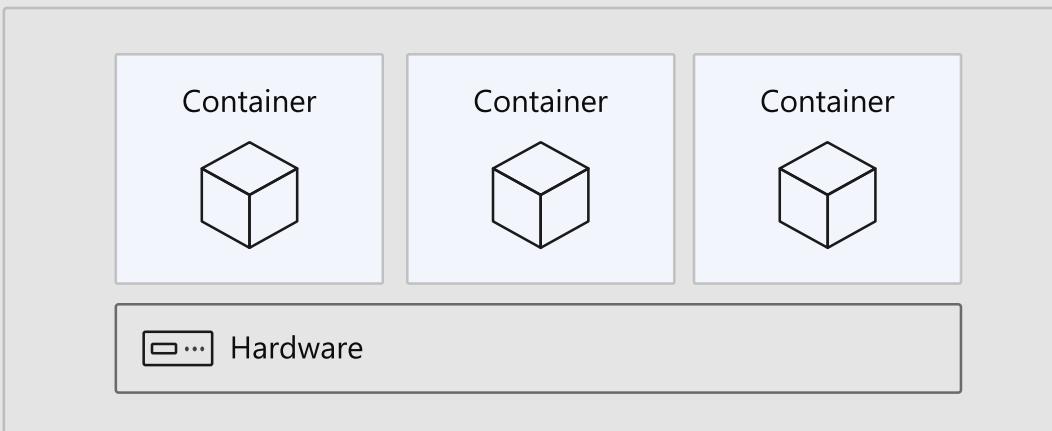
Containers = operating system virtualization



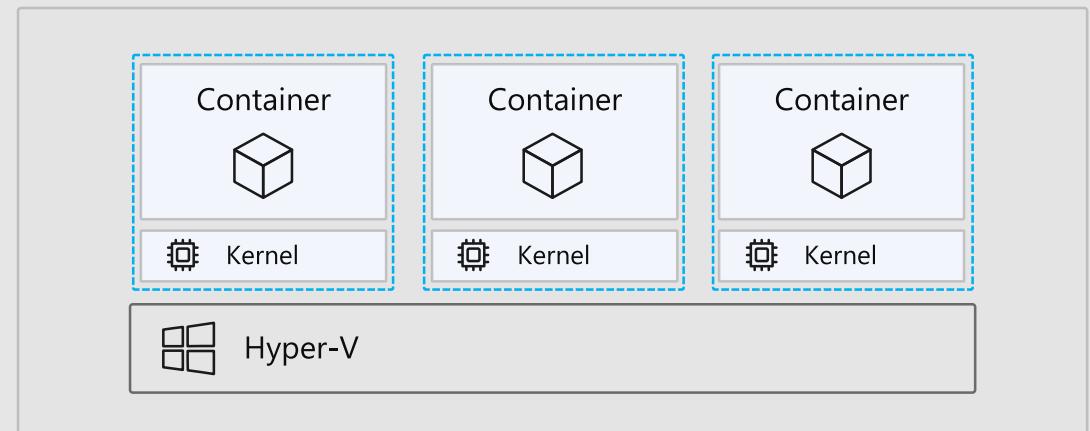
Traditional virtual machines = hardware virtualization



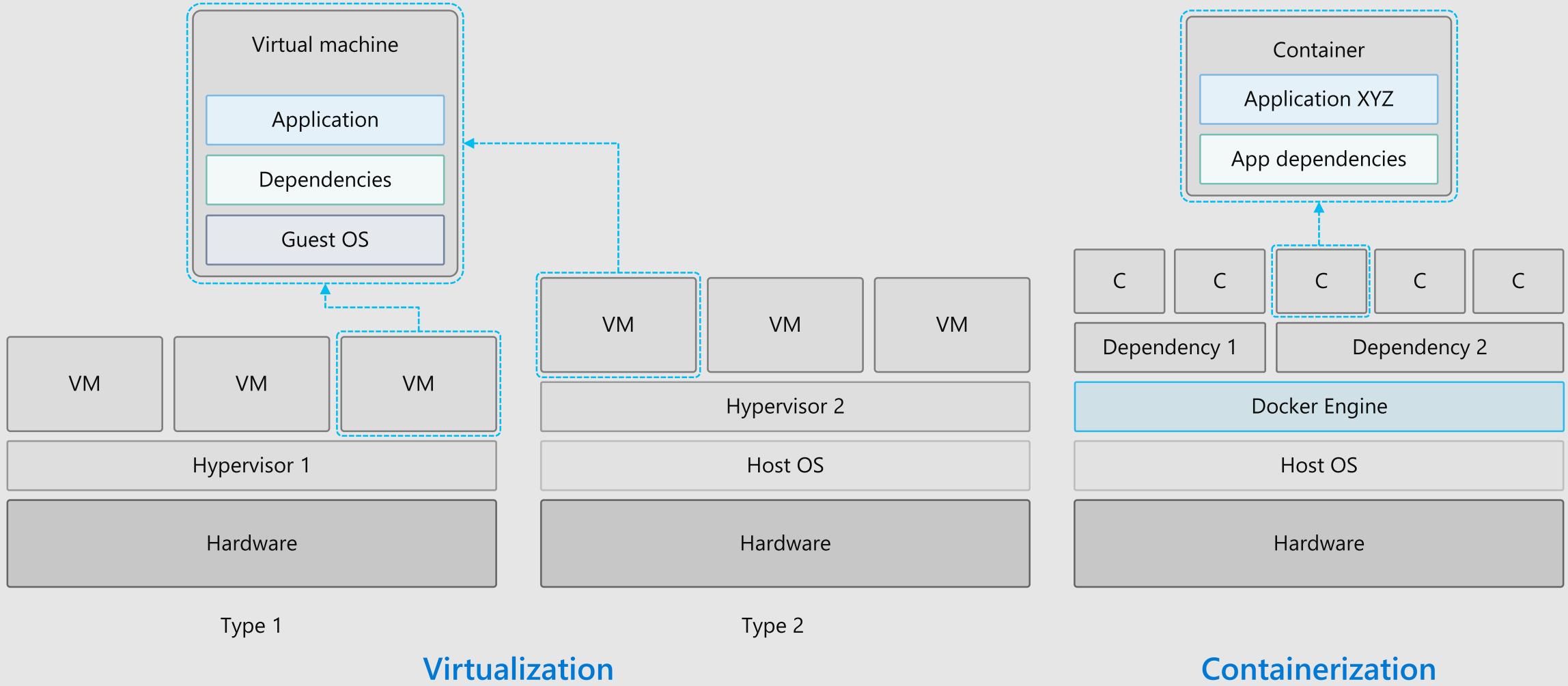
Windows Server containers: maximum speed and density



Hyper-V containers: isolation plus performance



Virtualization vs. containerization

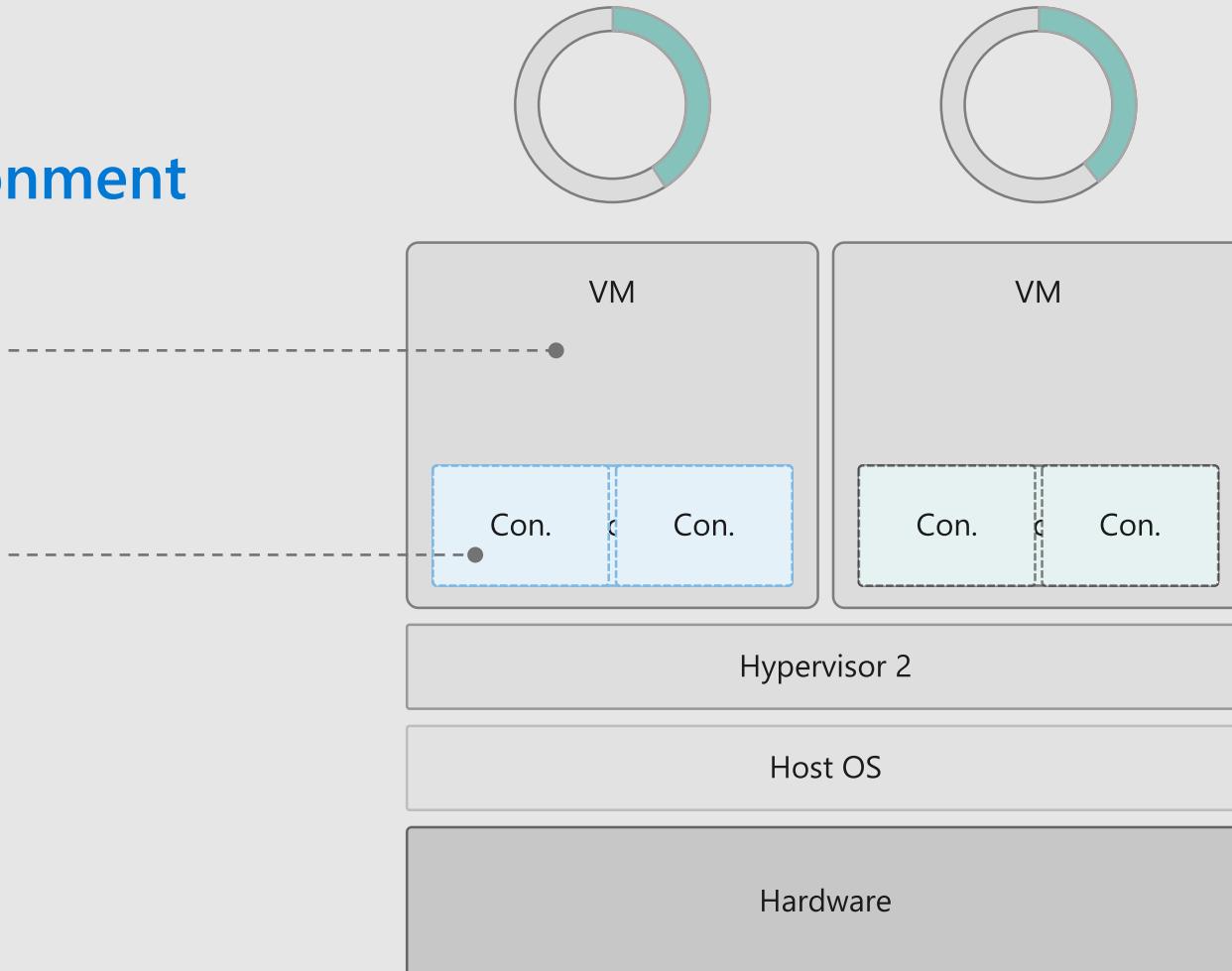


The container advantage

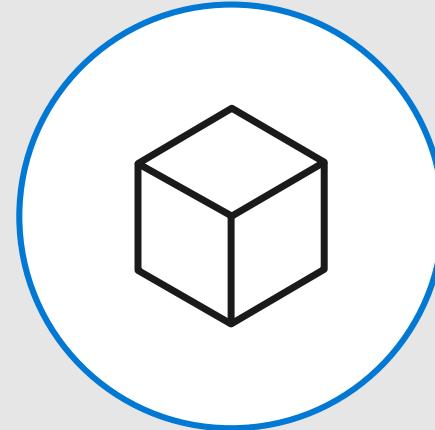
Traditional virtualized environment

Low utilization of container resources

Containerization of applications
and their dependencies



The container advantage



Fast
iteration



Agile
delivery



Immutability



Cost
savings



Efficient
deployment

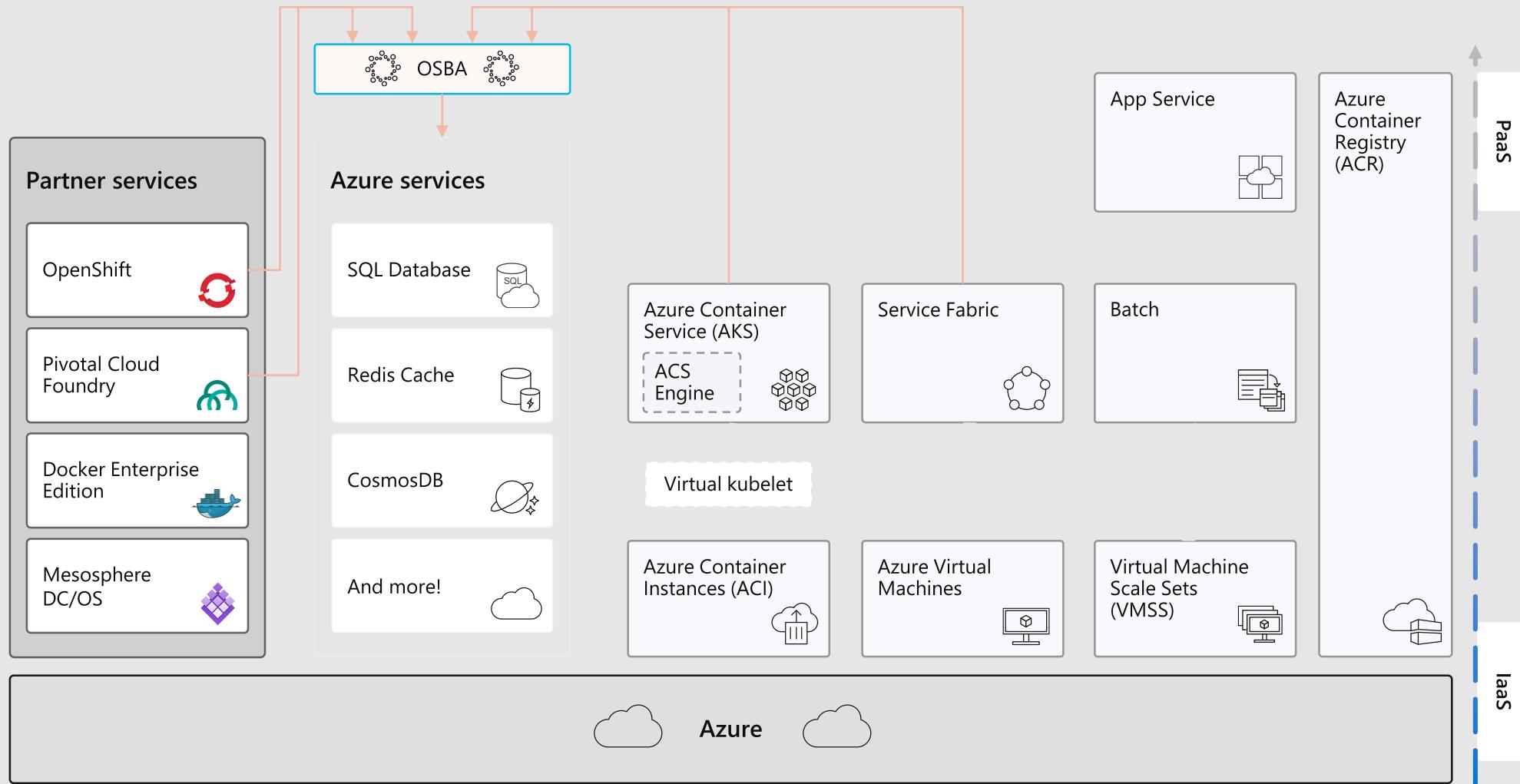


Elastic
bursting

For developers

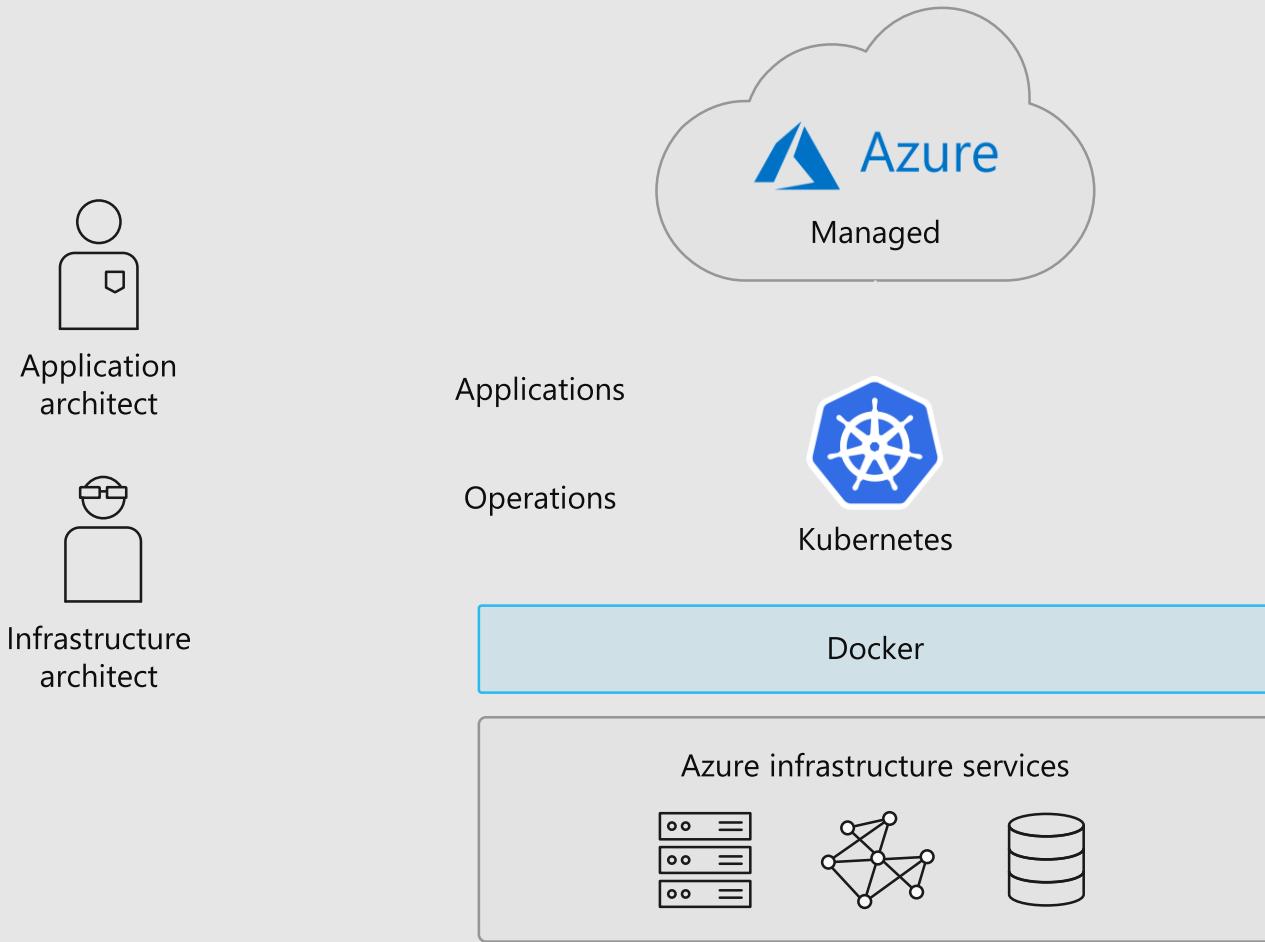
For IT

Azure container ecosystem



Azure Container Service (AKS)

A fully-managed Kubernetes Cluster



- Managed control pane
- Automated upgrades, patches
- Easy cluster scaling
- Self-healing
- Cost savings



Azure Container Service (AKS)



Azure Container Instances (ACI)



Azure Container Registry



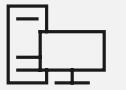
Open Service Broker API (OSBA)



Release Automation Tools

What is serverless?

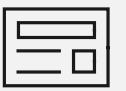
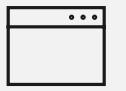
Actually, there are a lot of servers



Someone else's servers

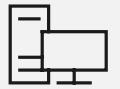


You don't have to manage infrastructure



What is Serverless?

Abstraction of servers, infrastructure and operating systems



Event-driven



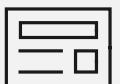
Fully-managed



Server management based on resources consumed



Capacity planning based on time code is running



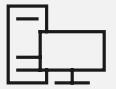
Serverless in Azure

Microsoft flow

Built on Logic Apps

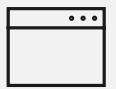
Create simple integrations

Designed for non-tech employees



Azure logic apps

Advanced Flow for developers, operations folks and IT pros



Azure functions

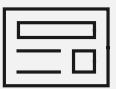
Serverless compute service

Runs locally and in the cloud



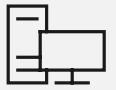
Azure app service webjobs

Run scripts in the context of an App Service



Azure Functions

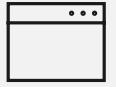
Small pieces of code, easy to run



Develop serverless applications on Azure



Pay only for the time your code runs

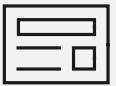


Use your development language of choice

Supported languages: C#, JavaScript, F#, Java, Python,
TypeScript, PHP, Batch, Bash, PowerShell



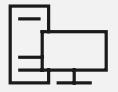
Simplify integration with Azure services



Functions runtime is open source

Azure App Service

Build and host web apps in your language of choice



Auto-scaling and high availability



Automated deployments from GitHub and Azure DevOps

Quickstarts



.NET



PHP

Node.js

Java

Python

Ruby

Docker/Go

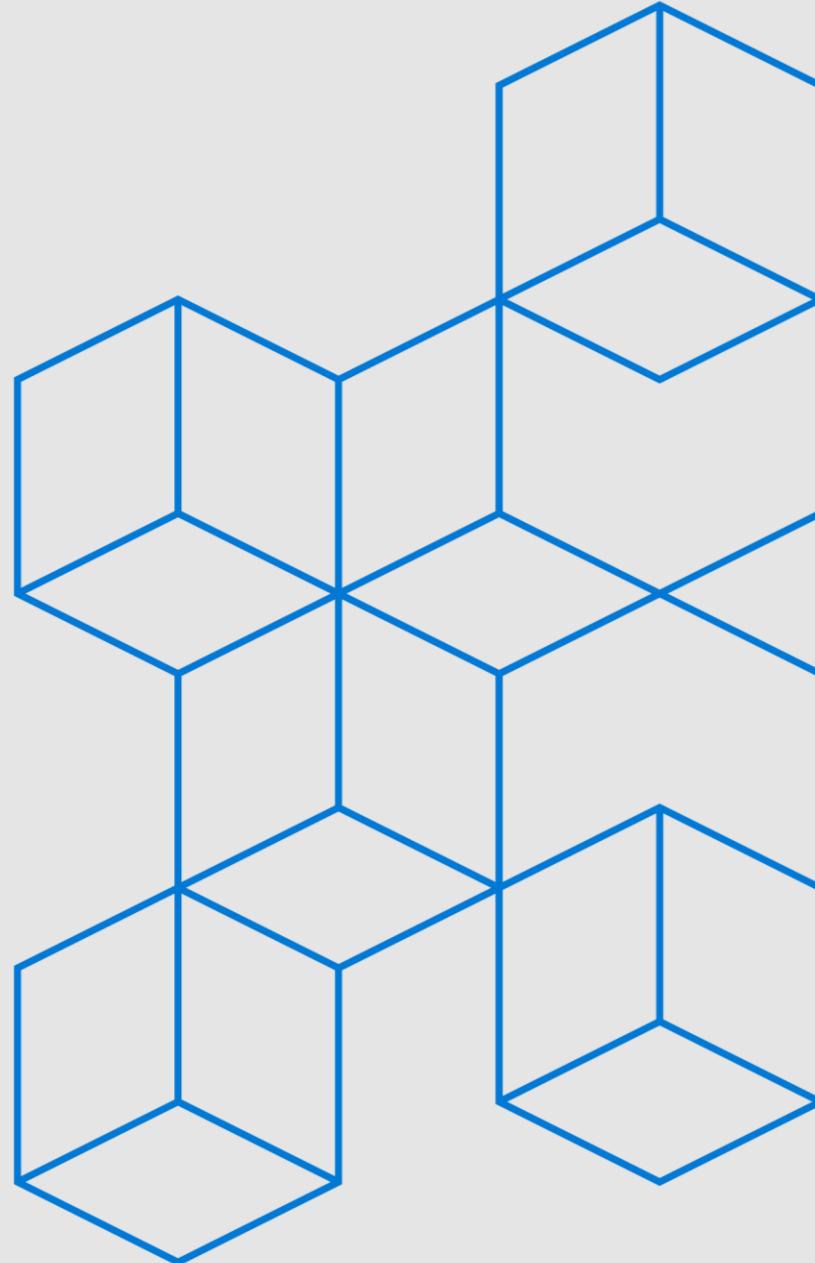


Demo

<https://aka.ms/azure-portal>



Discovering Azure Tooling and Utilities



Goals for this talk

Introduction to tools that help deploy and manage Azure solutions

- Command line tools (Azure CLI and PowerShell)
- Visual Studio Code
- Azure Cloud Shell
- Azure Resource Manager templates

Command Line Tooling

Azure Command Line Interface (CLI)

Cross platform CLI for provisioning and managing Azure infrastructure

- Version 2.0.x
- Run on macOS, Windows, or Linux
- Run in Azure Cloud Shell
- Create and manage Azure resources from command line
- Write scripts to create and manage Azure resources

PowerShell Modules for Azure

PowerShell modules for working with Azure infrastructure

- PowerShell module for Windows
- PowerShell core
- Windows, macOS, Linux, and as a Docker image

Visual Studio Code

What is Visual Studio Code?

 Visual Studio Code Docs Updates Blog Community Extensions FAQ 

Code editing. Redefined.

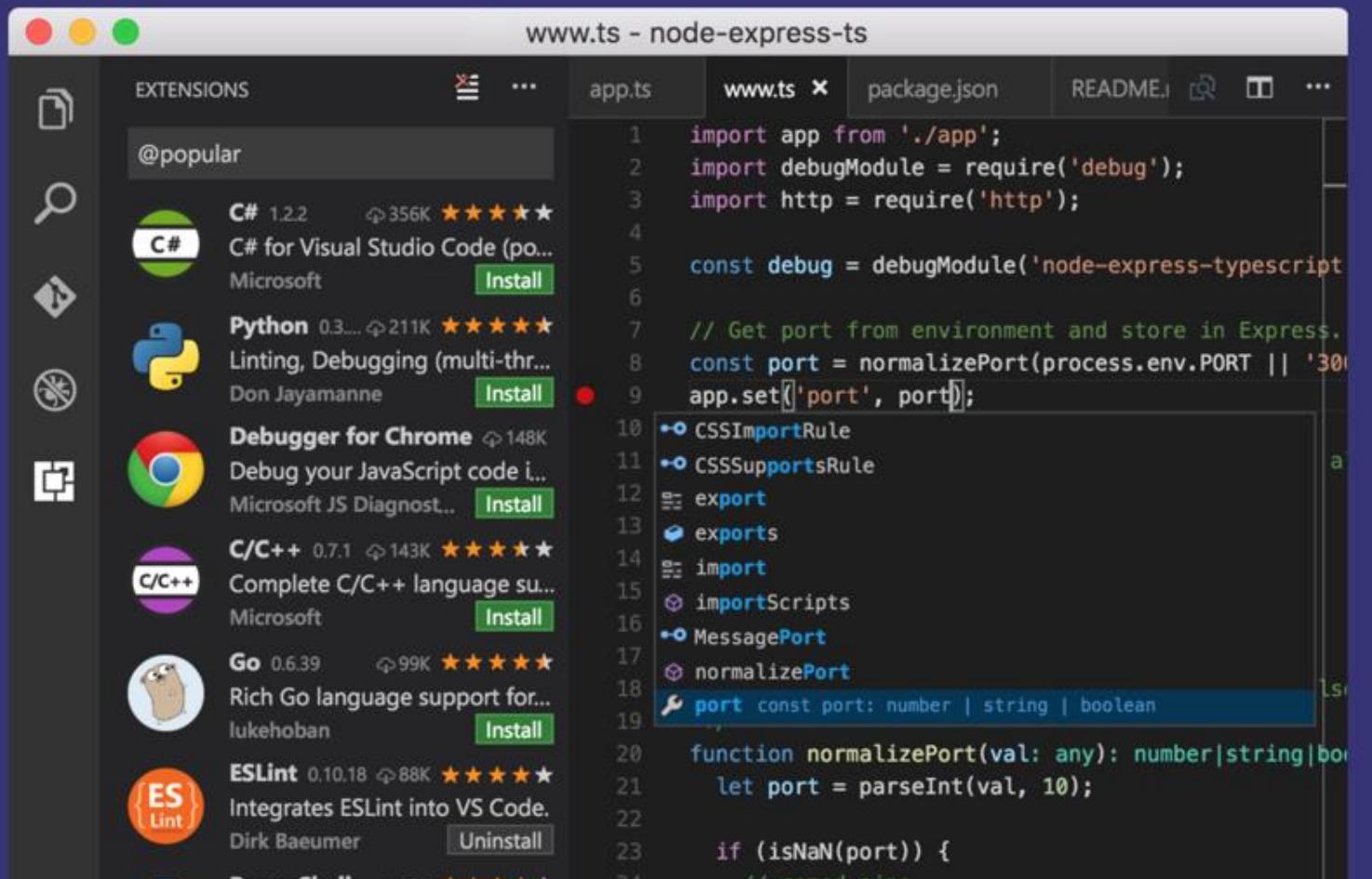
Free. Open source. Runs everywhere.

[Download for Mac](#)

Stable Build

[Other platforms and Insiders Edition](#)

By using VS Code, you agree to its
license and privacy statement.



The screenshot shows the Visual Studio Code interface. The main area displays a Node.js application's codebase with syntax highlighting for TypeScript. The code includes imports for 'app', 'debugModule', and 'http', and defines a 'normalizePort' function. The left sidebar features a file tree, while the right sidebar lists various extensions like 'C#', 'Python', and 'Debugger for Chrome'. A status bar at the bottom indicates the current file is 'www.ts'.

```
import app from './app';
import debugModule = require('debug');
import http = require('http');

const debug = debugModule('node-express-typescript');

// Get port from environment and store in Express.
const port = normalizePort(process.env.PORT || '3001');
app.set('port', port);

• CSSImportRule
• CSSSupportsRule
export
exports
import
importScripts
MessagePort
normalizePort
port const port: number | string | boolean

function normalizePort(val: any): number|string|boolean {
  let port = parseInt(val, 10);
  if (isNaN(port)) {
```

What can I use it with?

VS Code for

Markdown

SQL

Dockerfile

F#

Batch

Why Visual Studio Code?

Rich coding
experience

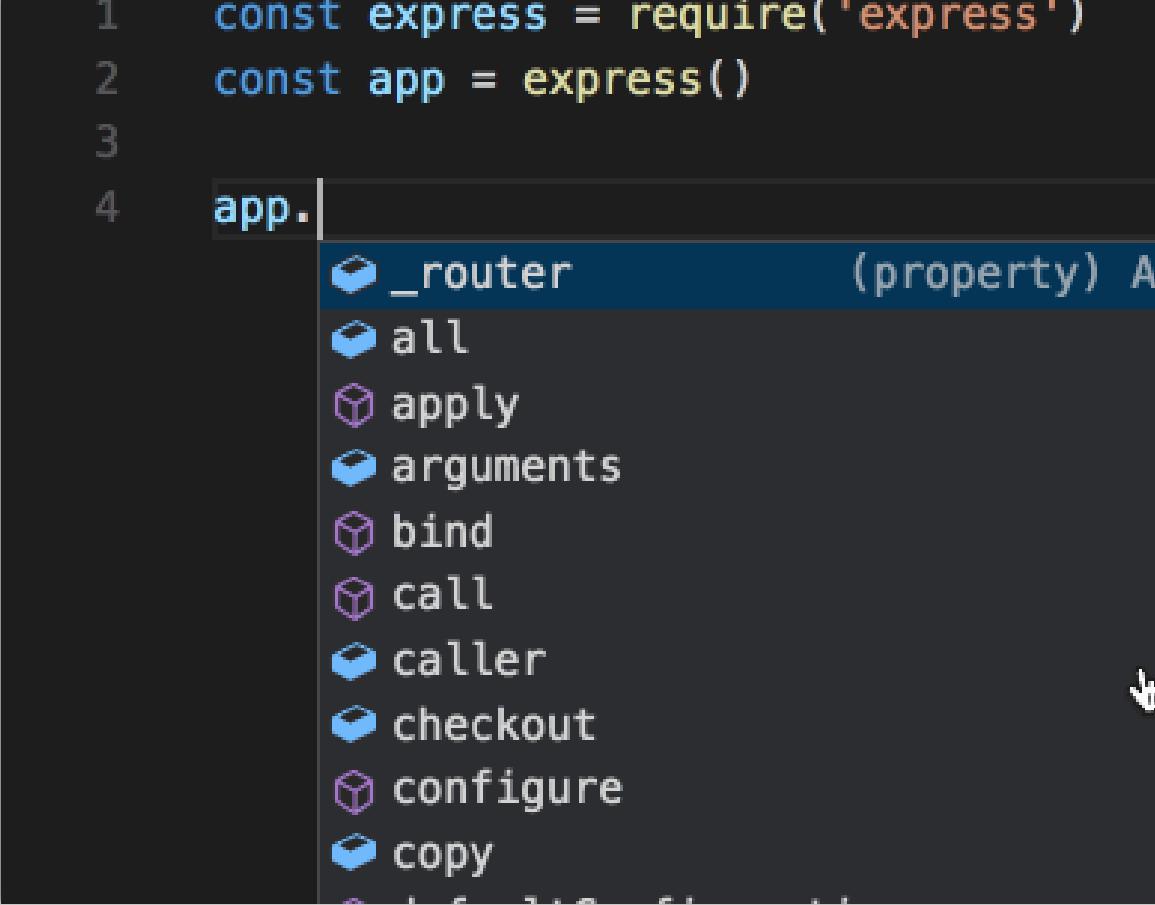
One tool,
many jobs

Customizable

Extensible

Rich coding experience

```
1 const express = require('express')
2 const app = express()
3
4 app.
```



- 📦 _router (property) A
- 📦 all
- 📦 apply
- 📦 arguments
- 📦 bind
- 📦 call
- 📦 caller
- 📦 checkout
- 📦 configure
- 📦 copy

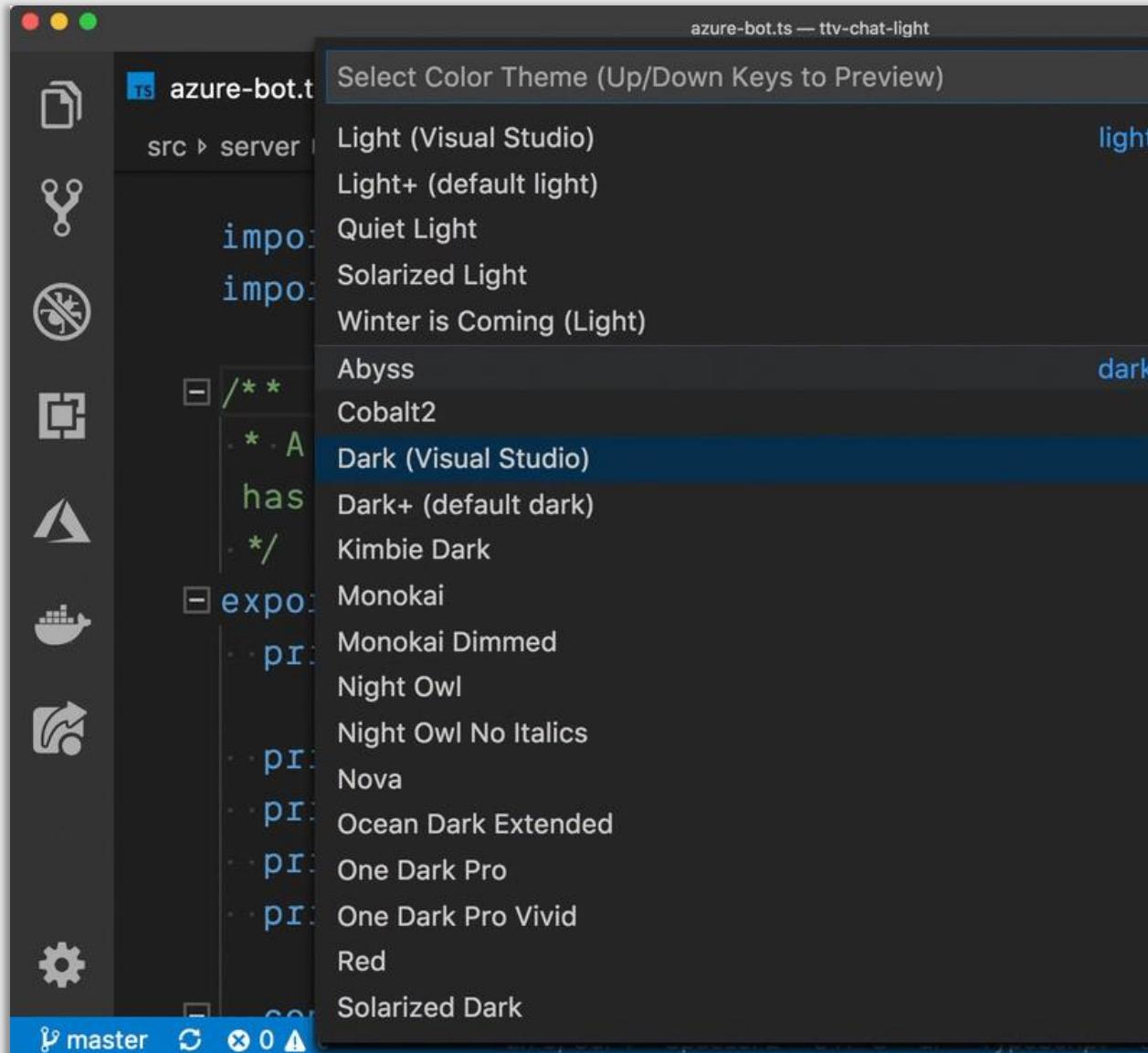
A screenshot of the Visual Studio Code interface. The title bar says "azure-bot.ts — ttv-chat-light". The left sidebar shows the "EXPLORER" view with a tree structure of files and folders under "TTV-CHAT-LIGHT". The "src" folder contains ".github", ".vscode", "dist", "node_modules", and "src". "src" has subfolders "assets", "client", and "server". "server" contains "@types", "routes", "alerts-manager.ts", "azure-bot.ts" (which is selected), "config.ts", "discord-bot.ts", "effects-manager.ts", "effects.json", "file-manager.ts", and "index.ts". The bottom status bar shows "master" and "Ln 1, Col 1". The main code editor window displays the "azure-bot.ts" file:

```
azure-bot.ts
src > server > azure-bot.ts > ...
import fetch from 'isomorphic-fetch';
import * as config from './config';
import { log } from './log';

/**
 * A Plugin of sorts to deal with
 * the AzureBot if the user has
 * decided to configure it
 */
export class AzureBot {
    private azureBotToken = config.azureBotToken;
    private conversationId: string | undefined;
}
```

One tool,
many jobs

Customizable



EXTENSIONS: MARKETPLACE

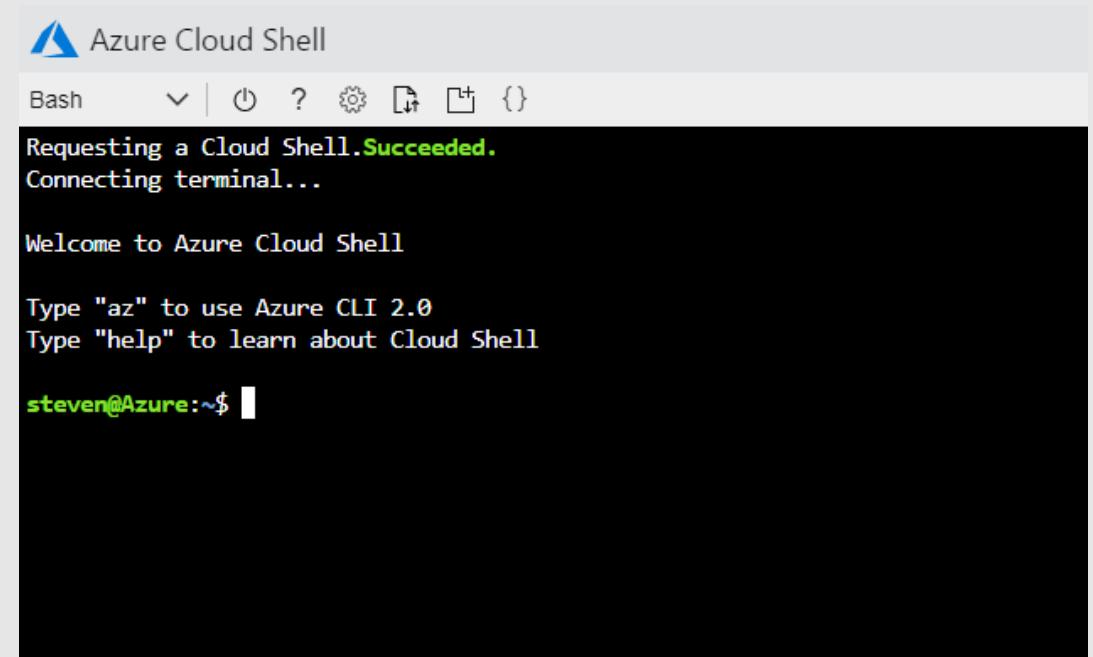
@sort:installs

-  **Python** 2018.3.1
Linting, Debugging (multi-threaded, remote), Intellisense, and code browsing for Python.
Microsoft
-  **Debugger for Chrome** 4.3.0
Debug your JavaScript code in the Chrome browser.
Microsoft
-  **C/C++** 0.16.1
C/C++ IntelliSense, debugging, and code browsing.
Microsoft
-  **ESLint** 1.4.8
Integrates ESLint into VS Code.
Dirk Baeumer
-  **vscode-icons** 7.22.0
Icons for Visual Studio Code.
Roberto Huertas
-  **C#** 1.14.0
C# for Visual Studio Code (powered by OmniSharp).
Microsoft

Extensible

Azure Cloud Shell

- Authenticated access
- Bash & PowerShell
- Private & secure environment
- Common languages & tools

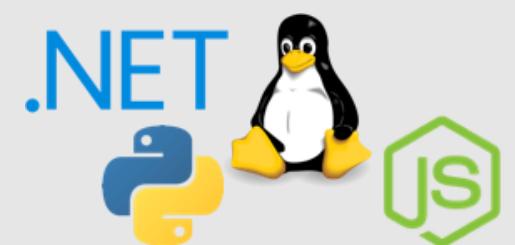


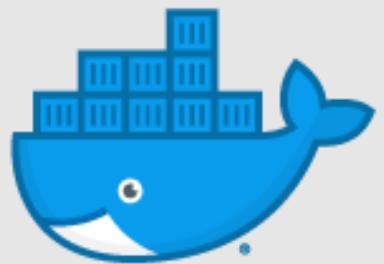
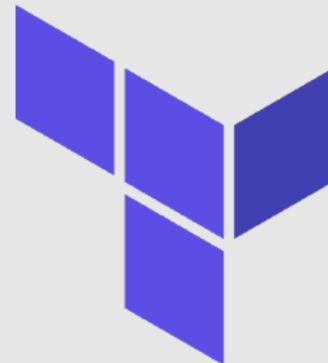
The screenshot shows the Azure Cloud Shell interface. At the top, there's a header with the Azure logo and the text "Azure Cloud Shell". Below the header, there are icons for switching between Bash and PowerShell, and for exiting the session. The main area is a terminal window with the following text:
Requesting a Cloud Shell.**Succeeded.**
Connecting terminal...

Welcome to Azure Cloud Shell

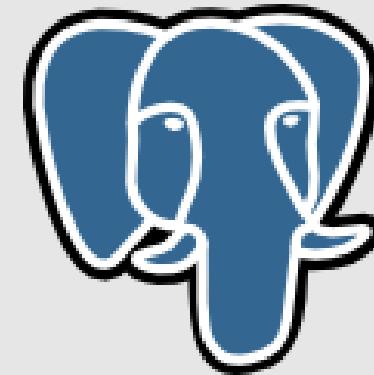
Type "az" to use Azure CLI 2.0
Type "help" to learn about Cloud Shell

steven@Azure:~\$ █





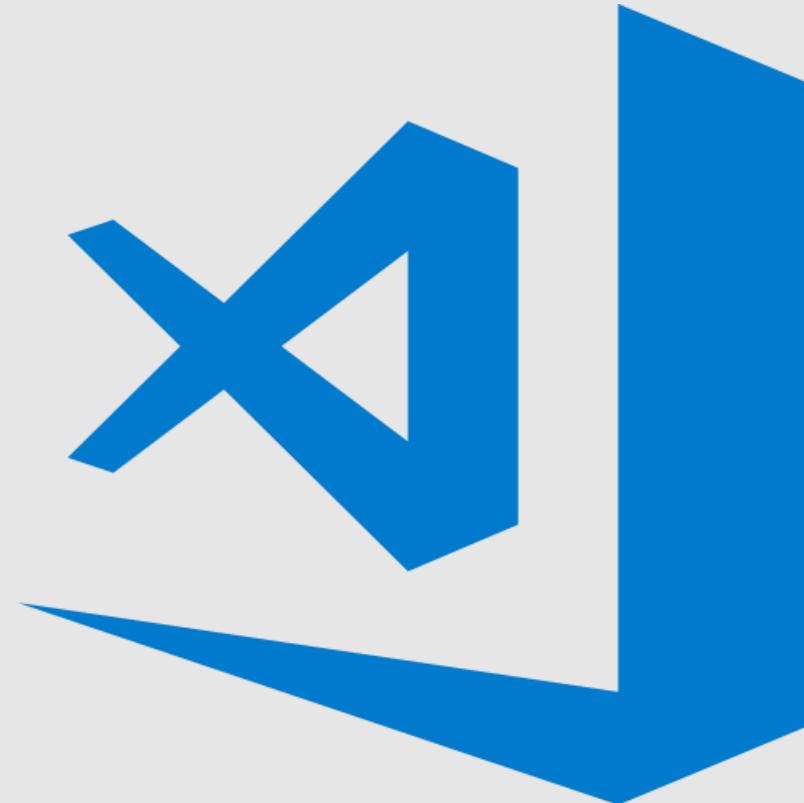
CLOUD FOUNDRY



npm

And many more!!!

Other places to find Azure CloudShell



Demo

Speaker name

Azure Resource Management (ARM) templates

Azure's Infrastructure as
Code solution

IaaS, PaaS, Serverless

Group resources together

Deploy, update, or delete in
a single operation

1 template, many environments

ARM templates

Benefits

Deploy, manage, and monitor all as a group

Repeatedly deploy your solution

Declarative templates

Define dependencies

Apply access control

Apply tags to resources

JSON

Parameters

Variables

Resources

Outputs

Working with
templates—
terminology

Resource

```
{  
  "apiVersion": "2015-08-01",  
  "name": "[variables('hostingPlanName')]",  
  "type": "Microsoft.Web/serverfarms",  
  "location": "[resourceGroup().location]",  
  "sku": {  
    "name": "[parameters('skuName')]",  
    "capacity": "[parameters('skuCapacity')]"  
  }  
}
```

Variables

```
"var1": "[concat(parameters('p1'), '-web')]",  
"var2": "[concat(parameters('p2'), '-sp')]",  
"var3": "[concat(parameters('p3'), '-sql')]"
```

Parameters

```
"administratorLogin": {  
    "type": "string"  
},  
"administratorLoginPassword": {  
    "type": "securestring"  
},  
"databaseName": {  
    "type": "string"  
}
```

There has to
be another way...



Start in the Azure Portal

The screenshot shows the Azure Portal interface for the resource group 'lp5s1-dean'. The left sidebar contains navigation links for Overview, Activity log, Access control (IAM), Tags, Events, Settings, Resource costs, Deployments, Policies, Properties, Locks, Automation script, Monitoring, Insights (preview), Alerts, Metrics, Diagnostic settings, Advisor recommendations, and Support + troubleshooting. The main content area displays the resource group details, including Subscription ID (cd400f31-6f94-40ab-863a-673192a3c0d0) and Deployments (No deployments). A list of resources is shown, filtered by name, type, and location. The resources include:

NAME	TYPE
tailwind-frontend-lp5s1-dean	App Service
tailwind-insights-lp5s1-dean	Application Insights
tailwind-inventory-lp5s1-dean	App Service
tailwind-product-service-lp5s1-dean	App Service
tailwind-svcs-lp5s1-dean	App Service plan
twlp5s1dean	Azure Cosmos DB account
tw-sql-lp5s1-dean	SQL server
tailwind (tw-sql-lp5s1-dean/tailwind)	SQL database

Under settings

The screenshot shows the Azure Resource Group settings interface. At the top, it displays the resource group name "Ip5s1-dean". Below the header, there is a search bar labeled "Search (Ctrl+ /)". The main area is divided into two sections: "Overview" and "Settings".

Overview (Left Column):

- Activity log
- Access control (IAM)
- Tags
- Events

Settings (Right Column):

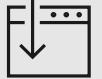
- Quickstart
- Resource costs
- Deployments
- Policies
- Properties
- Locks
- Automation script

Demo

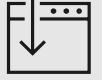
Speaker name



Next steps

 Get session presentations

<http://aka.ms/MyMSIgniteTheTour>

 Get session code on GitHub

<http://aka.ms/MSIgniteTheTourCode>



/Docs alert

Microsoft Docs has thousands of articles about Azure and its various services

<https://aka.ms/learn-azure>

The screenshot shows a Microsoft Docs page for Azure services. At the top, there are tabs: Get Started, Products (which is selected), SDKs/Tools, and Architecture. On the left, a sidebar lists categories: All, Compute (selected), Networking, Storage, Web, Mobile, Containers, Databases, Analytics, AI + Machine Learning, Internet of Things, Integration, Identity, Security, DevOps, Developer Tools, Management Tools, and Media. The main content area displays nine service cards arranged in a grid:

- Linux Virtual Machines**: Provision virtual machines of Ubuntu, Red Hat, and more.
- Windows Virtual Machines**: Provision virtual machines for SQL Server, SharePoint, and more.
- App Service**: Quickly create powerful cloud apps for web and mobile.
- Container Instances**: Easily run containers with a single command.
- Azure Batch AI**: Easily experiment and train your deep learning and AI models in parallel at scale.
- Service Fabric**: Develop microservices and orchestrate containers on Windows or Linux.
- Azure Kubernetes Service (AKS)**: Simplify the deployment, management, and operations of Kubernetes.
- Cloud Services**: Create highly-available, infinitely-scalable cloud applications and APIs.
- SQL Server on Virtual Machines**: Host enterprise SQL Server apps in the cloud.



/Microsoft Learn

Learn Azure at your own pace via Microsoft Learn

<https://aka.ms/learn-azure>

The screenshot shows the Microsoft Learn homepage. At the top, there's a navigation bar with the Microsoft logo, a search bar, and links for Learn, Azure, Business Applications, About, Browse All, and Certifications. Below the navigation is a breadcrumb trail: Docs / Learn. The main header reads "WELCOME TO Microsoft Learn" and "Introducing a new approach to learning". It highlights that skills required for career advancement are now more easily achievable through hands-on learning, earning points, levels, and achievements. A "More coming soon!" message is visible. Below this, there are three tabs: "Learning paths" (selected), "Hands-on learning", and "Learn for free". A prominent feature is a callout for the "Introduction to Azure" module, which consists of 6 units and starts with creating and configuring a virtual machine in the cloud. A "Start learning for free >" button is present. Further down, there's a section titled "Start a learning path" with a dropdown menu for selecting a role. A description explains that learning paths are tailored by developer and technology masterminds to prepare for industry-recognized Microsoft certifications. To the right, there's a visual representation of a learning path as a series of interconnected hexagonal icons connected by dotted lines, representing various Azure services like storage, databases, and machine learning. At the bottom, there's a "Learn Azure" section with a link to explore more advanced topics.

