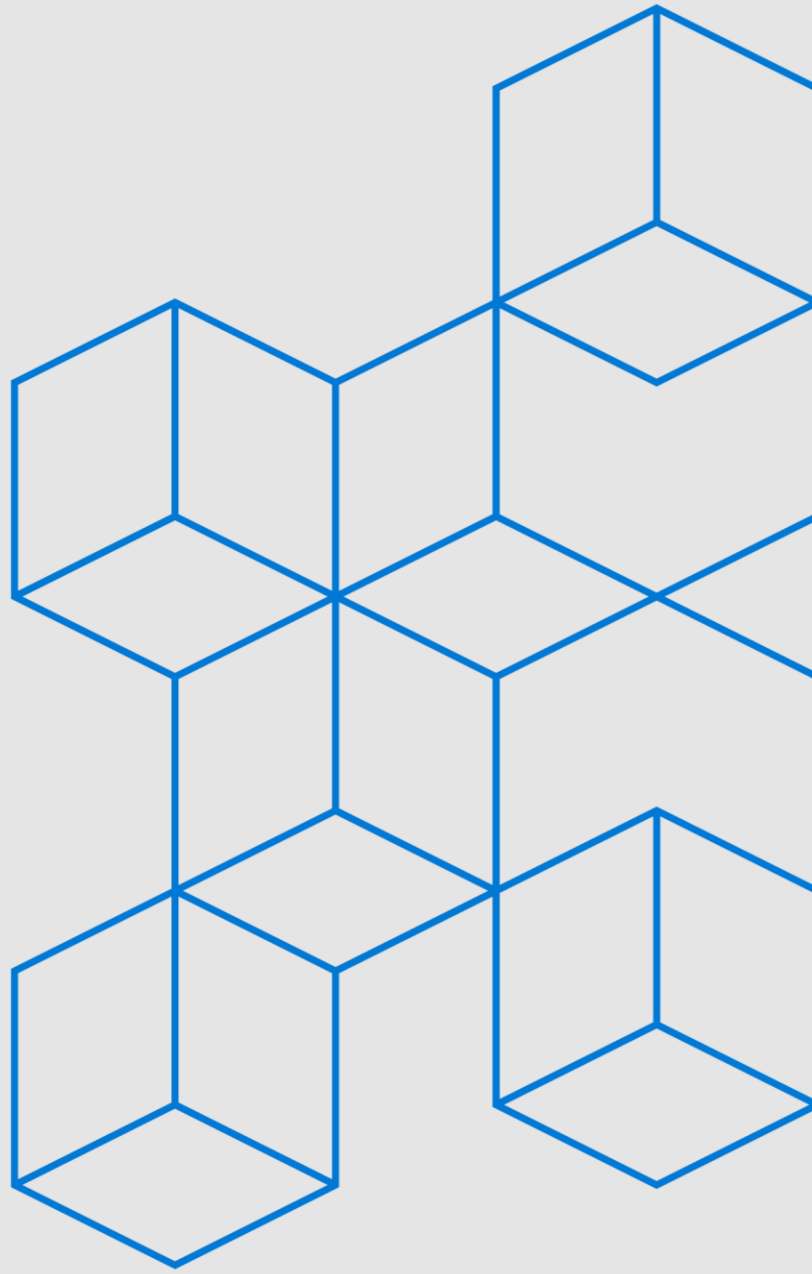
Microsoft

Discovering Microsoft Azure

Introducing core concepts and fundamentals



Velin Georgiev

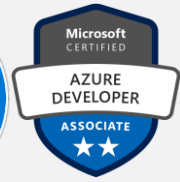
Microsoft MVP- Office Dev, Expert in Azure, .NET and Frond End Dev

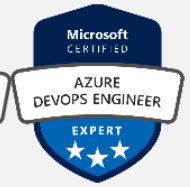
Technical Architect – Pramerica

@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

Migrate

Rehost

Application Modernization

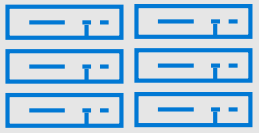
Refactor

Rearchitect

Rebuild

SaaS

Replace



On-Premises

Infrastructure Platform

IaaS

Infrastructure Platform
"Lift and shift"

Containers

Managed Container Platform

PaaS/Serverless

Application Platform

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:

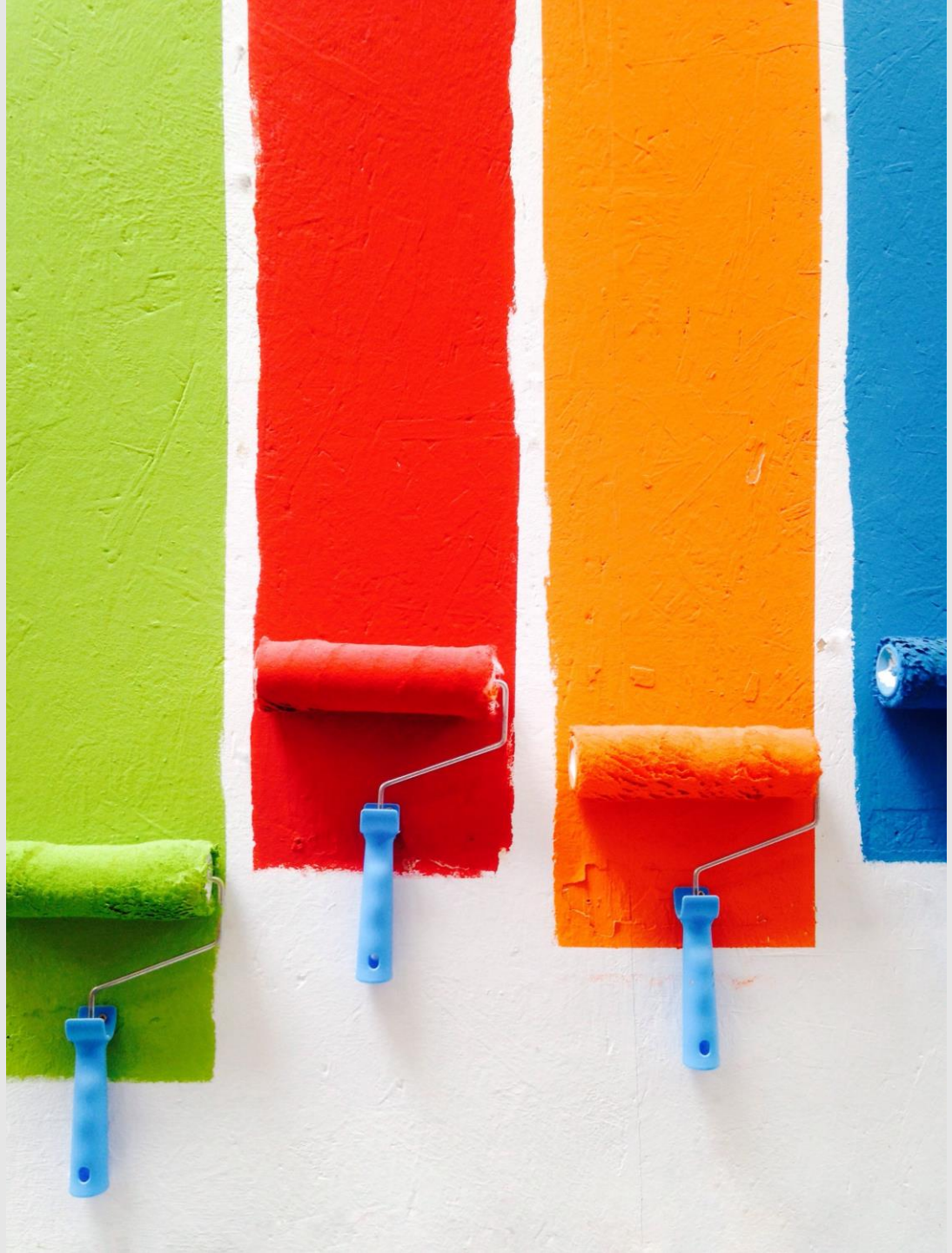
- Data backups
- Disaster recovery
- Data replication

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)

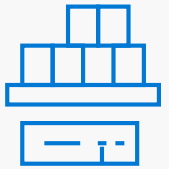
- ✓ Extremely flexible
- ✓ Aims to give you control over hardware
- ✓ Instead of buying hardware, you rent it

Platform as a Service (PaaS)

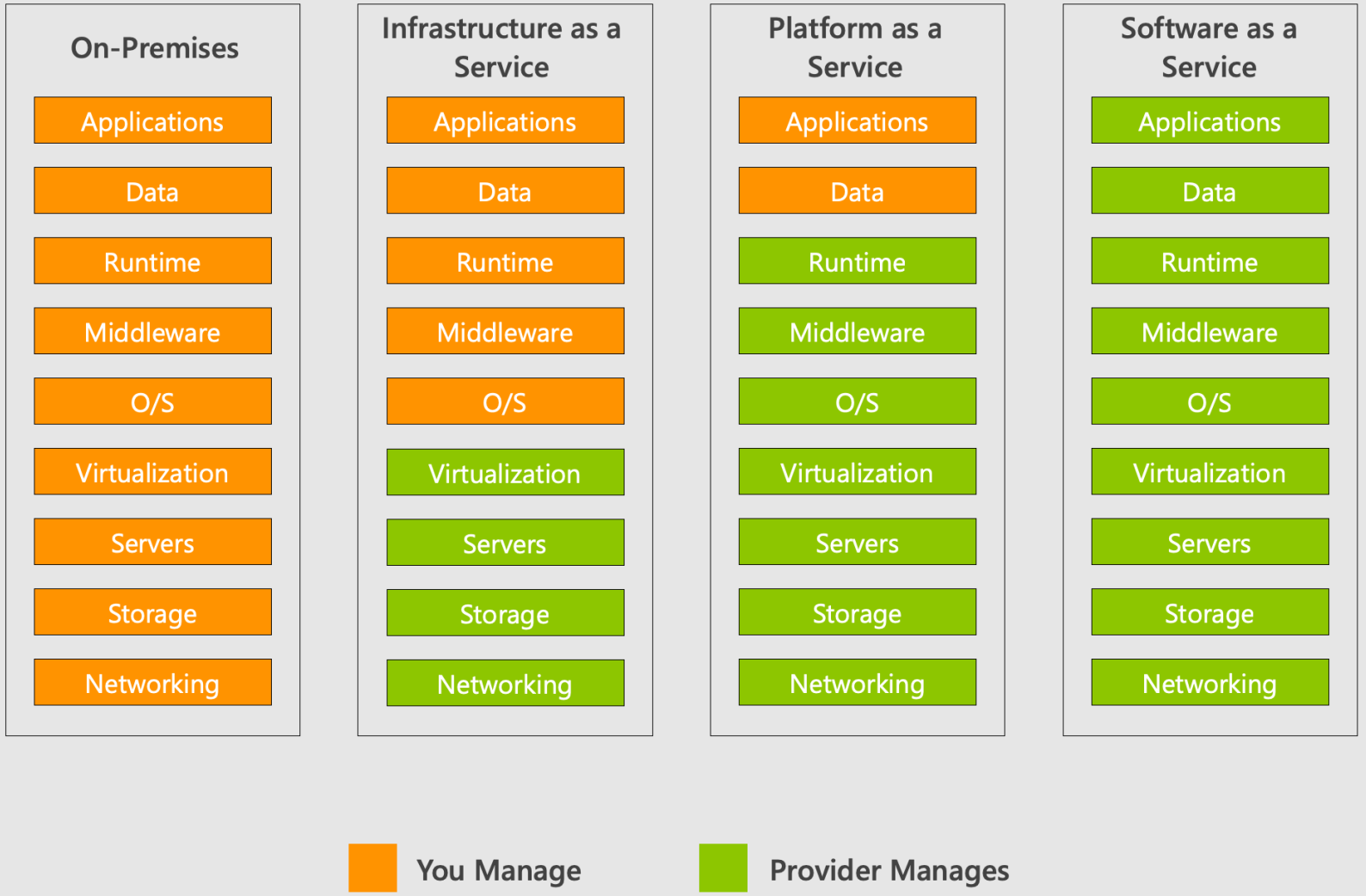
- ✓ Build, test, and deploy software
- ✓ Don’t worry about infrastructure
- ✓ No installing an OS, web server or updates

software as a Service (SaaS)

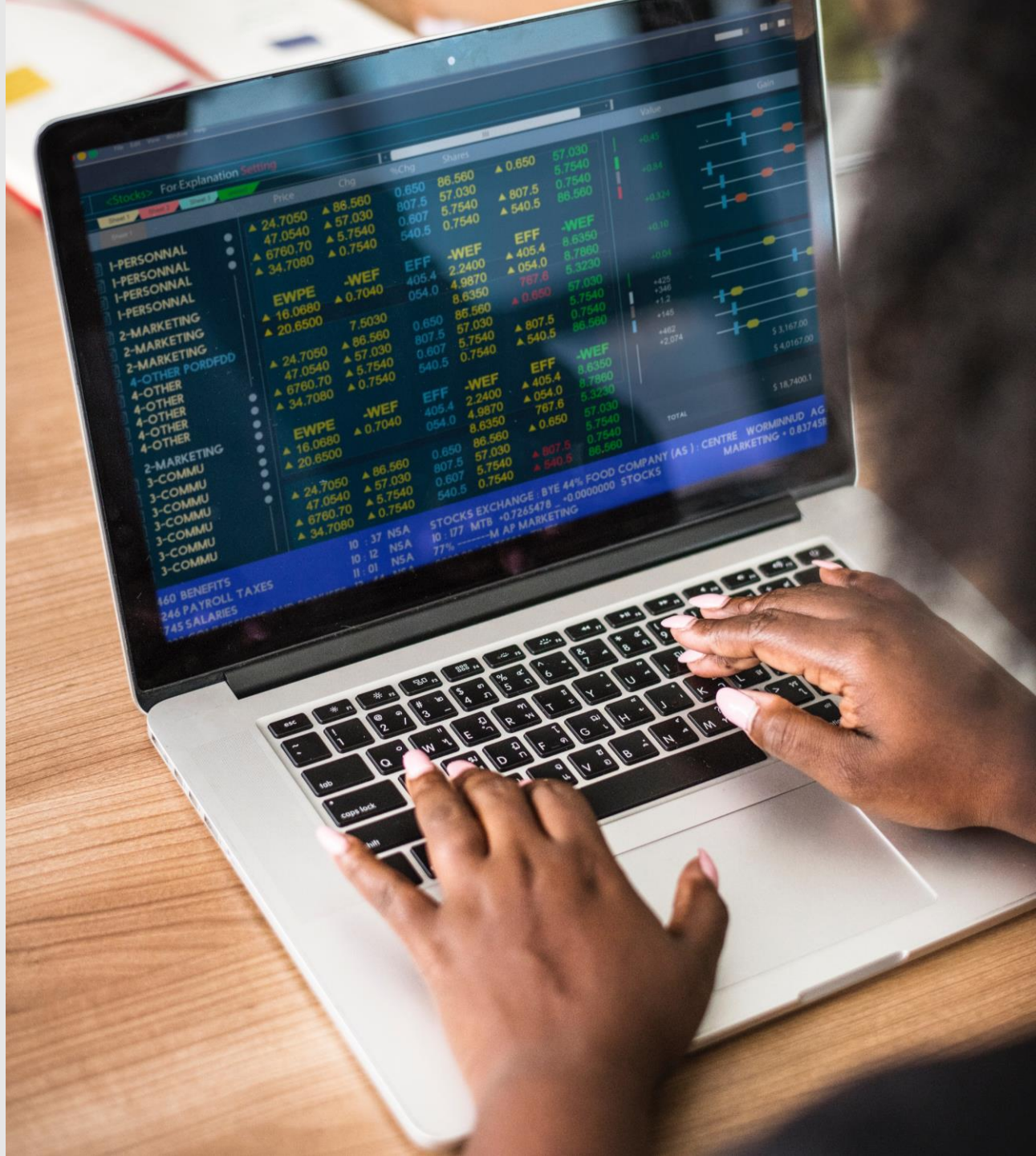
- ✓ Software that is centrally hosted and managed
- ✓ Licensed through a monthly or annual subscription
- ✓ Office 365 is an example of SaaS



Cloud computing categories overview



Cloud computing services



Cloud computing services

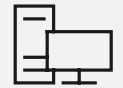
Compute power
- Windows and Linux virtual machines

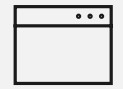
Storage
- Object storage

Applications
- NoSQL and SQL database applications

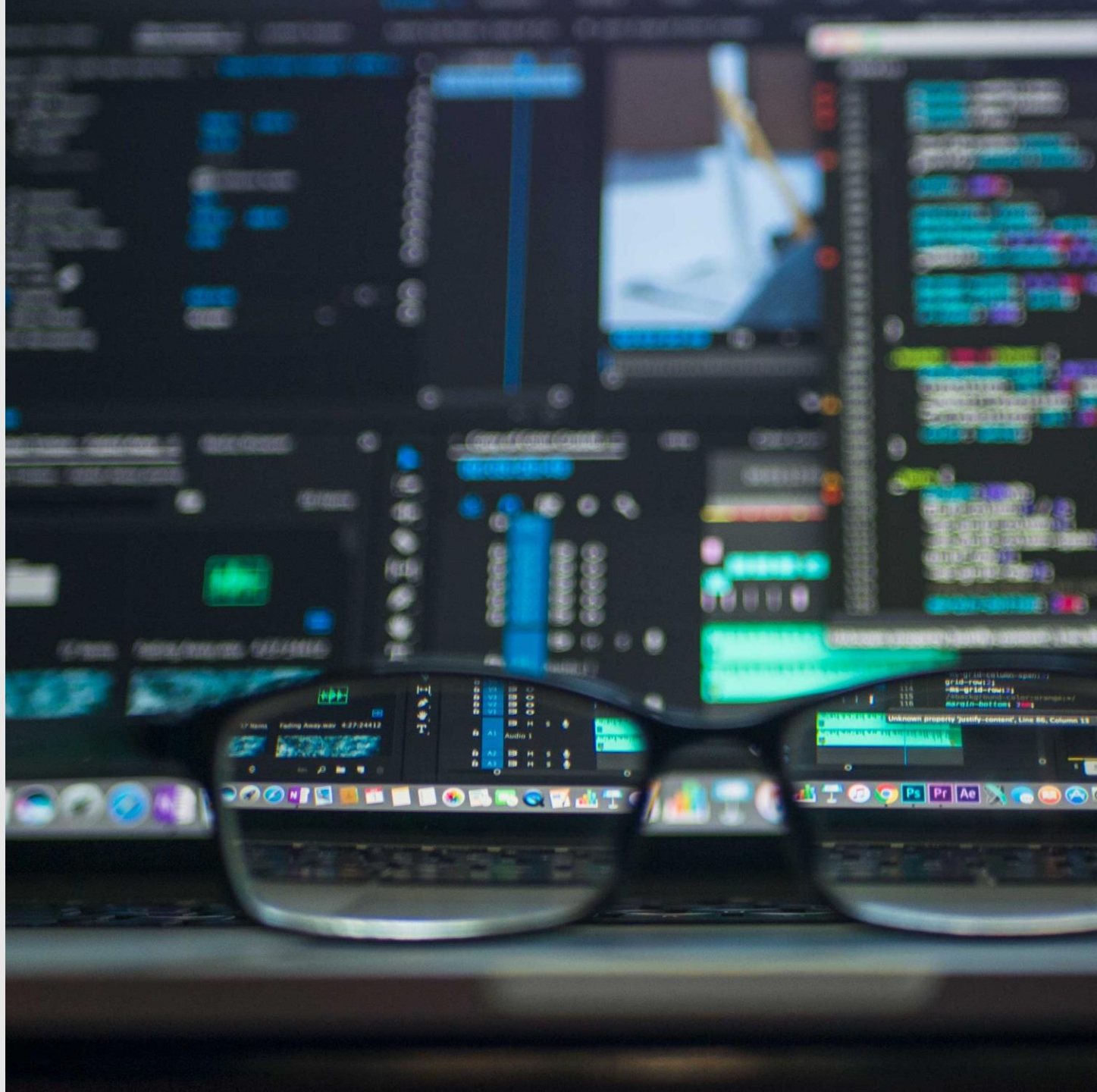
Networking
- Setting up virtual networks

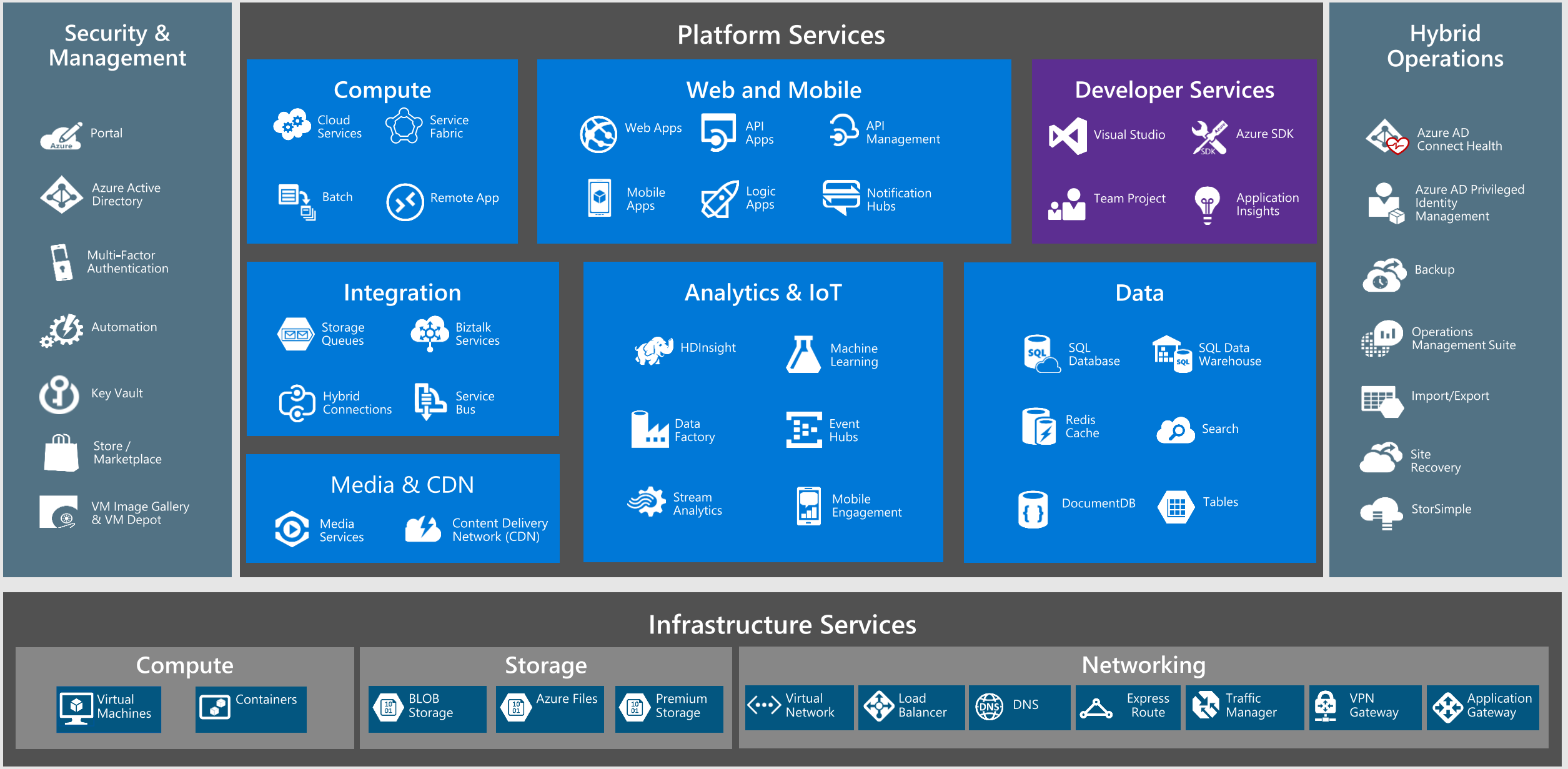
Analytics
- Visualizing telemetry
- Performance data



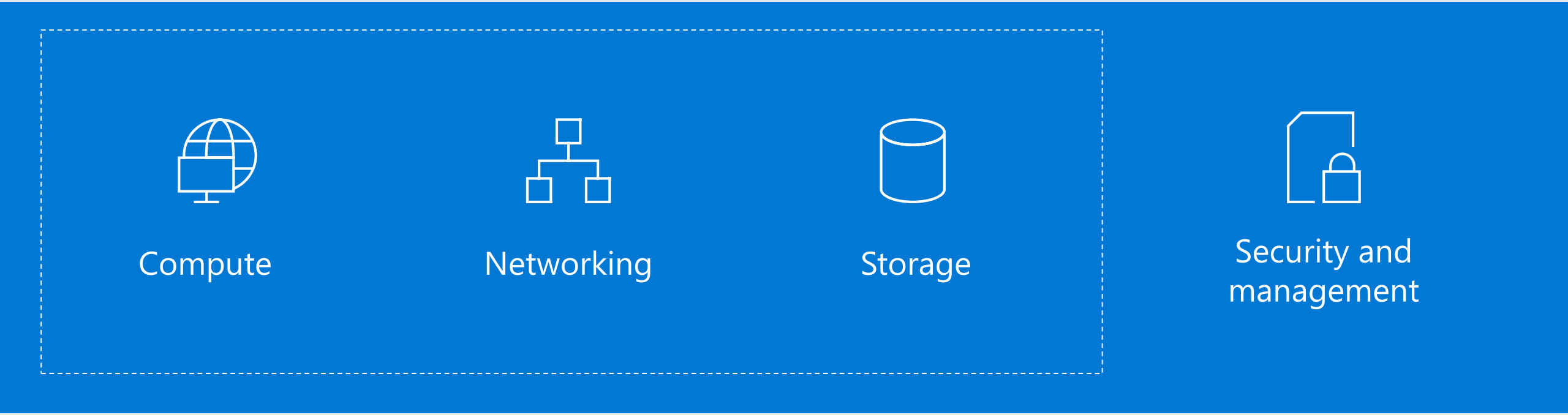


What is Azure?




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
Analytics & IoT
HDInsight
Machine Learning
Data Factory
Event Hubs
Stream Analytics
Mobile Engagement
Data
SQL Database
SQL Data Warehouse
Redis Cache
Search
DocumentDB
Tables
Media & CDN
Media Services
Content Delivery Network (CDN)
Hybrid Operations
Azure AD Connect Health
Azure AD Privileged Identity Management
Backup
Operations Management Suite
Import/Export
Site Recovery
StorSimple
Infrastructure Services
Compute
Virtual Machines
Containers
Storage
BLOB Storage
Azure Files
Premium Storage
Networking
Virtual Network
Load Balancer
DNS
Express Route
Traffic Manager
VPN Gateway
Application Gateway

Azure is secure, cost-effective, and ubiquitous



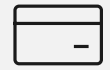
Getting started with Azure

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?

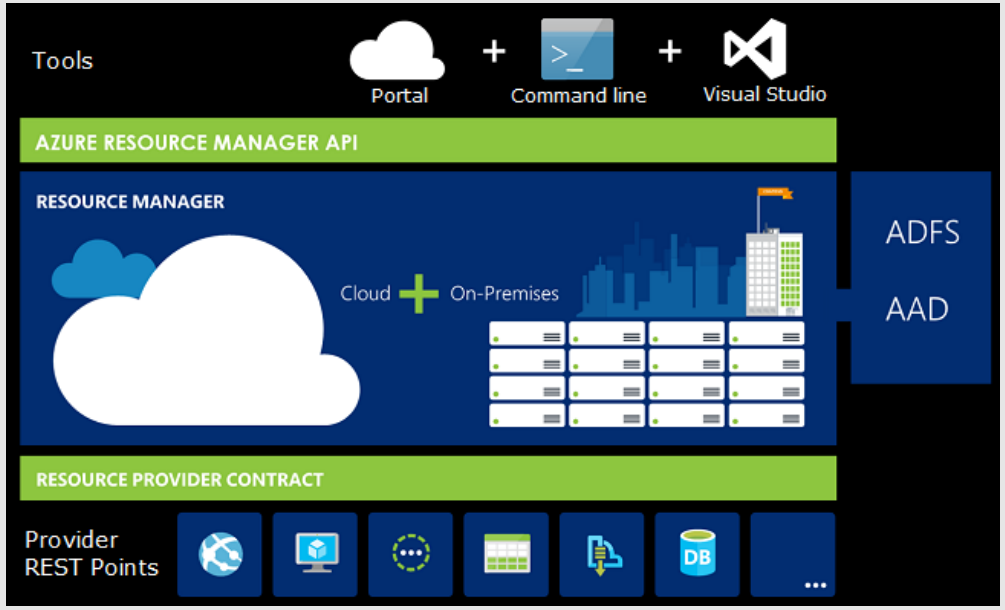
Azure AD is a multi-tenant, cloud-based directory and identify management service

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

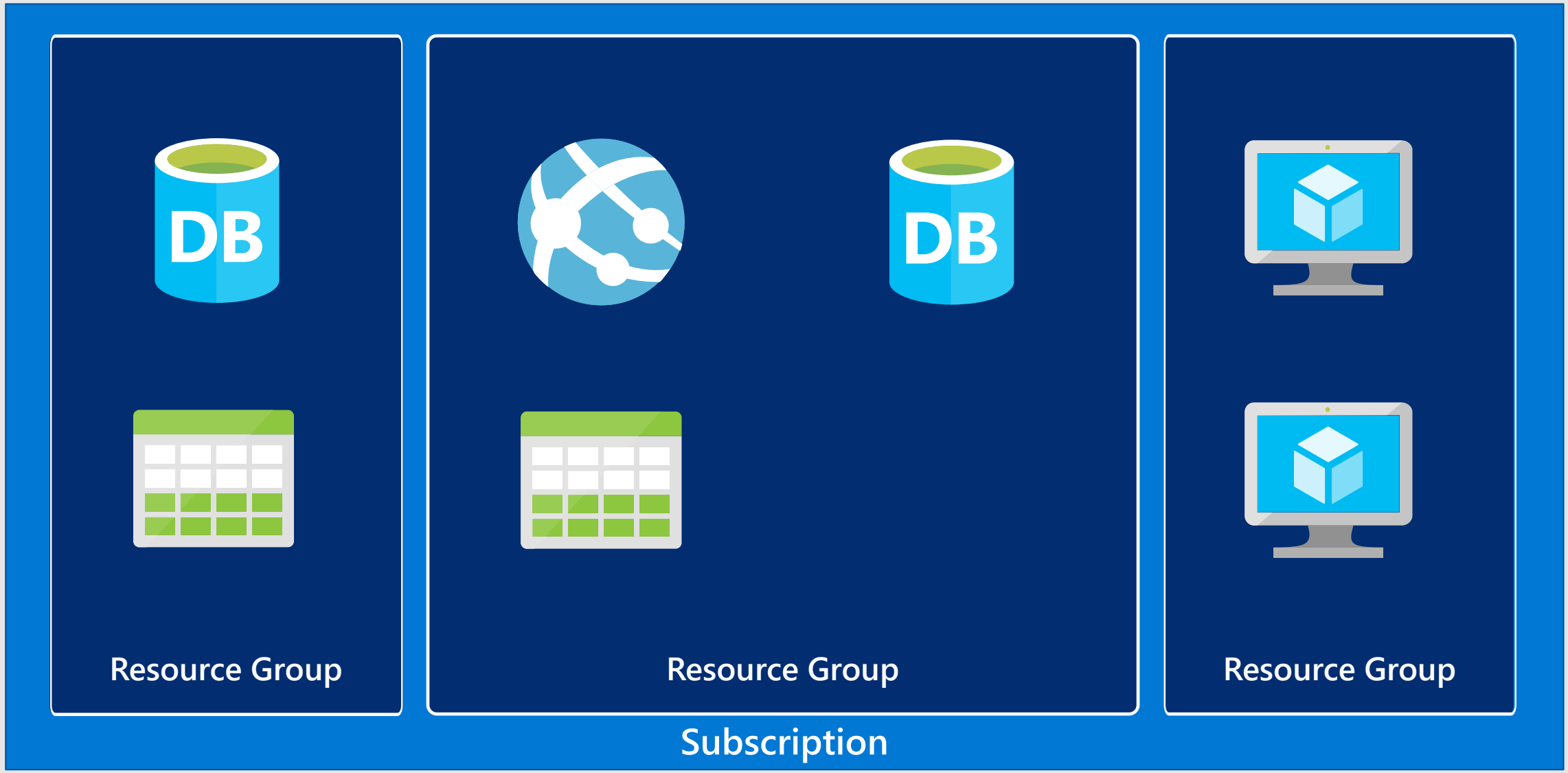
A service that supplies the resources you can deploy and manage

Resource manager template

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

Defines dependencies between resources

Subscriptions, resource groups, and resources



Azure compute options

- Virtual machines
- Containers
- Serverless

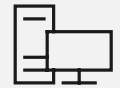
What’s a Virtual Machine (VM)?

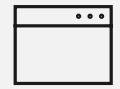
Software emulation of a physical computer

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

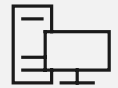
- A template used to create a VM
- Includes an OS and usually some other software

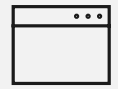
Regions

- 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)





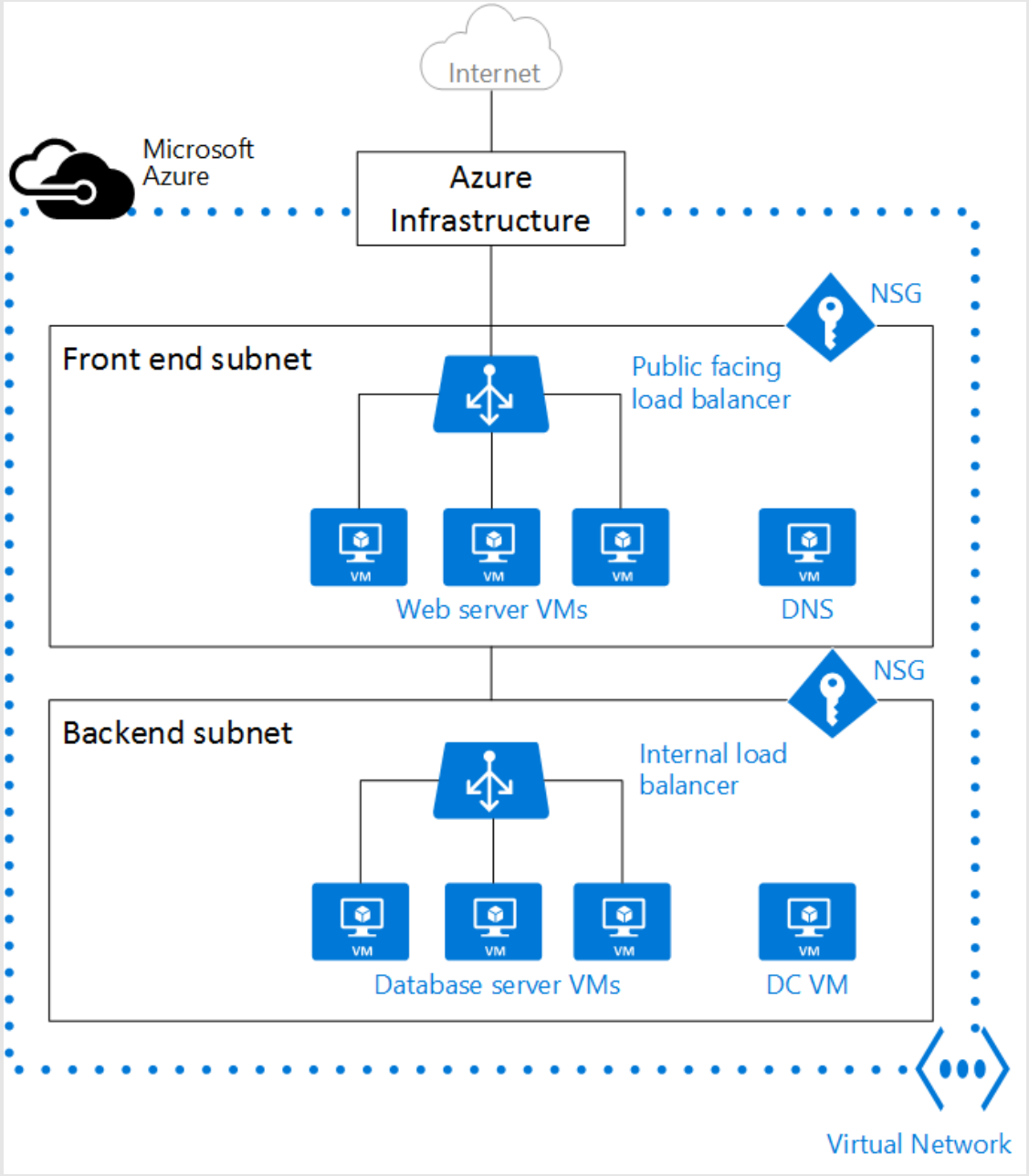
Virtual Machines (VMs)

Required resources

- Network interfaces
- IP addresses
- Virtual network and subnets

Additional resources

- Network security groups
- Load balancers

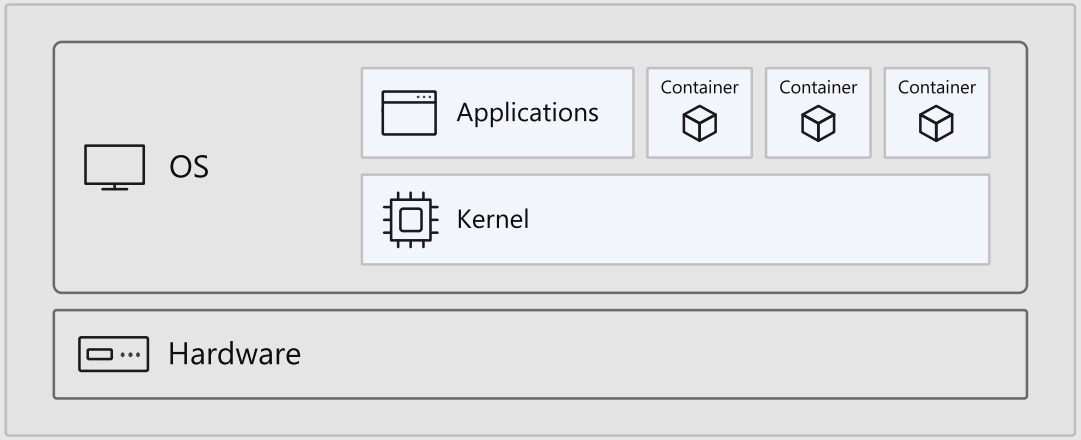


Azure compute options

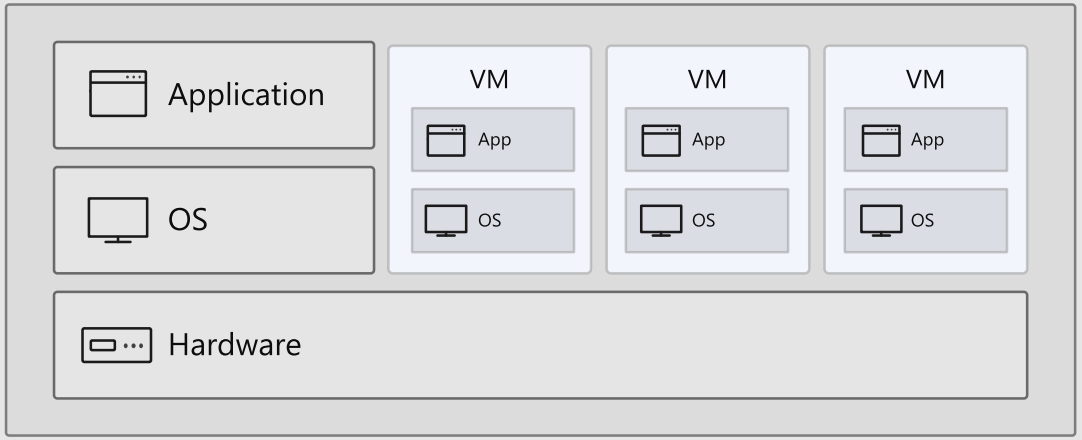
Containers

Container?

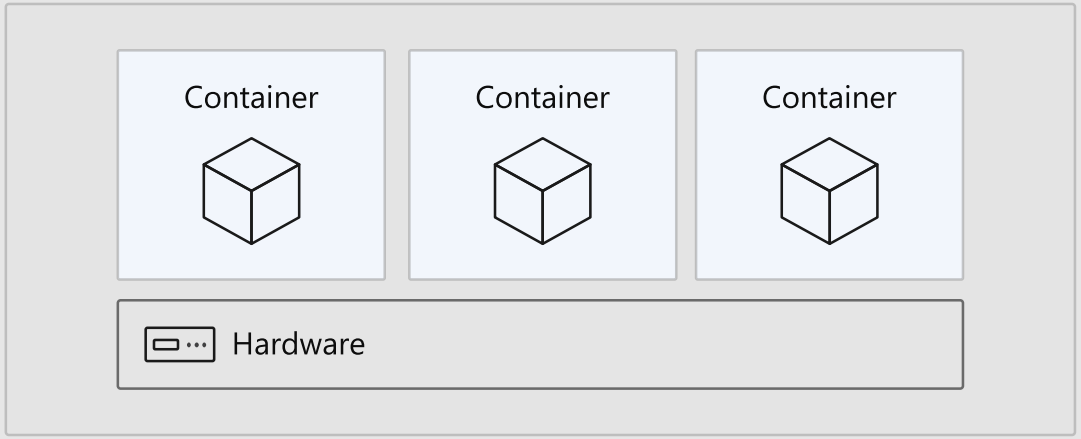
Containers = operating system virtualization



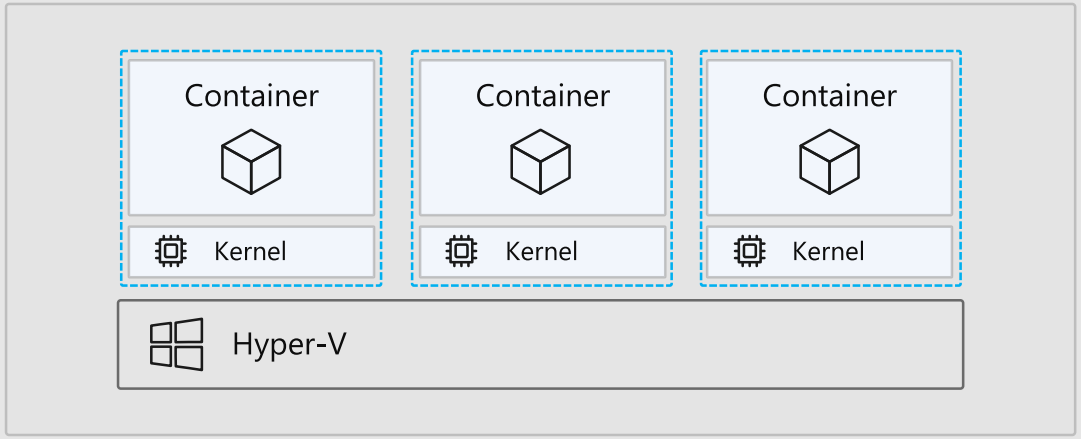
Traditional virtual machines = hardware virtualization



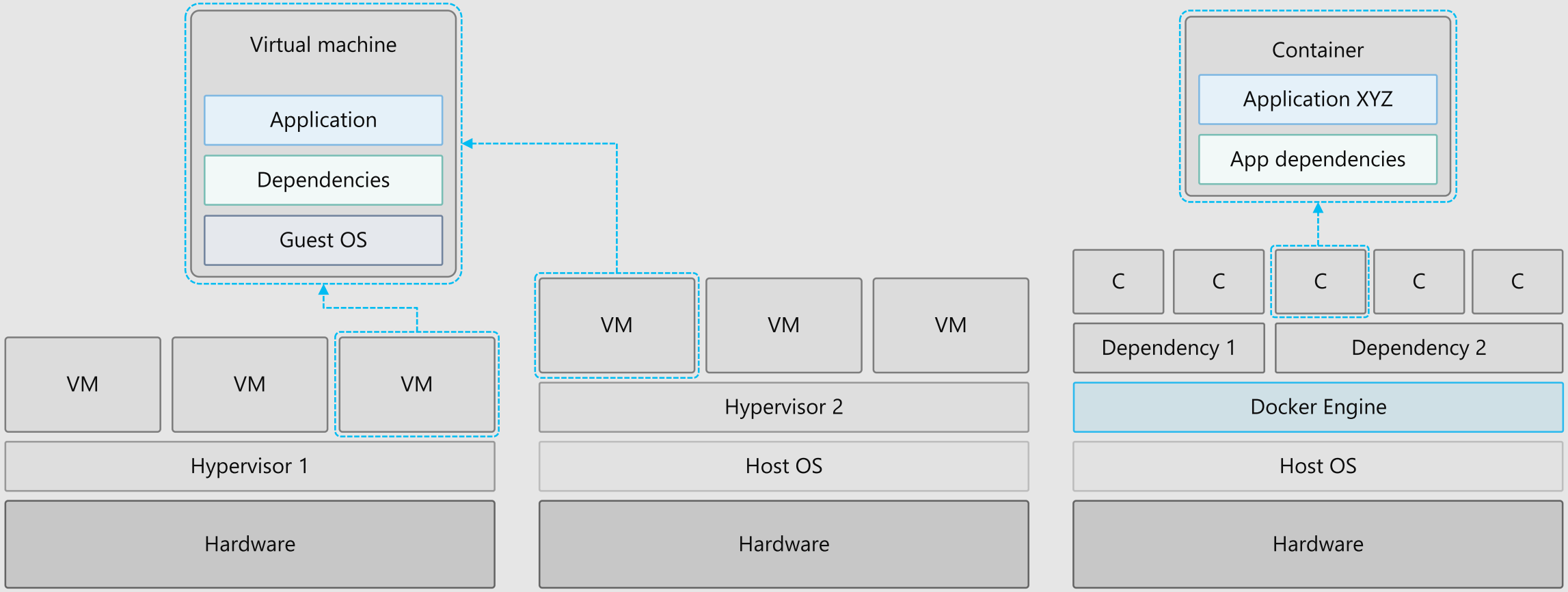
Windows Server containers: maximum speed and density



Hyper-V containers: isolation plus performance



Virtualization vs. containerization

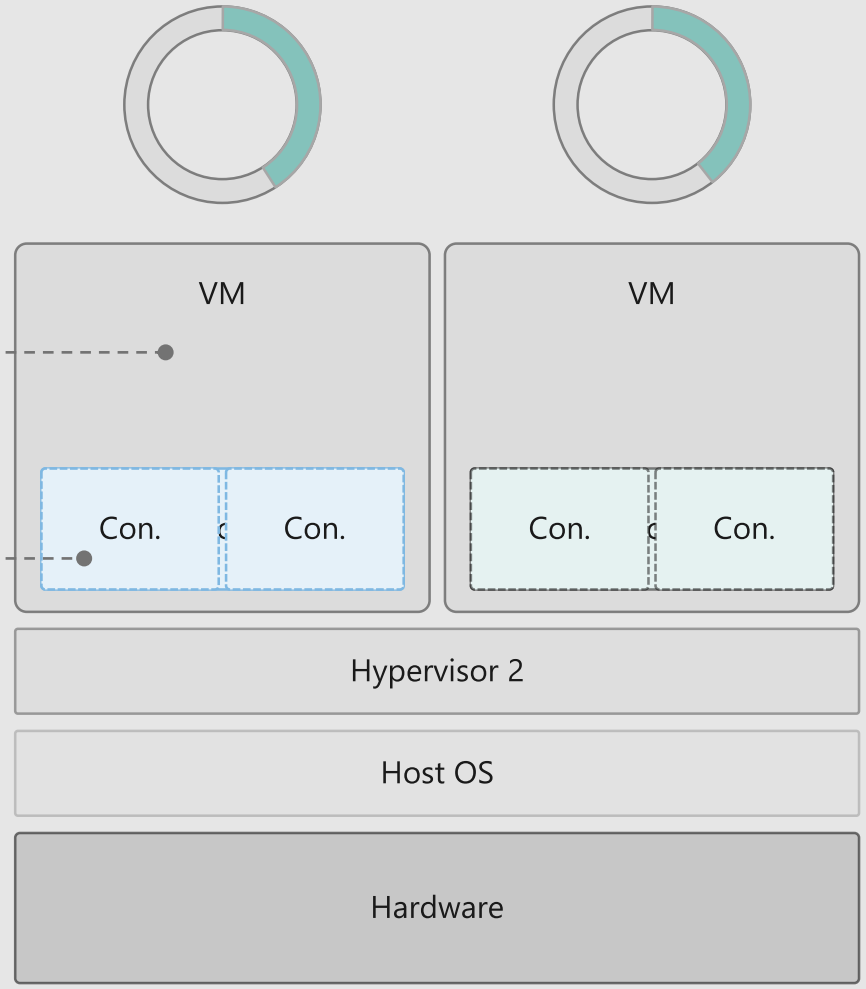


The container advantage

Traditional virtualized environment

Low utilization of container resources

Containerization of applications and their dependencies



The container advantage

Fast iteration

Agile delivery

Immutability

Cost savings

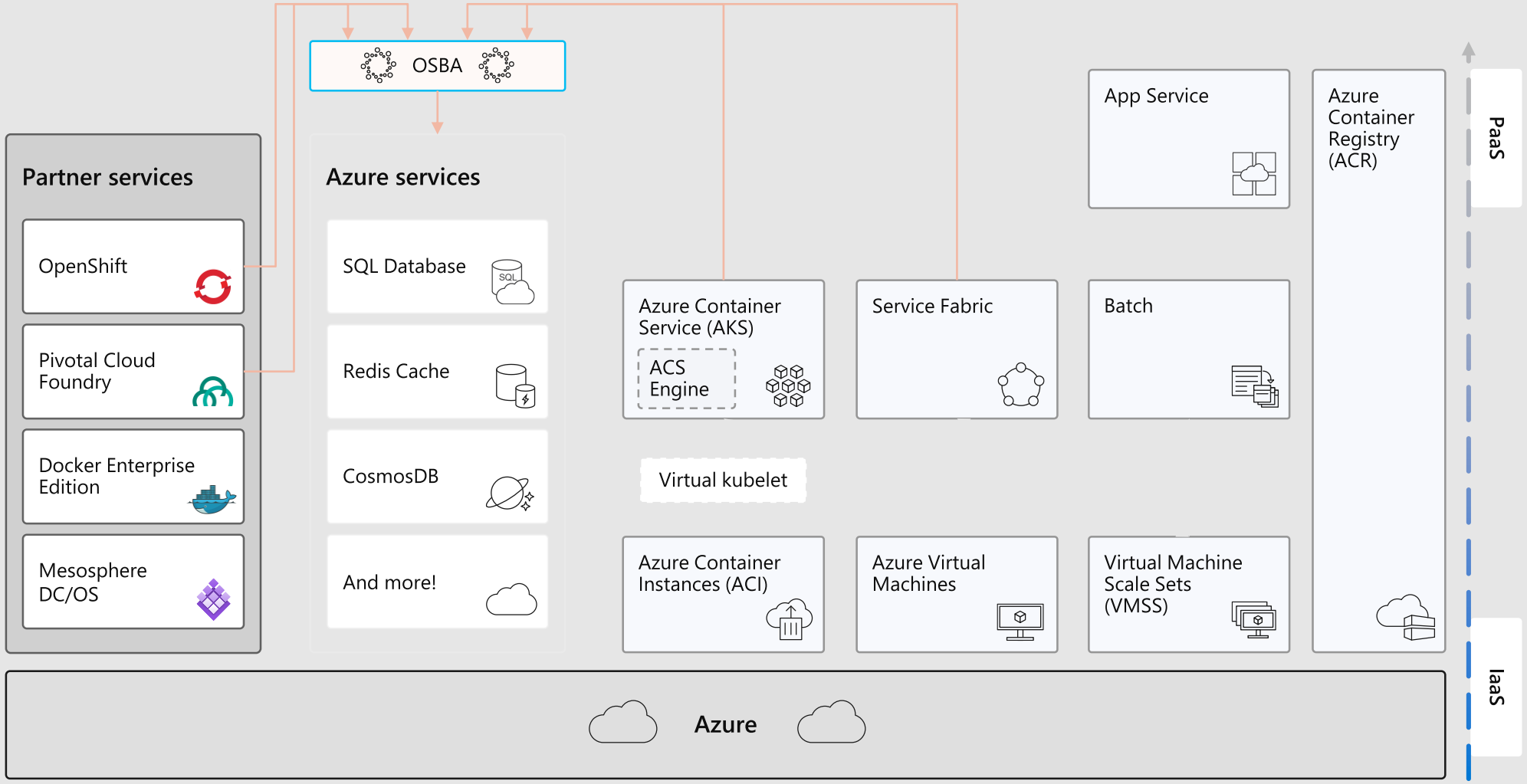
Efficient deployment

Elastic bursting

For developers

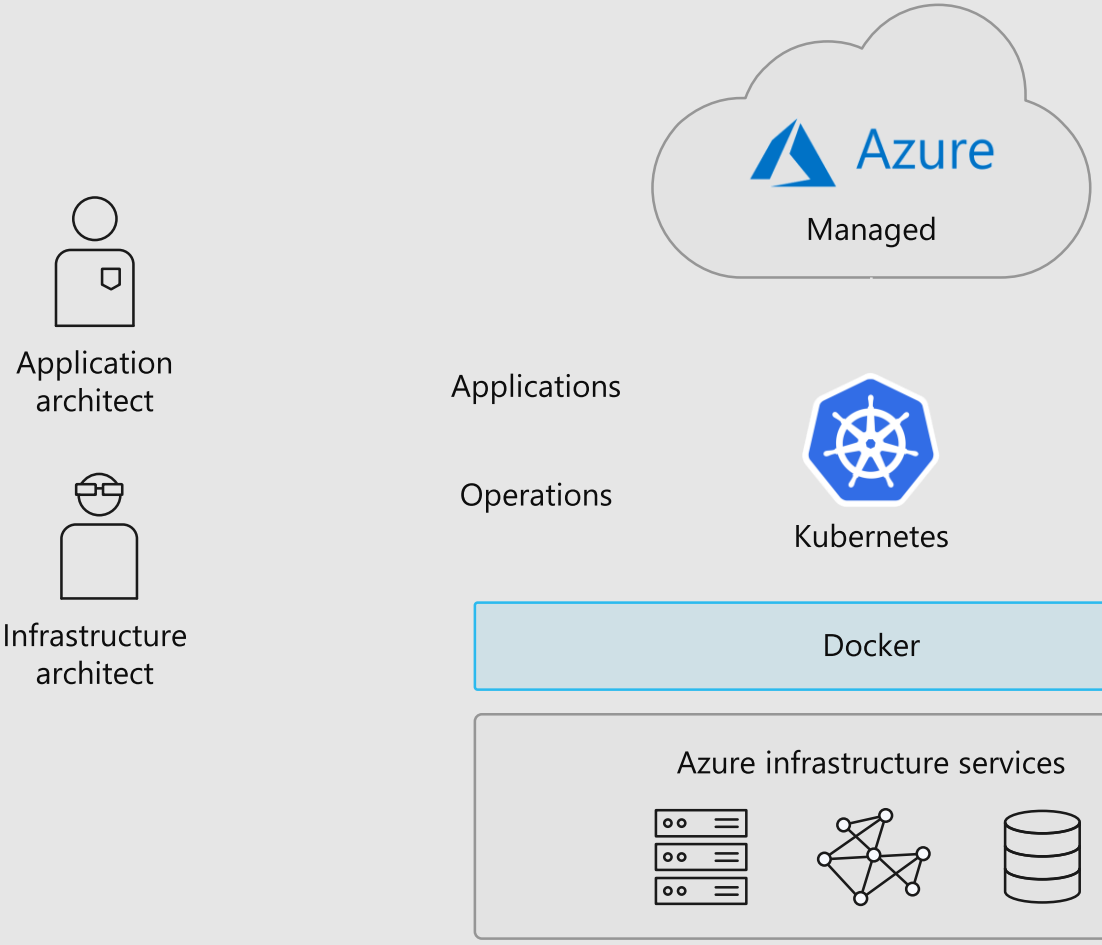
For IT

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?

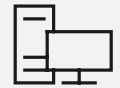
Abstraction of servers, infrastructure and operating systems

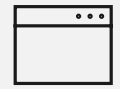
Event-driven

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

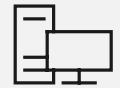
- Advanced Flow for developers, operations folks and IT pros

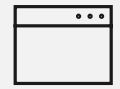
Azure functions

- 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 opensource

Azure App Service

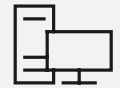
Build and host web apps in your language of choice

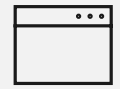
Auto-scaling and high availability

Automated deployments from GitHub and Azure DevOps

Quickstarts

- .NET
- PHP
- Node.js
- Java
- Python
- Ruby
- Docker/Go



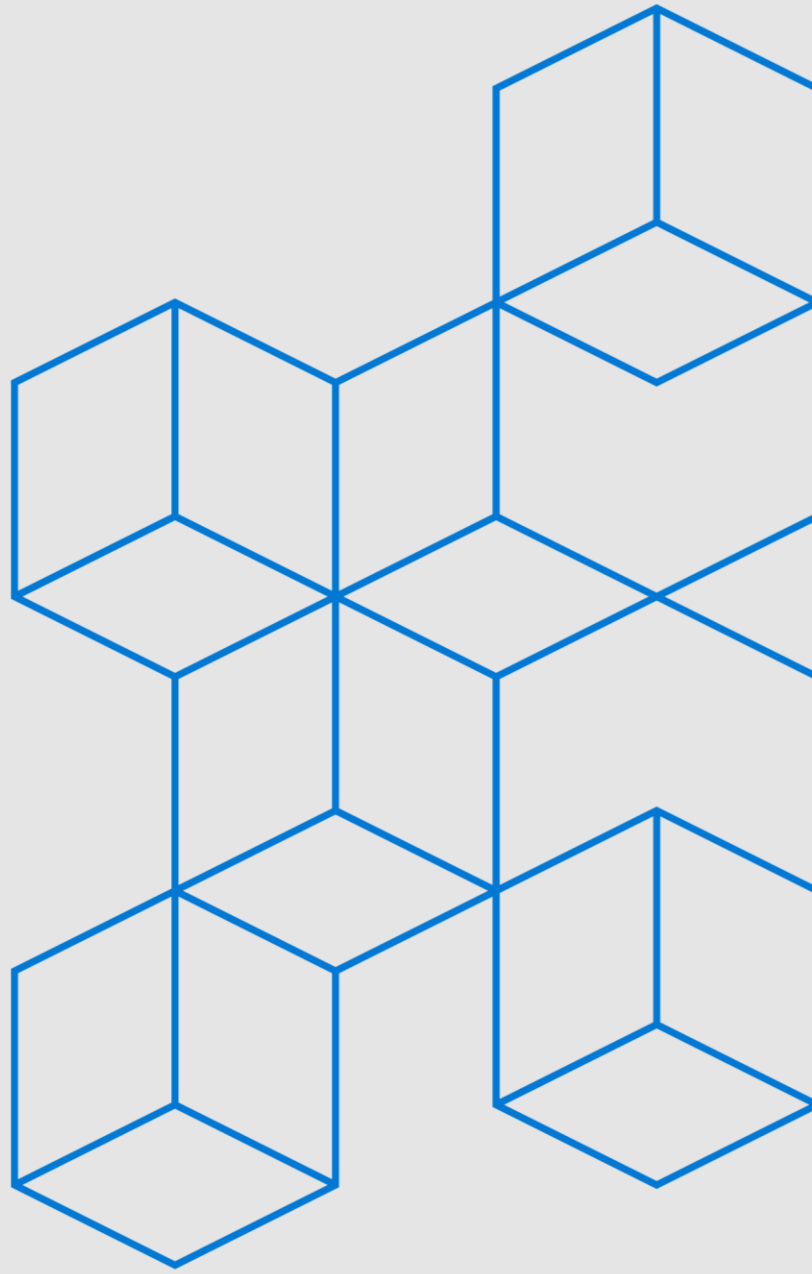


Demo

https://aka.ms/azure-portal

Microsoft

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

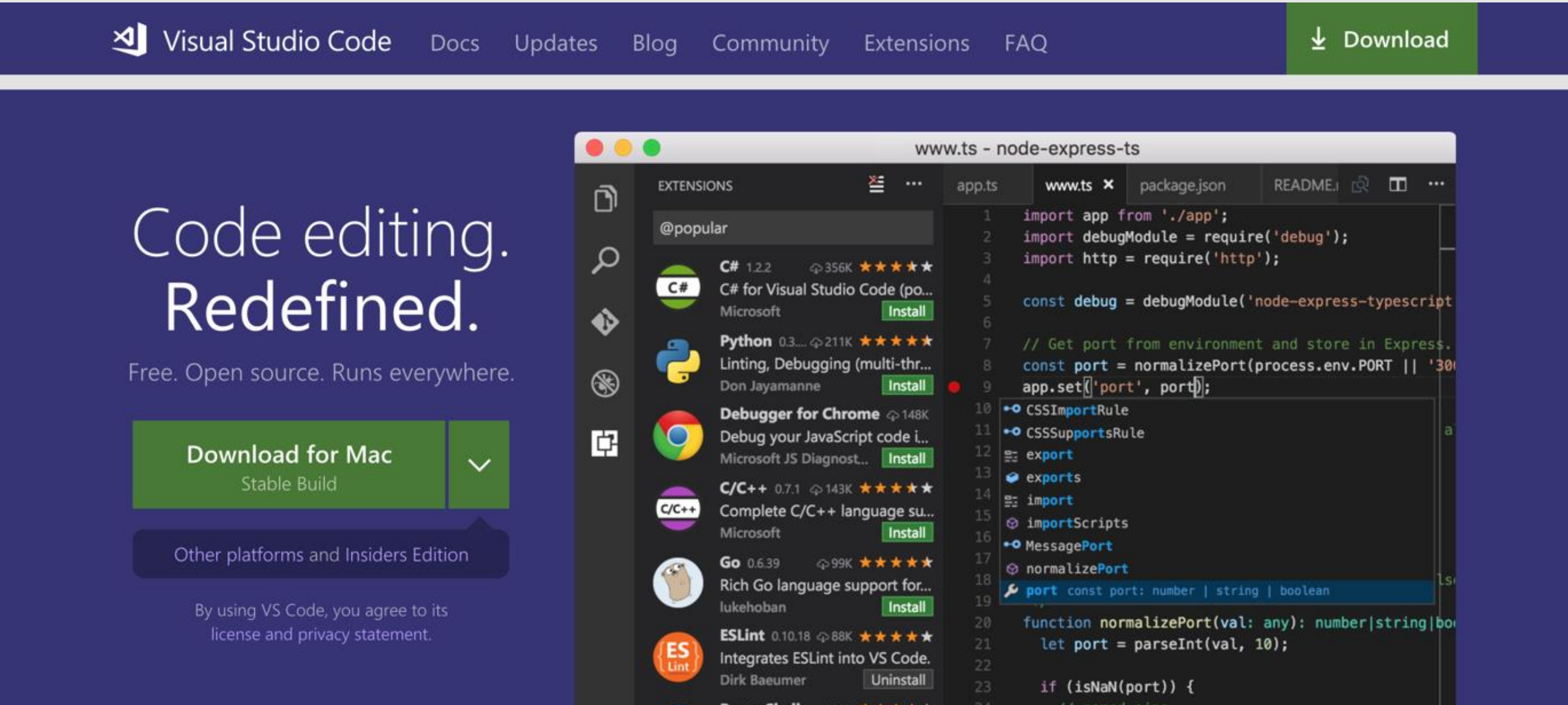
PowerShell Modules for Azure

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?



What can I use it with?

VS Code for

Markdown
SQL
Dockerfile
F#
Batch

Why Visual Studio Code?

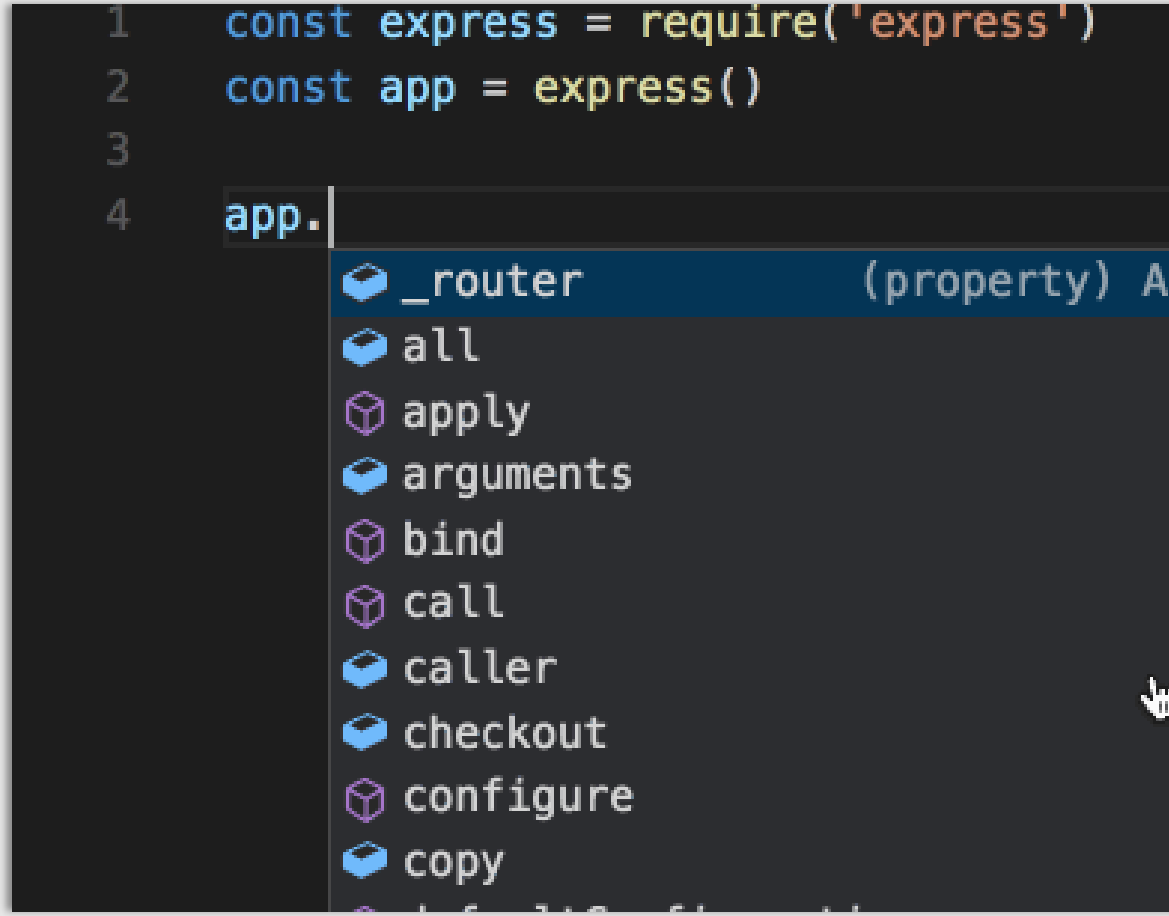
Rich coding experience

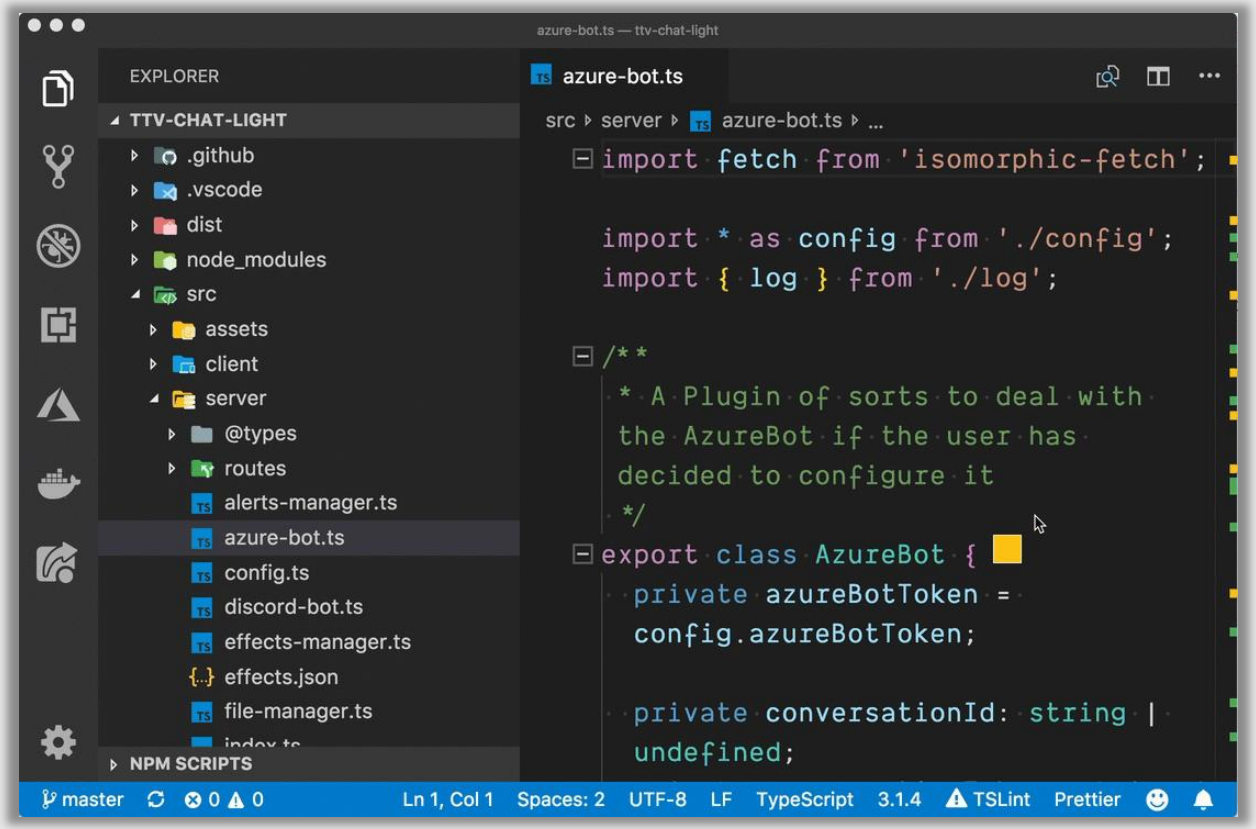
One tool, many jobs

Customizable

Extensible

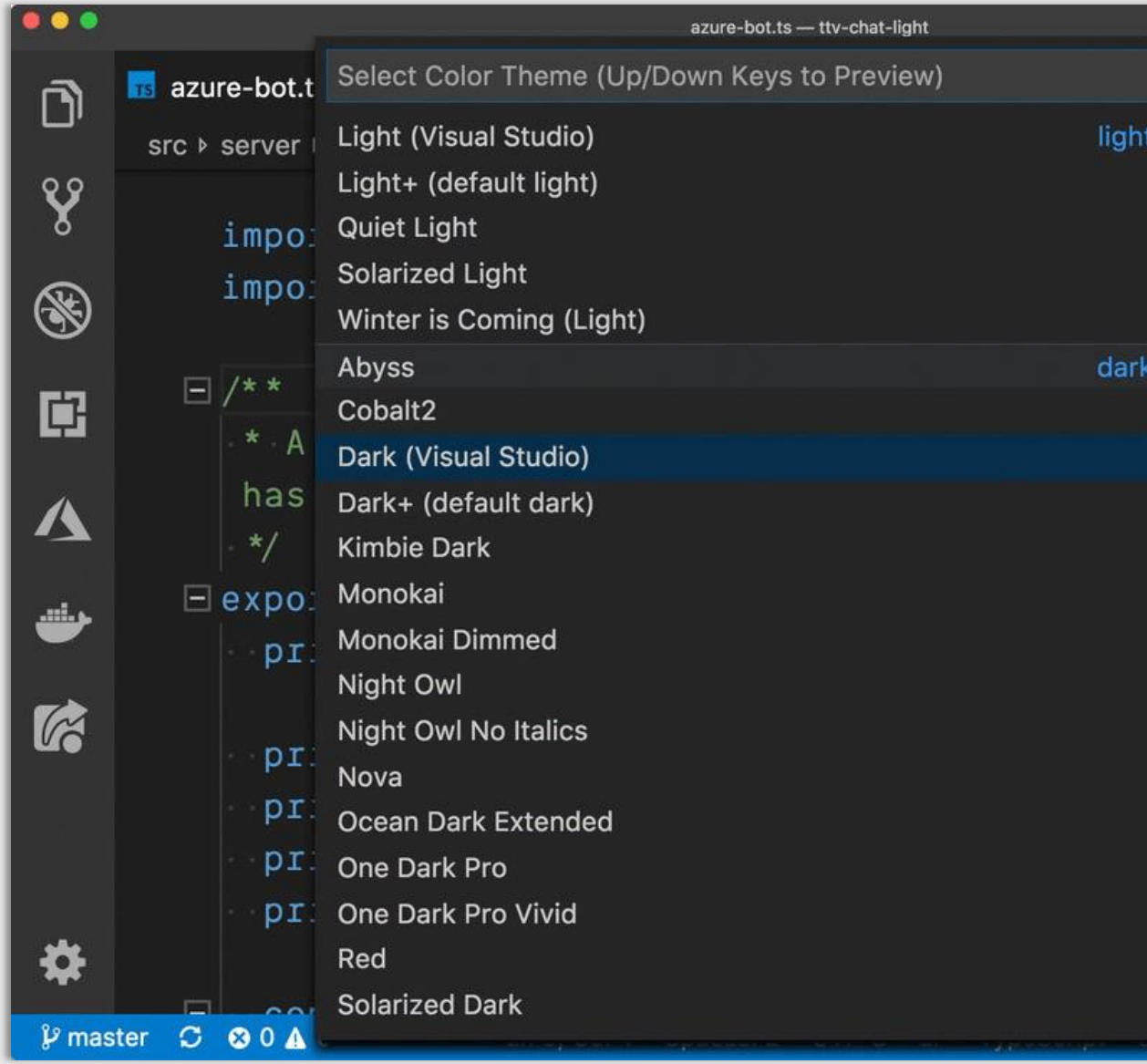
Rich coding experience

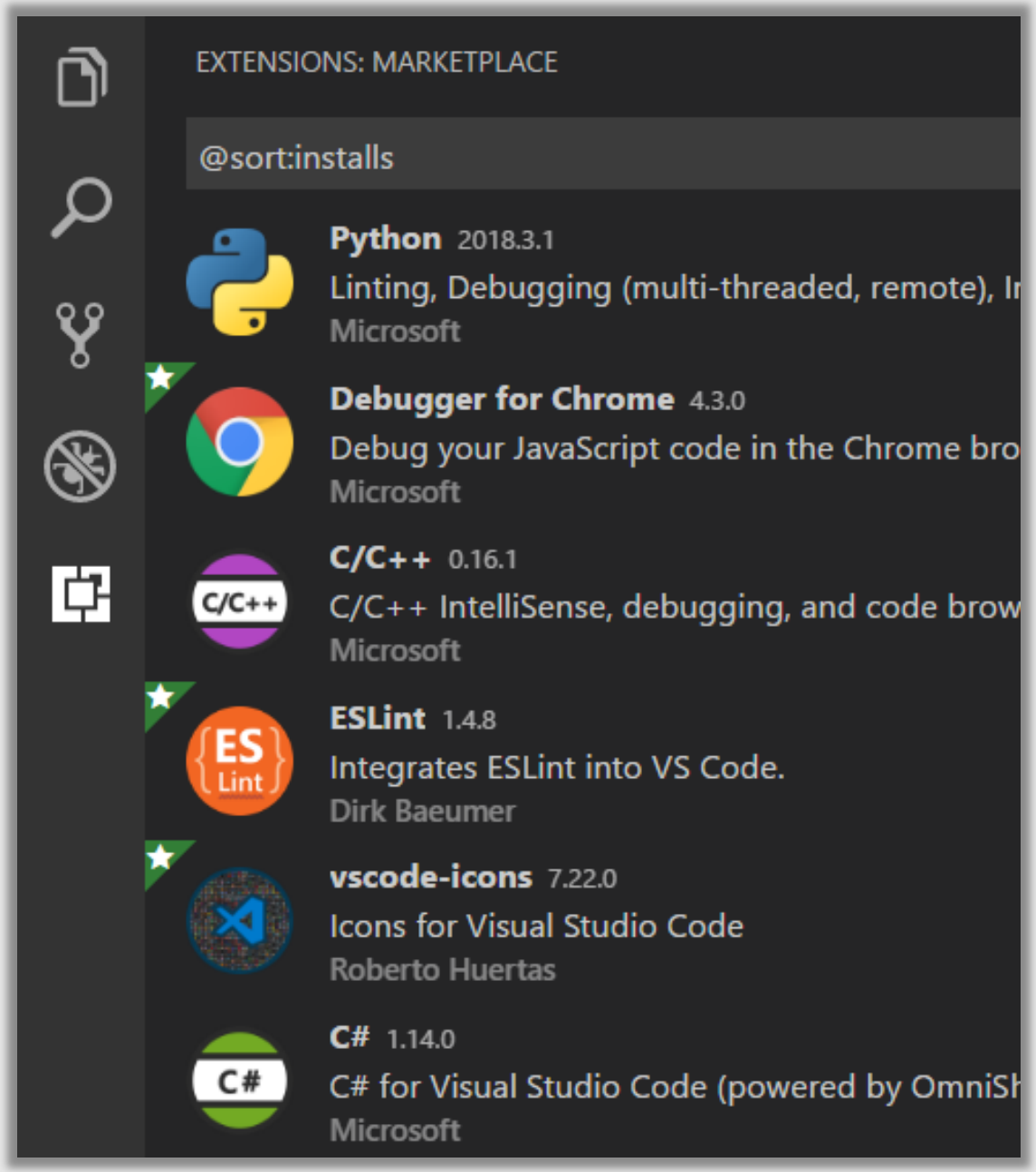




One tool, many jobs

Customizable

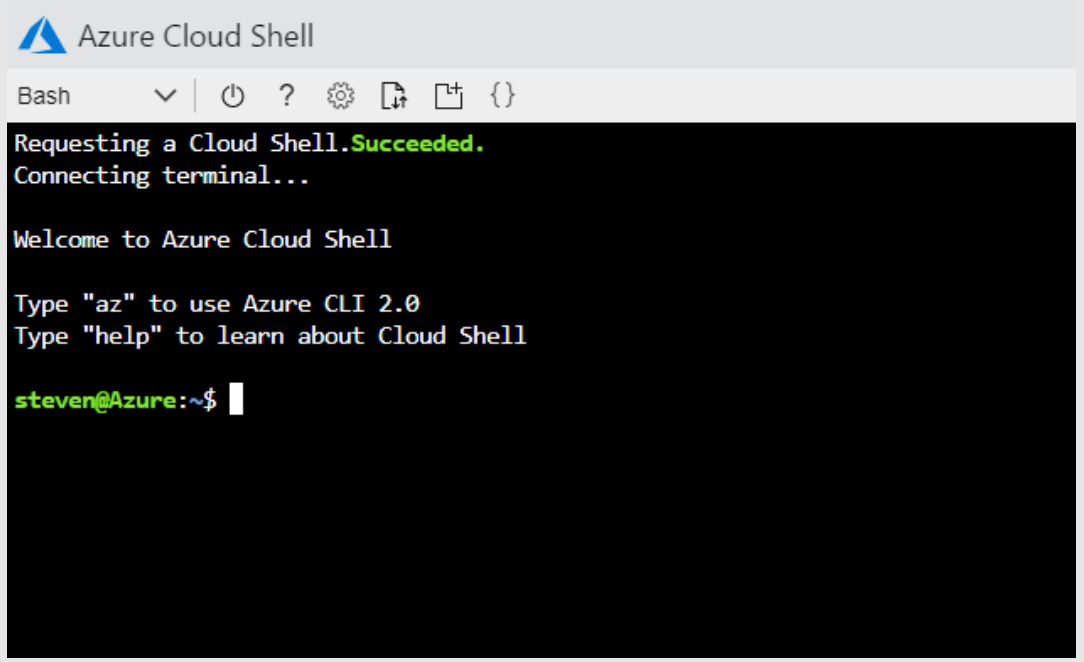


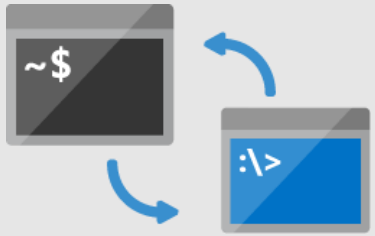

EXTENSIONS: MARKETPLACE
@sort:installs
Python 2018.3.1
Linting, Debugging (multi-threaded, remote), I
Microsoft
Debugger for Chrome 4.3.0
Debug your JavaScript code in the Chrome bro
Microsoft
C/C++ 0.16.1
C/C++ IntelliSense, debugging, and code brow
Microsoft
ESLint 1.4.8
Integrates ESLint into VS Code.
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 OmniSh
Microsoft

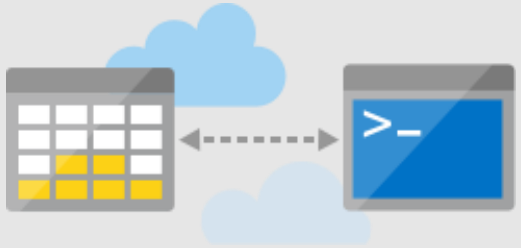
Extensible

Azure Cloud Shell

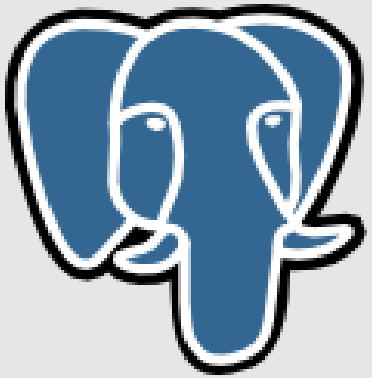
- Authenticated access
- Bash & PowerShell
- Private & secure environment
- Common languages & tools







CLOUDFOUNDRY



And many more!!!

Other places to find Azure CloudShell

Demo

Speaker name

Azure Resource Management (ARM) templates

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

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')]",
```

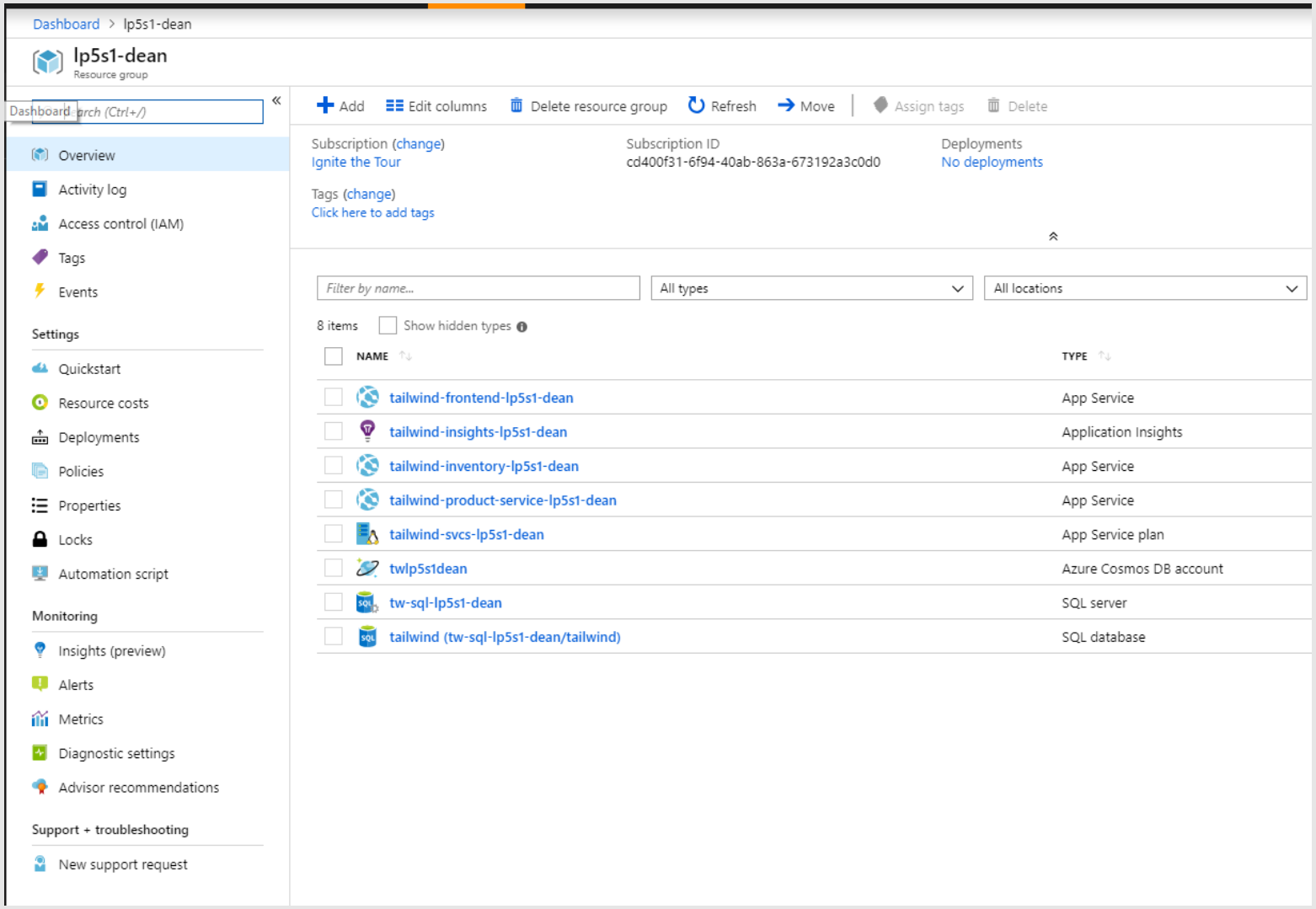
Parameters

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

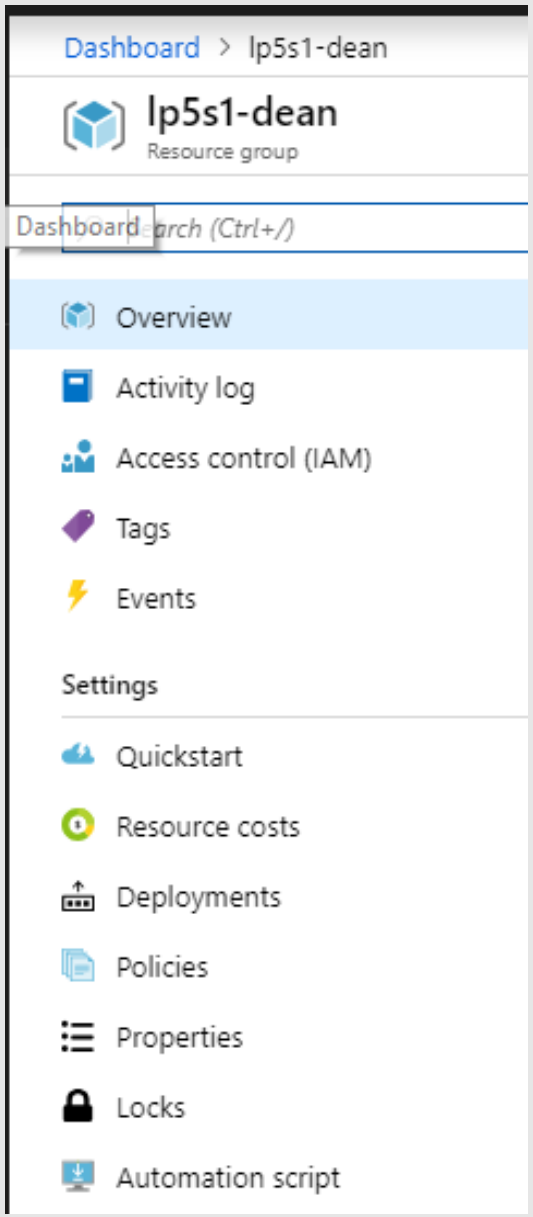
Potential Copy Right

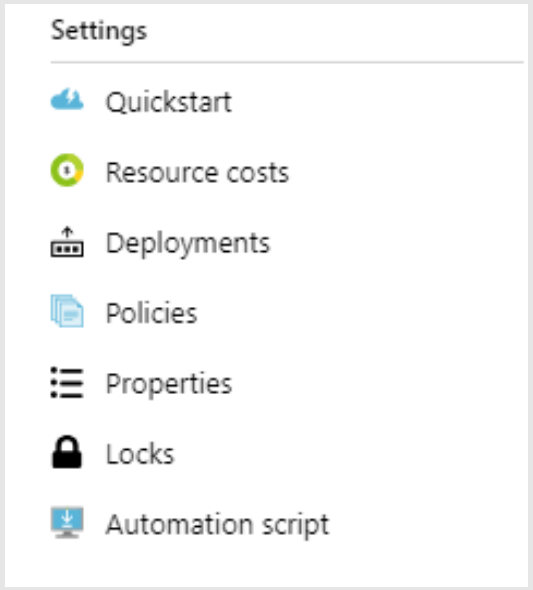
There has to be another way...

Start in the Azure Portal



Under settings





Demo

Speaker name

Next steps

Get session presentations

http://aka.ms/MyMSIgniteTheTour

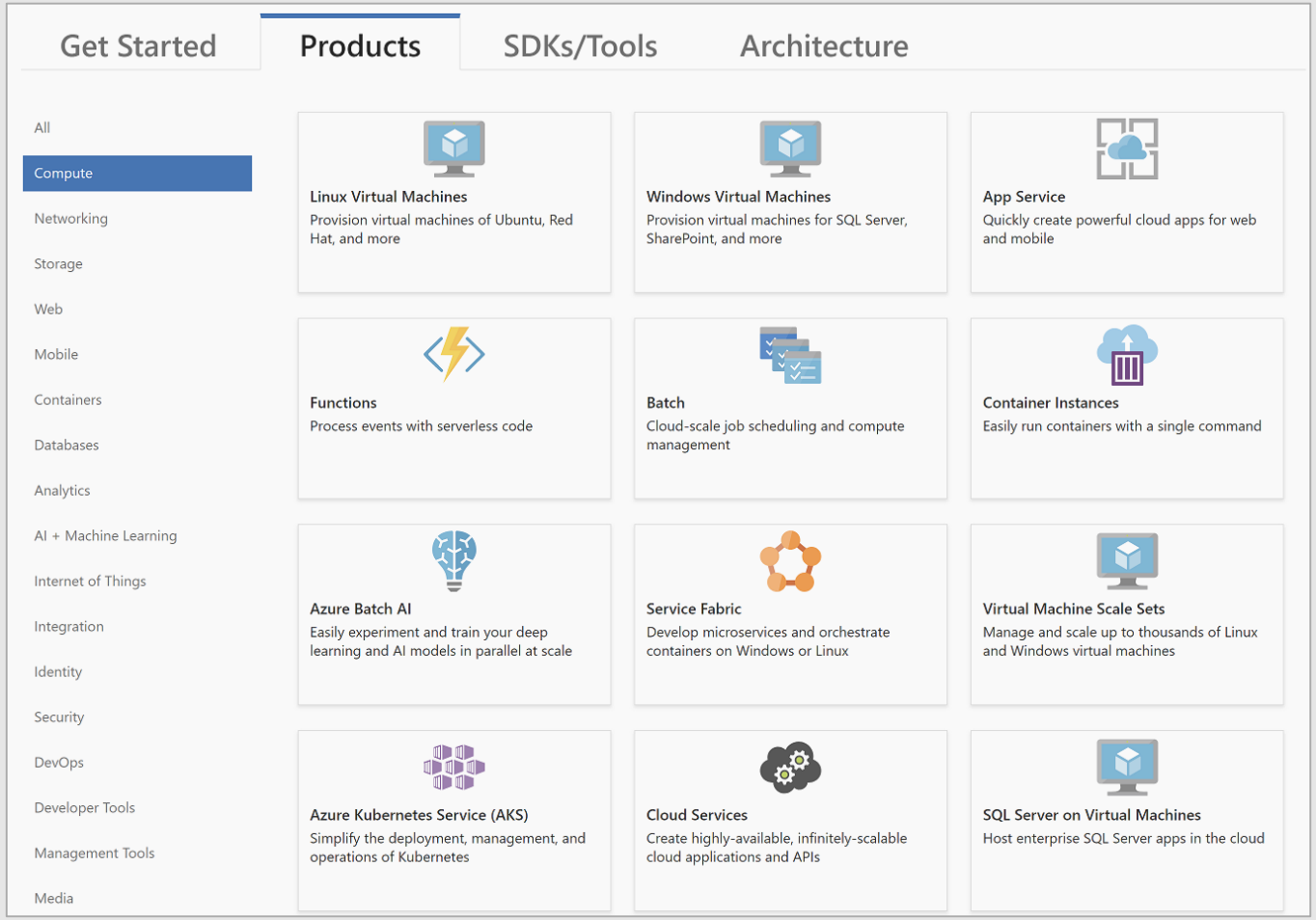
Get session code on GitHub

http://aka.ms/MSIgniteTheTourCode

/Docs alert

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

https://aka.ms/learn-azure



/Microsoft Learn

Learn Azure at your own pace via Microsoft Learn

https://aka.ms/learn-azure