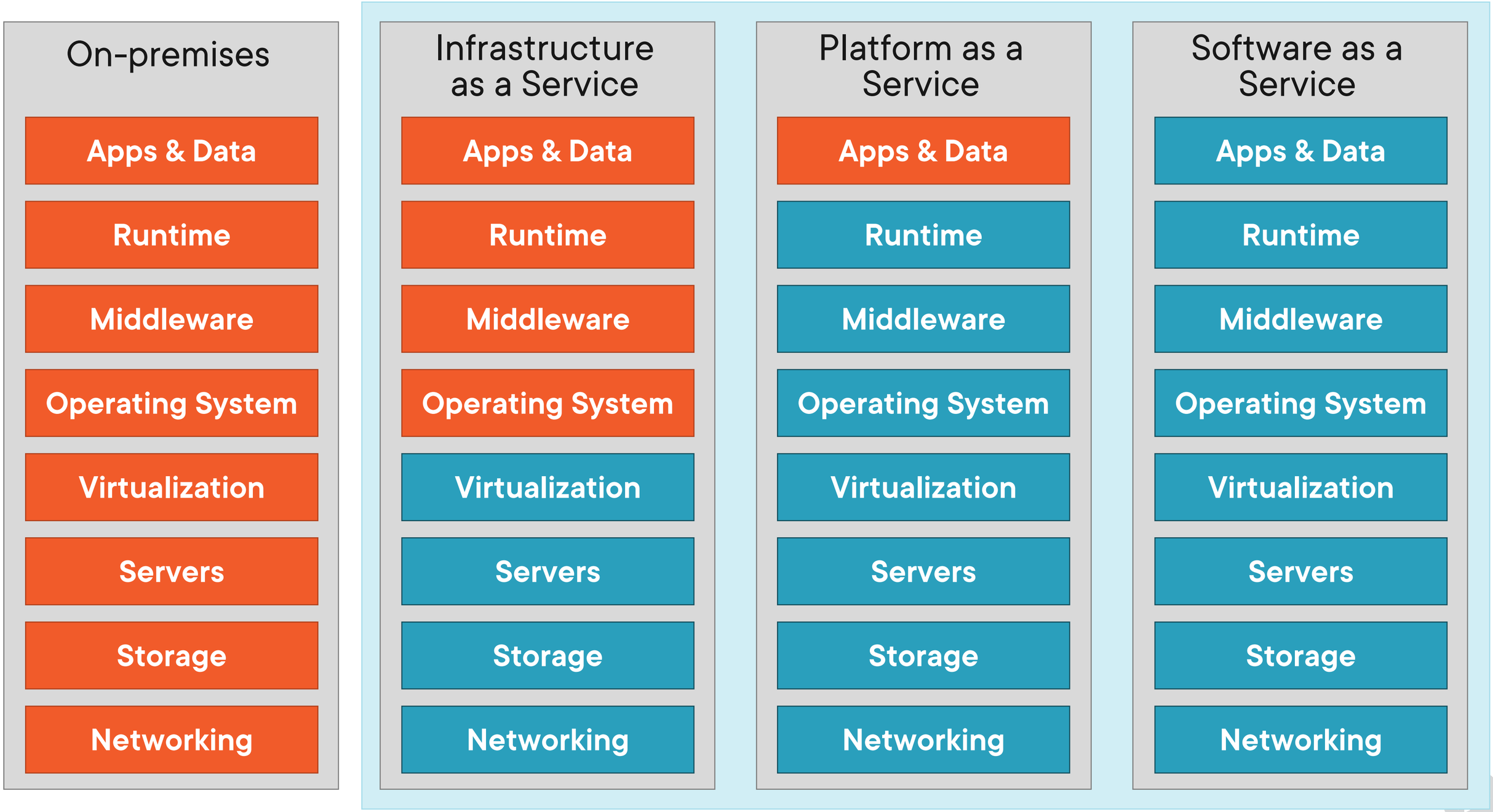
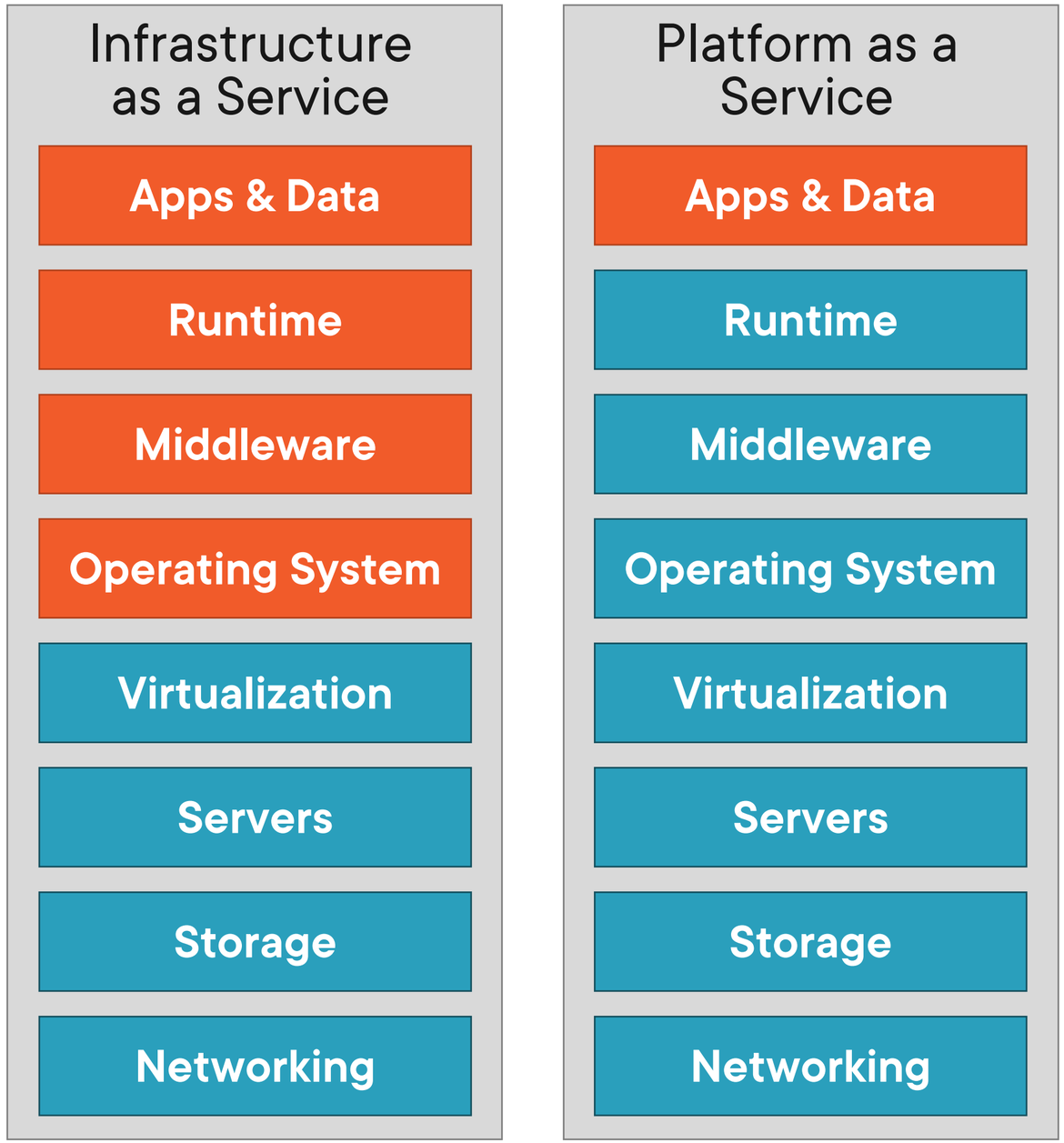
Exploring Azure Compute

Neil Morrissey
Solutions Architect

@morrisseycode www.neilmorrissey.net


On-premises
Apps & Data
Runtime
Middleware
Operating System
Virtualization
Servers
Storage
Networking
Infrastructure as a Service
Apps & Data
Runtime
Middleware
Operating System
Virtualization
Servers
Storage
Networking
Platform as a Service
Apps & Data
Runtime
Middleware
Operating System
Virtualization
Servers
Storage
Networking
Software as a Service
Apps & Data
Runtime
Middleware
Operating System
Virtualization
Servers
Storage
Networking


Infrastructure as a Service
Apps & Data
Runtime
Middleware
Operating System
Virtualization
Servers
Storage
Networking
Platform as a Service
Apps & Data
Runtime
Middleware
Operating System
Virtualization
Servers
Storage
Networking

Module Overview

- Service Models in Azure
- Azure Compute Options
- Azure Virtual Machines
- Container options in Azure
- Azure App Service
- Azure Functions

Azure Compute Options

Azure Compute

Azure Virtual Machines

Container Instances

Azure App Service

Azure Functions

Azure Virtual Machines

Software emulations of physical computers

Can remote into server to manage

Install middleware, runtimes, applications

You are responsible for patching

- Azure makes this easier

Azure Virtual Machines Benefits

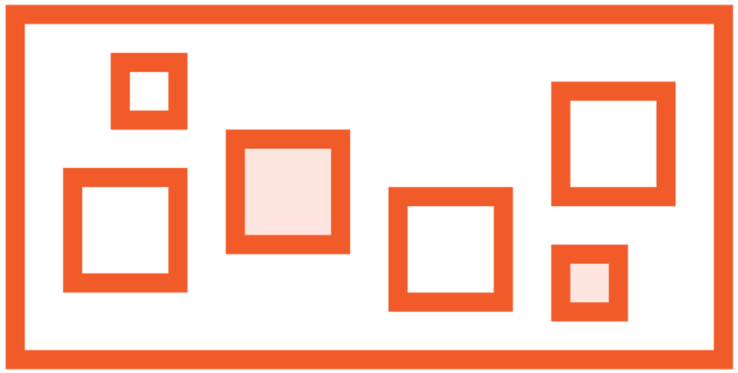
Familiar hosting option for on-premises organizations

Offers “lift and shift” approach to cloud migration

Ability to install COTS products

Density of applications

Containers in Azure



- Packages application and dependencies
- Solves problems with deploying applications
- Need a container runtime on server
- Can host multiple containers on a single VM
- Several services in Azure to host containers

Azure App Service

Platform-as-a-Service offering for hosting

- Web applications
- Mobile app backends
- API apps
- WebJobs

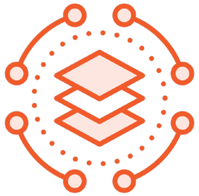
Runtimes pre-installed

Linux or Windows for underlying VMs

Azure App Service Benefits

Azure manages underlying virtual machines

Built-in authentication options to speed development



Deployment slots for development, testing and production

Ability to scale resources to handle increased load

Azure Functions

Run code without a full application

- Process a file
- Update a database table
- Send a message

Part of a bigger solution

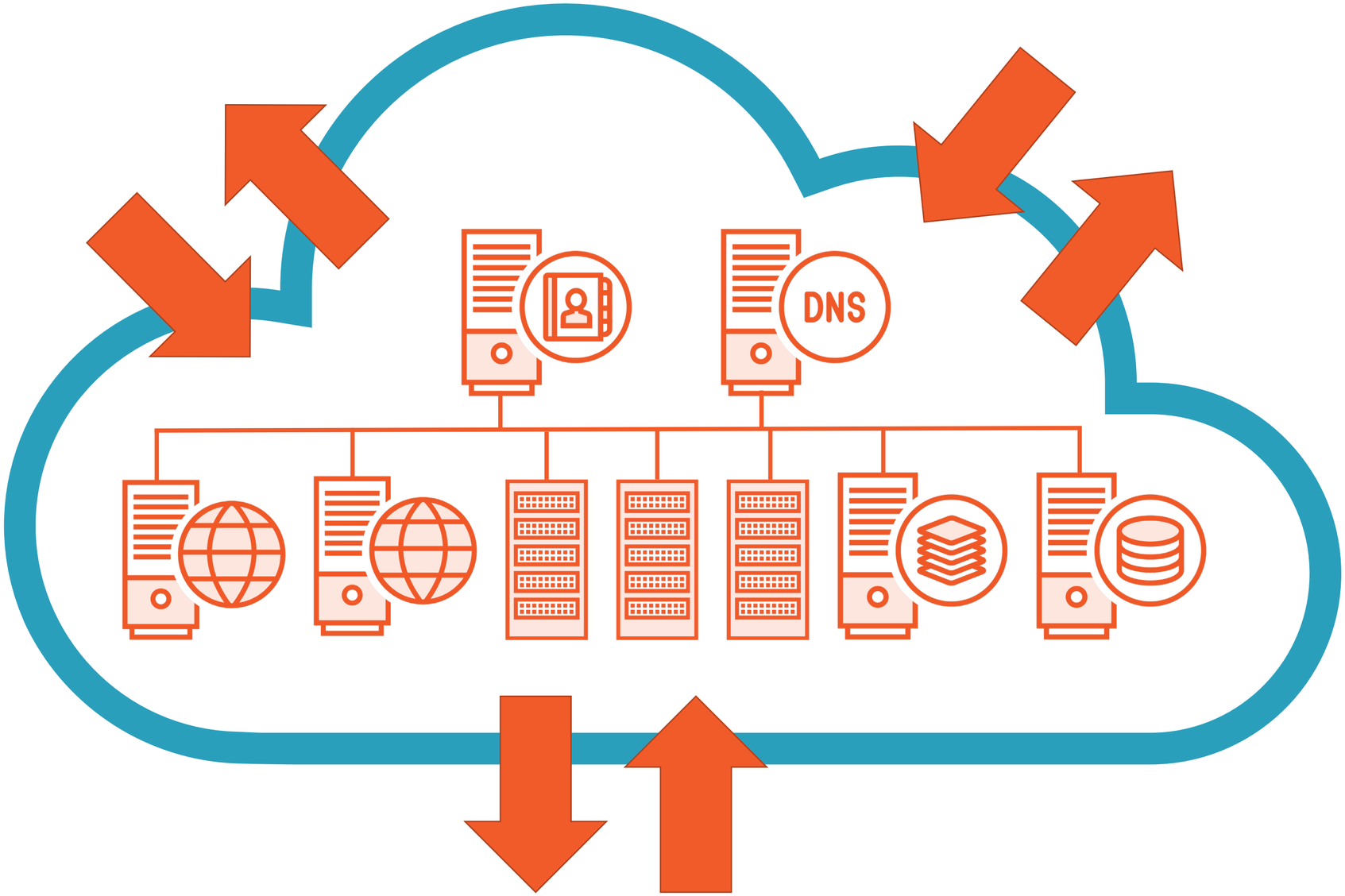
Functions can run on a timer

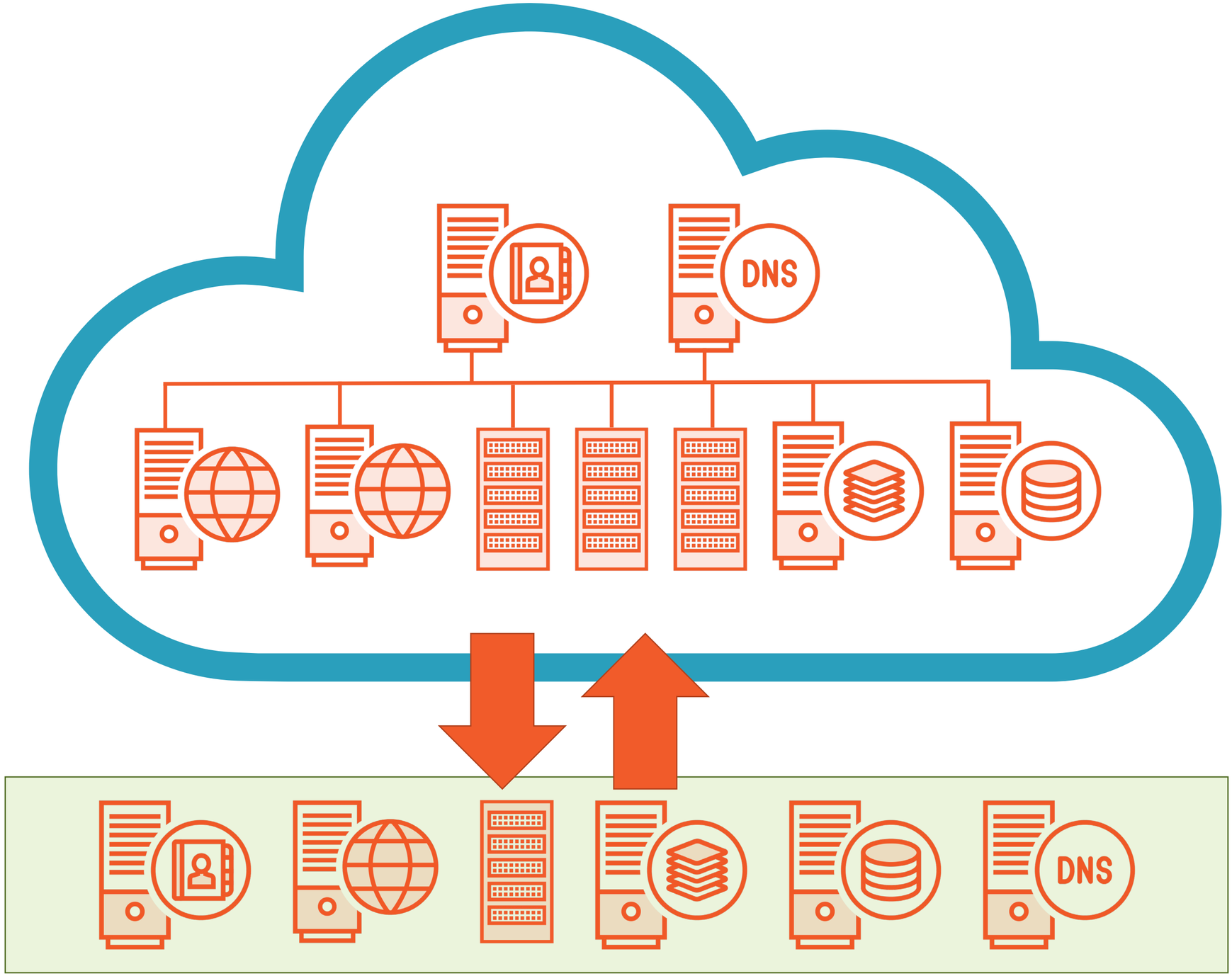
Respond to HTTP calls

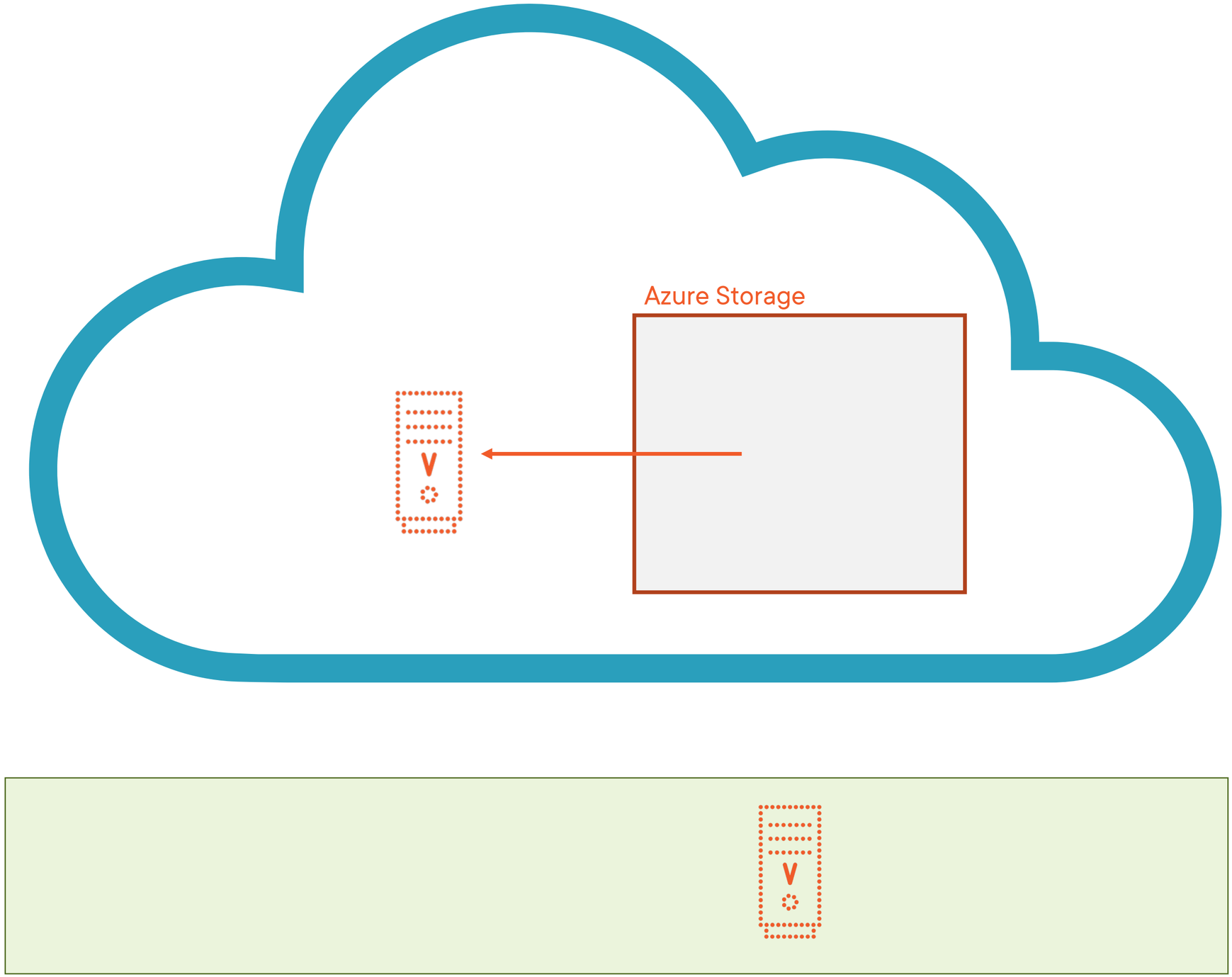
Respond to event triggers in Azure

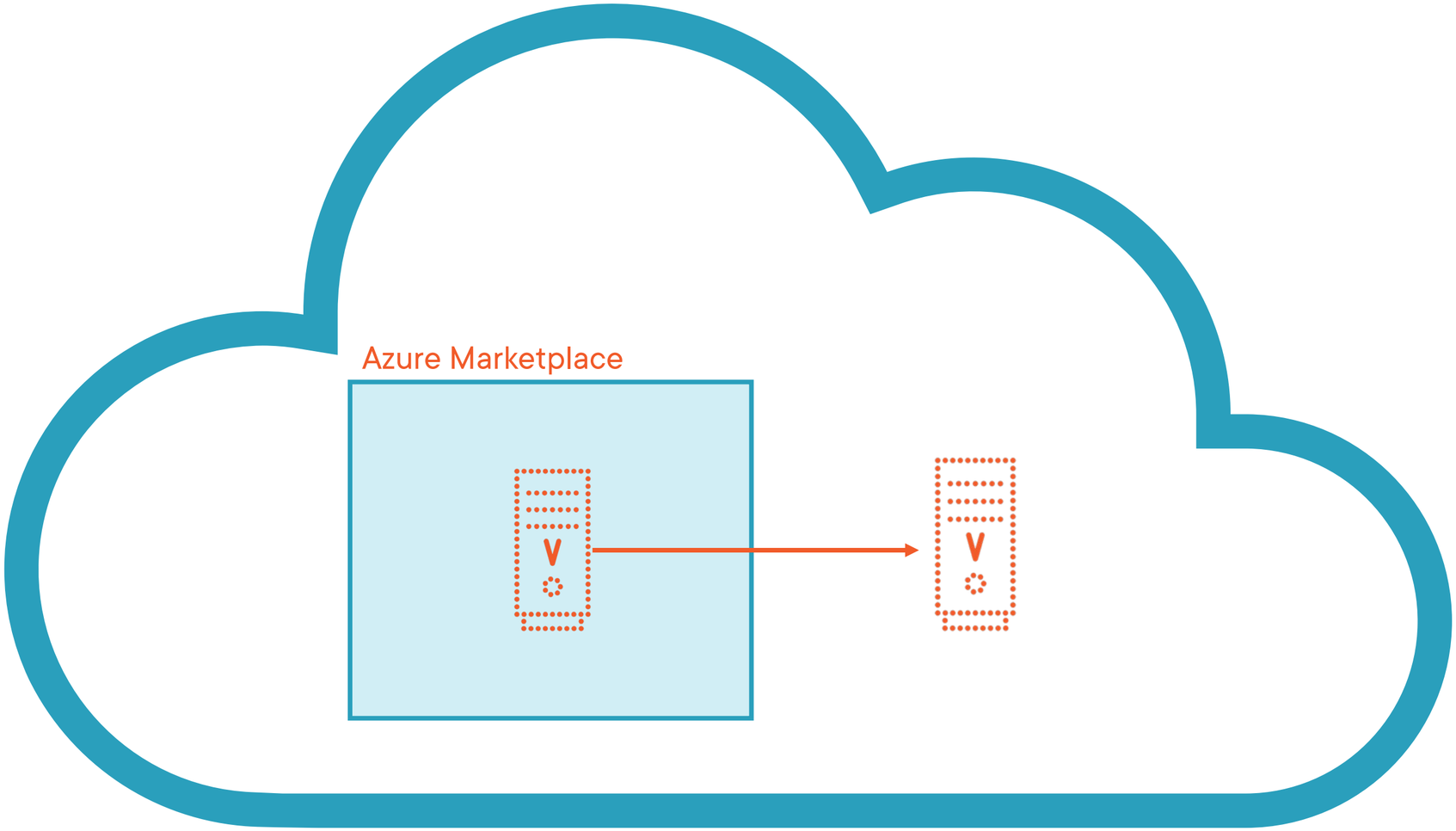
“Serverless Compute”

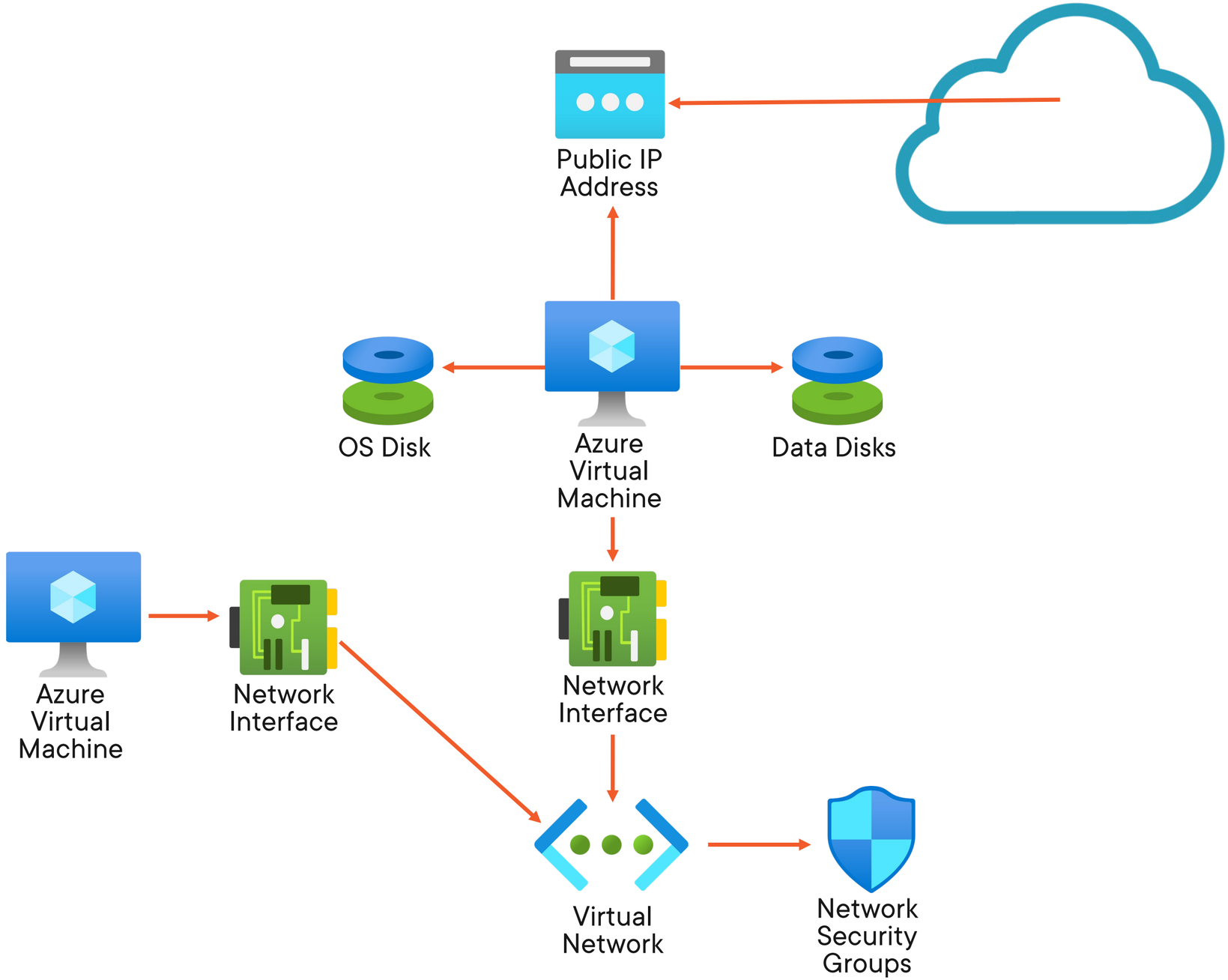
Understanding Azure Virtual Machines


DNS

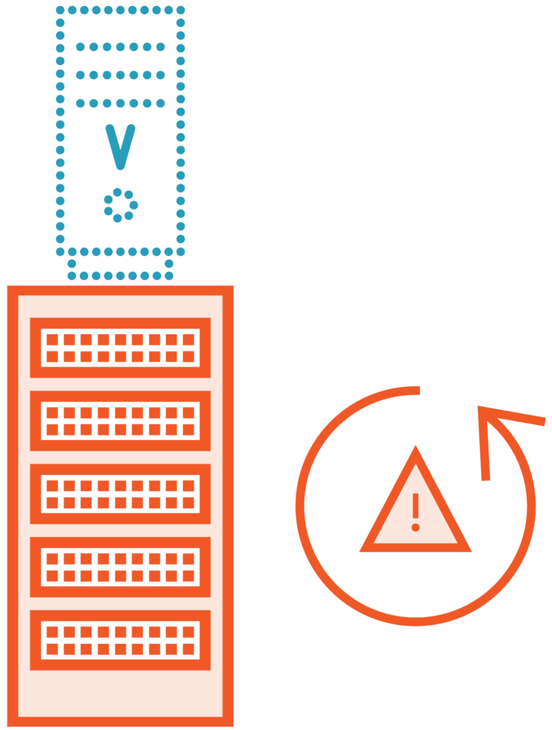

DNS
DNS


Azure Storage

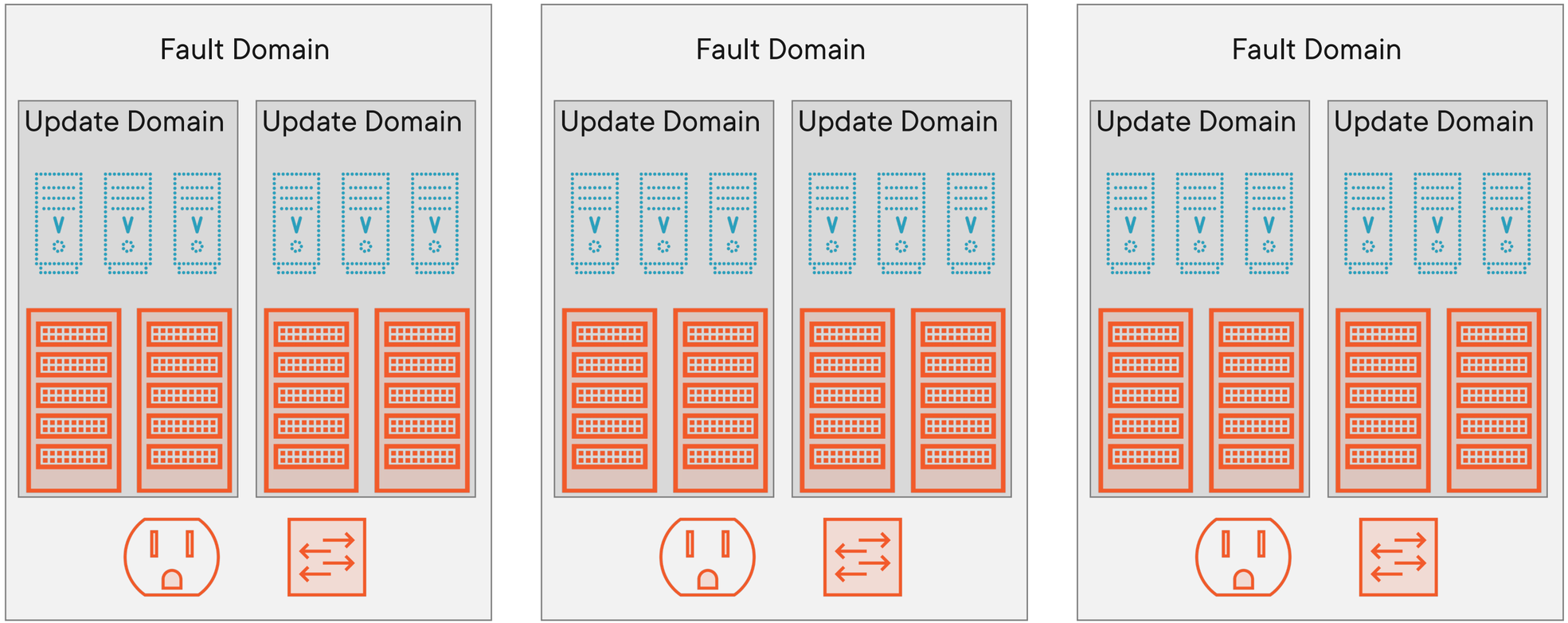

Azure Marketplace

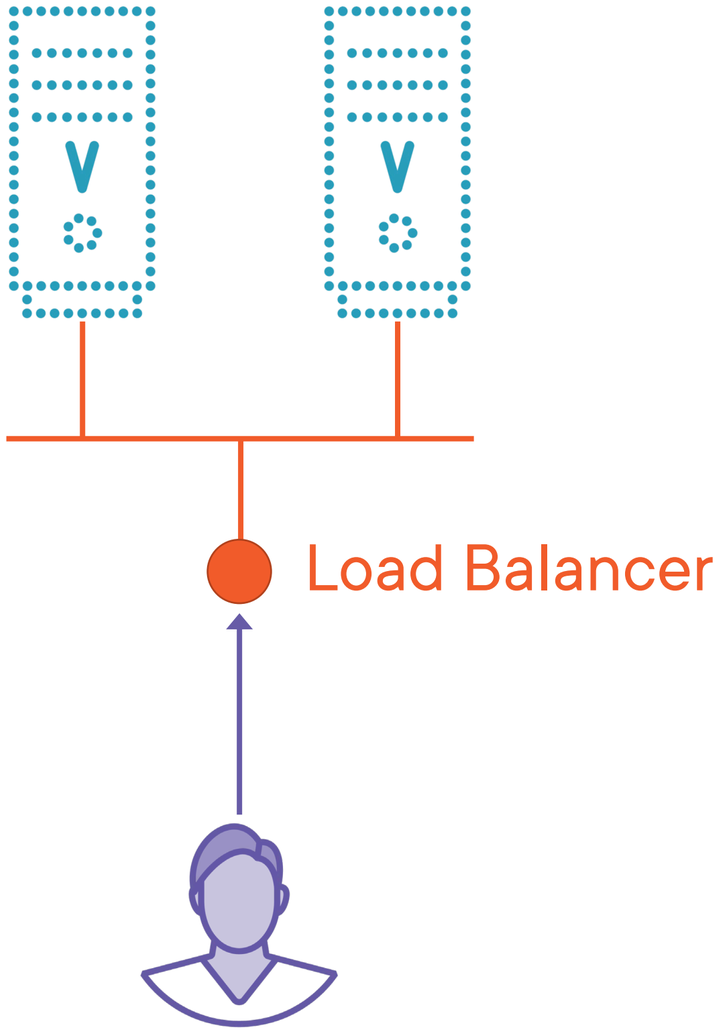

Public IP Address
OS Disk
Azure Virtual Machine
Data Disks
Azure Virtual Machine
Network Interface
Network Interface
Virtual Network
Network Security Groups

Virtual Machine Scale Sets and Availability Sets

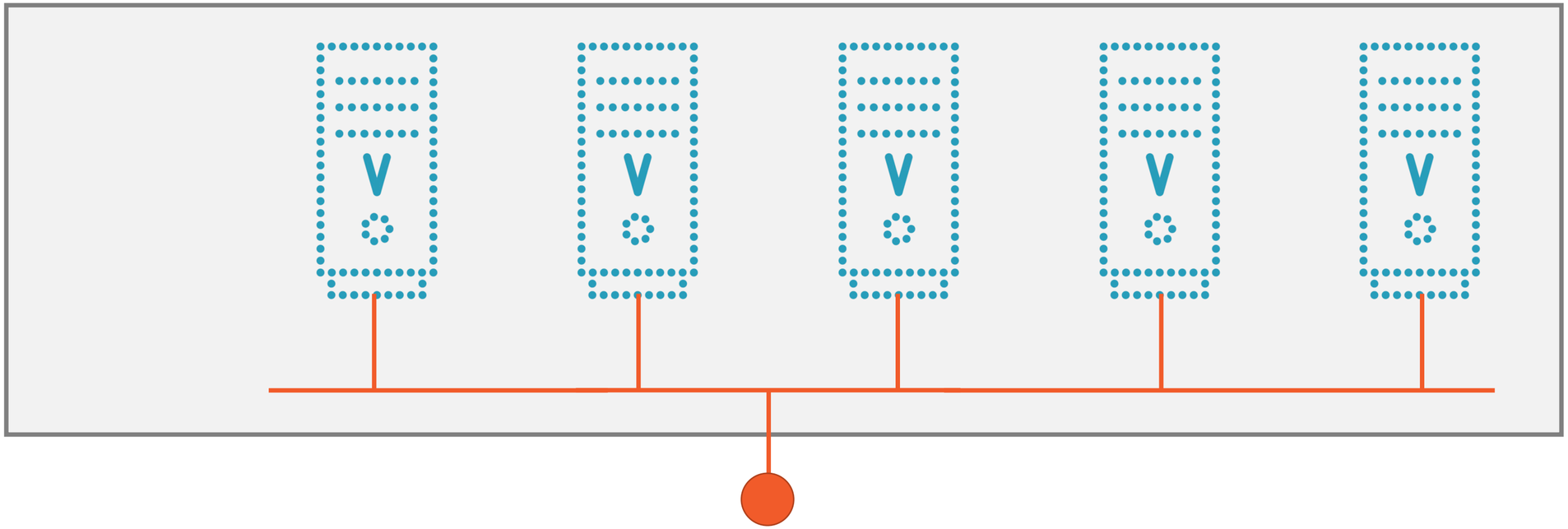


Update Domains and Fault Domains
(used by Availability Sets)



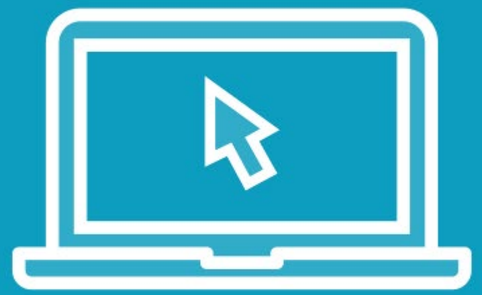

Load Balancer

Virtual Machine Scale Sets



Up to 1000 VMs supported

Demo



Create an Azure Virtual Machine

Explore Azure Virtual Machines

Azure Active Directory Domain Services

AAD vs AD

Azure Active Directory

Store users and group

Web authentication protocols

OAuth 2.0 and OpenID Connect

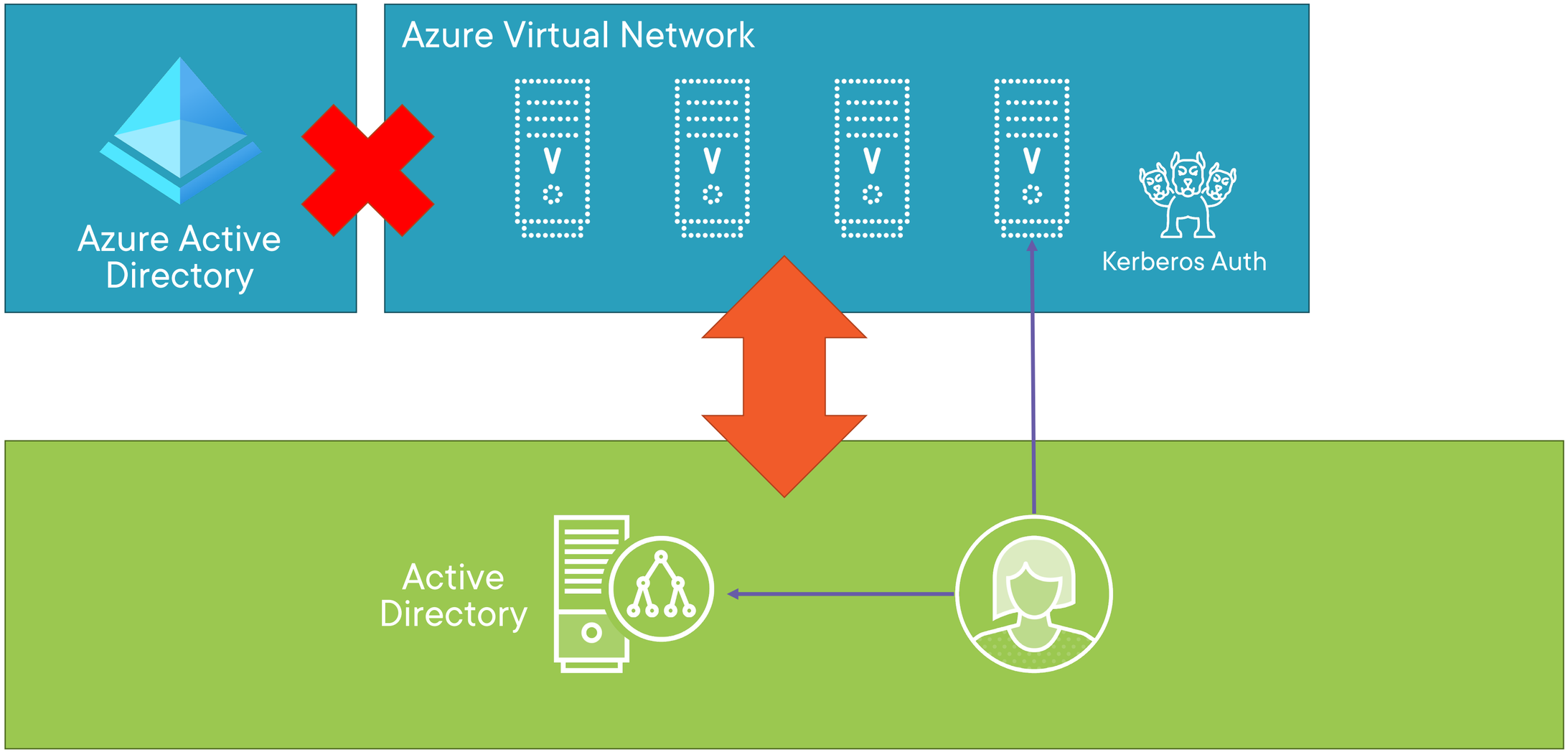
Active Directory

Store users and groups

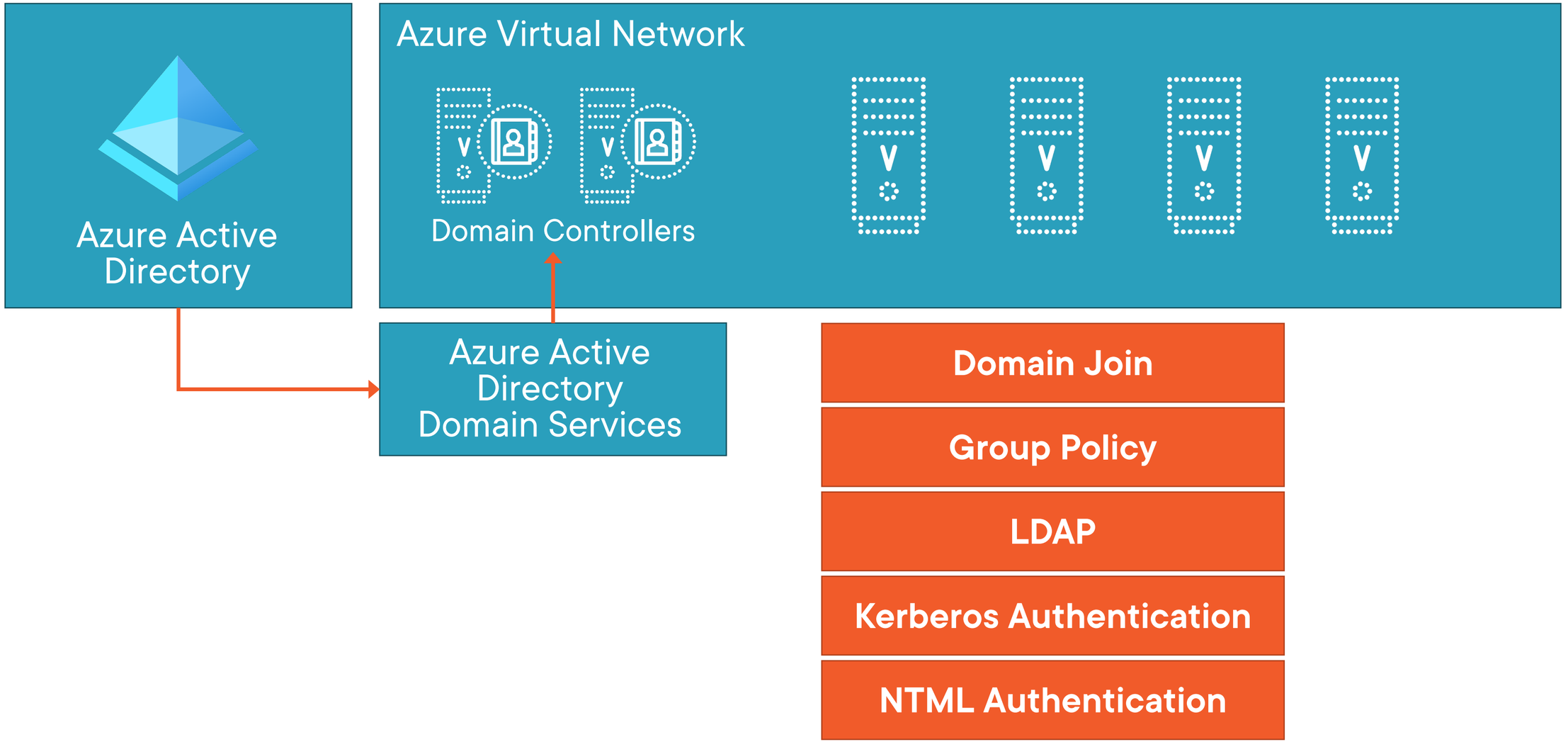
Windows Integrated Authentication (WIA)

- Kerberos and NTML
- Many legacy apps use WIA
- COTS products also

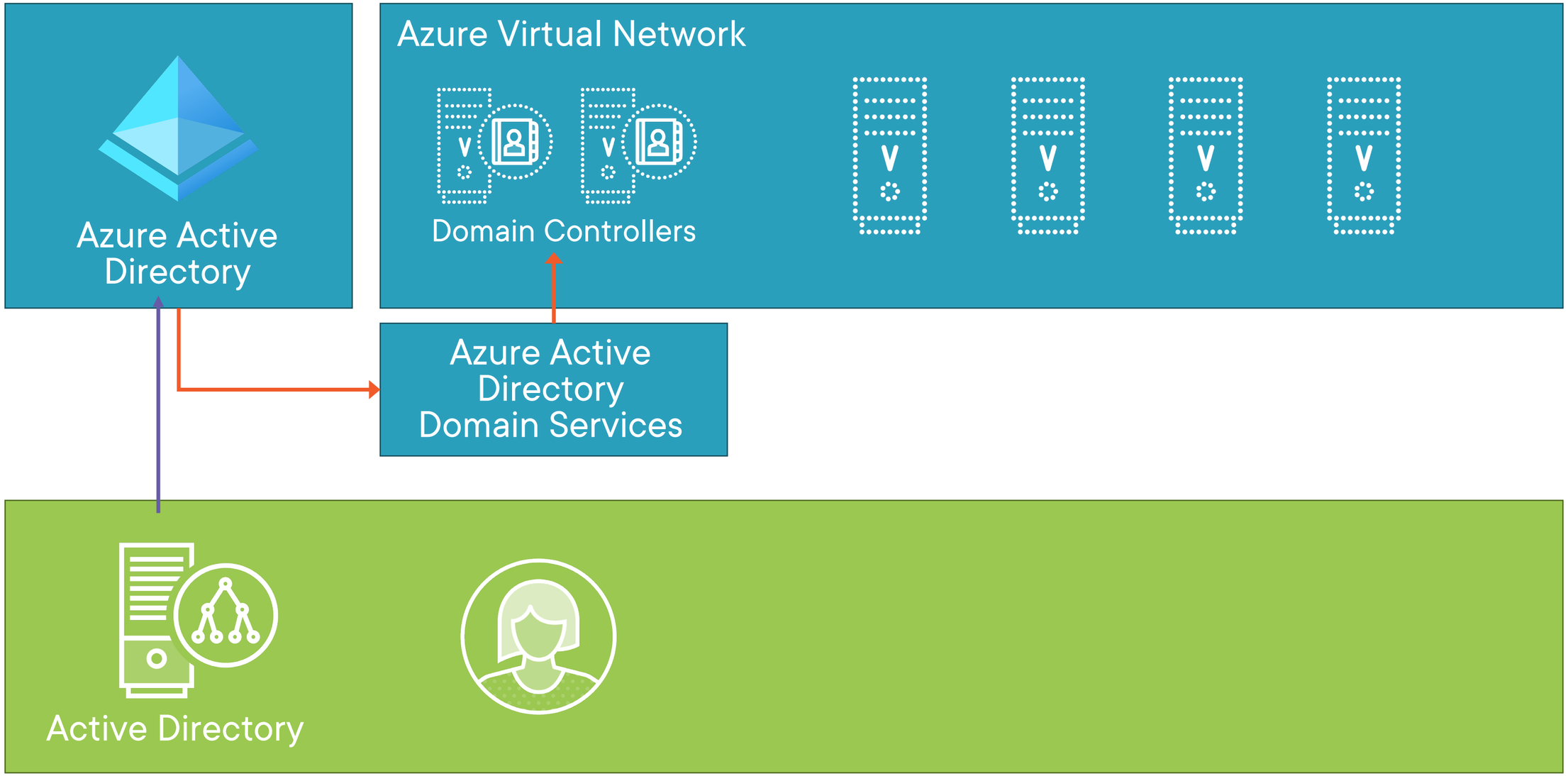
Extending Your Network to Azure



Azure Active Directory Domain Services

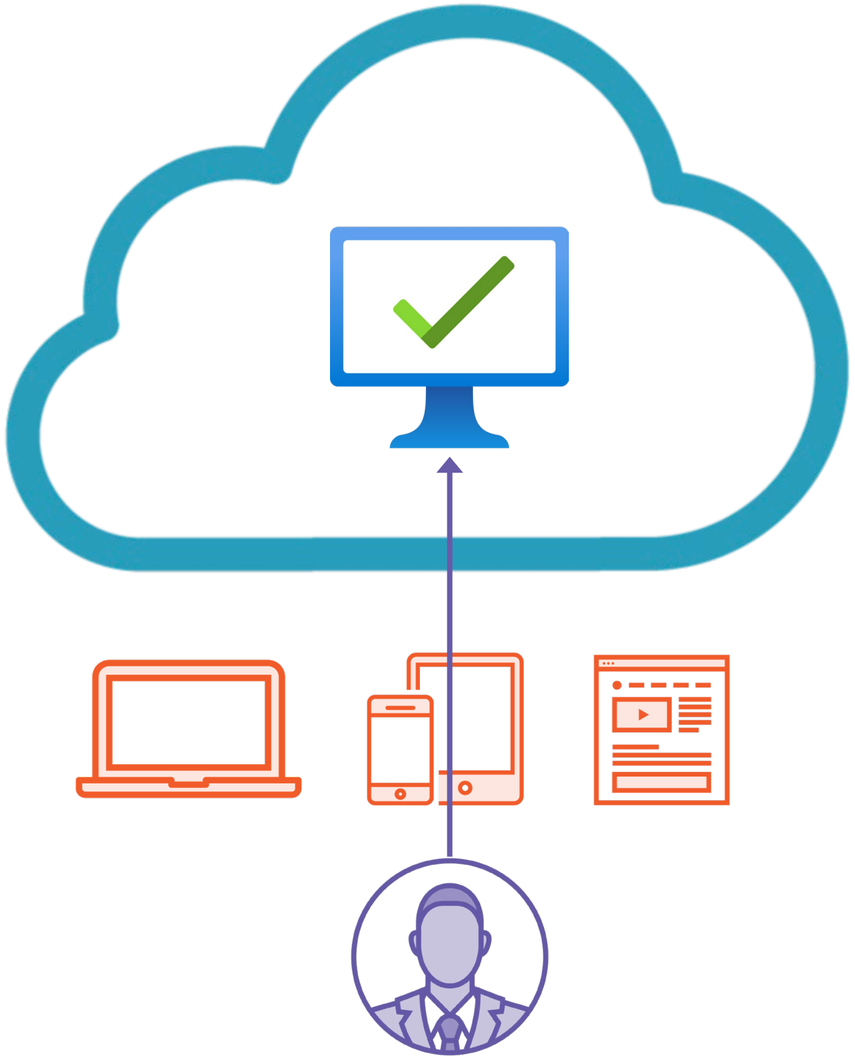


Azure Active Directory Domain Services



Azure Virtual Desktop

Azure Virtual Desktop



Azure Virtual Desktop

Separates OS, data and apps from local hardware

Central management of user desktops

Reduces risk with confidential information

Standardize computer images

Ease of deployment

Azure Virtual Desktop

Windows desktop operating systems

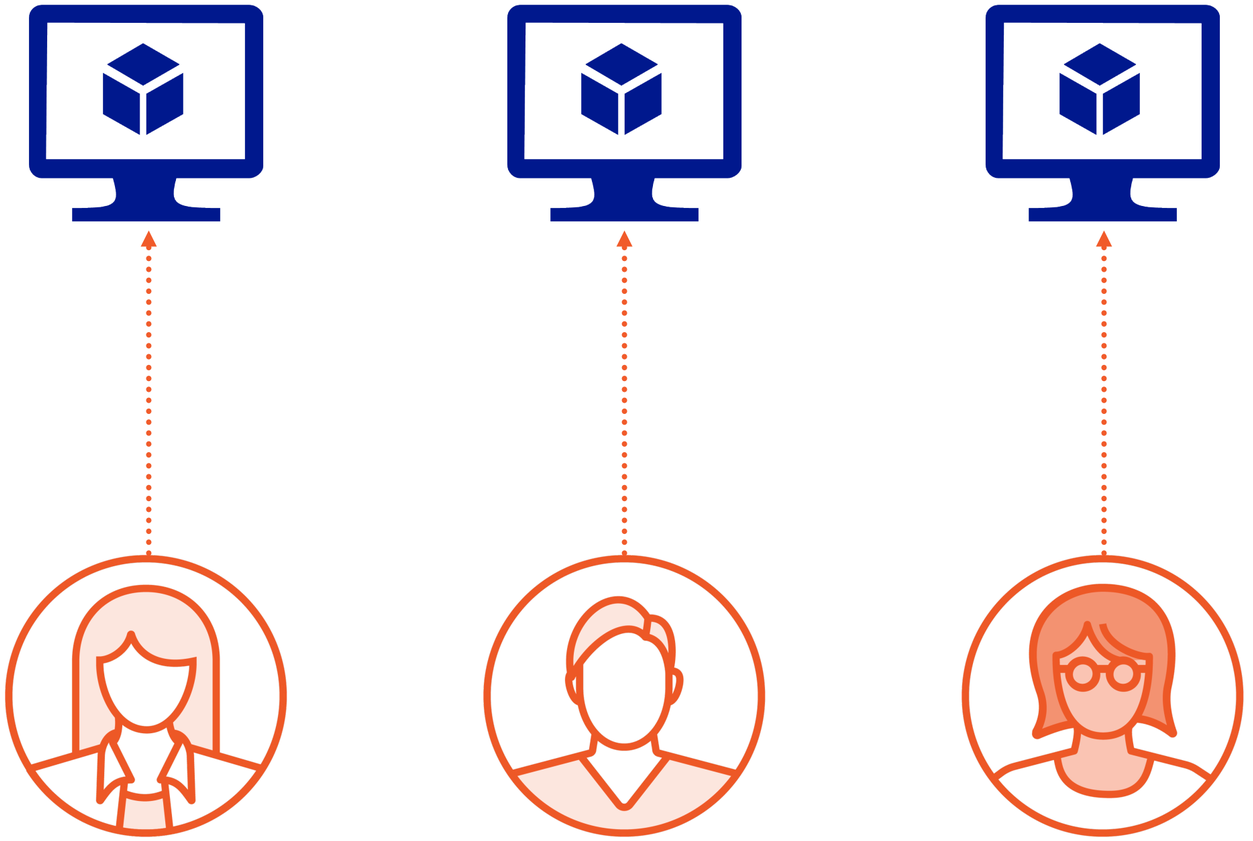
Windows server operating systems

User profile loaded on sign-in

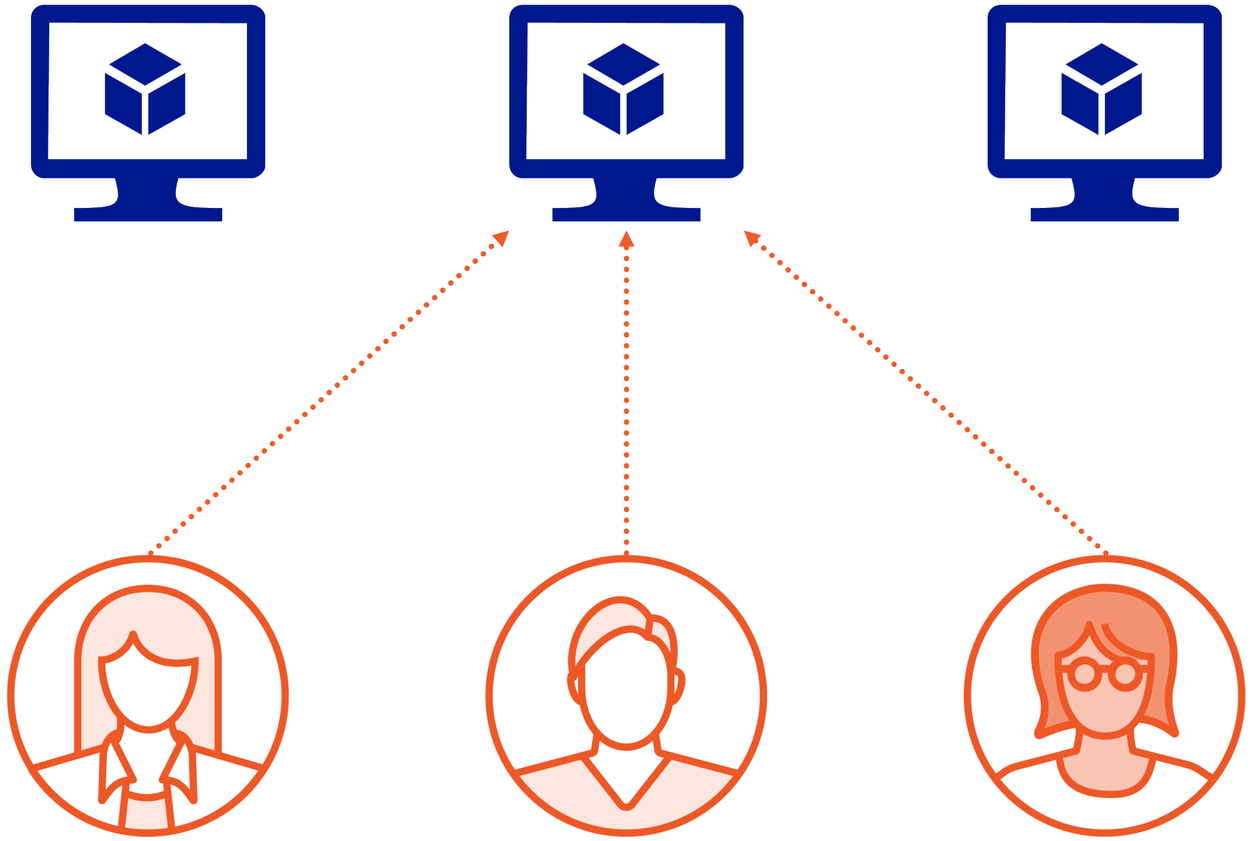
User data

Add/remove programs

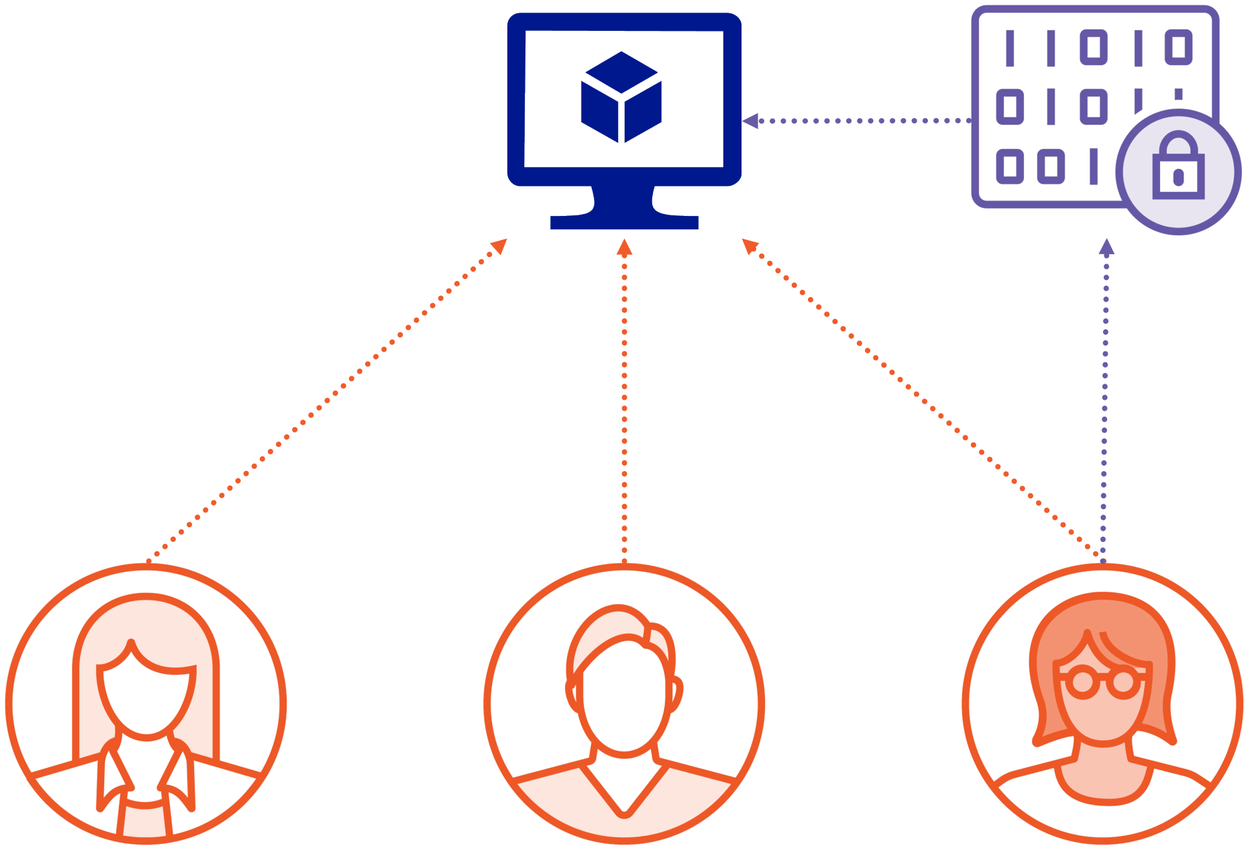
Remote Desktop Services



Azure Virtual Desktop



Azure Virtual Desktop



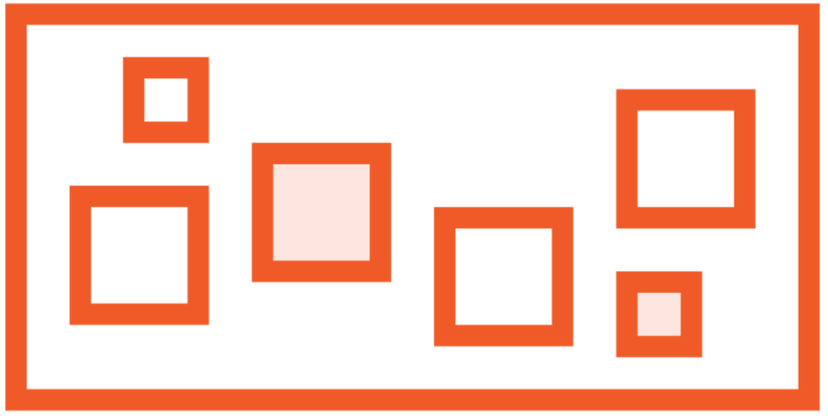
Azure Virtual Desktop

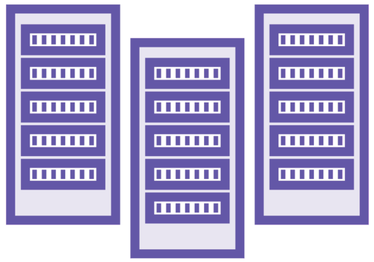
Join desktop to

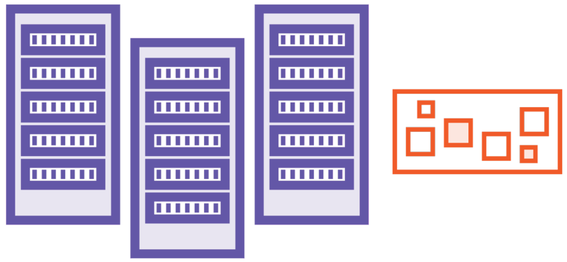
- Azure AD Domain Services
- Active Directory Domain Services

Supports Azure Multi-factor Authentication

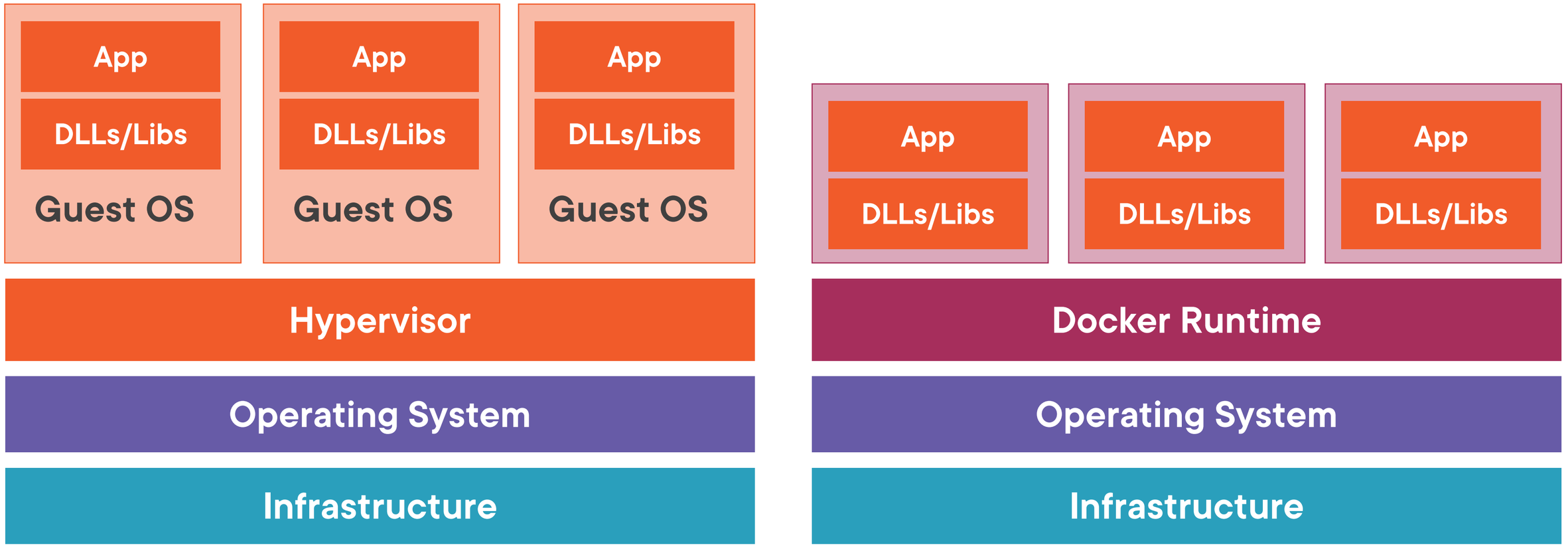
Container Options in Azure

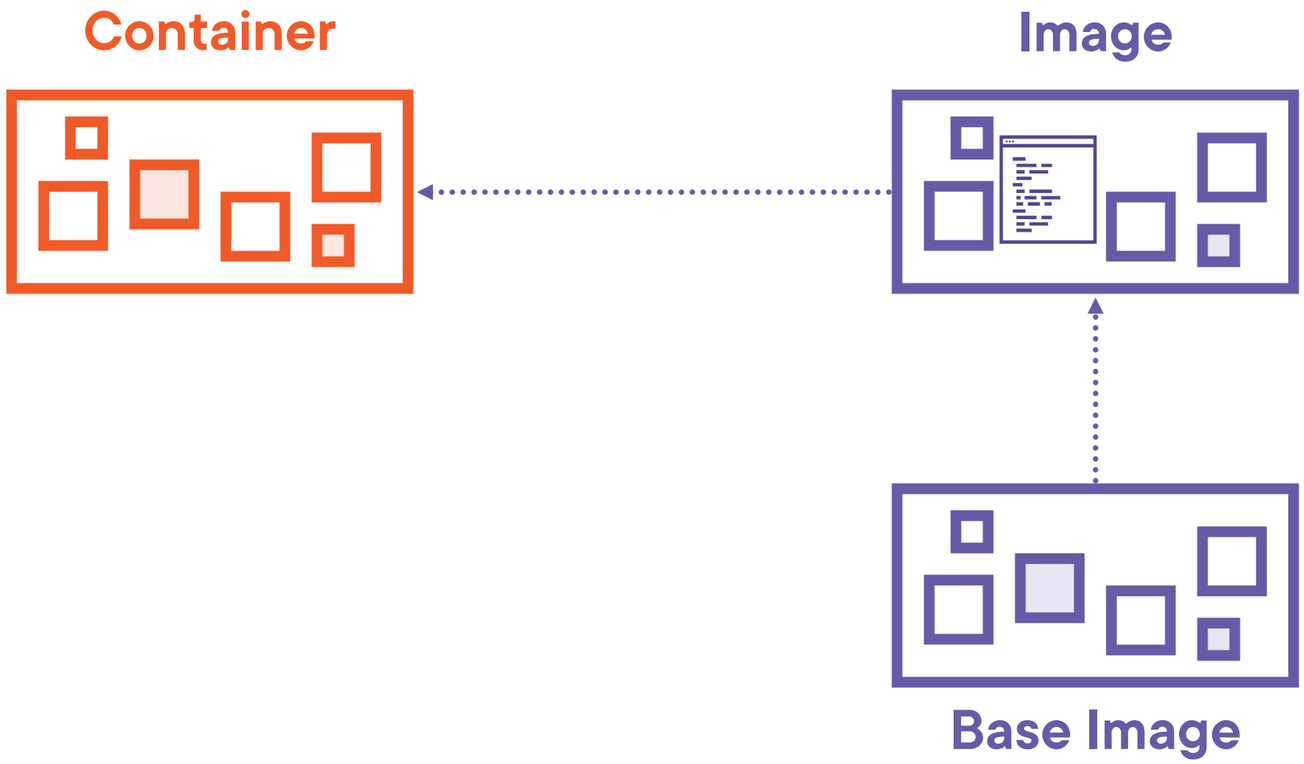


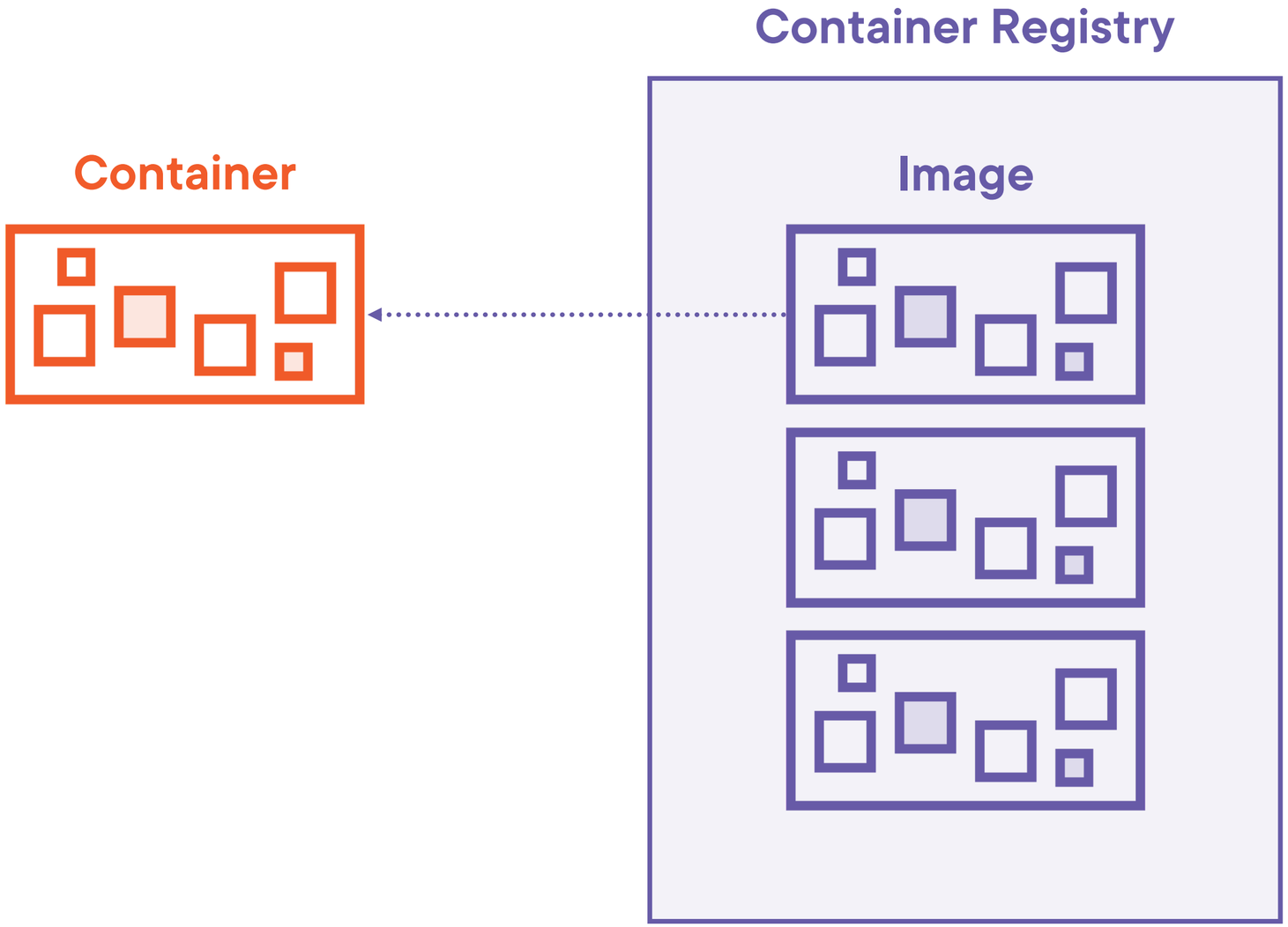


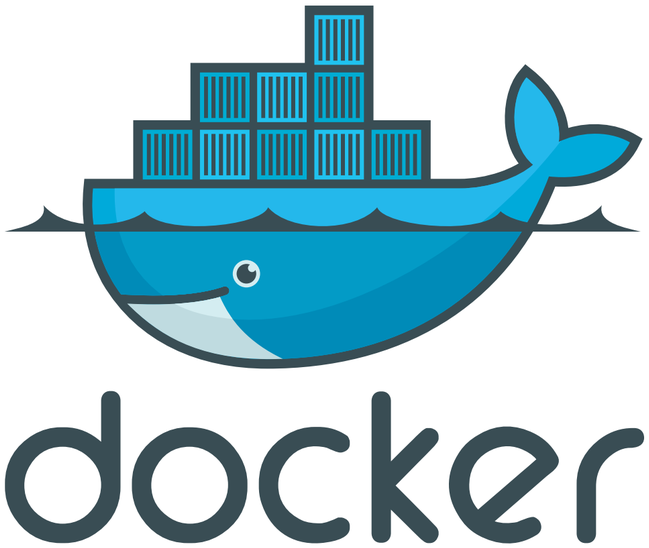


Virtual Machines vs Containers




Container
Image
Base Image


Container Registry
Container
Image



Standard for container format

Runtime for Docker containers

Open-source project

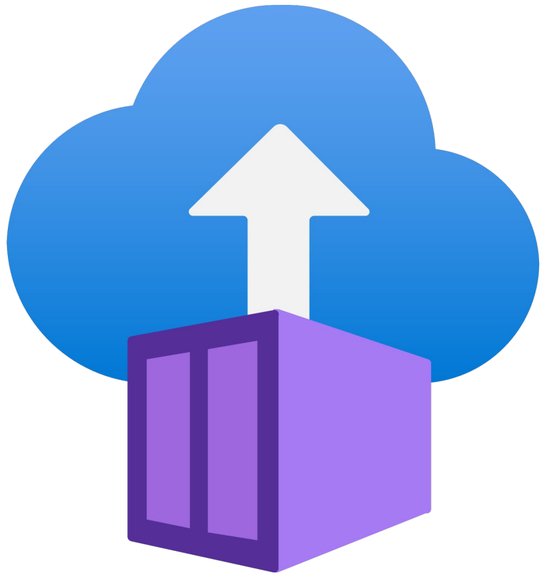
Docker is also a company that evolves the technology

Container Hosting Options

Local Workstation

On-premises Virtual or Physical Servers

Azure Virtual Machines



Azure PaaS Container Hosting

- Azure Container Instances (ACI)
- Azure Kubernetes Service (AKS)
- Azure Red Hat OpenShift
- Azure Spring Apps
- Azure App Service
- Azure Functions
- Azure Container Apps

Azure App Service

Azure App Service

Like traditional web hosting

Framework runtimes installed on servers

Azure manages web servers for you

Azure App Service

Web Apps

API Apps

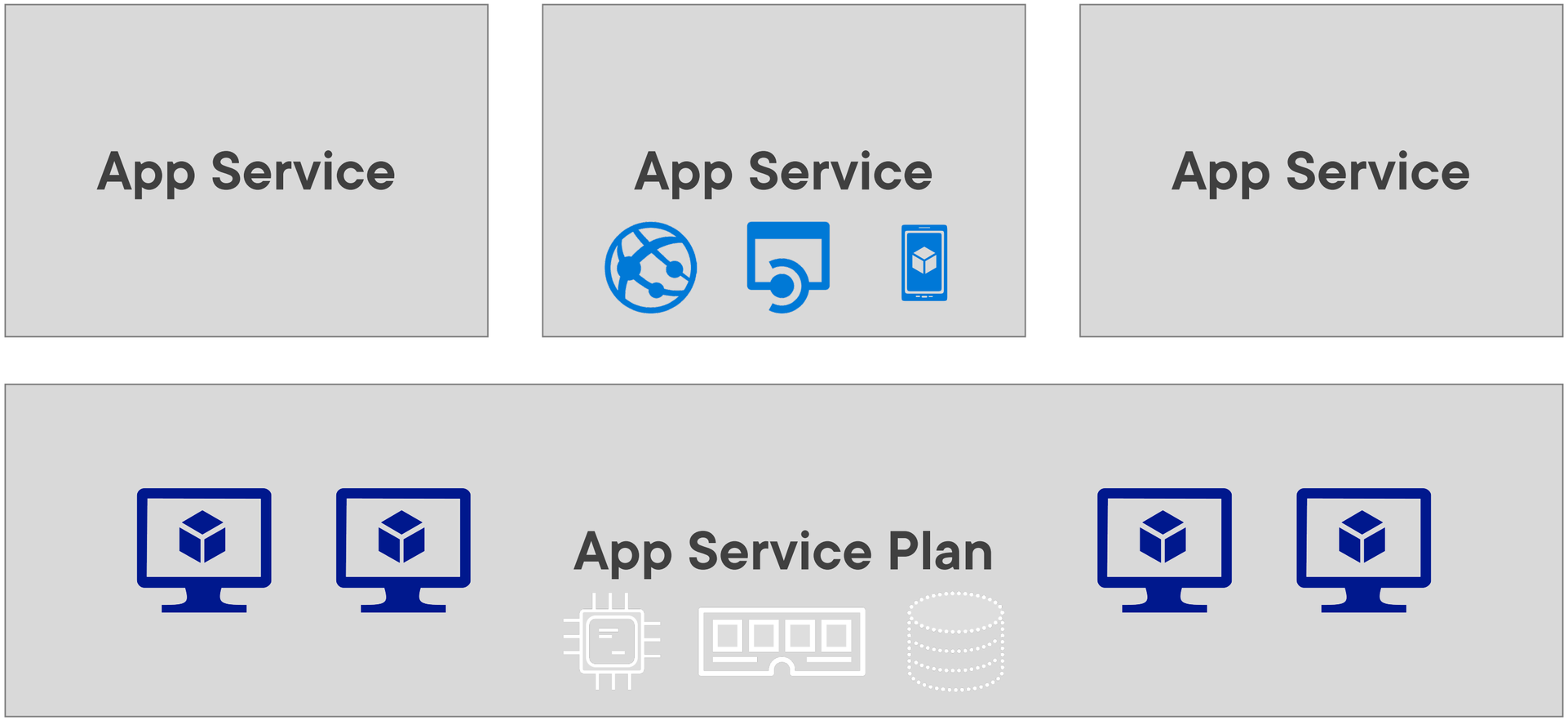
Mobile Apps

Containers

WebJobs

https://<your app service name>.azurewebsites.net

Azure App Service Plans



Serverless Computing in Azure

Serverless Computing

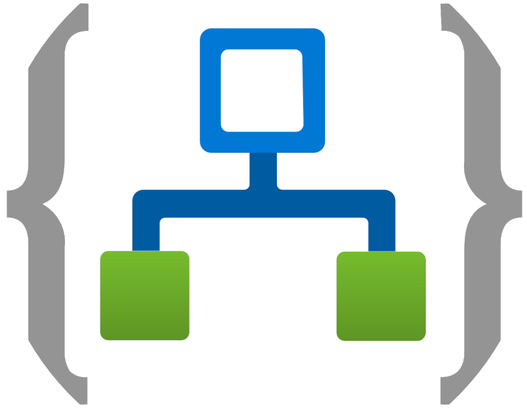
Developers focus on code and business logic

Environment automatically scales on demand

Consumption based billing

Serverless Computing

Azure Function Apps



Azure Logic Apps

Azure Functions

Run individual functions in Azure

Function code is initiated by “triggers”

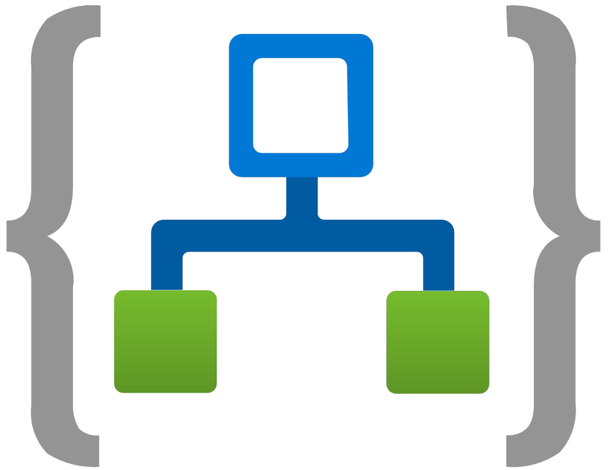
- HTTP calls
- Events in Azure
- Scheduled on a timer

Languages supported

- C#, Java, JavaScript, TypeScript
- Python, PowerShell

Consumption based billing or host on App Service

Azure Logic Apps

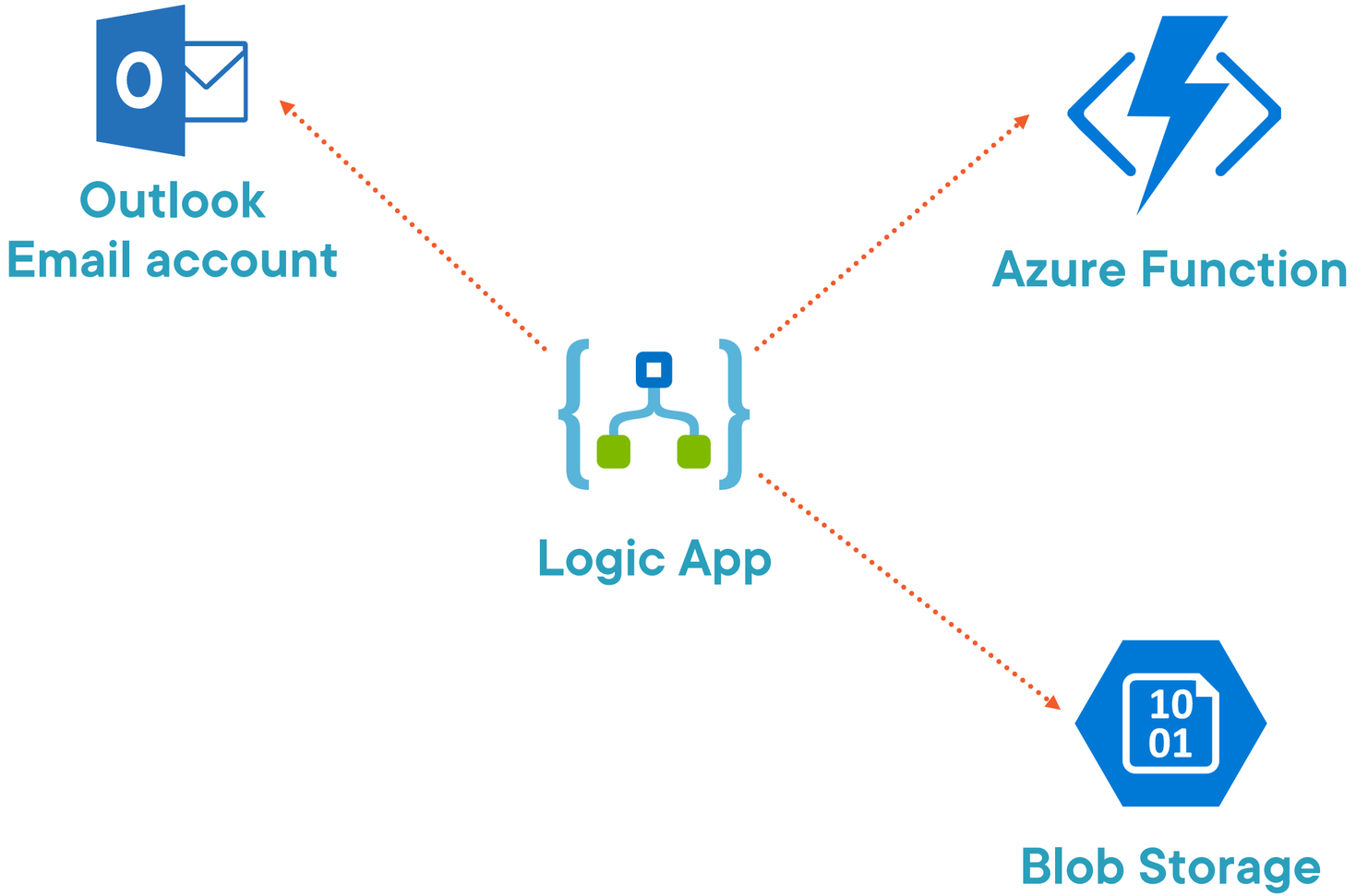


Design workflows in the Azure Portal

Integrate apps, data, services

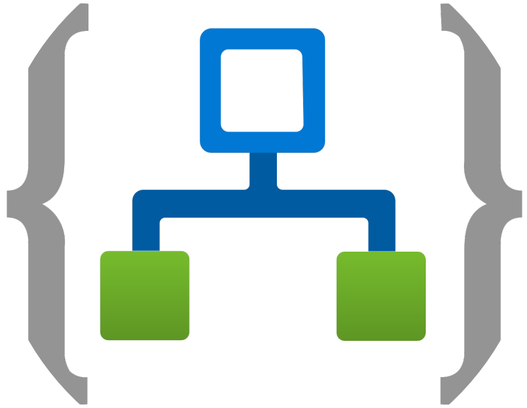
Many connectors available to services inside and outside of Azure

Can call Azure Functions when custom code is needed


Outlook
Email account
Azure Function
Logic App
10
01
Blob Storage

Serverless Computing

Azure Function Apps
Solution requires custom algorithms



Azure Logic Apps
Solution will use well known APIs

Module Summary

- Service Delivery Models
- Azure Virtual Machines
- Container Options in Azure
- Azure App Service
- Azure Functions

Up Next:
Networking in Azure