

Partner Practice Enablement

Cloud Application Development

Day 2

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January 2018



Objectives & Takeaways

Objectives → Be inter-active!

Train The Trainer - TTT

Get you excited! ☺

Introduce and cover most of the Azure Cloud App Dev capabilities (L100) – 25%

Illustrate with demos (L200) – 25%

Practice with Hands-on Labs (L300) – 50%

Takeaways → Be evangelist!

Think Cloud App Dev and PaaS offers first

Spread the words, help and train your teammates, managers and customers

Make more concrete your L300 by practicing

3 days!

Day 1 App Service & Serverless

- ✓ Introduction
- ✓ App Service
- ✓ Web App
- ✓ Mobile App
- ✓ API App
- ✓ Functions
- ✓ Event Grid
- ✓ Logic App

+ Hands-on Lab

Day 2 Media, Storage & Containers

- ✓ Media, CDN, Cognitive Services
- ✓ Storage, Databases, Redis, Search
- ✓ Containers
- ✓ Service Fabric
- ✓ API Management

+ Hands-on Lab

Day 3 DevOps & VSTS

- ✓ Resource Groups
- ✓ ARM Templates
- ✓ Dev/Test Lab
- ✓ DevOps
- ✓ VSTS
- ✓ Application Insights, OMS
- ✓ Further resources

+ Hands-on Lab

Day 2

Media, Storage & Containers

- ✓ Media, CDN, Cognitive Services
- ✓ Storage, Databases, Redis, Search
- ✓ Containers
- ✓ Service Fabric
- ✓ API Management

+ Hands-on Lab

Day 2's Agenda

8:30AM – *Breakfast*

9:00AM – Session Starts

[1h30] Media – Cognitive Services - CDN – Storage, Databases

10:30AM – *Break*

10:45AM – Session Continues

[1h45] Containers – Service Fabric – API Management
+ Wrap up

12:30PM – *Lunch*

1:30PM – Session Resumes

[3h30] Hands-On Lab
+ Wrap up

5:00PM – *Session Ends*

Who has experience with? How deep?

Media Services

Cognitive Services

Storage / Database

CDN

Search / Redis Cache

Containers

Service Fabric

The breadth of Azure

60+ services and growing

Compose highly functional apps

Maximize app lifecycle efficiency

Leverage enterprise grade services

Limitless possibilities



Security & Management

- Security Center
- Portal
- Azure Active Directory
- Azure AD B2C
- Multi-Factor Authentication
- Automation
- Scheduler
- Key Vault
- Store/ Marketplace
- VM Image Gallery & VM Depot

Media & CDN



Integration

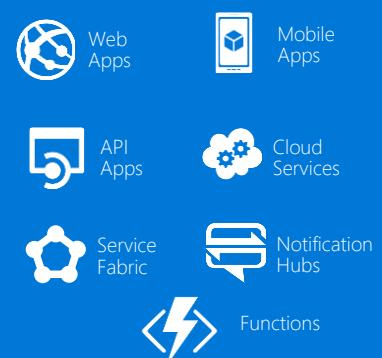


Compute Services



Platform Services

Application Platform



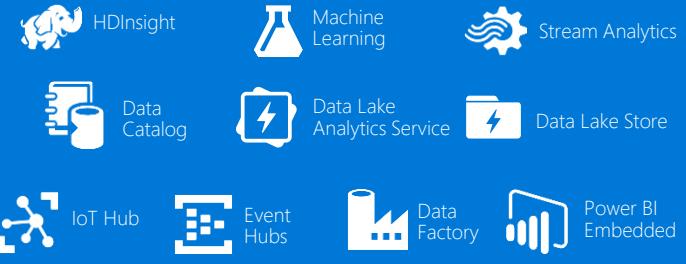
Data



Intelligence



Analytics & IoT



Hybrid Cloud

- Azure AD Health Monitoring
- AD Privileged Identity Management
- Domain Services
- Backup
- Operational Analytics
- Import/Export
- Azure Site Recovery
- StorSimple

Compute



Storage



Infrastructure Services

Networking



Datacenter Infrastructure (38 Regions, 30 Online)



Media Services

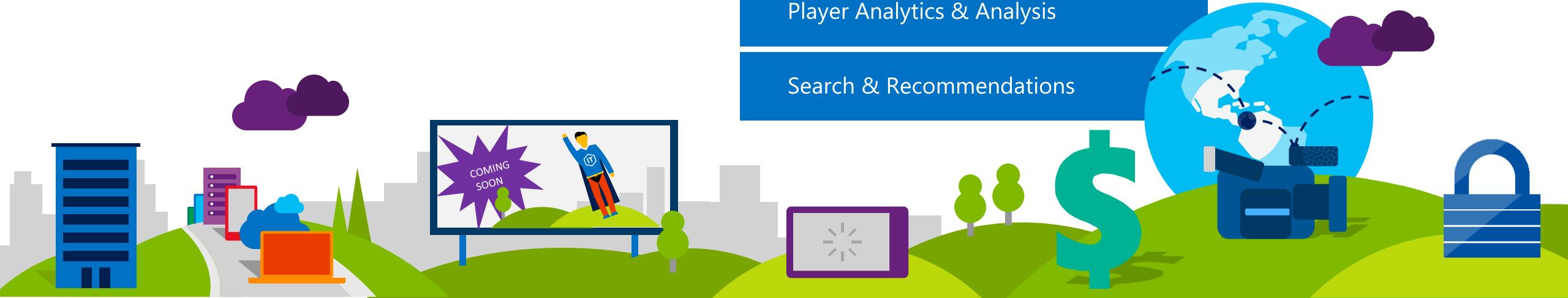
Video

is how we

communicate
educate
entertain
inform
collaborate

The Content Owner Dilemma:

How can I distribute my content widely but still protect, and monetize my content?



Azure Media Services

Microsoft's cloud platform enables on demand and live streaming video solutions for consumer and enterprise scenarios.

Delivery

Encoding



Azure Media Services

Azure Media Services is an extensible, multi-tenant platform that enables end-to-end video workflows in the Azure public cloud.



Azure Media Scenarios

Cloud based Video Streaming

Video On-Demand Portals

- Sports
- Entertainment
- Education
- News

Live Broadcast & Events

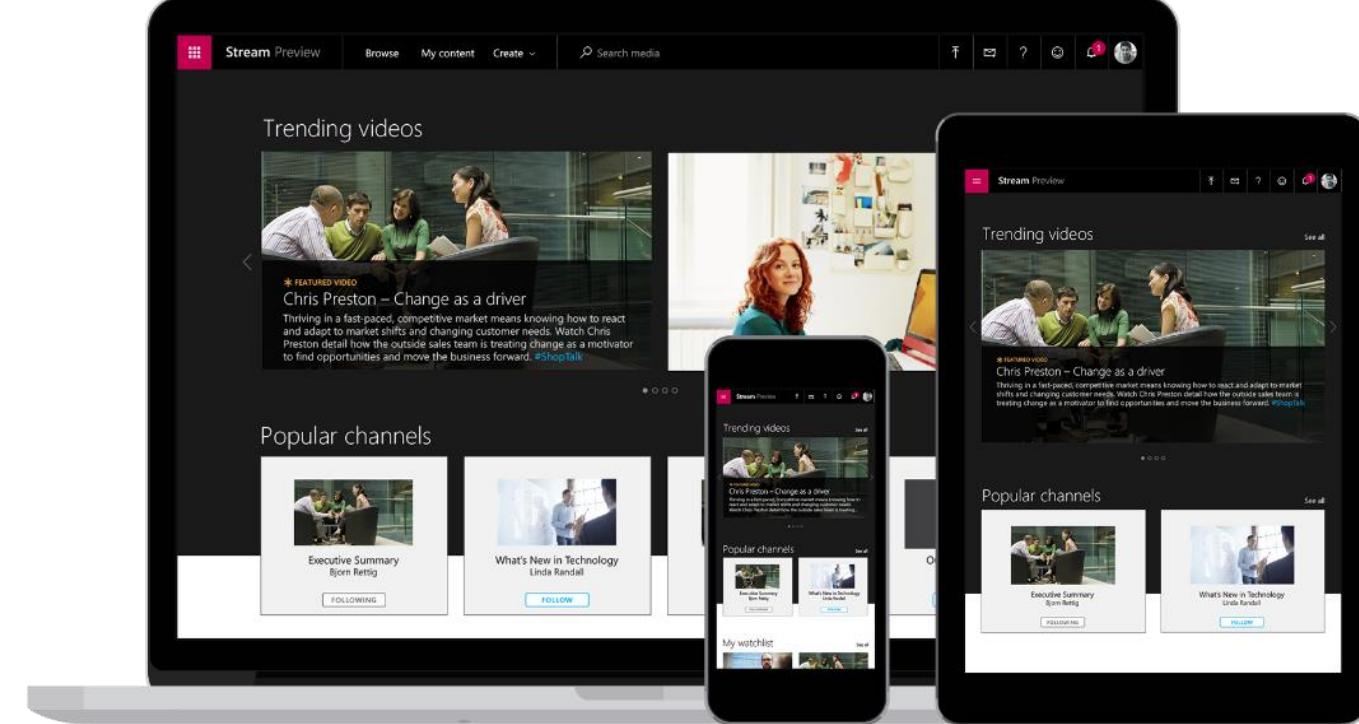
- Sports Broadcasters
- News Channels
- Music Concerts
- Awards Ceremonies
- Town Halls / Conferences

Digital Marketing / Advertising

- Retail
- Finance / Banking
- Brand Awareness
- Sales Support

Enterprise / Collaborative

Corporate



CDN Use Cases

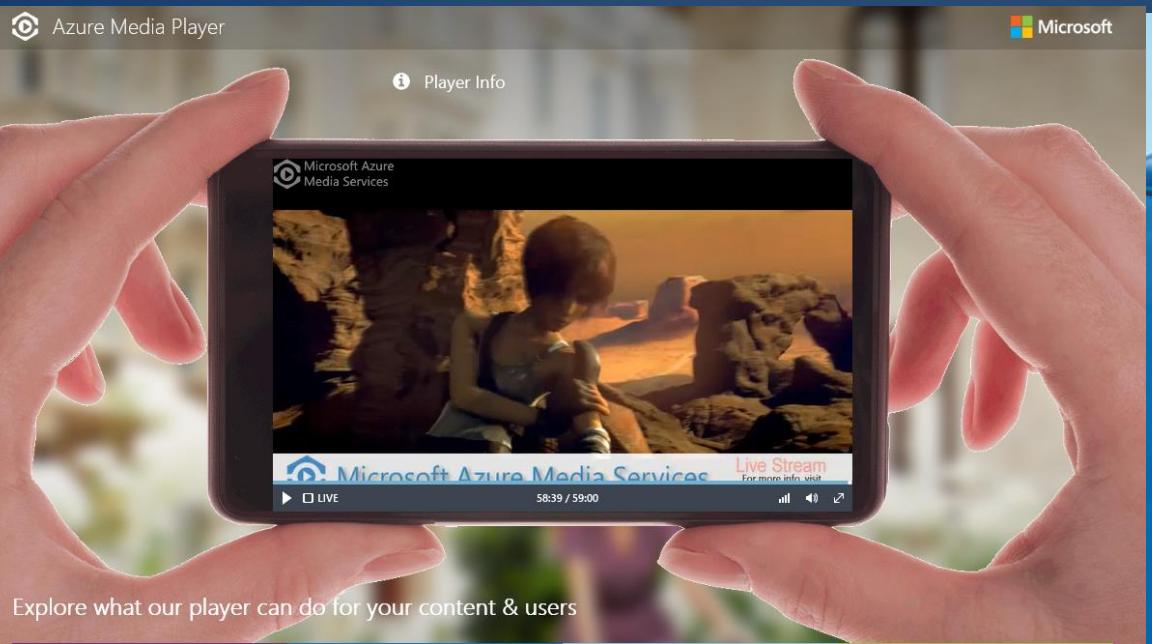
- Websites

ops
ng
marketing
software updates
ware
ware
ing

Microsoft Stream

The Azure Media Player

Azure Media Player



Explore what our player can do for your content & users

Customize & embed it in your own web or mobile site

Single Player for all screens and devices
HTML / JavaScript / CSS development
HTML5 with Fallback to Flash / Silverlight
Auto-detect and playback of best format



Azure Media Analytics

Speech and Vision
Services at enterprise
scale, compliance, security
and global reach



Cloud Upload & Storage

Encoding

Computer Vision

Speech

Analytics Clients

3rd Party industry
specific SaaS solutions



AND MORE

Azure Media Analytics | Video AI Services

Audio transcript Convert audio to text based on acoustic language models	Face detection Find when each face appears in the video	Video stabilization Create smooth videos from videos captured by moving camera	Video OCR Extract text that appears in videos as overlay, slides or background	Face redaction Detect faces and choose which ones you want to redact
Motion detection Detect when motion has occurred in videos	Face emotion detection Recognize the emotion of a person or crowd based on facial expressions	Video summaries Create summaries of long videos to enable quick previews	Content moderation Detect and prevent explicitly visual content	Object detection Detect objects based on a pre-defined object model

Microsoft Cognitive Services

Give your apps a human side



Vision

From faces to feelings, allow your apps to understand images and video



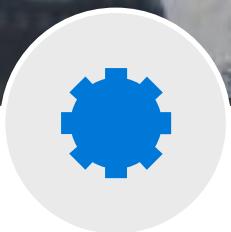
Speech

Hear and speak to your users by filtering noise, identifying speakers, and understanding intent



Language

Process text and learn how to recognize what users want



Knowledge

Tap into rich knowledge amassed from the web, academia, or your own data



Search

Access billions of web pages, images, videos, and news with the power of Bing APIs

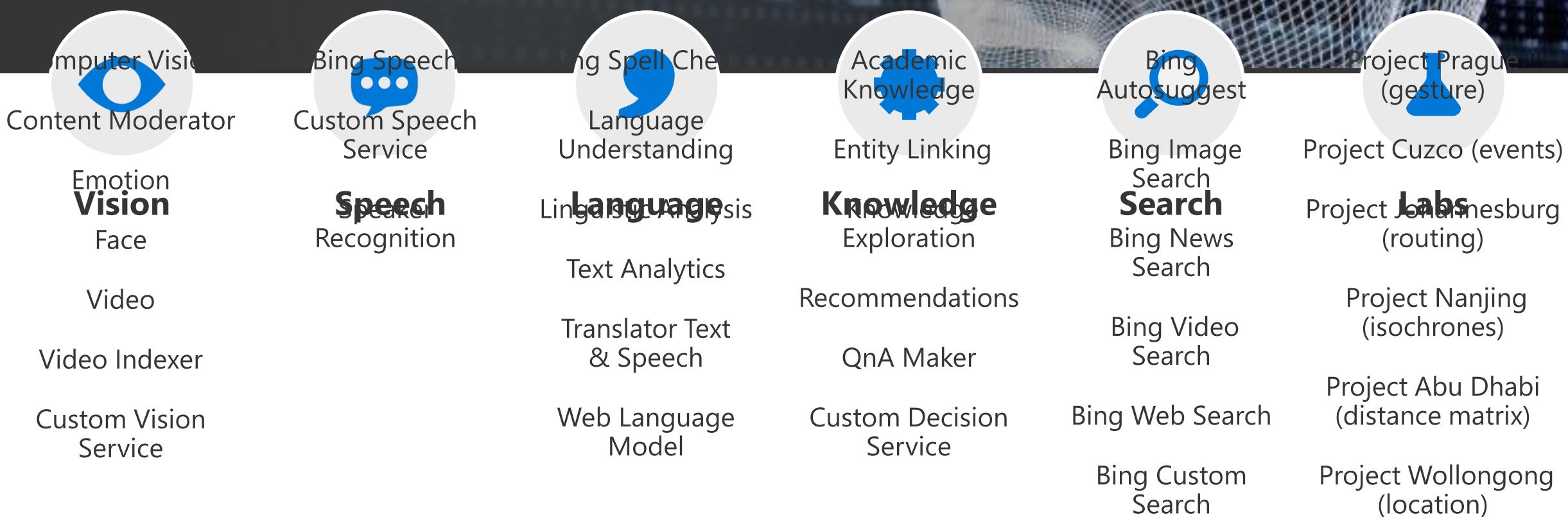


Labs

An early look at emerging Cognitive Services technologies: discover, try & give feedback on new technologies before general availability

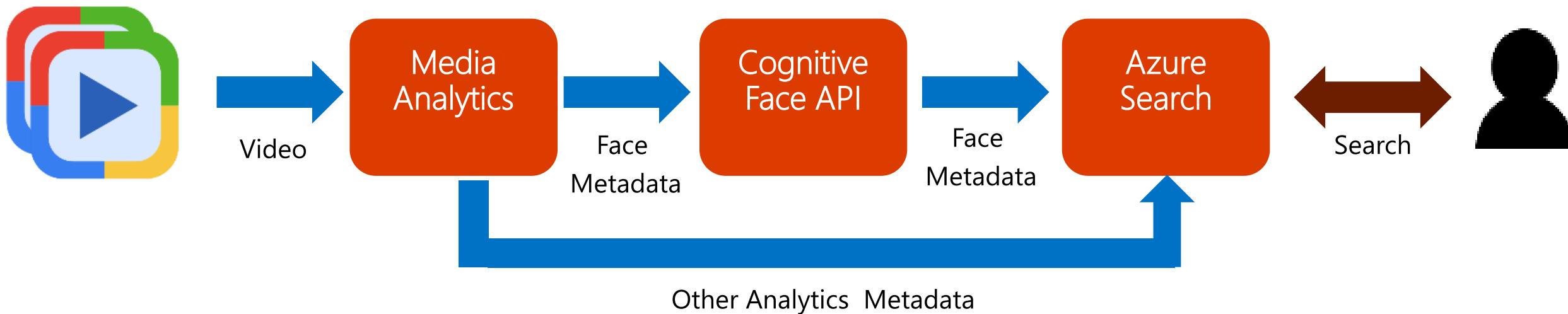
Microsoft Cognitive Services

Give your apps a human side



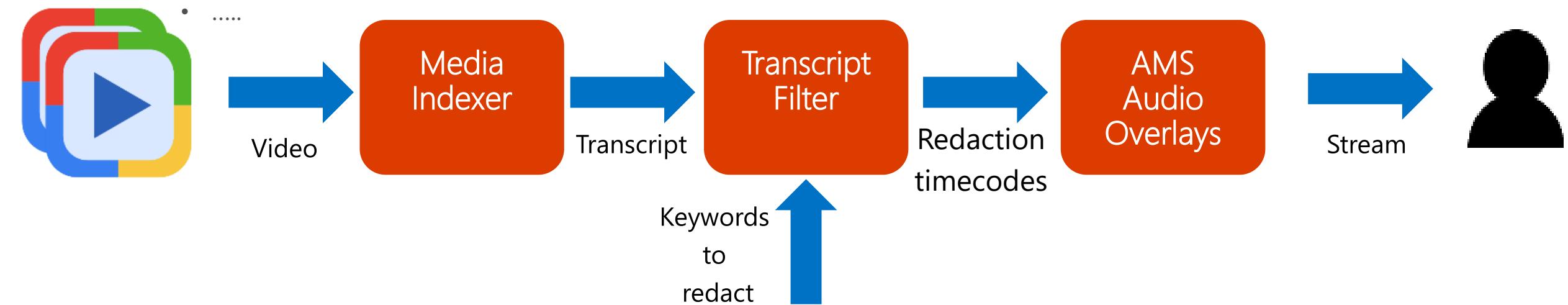
Face recognition

- Input – Videos of any type (entertainment, surveillance etc.)
- Output – Search index based on list of known faces
- User should be able to search for videos where
 - Person X and Y were sighted together
 - Person X said certain words or phrases
 -

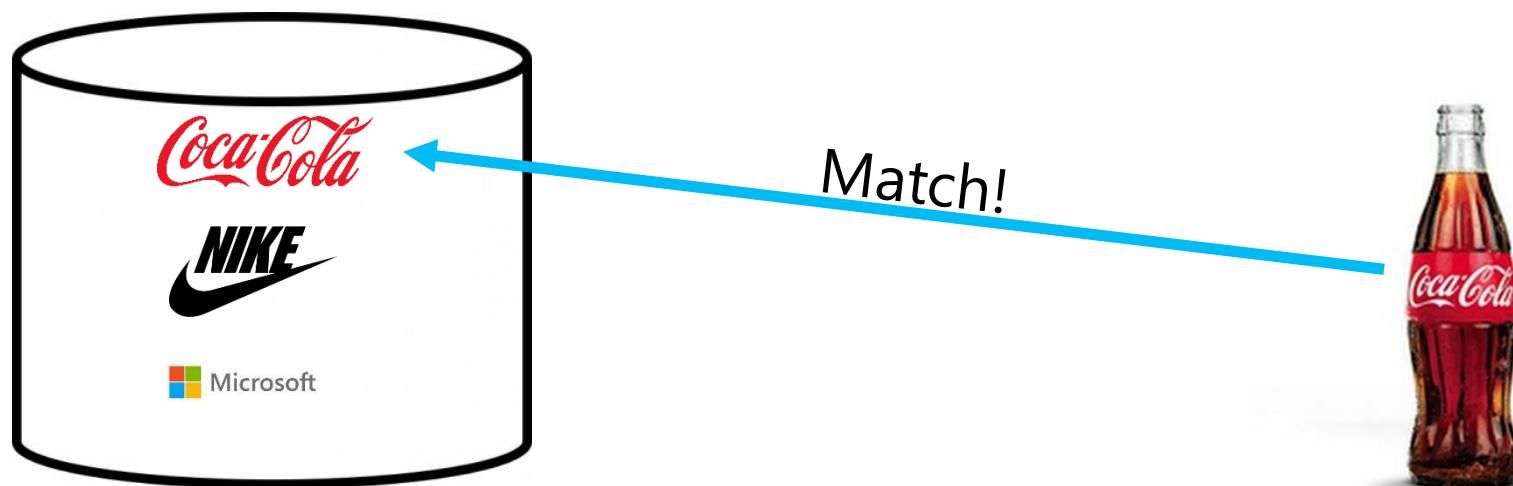


Audio redaction

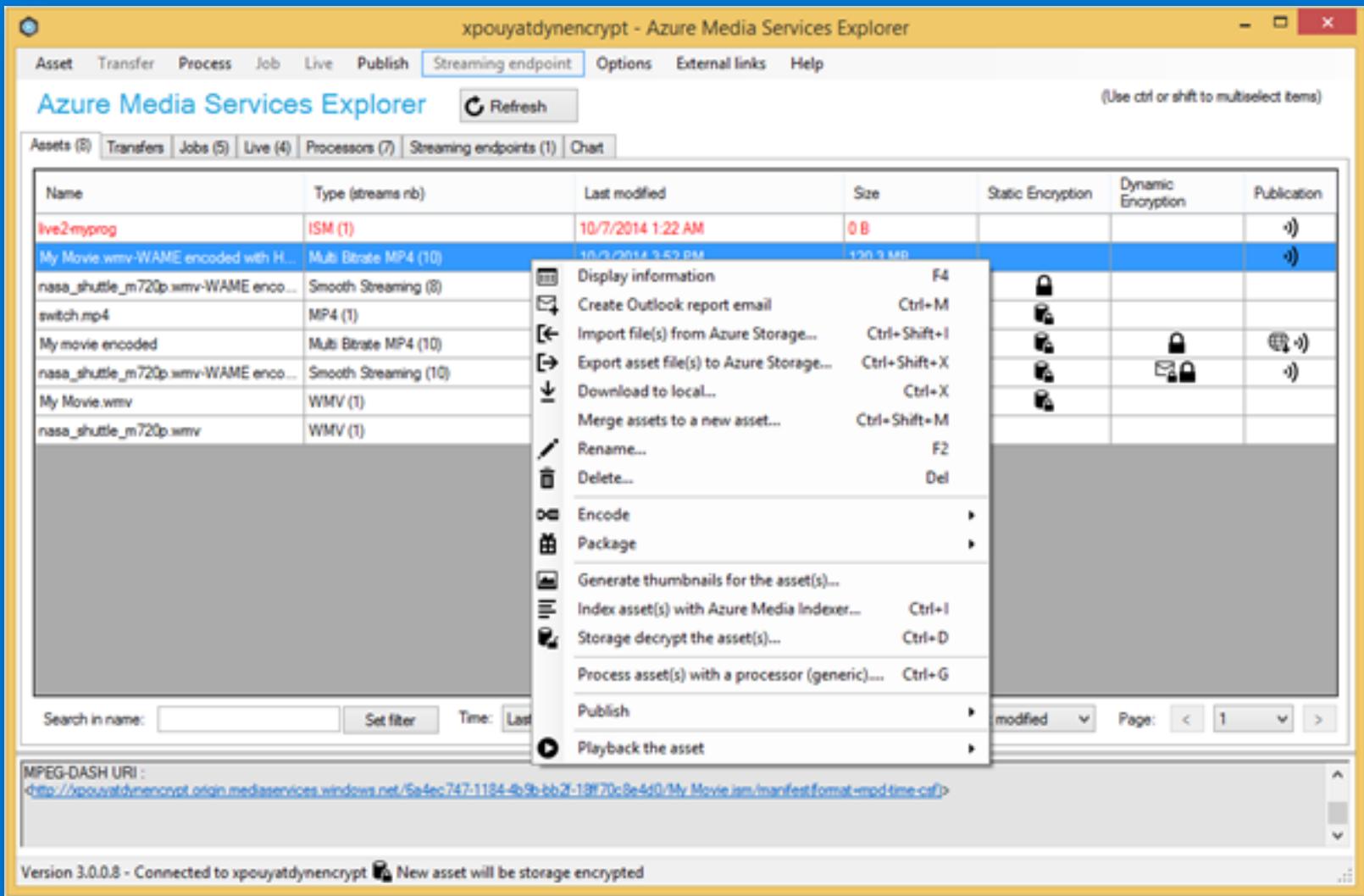
- Input – Videos of any type
- Output – Videos with keywords redacted
- Useful in following scenarios
 - Content moderation
 - Identity protection (security videos)
 - Applying censorship (broadcasting on public channels)
 -



- Detect instances of logos in video
- Useful to verify product placement or analyze branding
- Create your own customer “dictionary” of logos



- Don't Want to Code?
- Try the Azure Media Services Explorer Tool



- A No-Code Easy UI way to use Azure Media Services.

ARM Templates + Azure Logic Apps & Azure Functions

- Server-less Automated Deployment of Azure Media Services capabilities
 - <https://github.com/Azure-Samples/media-services-dotnet-functions-integration>
- Media Services ARM Template now available
 - Auto deploys all needed components
 - <https://github.com/Azure/azure-quickstart-templates/tree/master/101-media-services-create>
- Growing List of Azure Media Functions
- Come join the community!

Demo: Azure Media Services

On-demand and live video workflow via the Azure portal:

<https://portal.azure.com/#create/Microsoft.MediaService>

Ingest/Store

Encode/Encrypt

Publish

Stream/Deliver

AMS Player

<http://aka.ms/azuremediaplayer>

AMS Video Subclipper

http://ampdemo.azureedge.net/amp_editor.html

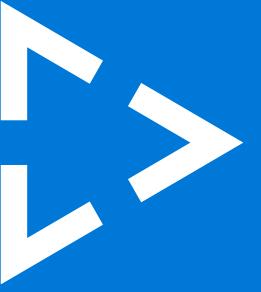
AMS Labs - <http://aka.ms/amslabs>

Indexer / Speech-to-text

Hyperlapse

Face & Emotion and Motion detection

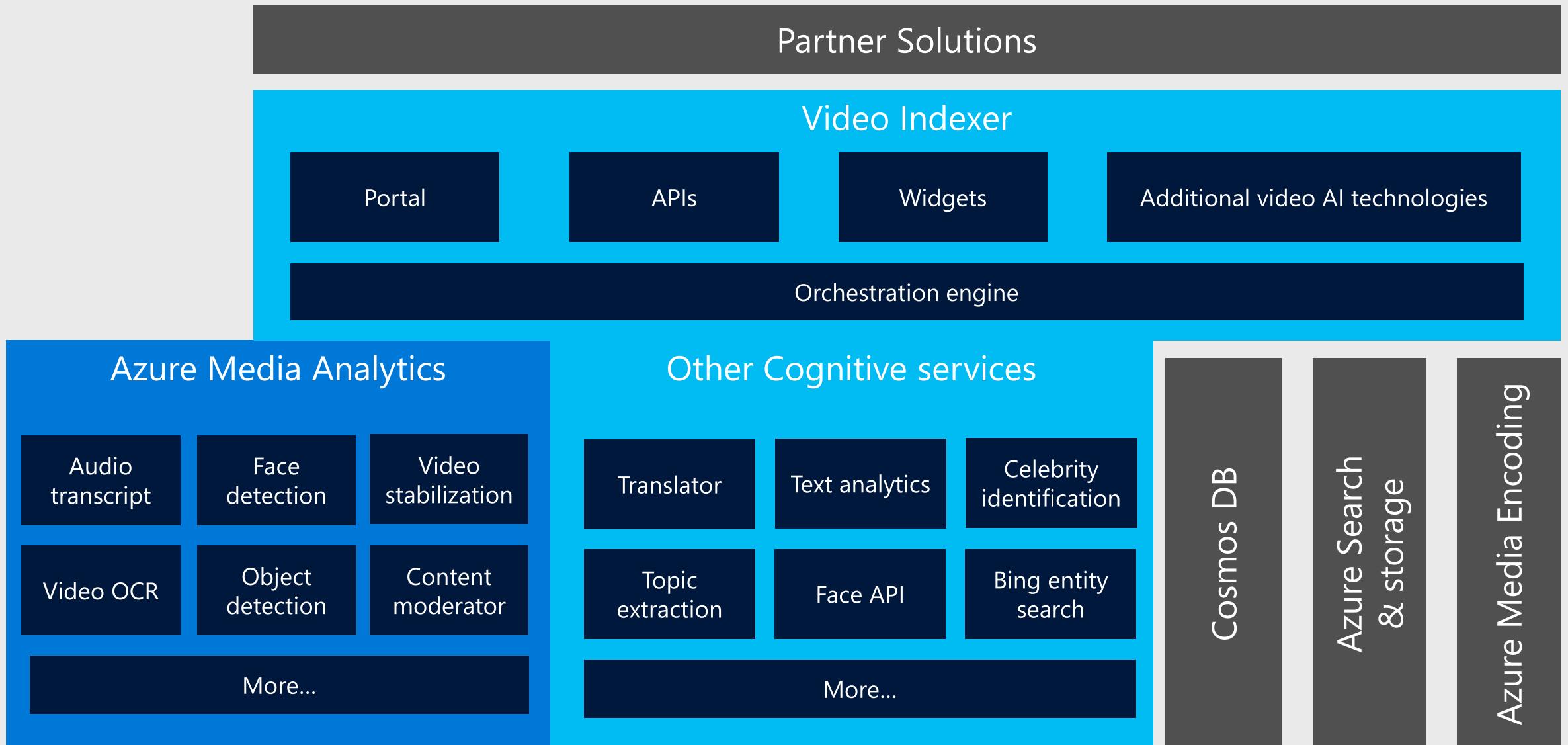
Video summarization



Video Indexer

<https://www.videoindexer.ai/>

Video AI | Integrated for Success



Video Indexer APIs

DELETE Delete

Breakdown

GET Get Breakdown

GET Get Insights Widget
Url

GET Get Insights Widget
Url By External Id

GET Get Player Widget
Url

GET Get Processing State

GET Get Vtt Url

GET Search

POST Upload Video

Use cases:

1. Index only
2. Index and Translate
3. Search
4. Visualize Insights
5. Streaming



Azure CDN

Gain performance, speed, reach and scalability!

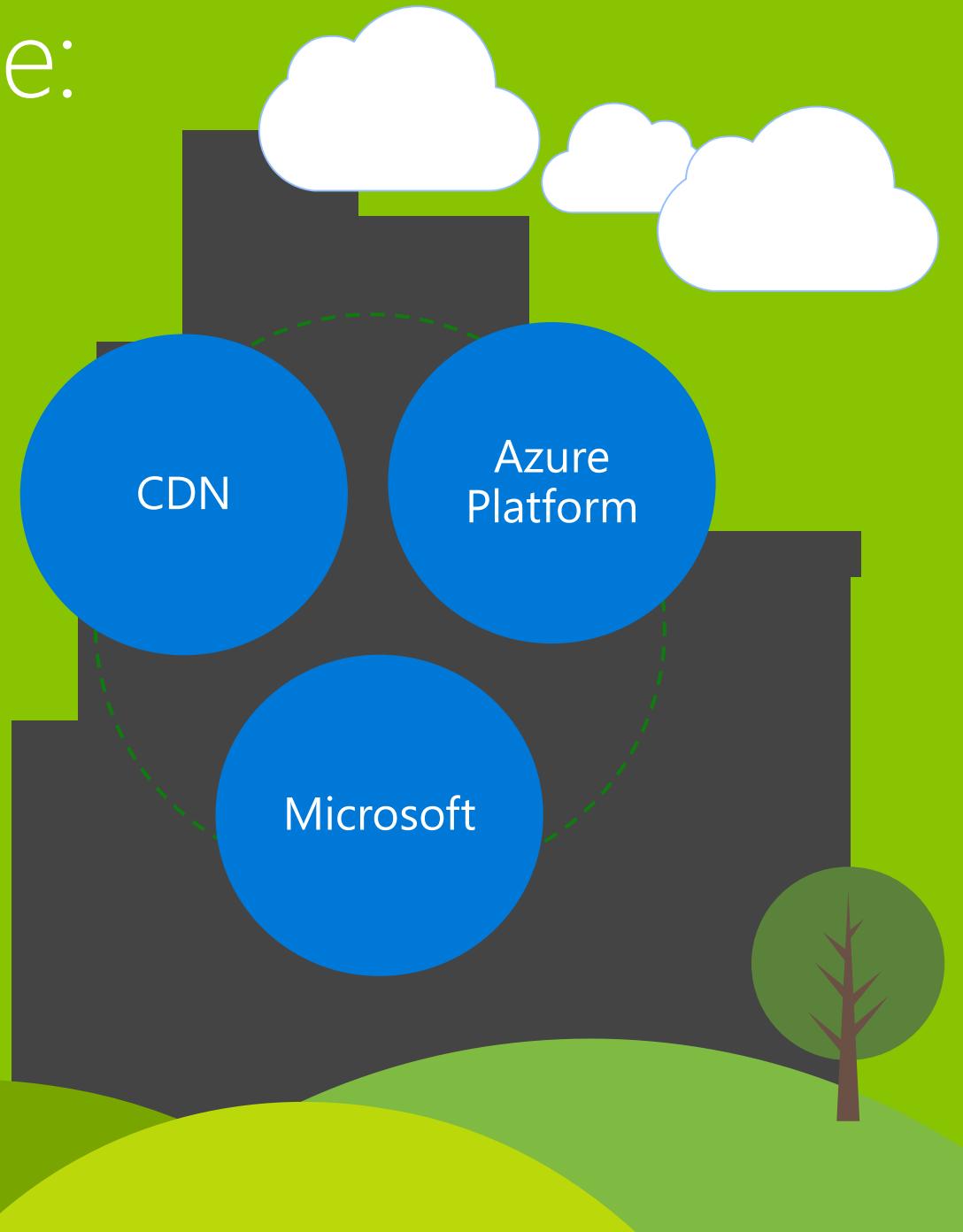
Azure CDN lets you leverage:

Multi CDN endpoints including from
Verizon and **Akamai Networks**

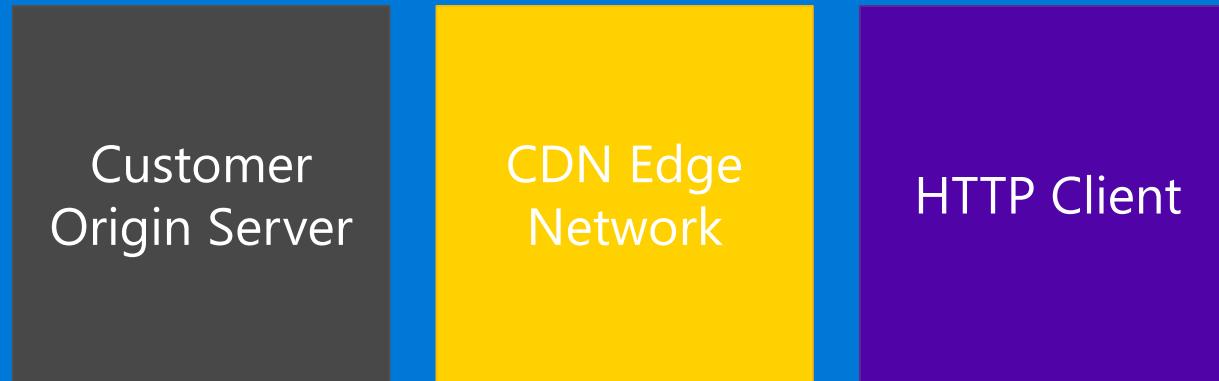
Gain Performance, Speed, Reach, and
Scalability

Optimization and Direct Integration
from the entire Azure Platform

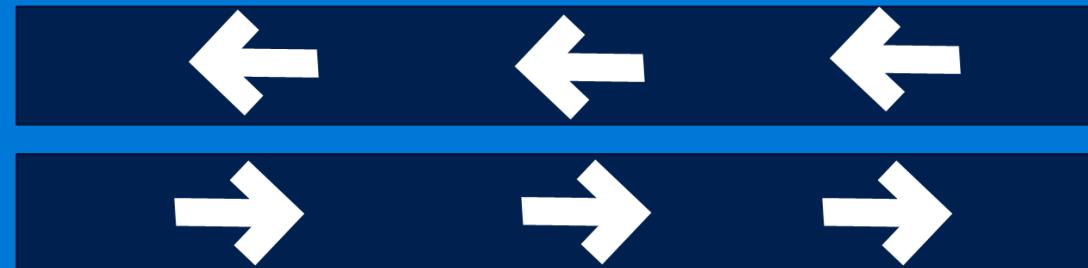
Enterprise-scale advantages from
Microsoft



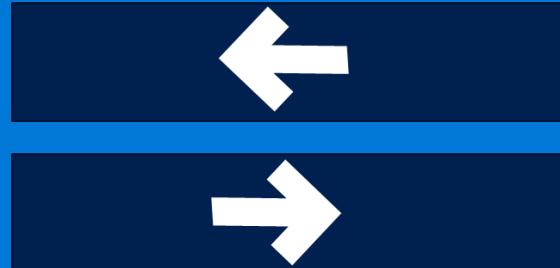
Core CDN Traffic Flow



First
Request



Subsequent
Requests





Storage

An unified and distributed storage system!

Azure Storage Services

IaaS



Storage



Virtual
machines



Networking

PaaS



Existing
frameworks



Web
and mobile



Microservices



Serverless
Compute

Disks

Persistent disks for Azure IaaS VMs

Premium Storage Disks option: SSD based, high IOPS, low latency

Files

Fully Managed File Shares in the Cloud

SMB and REST access
“Lift and shift” legacy apps

Objects

Highly scalable, REST based cloud object store

Block Blobs: Sequential file I/O
Cool Tier Available
Page Blobs: Random-write pattern data
Append Blobs

Tables

Massive auto-scaling NoSQL store

Dynamic scaling based on load
Scale to PBs of table data
Fast key/value lookups

Queues

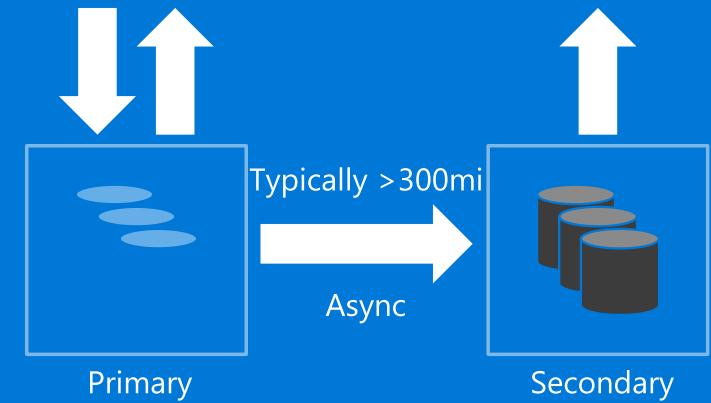
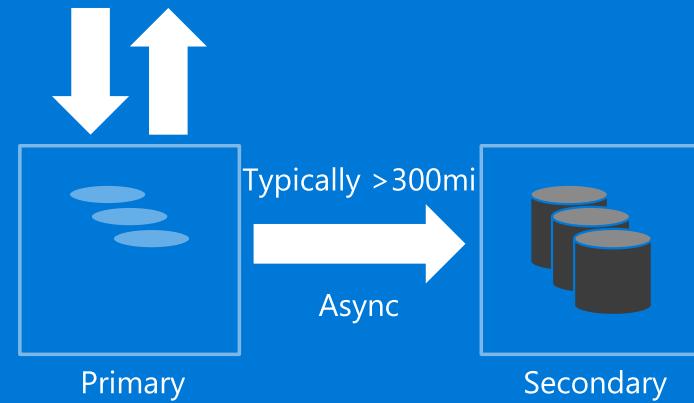
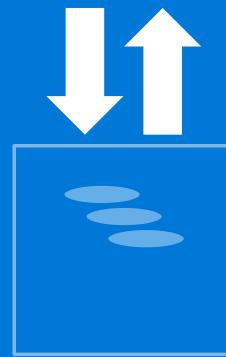
Reliable queues at scale for cloud services

Decouple and scale components
Message visibility
timeout and update message to protect against unreliable dequeuers

Built on a unified Distributed Storage System

Durability, Encryption at Rest, Strongly Consistent Replication, Fault Tolerance, Auto Load-Balancing

Azure Storage Durability



LRS

- 3 replicas, 1 region
- Protect against disk, node, rack failures
- Write is ack'd when all replicas are committed
- Superior to dual-parity RAID

GRS

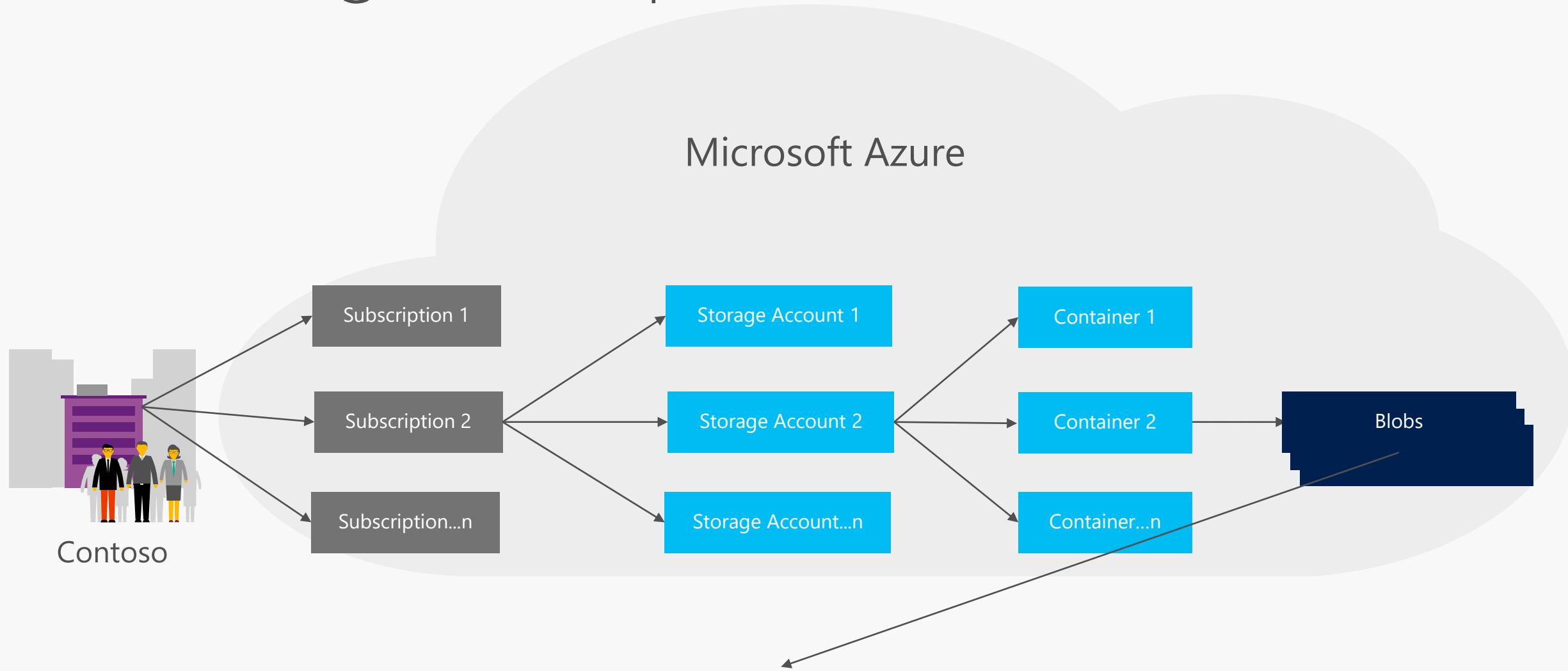
- 6 replicas, 2 regions (3/region)
- Protects against major regional disasters
- Asynchronous to secondary

RA-GRS

- GRS + Read access to secondary
- Separate secondary endpoint
- RPO delay to secondary can be queried

Strong consistency, checksums/CRC and background scrubbing to preserve data integrity

Blob Storage Concepts



<http://<StorageAccount>.blob.core.windows.net/<Container>/<Blob>>

Demo: Azure Storage

Create Storage from the Azure Portal

<https://portal.azure.com/#create/Microsoft.StorageAccount-ARM>

Navigate the blades

Use the Microsoft Azure Storage Explorer

<http://storageexplorer.com/>

From there, Manipulate File, Blob, Queue, Table even CosmosDB now!

[AzCopy](#) could be an option for heavy copy actions from/to Storage



SQL Database

The developer's intelligent cloud-database service SQL Database!

Complete services for all database needs

Whether on-prem, cloud, relational, or NoSQL, Microsoft has you covered

Fully featured RDBMS

On-Premises



SQL Server

Cloud

Azure SQL
Database

NoSQL non-relational database

Azure
CosmosDB



HBase on
Azure
HDInsight



Azure Redis
Cache



Azure Tables



Elastic scale

SQL query

Transactional processing

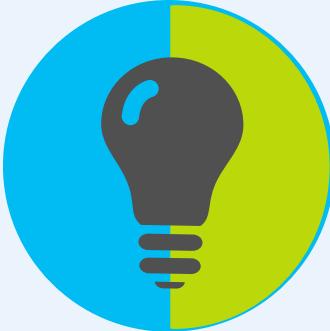
Managed as a service

Distributed data at scale

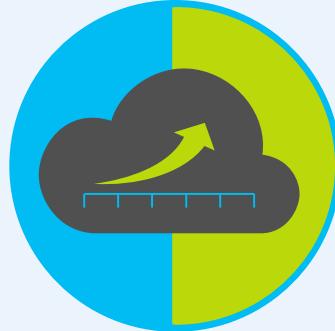
Schema-free data model

Azure SQL Database

**Learns
& adapts**



**Scales
on the fly**



**Redefines
multi-tenancy**



**Works in your
environment**

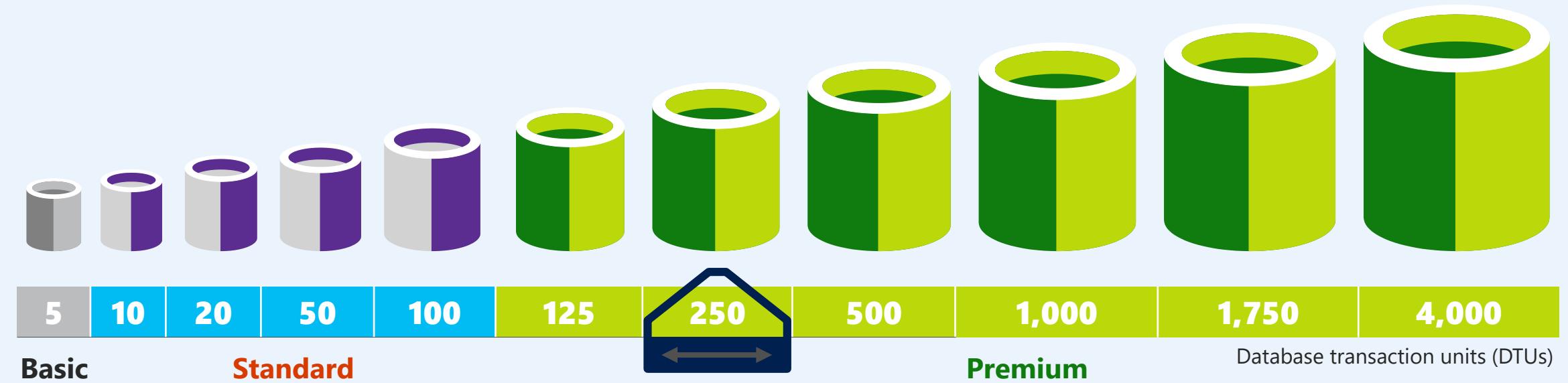


**Secures
& protects**



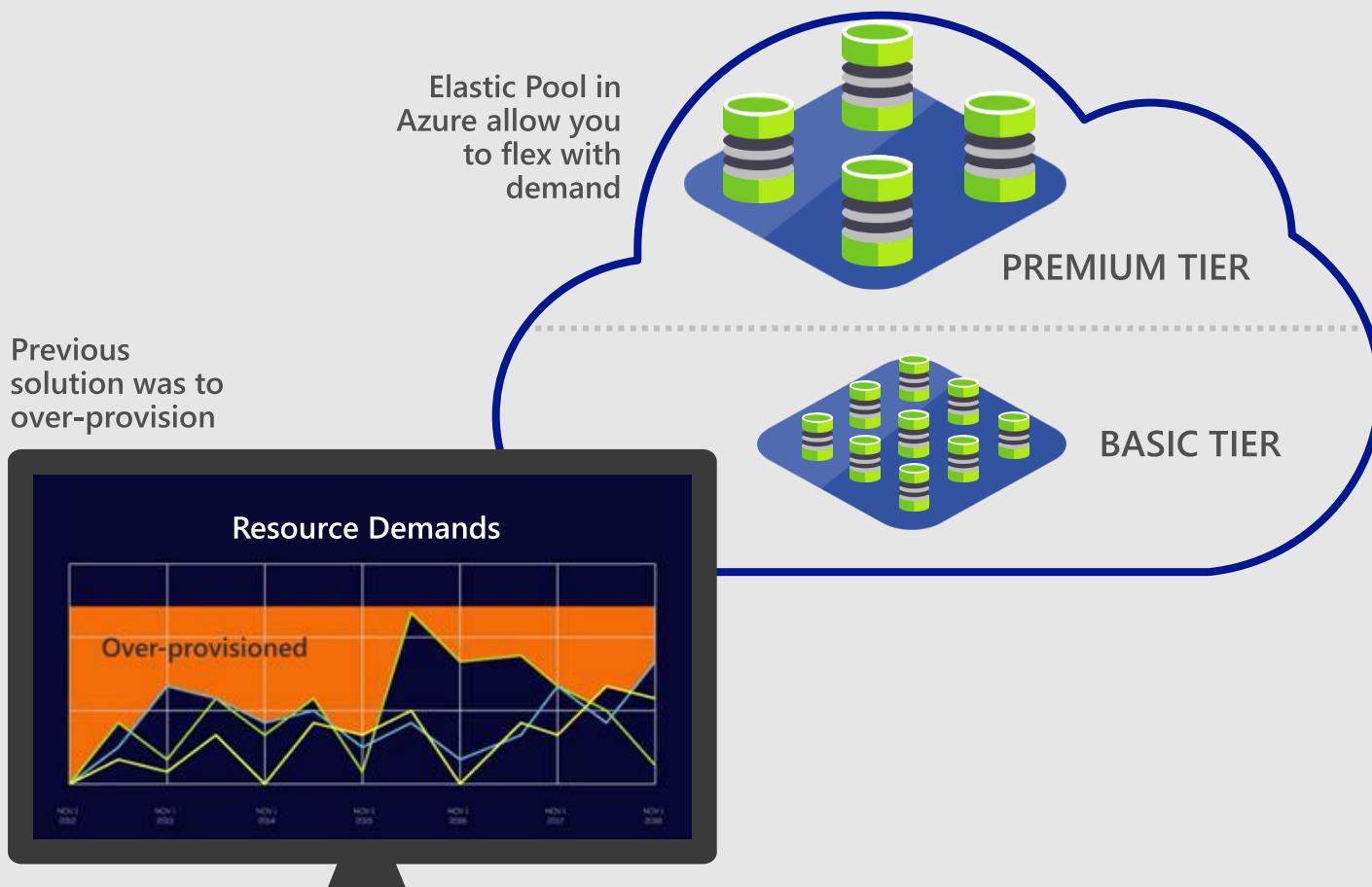
Scale on the fly

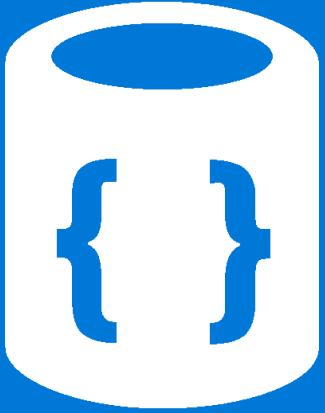
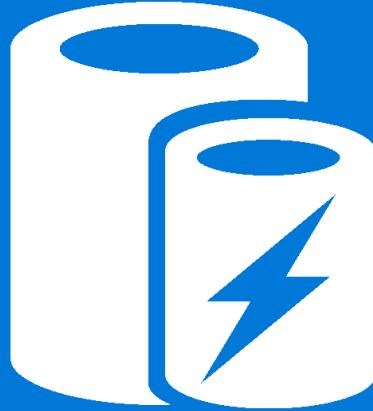
- Scale up with one click
- Accommodate growth and peak workloads
- Pay for what you need, when you need it



Azure SQL Database: Elastic Pool

- Unpredictable database resource demands
- Instead of overprovisioning databases to meet peak demand





Other storages for your apps
and apis



Azure Cosmos DB

A globally distributed, massively scalable, multi-model database service



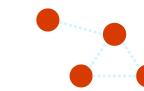
Key-value



Column-family



Document



Graph

Turnkey global distribution

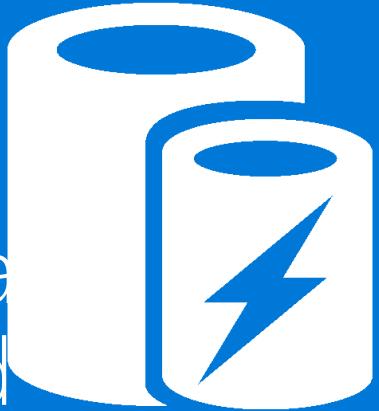
Elastic scale out
of storage & throughput

Guaranteed low latency at the 99th percentile

Five well-defined consistency models

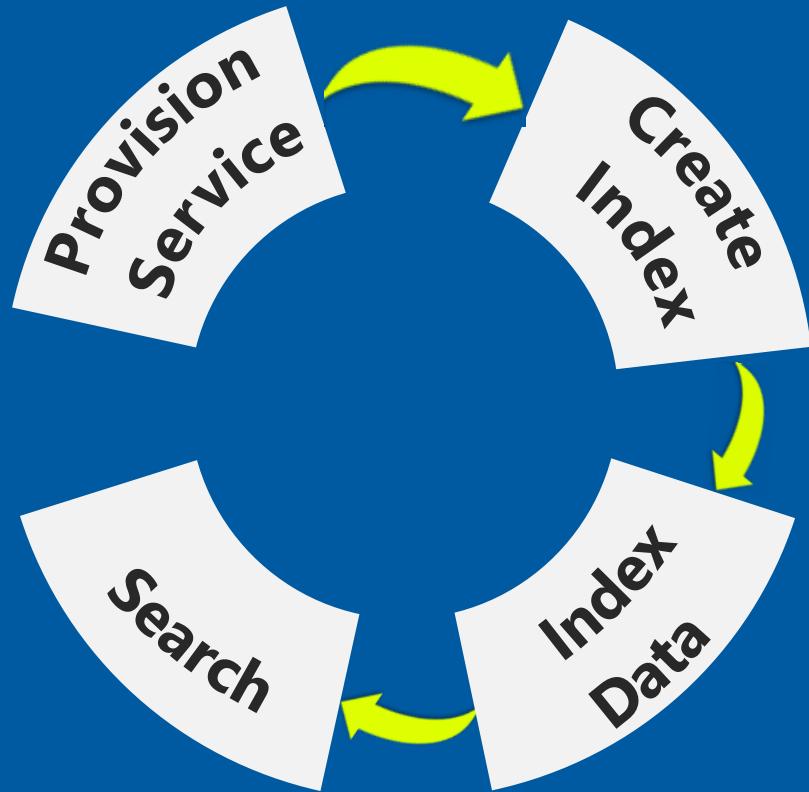
Comprehensive SLAs

What is Redis?

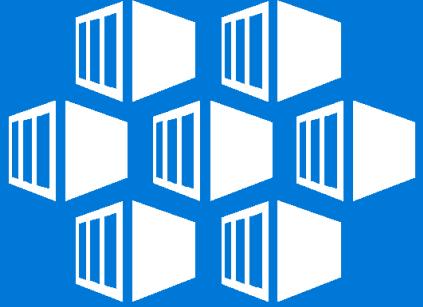


- An in-memory data store with many built-in data structure types - something between NoSQL and shared memory
- Designed for very fast read/write performance
- Additional support for replication, persistence and clustering
- Optimized as a cache, but also for many other scenarios (message broker, queue, leaderboard, ...)

Azure Search – Simplify the search experience



A search-as-a-service solution allowing developers to incorporate great search experiences into applications without managing infrastructure or needing to become search experts.



Containers

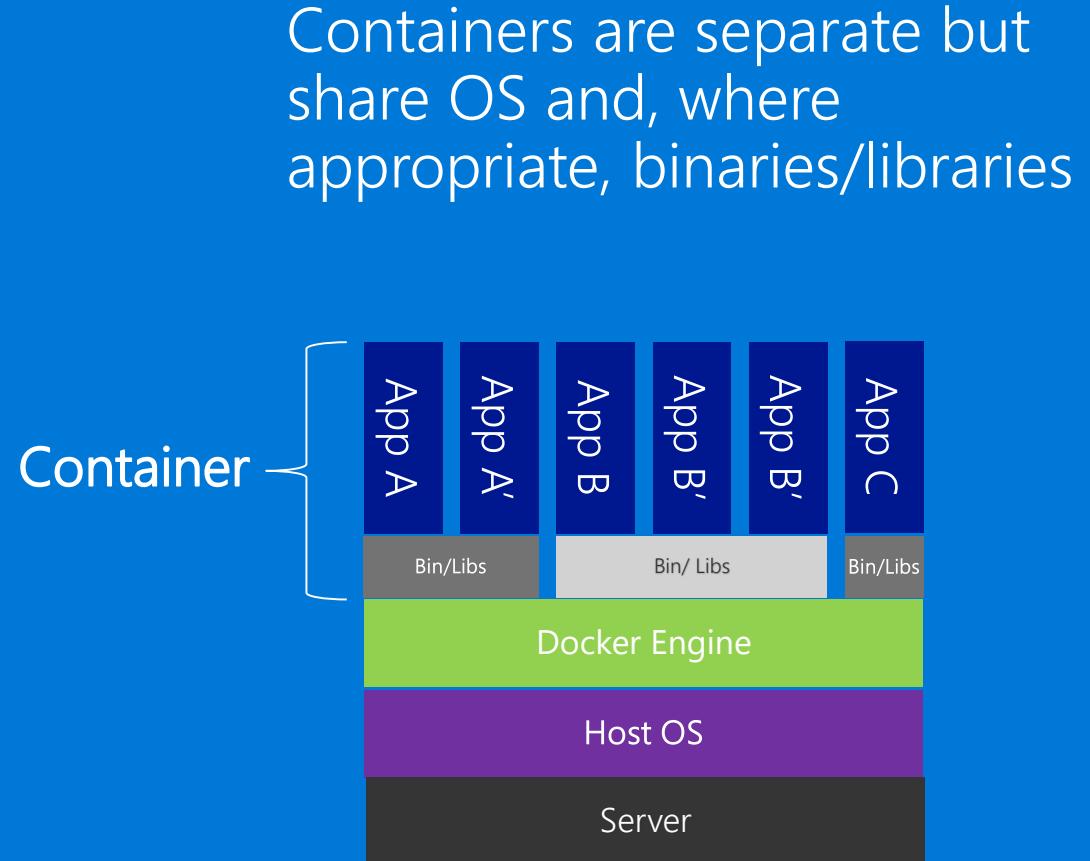
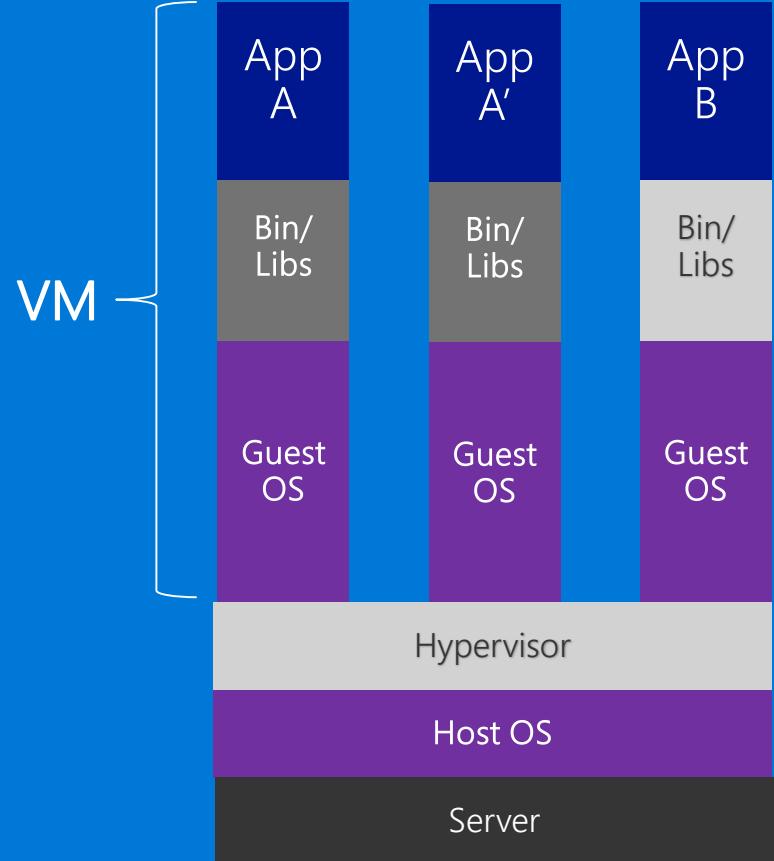
VMS



Containers



Comparing Containers and VMs



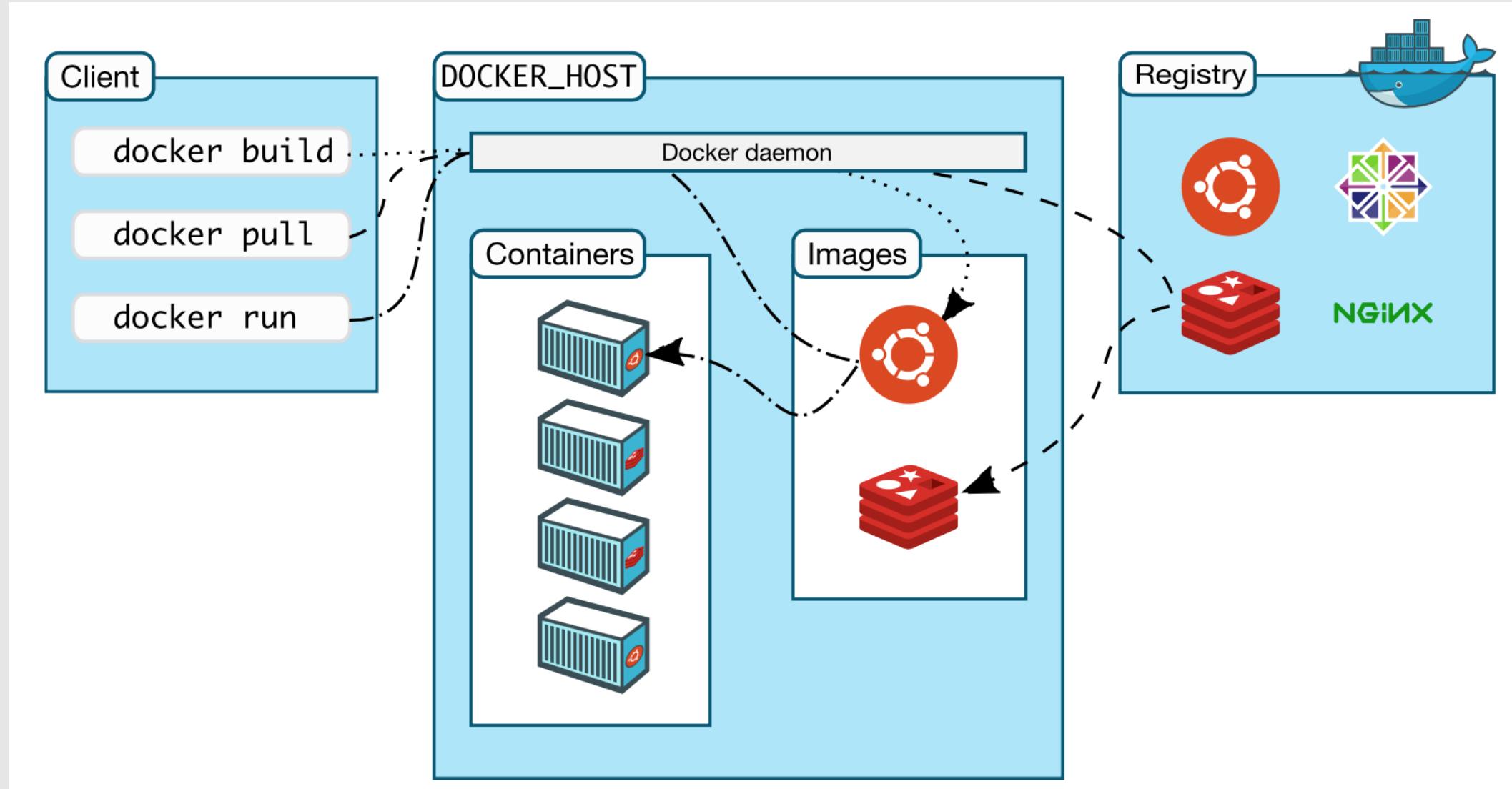
Why containers?

Benefits of a container architecture:

- Repeatable execution:
 - Immutable environment.
 - Reusable and portable code ("Build, Ship, and Run").
- Consistency across development, test & production.
- Fast & agile app deployment; instant startup.
- Cloud portability.
- Density, partitioning, scale.
- Diverse developer framework support.
- Microservices.



Docker terminologies and workflow



Orchestrators: Container management at scale

Cluster Management	Scheduling	Lifecycle & Health	Naming & Discovery	Load Balancing
Deploy and manage cluster resources	When containers run	Keep containers running despite failure	Where are my containers	Distribute traffic evenly
Scaling	Image Repository	Continuous Delivery	Logging & Monitoring	Storage Volumes
Make container sets elastic in number	Centralized, secure container images	CI/CD pipeline and DevOps workflow	Track events in containers and cluster	Persistent data for containers

Azure Container support

Pivotal
Cloud Foundry



Azure Container Instance



Container Service



Service Fabric



Web Apps

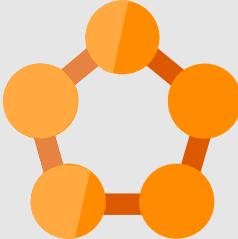


Batch

Azure Container technologies

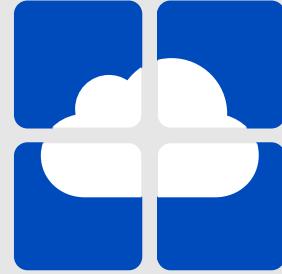


Open Source
Docker, DC/OS, Kubernetes



Microservices platform with
Windows and Linux Containers

Container Service

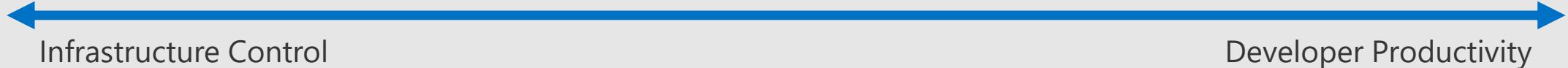


Single Container Apps



App Service

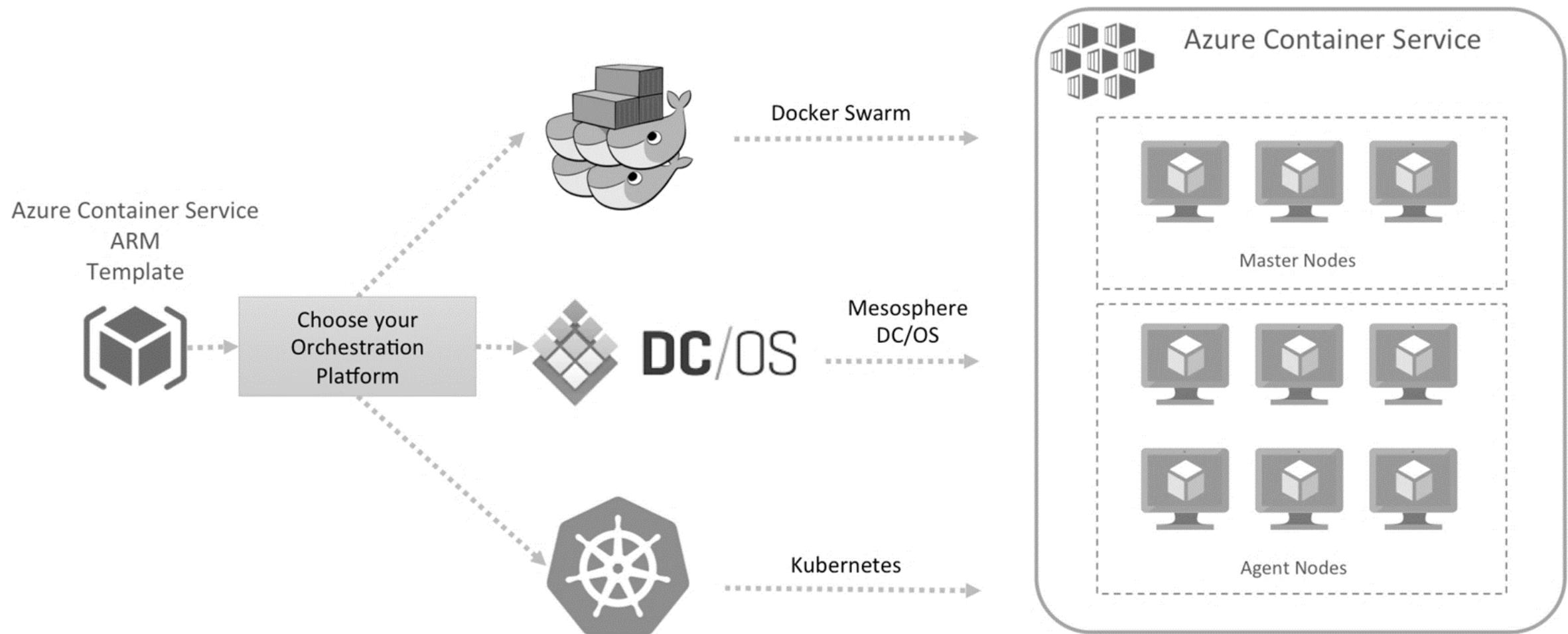
Container Instance



Infrastructure Control

Developer Productivity

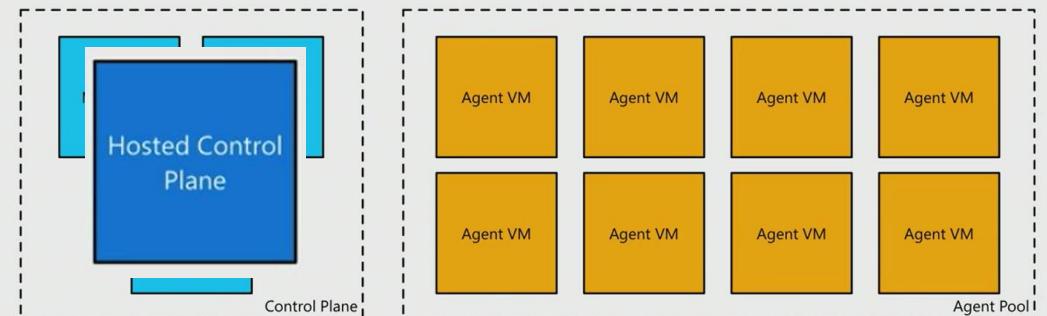
Container orchestrators



Managed Kubernetes for ACS

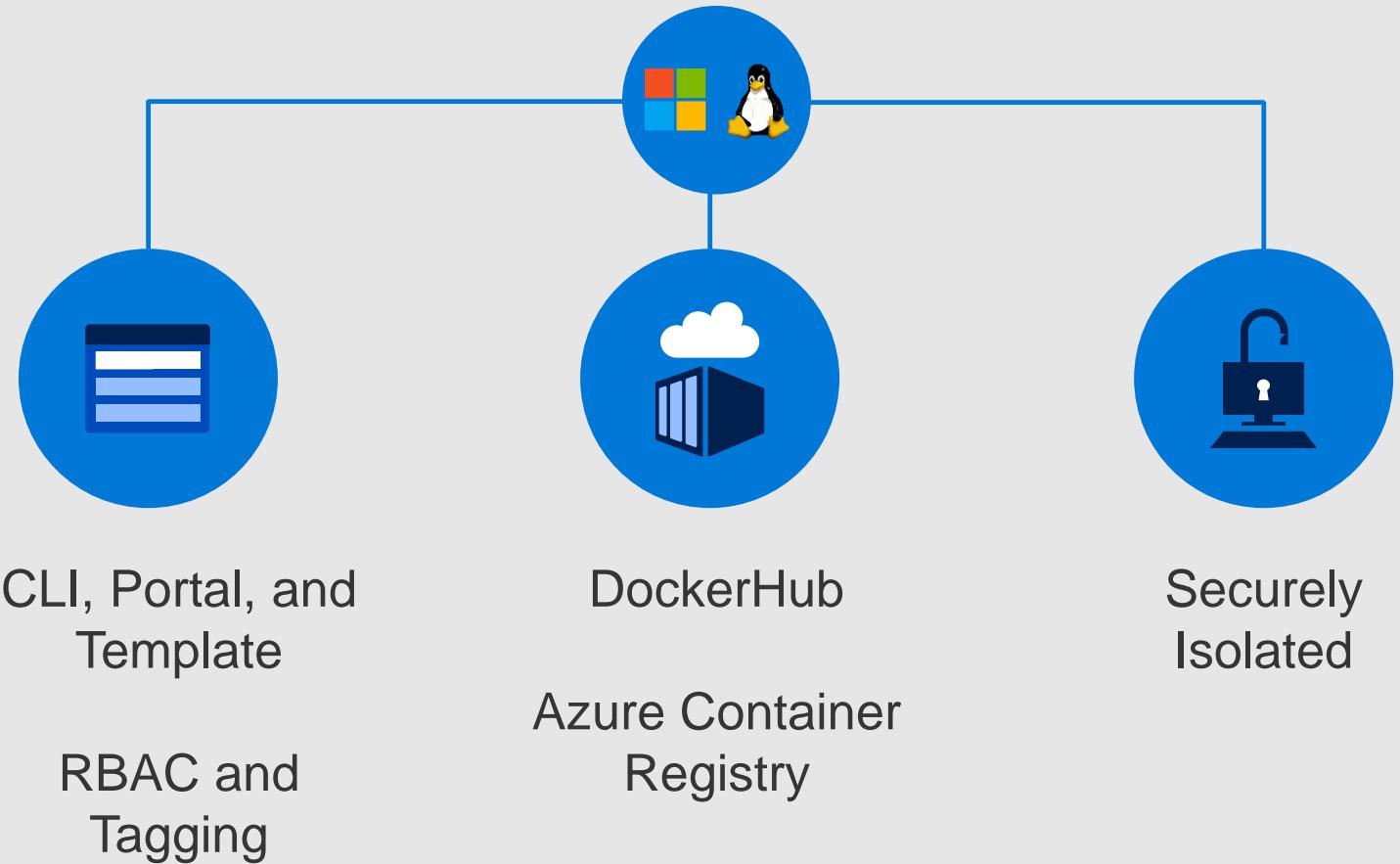
Why AKS?

- Easy to use
 - Fastest path to Kubernetes on Azure
 - Up and running with 3 simple commands
- Easy to manage
 - Automated upgrades and patching
 - Easily scale the cluster up and down
 - Self-healing control plane
- Uses Open APIs
 - 100% upstream Kubernetes



Azure Container Instances (ACI)

- Fastest and easiest way to run a container in the cloud
- No VM management
- Per-second billing based on resource requirements (CPU + Memory)
- Deploy images from DockerHub or Azure Container Registry (ACR)



Azure Container Registry (ACR)

Manage images for all types of containers

Azure Container Registry allows you to store images for all types of container deployments including DC/OS, Docker Swarm, Kubernetes, and Azure services such as App Service, Batch, Service Fabric, and others. Your DevOps team can manage the configuration of apps isolated from the configuration of the hosting environment.



Manage your storage account caching

Better meet your throughput demand and API calls by having Container Registry manage the caching of your storage accounts. Choose between Basic, Standard, or Premium SKU options, and easily move between them to meet your business needs—from Basic for limited deployments to Premium for complex deployments and higher throughput for replicating images across multiple storage accounts.



Keep container images close

Reduce network latency and eliminate ingress/egress charges by keeping your Docker registry in the same data center as your deployments. Azure Container Registry gives you local, network-close storage of your container images within your subscriptions, and full control over access and image names.



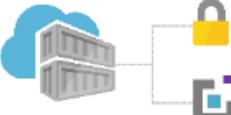
Use familiar, open-source Docker CLI tools

You don't have to learn new APIs or commands. Because Azure Container Registry is compatible with the open-source Docker Registry v2, you can use the same open-source Docker CLI tools you already know and the skills you have to efficiently interact with the registry.



Expand registry functionality

Keep your images safe by authenticating and managing access with Azure Active Directory. Trigger events based on container actions with Webhooks. Both technologies are compatible with standard registries.



Azure Container 101

Here's what service you should recommend ...

If your customer is looking for this ...

... use this

Scale and orchestrate containers using Kubernetes, DC/OS or Docker Swarm

[Container Service](#)

Easily run containers on Azure with a single command

[Container Instances](#)

Store and manage container images across all types of Azure deployments

[Container Registry](#)

Develop microservices and orchestrate containers on Windows or Linux

[Service Fabric](#)

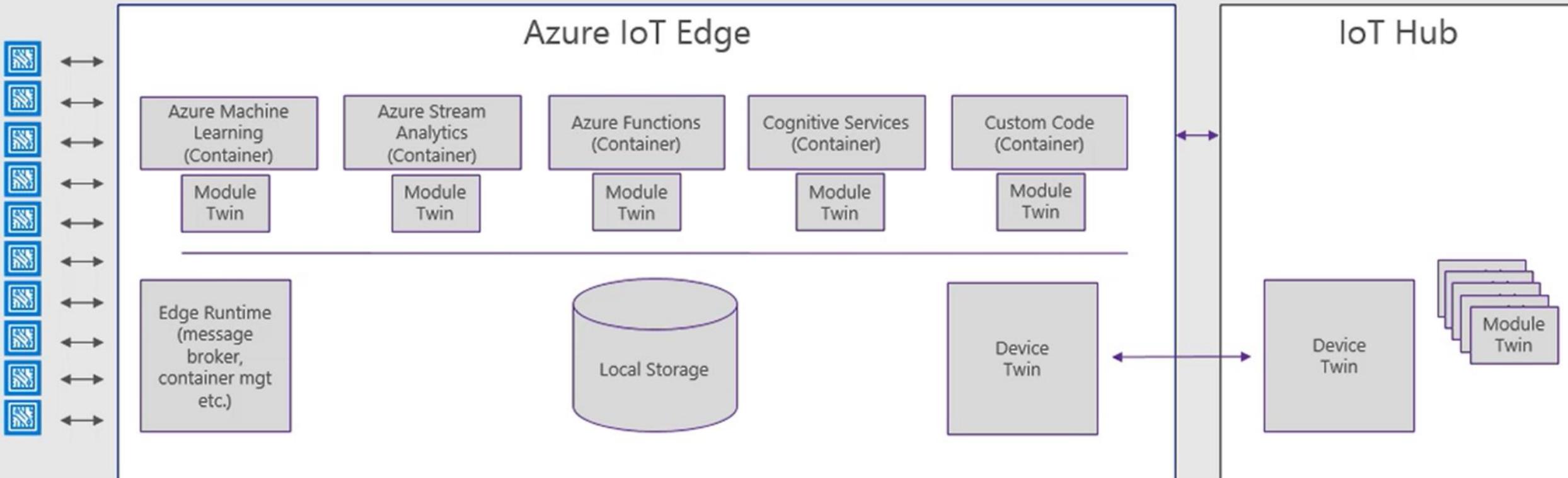
Deploy web applications on Linux using containers

[App Service](#)

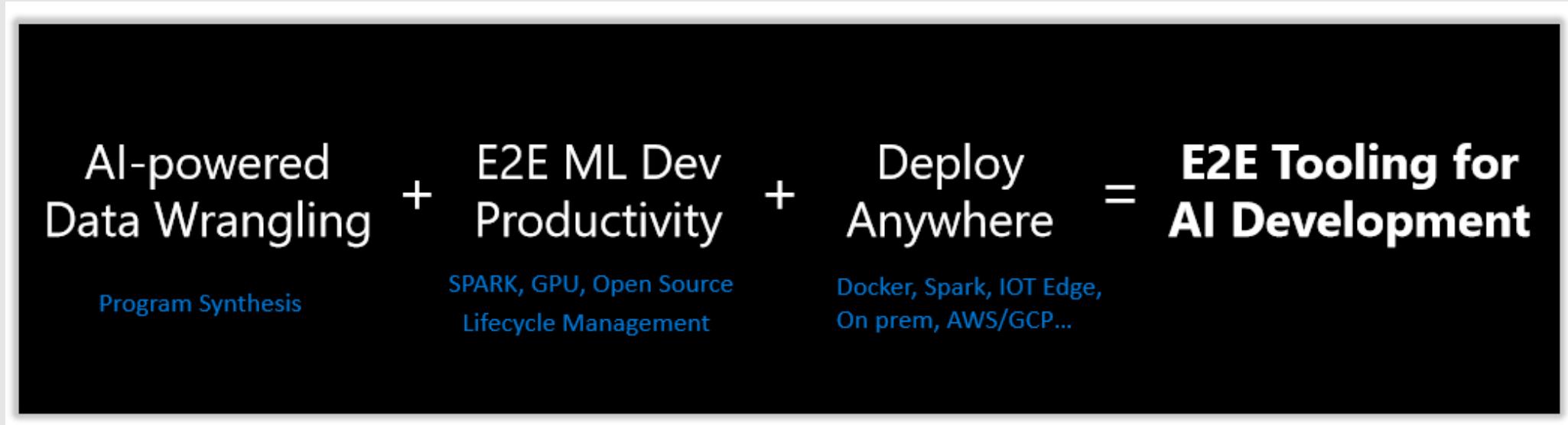
Run repetitive compute jobs using containers

[Batch](#)

IoT Edge



Azure Machine Learning



Containers - Demos

Build a container locally:

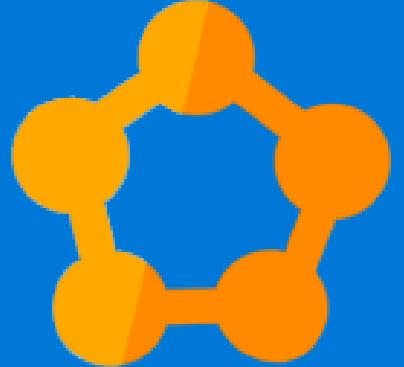
- Windows / Visual Studio
- Linux / Docker machine

Store a container on:

- Docker Hub
- ACR

Deploy a container on:

- ACI
- App Service
- ACS
- AKS

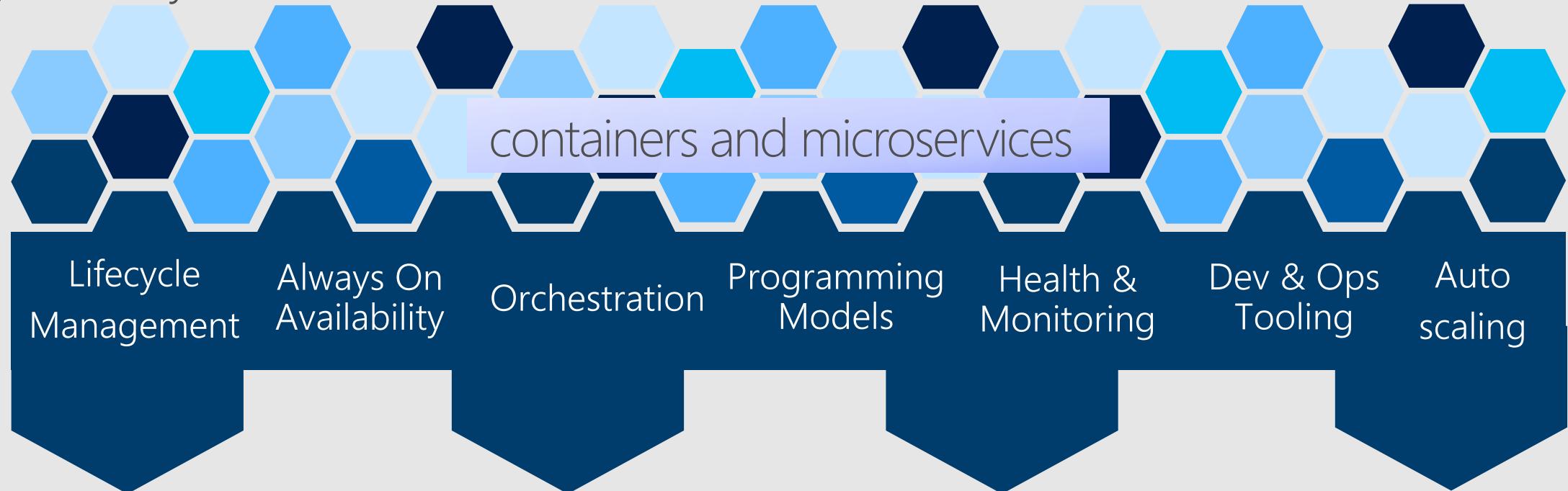


Service Fabric

Microservices on any OS, any Cloud

Azure Service Fabric

Any OS, Any Cloud

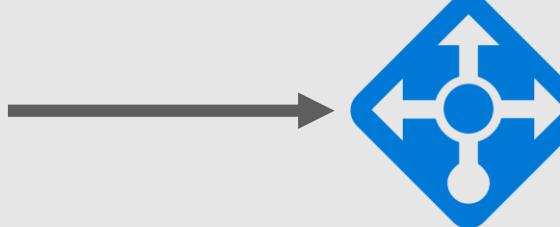


Service Fabric Managed Clusters in Azure

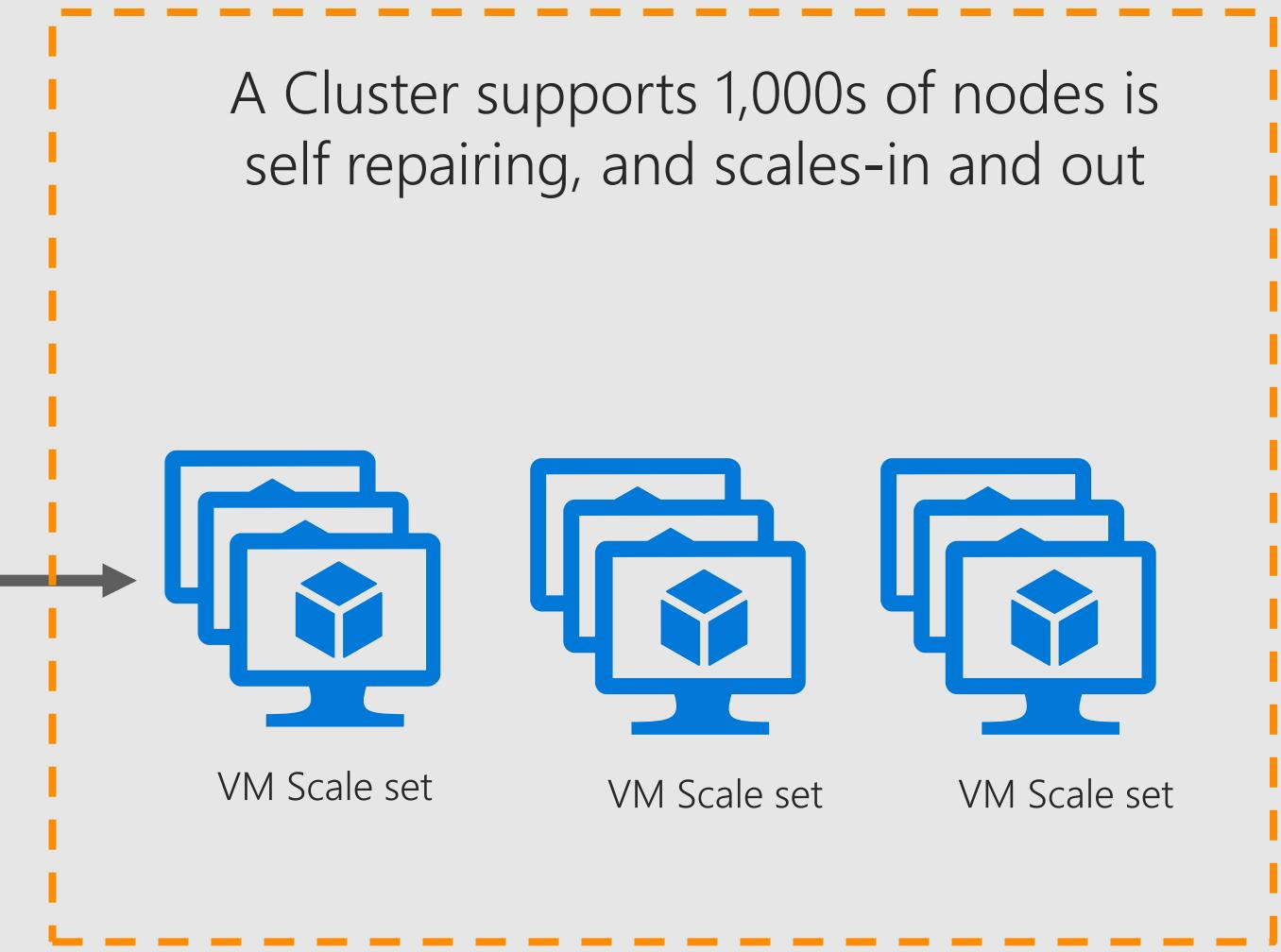


Service Fabric cluster

A Cluster supports 1,000s of nodes is self repairing, and scales-in and out



Load Balancer



VM Scale set

VM Scale set

VM Scale set

Services powered by Service Fabric



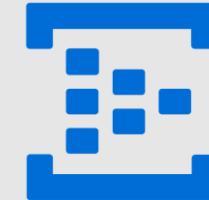
SQL Database
2.1 million DBs



Cosmos DB
Billions transactions/day



IoT Hub
Millions of messages



Event Hubs
640bn events/day



Event Grid



Skype



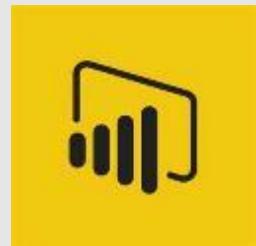
Cortana



Intune



Dynamics



Power BI

Designed for mission critical tier 1 workloads

30% of Azure cores run Service Fabric



API Management

Let's sale your APIs!

Azure API Management

API consumers



AZURE API MANAGEMENT

Facade

decouple
modernize
optimize

...

Middleware

secure
protect
cache

...

Monitoring

usage
health
monetization

...

Developer

discover
document
on-board

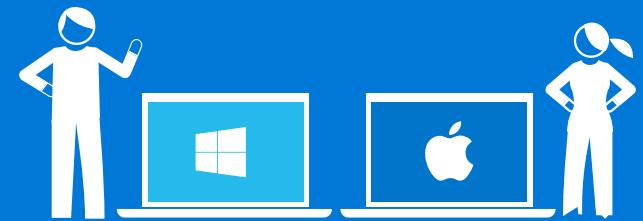
...

APIs on Azure

Azure APIs

On-prem APIs

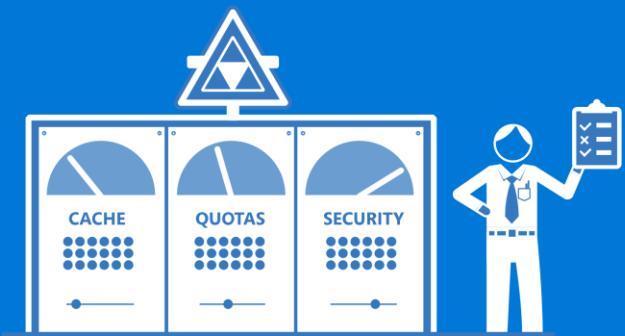
3rd party APIs



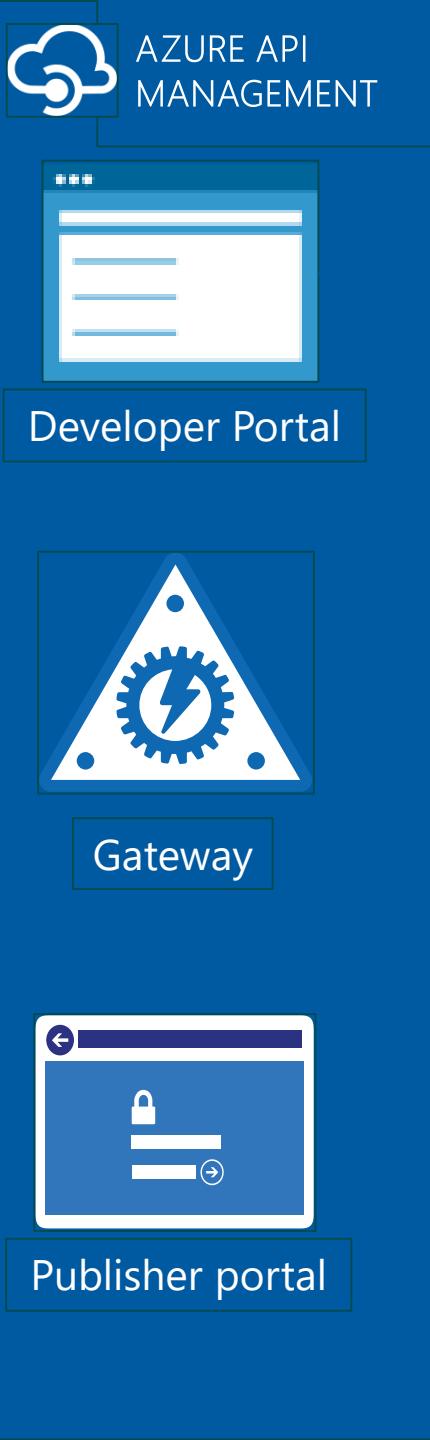
APP DEVELOPERS



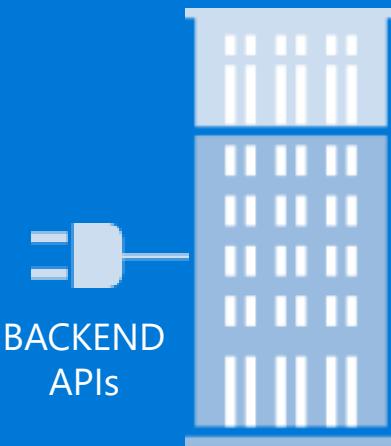
APPS



API PUBLISHERS



DIRECT OR
VPN

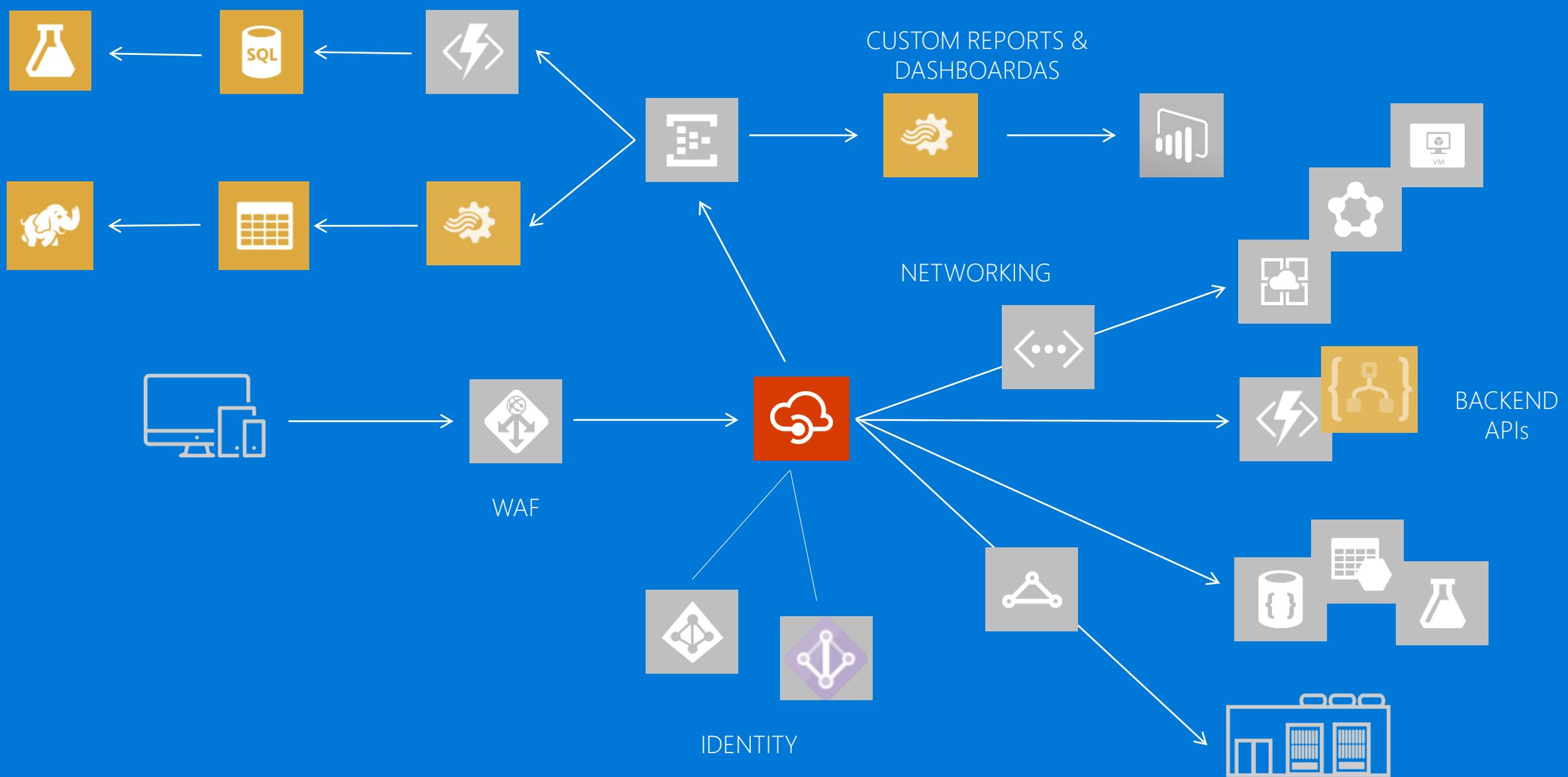


BACKEND
APIs

Hosted **anywhere**.

Developed using **any**
technology.





Wrap up

Media, Storage & Containers

- ✓ Media, CDN, Cognitive Services
- ✓ Storage, Databases, Redis, Search
- ✓ Containers
- ✓ Service Fabric
- ✓ API Management

+ Hands-on Lab

Resources

Cloud Application Development

<https://mva.microsoft.com/en-US/training-courses/cloud-application-development-17172>

Azure DocumentDB: Planet-Scale NoSQL

<https://mva.microsoft.com/en-US/training-courses/azure-documentdb-planetscale-nosql-16847>

Web and Data Application Development with Visual Studio 2017 and Azure

<https://mva.microsoft.com/en-US/training-courses/web-and-data-application-development-with-visual-studio-2017-and-azure-16931>

Azure Developer Workshop (Storage, Cognitive, ML, Stream Analytics, Containers, and Docker)

<https://mva.microsoft.com/en-US/training-courses/azure-developer-workshop-storage-cognitive-ml-stream-analytics-containers-and-docker-17033>

Building Intelligent Cross-Platform Mobile Applications Using Xamarin and Azure Search

<https://mva.microsoft.com/en-US/training-courses/building-intelligent-crossplatform-mobile-applications-using-xamarin-and-azure-search-16890>

Service Fabric Patterns and Practices

<https://mva.microsoft.com/en-US/training-courses/service-fabric-patterns-and-practices-16925>

Microsoft Azure on EdX

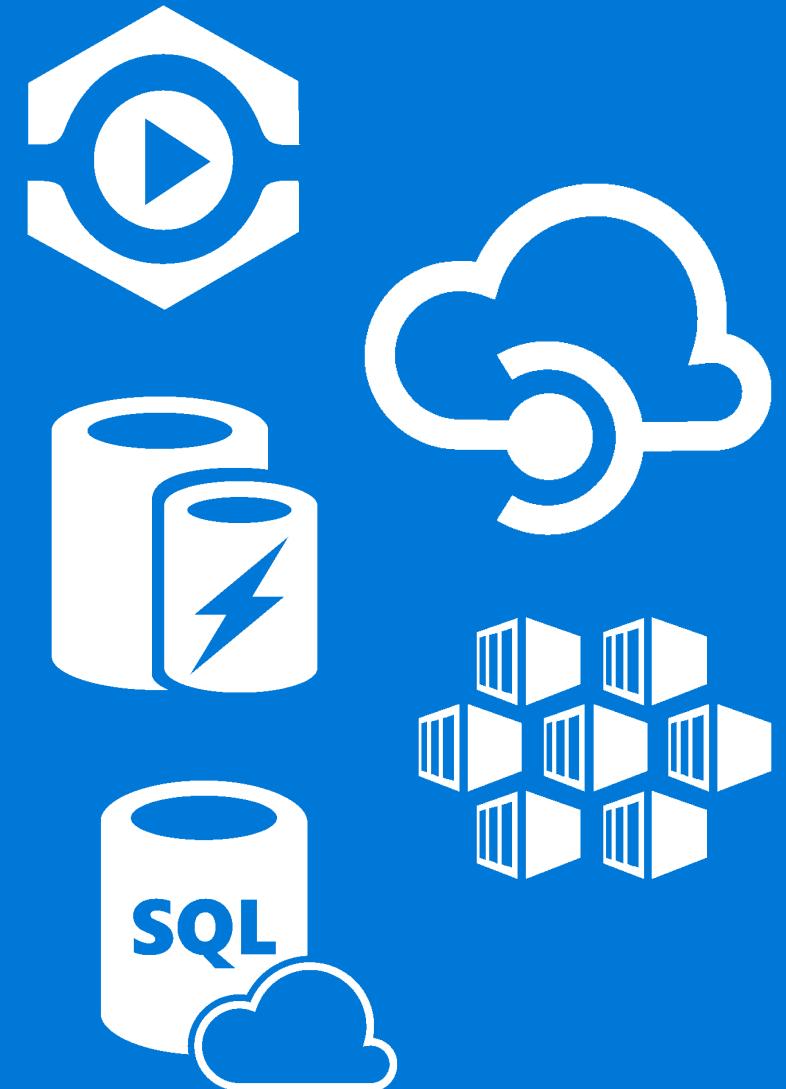
https://www.edx.org/course/?search_query=azure&school=Microsoft%3A%20Microsoft

Designing, building, and operating microservices on Azure

<https://docs.microsoft.com/en-us/azure/architecture/microservices/>

Learning Paths

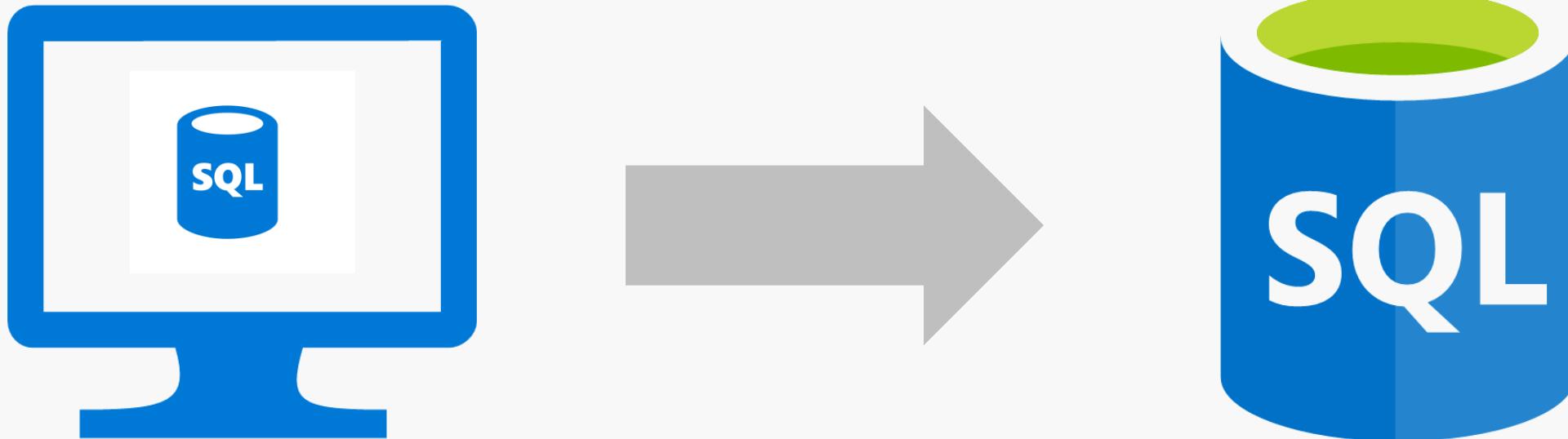
- Media Services
 - Live
 - On-demand
- API Management
- Redis Cache
- Service Fabric
- SQL Database



Choose between Azure SQL Database (PaaS) or
SQL Server on Azure VMs (IaaS)

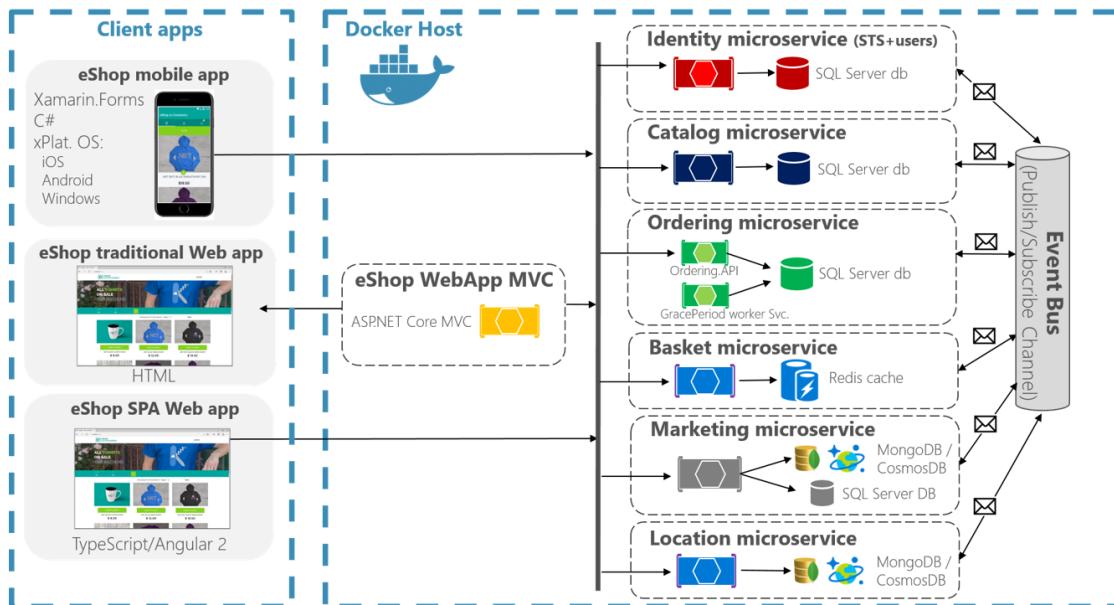


Azure SQL Database Migration Assistant tool

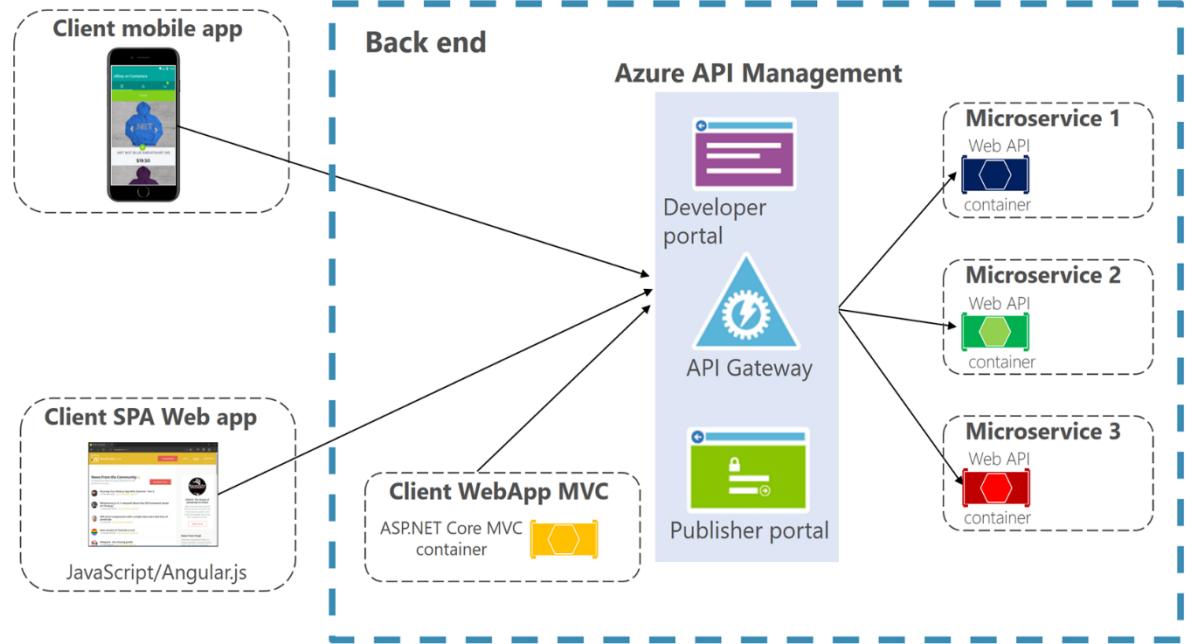


.NET Core Microservices Reference App

eShopOnContainers Reference Application - Architecture

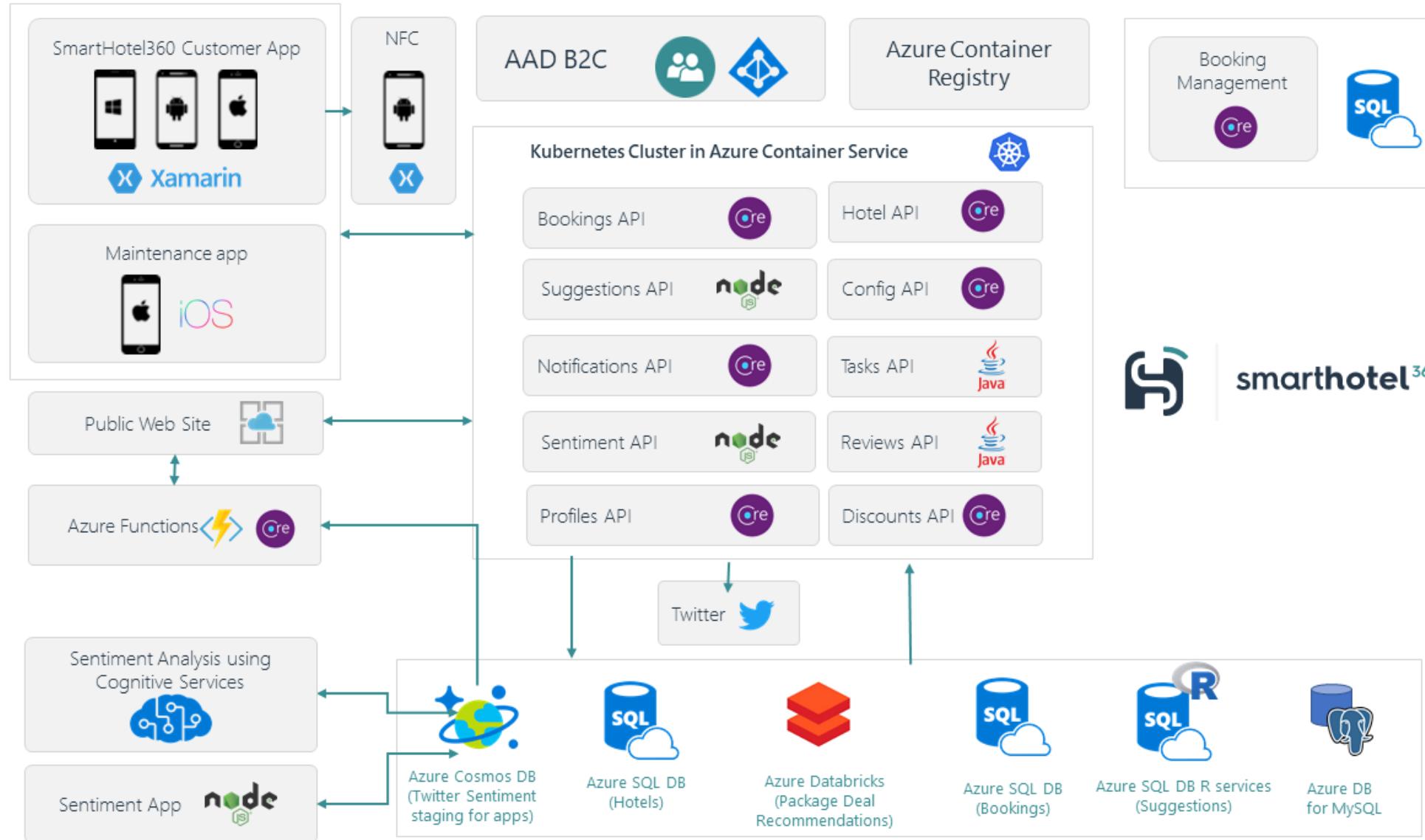


Recommended API Gateway use with Azure API Management for production environments



SmartHotel demo apps & architecture

Architecture Diagram



12-Factor Apps - <http://12factor.net>

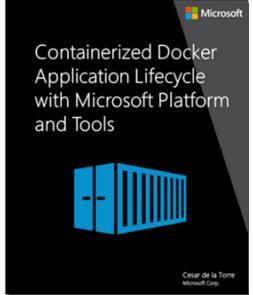
1. Single root **repo**; don't share code with another app
2. Deploy dependent **libs** with app
3. No config in code; read from **environment vars**
4. Handle unresponsive **app dependencies** robustly
5. Strictly separate build, release, & run steps
 - Build: Builds a version of the code repo & gathers dependencies
 - Release: Combines build with config ReleaseId (immutable)
 - Run: Runs app in execution environment
6. App executes as 1+ **stateless** process & shares nothing
7. App listens on **ports**; avoid using (web) host
8. Use processes for isolation; multiple for **concurrency**
9. Processes **can crash/be killed** quickly & start fast
10. Keep dev, staging, & prod environments similar
11. Log to stdout (dev=console; prod=file & archived)
12. Deploy & run admin tasks (**scripts**) as processes



Architecture guidance

- Know the limits of each service
- Know the SLA of each service
- Know the price of each service
- Know the regions where you could host each service
- Know the compliances of the Azure platform
- Know the Azure PaaS Security Best Practices and the Azure Security Services and Technologies
- Automate early and always with ARM Templates and for example with Visual Studio Team Services
- Don't reinvent the wheel, check out these Azure samples!
- Get inspired from the Microsoft Technical Case Studies and the Azure Solution Architectures and make amazing architecture diagrams with these icons
- Are you an AWS expert? Take a look at this service mapping page
- Are you a Java expert? Take a look at the Java Developer Center

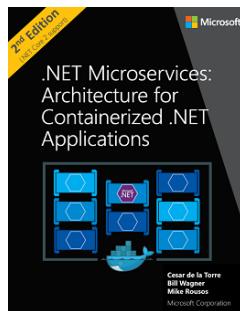
Free e-books



[Containerized Docker Application Lifecycle](#)



[Kubernetes objects on Microsoft Azure](#)



[Architecting & Developing Containerized and Microservice based .NET Applications](#)



[Migrating SQL Server Databases to Azure](#)



[Azure Developer Guide](#)



[Cloud Application Architecture Guide](#)

Questions

Answers

Hands-on labs
Day 2
3 options!

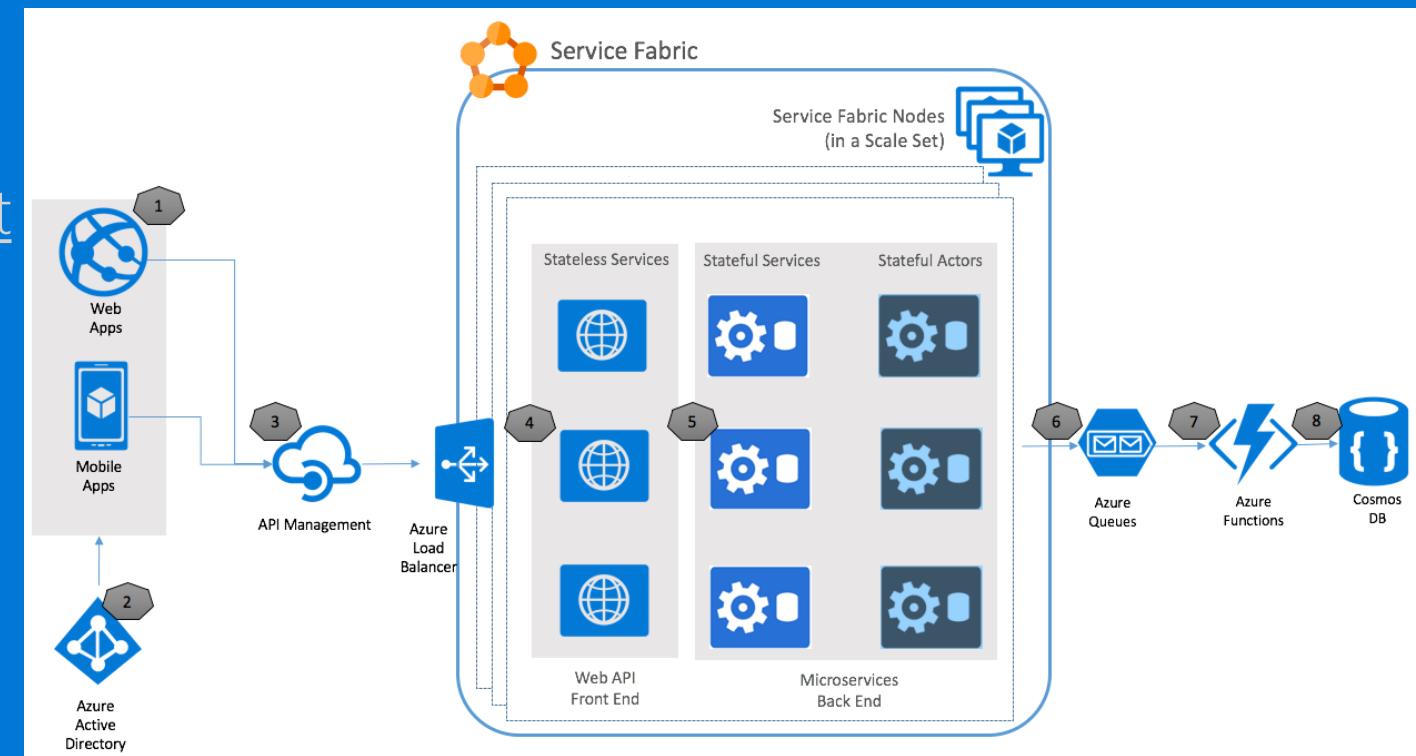
1 - Microservices & Serverless Architecture – 3h30

Implement scale and resiliency with Service Fabric with Visual Studio

Enable serverless solutions with Azure Functions

Control API access with API Management

Provide query flexibility with Cosmos DB



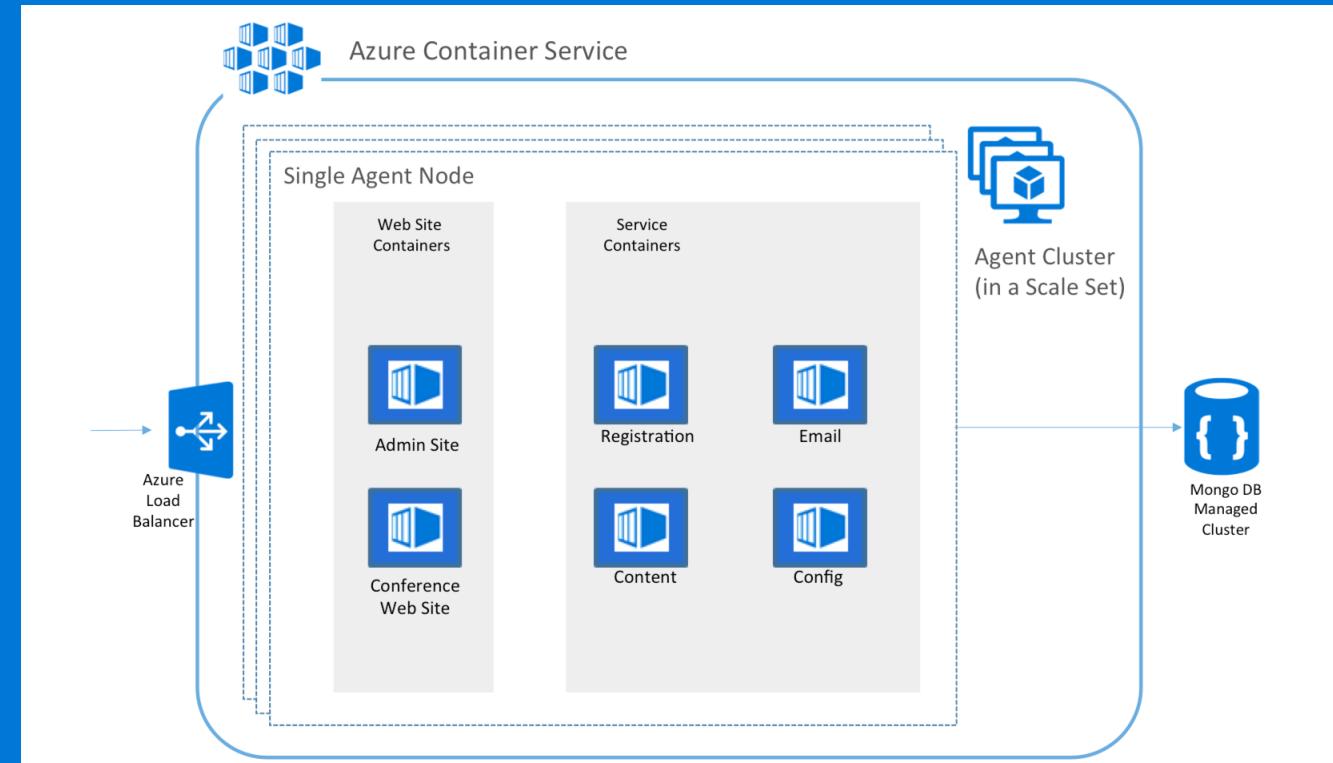
2 – Containers – 3h

Create & run a Docker Application on
Linux

Leverage Azure Container Registry

Deploy to Azure Container Service
(Kubernetes)

Implement load Balancing and service
discovery and scale the application and
test availability



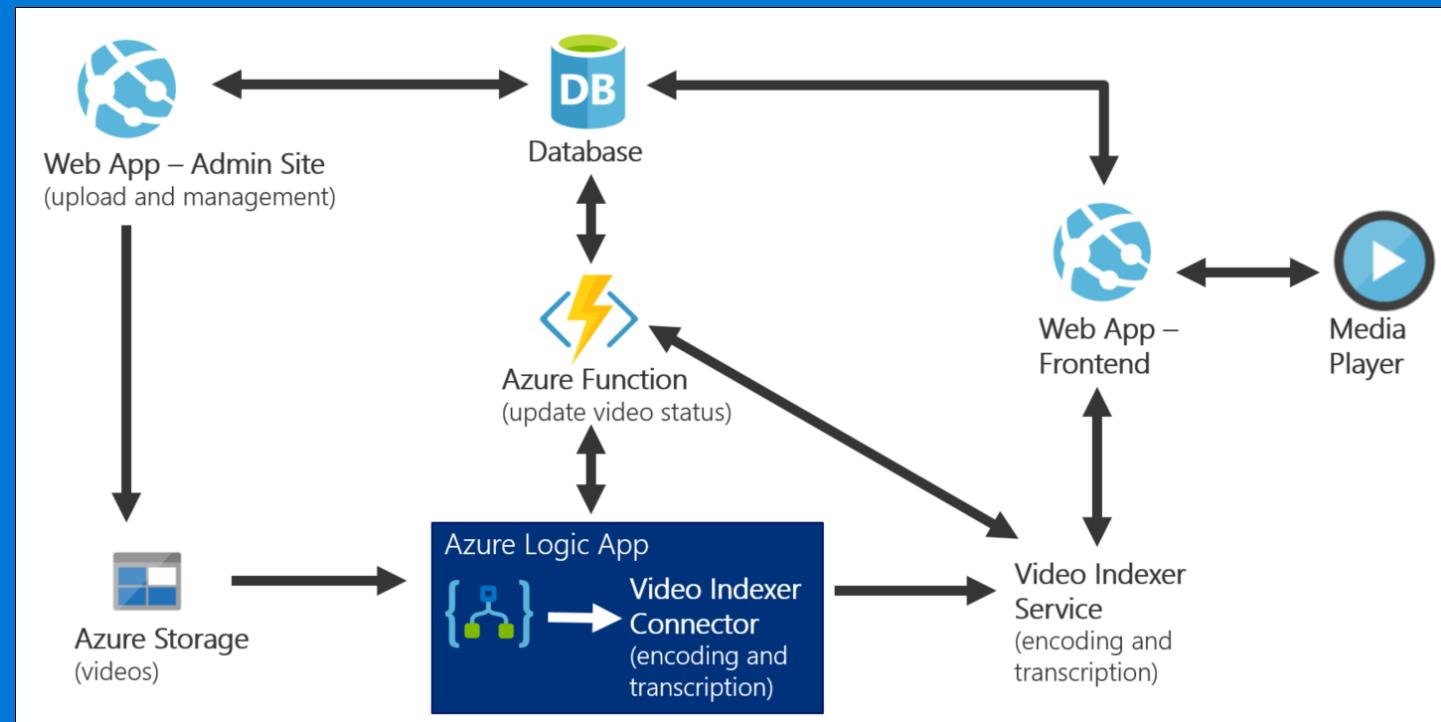
3 – Video Indexer – 2h

Setup Video Indexer API

Upload videos to Blob Storage to be encoded with Azure Video Indexer

Integrate Video Indexer through
CosmosDB, Logic Apps and Azure Functions

Deploy an admin and a public web app on App Service



Questions

Answers

