

The Power of Computing with Linux Servers & Windows Servers



Abdul Rasheed Feroz Khan
Director – CodeSizzler
Microsoft MVP - Azure



Objectives

 Virtual Machines

 Virtual Machine Scale Sets

 App Services

 Functions

 Batch

 Service Fabric

 Containers

 Kubernetes Service

Virtual Machines



**Development and
test**

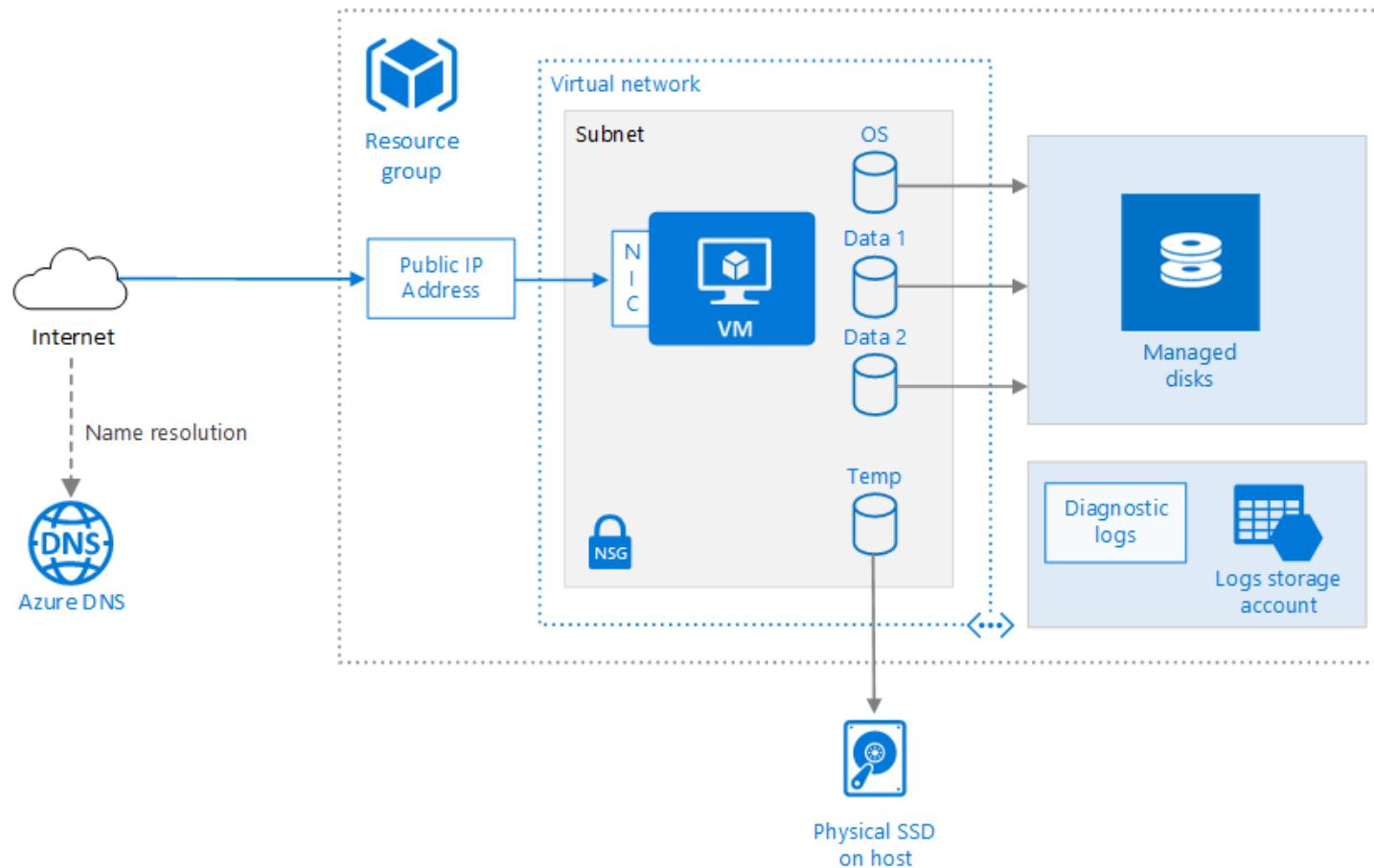


**Applications in the
cloud**



Extended datacentre

Architecture of Azure Virtual Machine



Why to go for Azure Virtual Machine



ON-DEMAND
SERVICE



SCALE TO WHAT
YOU NEED



GET MORE CHOICE



PAY ONLY FOR
WHAT YOU USE



ENHANCE SECURITY
AND COMPLIANCE

On-Premises



Ongoing Costs

- Apply patches, upgrades
- Downtime
- Performance tuning
- Rewrite customizations
- Rewrite integrations
- Upgrade dependent applications
- Ongoing burden on IT (hardware)
- Maintain/upgrade network
- Maintain/upgrade security
- Maintain/upgrade database

Cloud Computing



Ongoing Costs

- Subscription fees
- Training
- Configuration
- System Administration

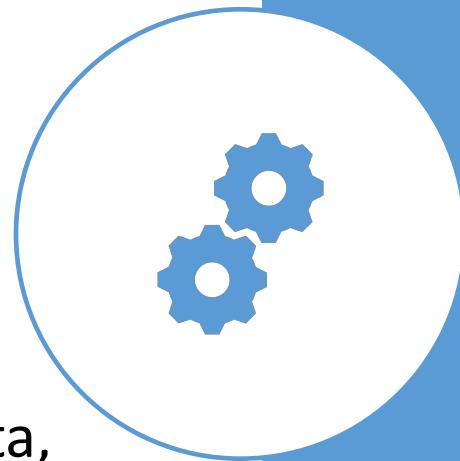
Explore Windows & Linux Virtual Machines

Virtual Machine Scale Sets

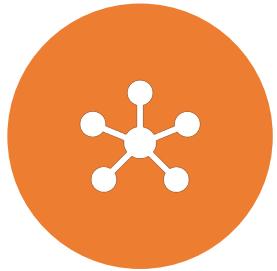


What are virtual machine scale sets?

- Scale sets let you create and manage a group of identical, load balanced VMs
- Scale sets provide high availability to your applications
- Build large-scale services for areas such as compute, big data, and container workloads



Why use virtual machine scale sets?



EASY TO CREATE AND MANAGE
MULTIPLE VMs



PROVIDES HIGH AVAILABILITY
AND APPLICATION RESILIENCY



ALLOWS YOUR APPLICATION TO
AUTOMATICALLY SCALE AS
RESOURCE DEMAND CHANGES



WORKS AT LARGE-SCALE

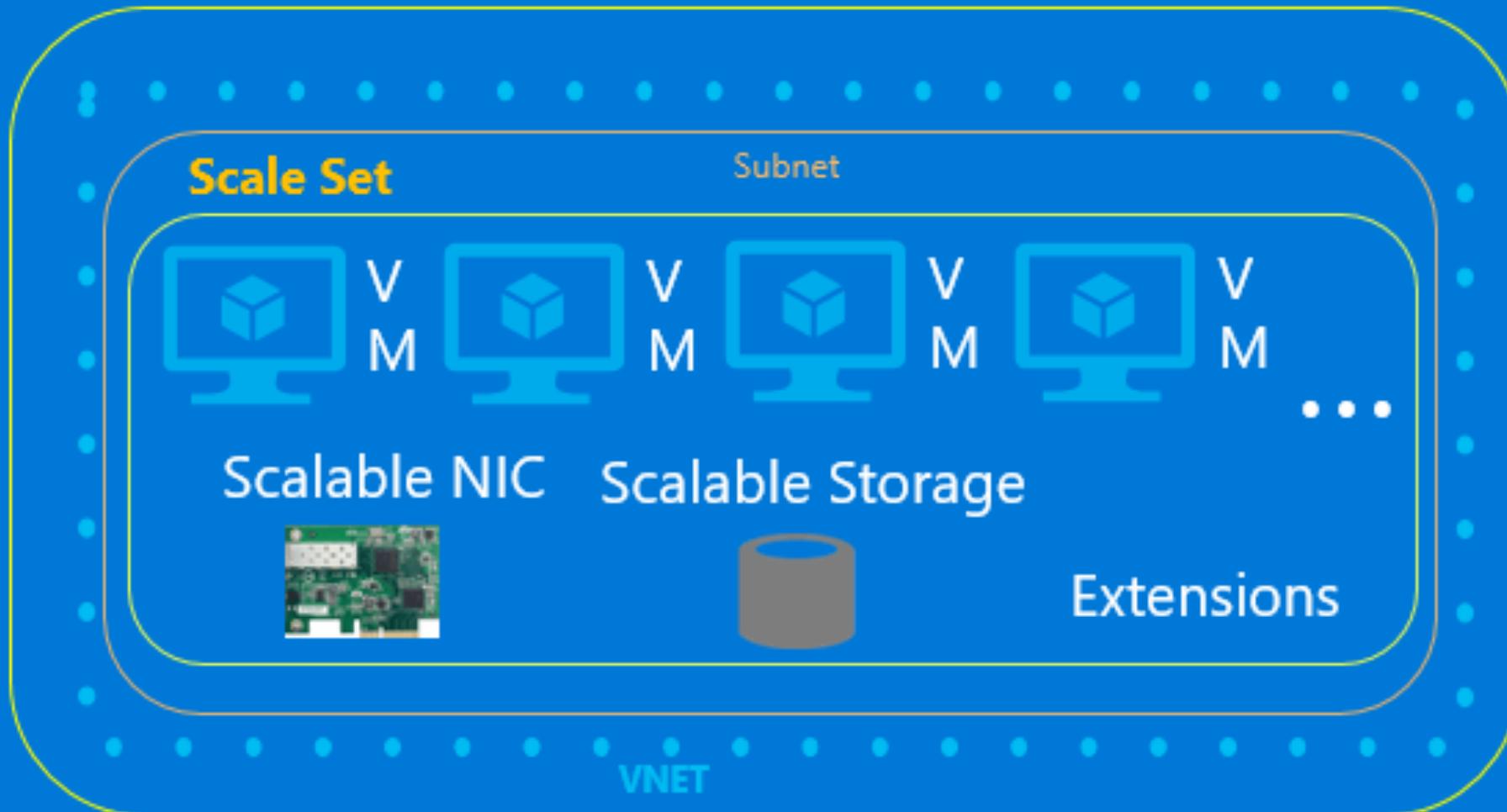
Differences between virtual machines and scale sets

Scenario	Manual group of VMs	Virtual machine scale set
Add additional VM instances	Manual process to create, configure, and ensure compliance	Automatically create from central configuration
Traffic balancing and distribution	Manual process to create and configure Azure load balancer or Application Gateway	Can automatically create and integrate with Azure load balancer or Application Gateway
High availability and redundancy	Manually create Availability Set or distribute and track VMs across Availability Zones	Automatic distribution of VM instances across Availability Zones or Availability Sets
Scaling of VMs	Manual monitoring and Azure Automation	Autoscale based on host metrics, in-guest metrics, Application Insights, or schedule

Clusters on VM Scale Sets

Microsoft Azure

Azure Virtual Machine Scale Sets



Azure App Services

Azure App Services Overview



MOBILE APPS

Build Mobile apps for any device

Mobile applications that can run on any device



API APPS

Easily build and consume APIs in the cloud

Hosting RESTful APIs that other services can leverage, such as in IoT scenarios



LOGIC APPS

Automate business process across SaaS and on-premises

Automating business processes and integrating systems and data across clouds without writing code



WEB APPS

Web apps that scale with your business

Web based applications that can scale with business requirements

Why use App Services?

Multiple languages
and frameworks

DevOps
optimization

Global scale with
high availability

Connections to
SaaS platforms and
on-premises data

Security and
compliance

Application
templates

Visual Studio
integration

API and mobile
features

Serverless code



App Services



Mobile Apps



Logic Apps



API Apps

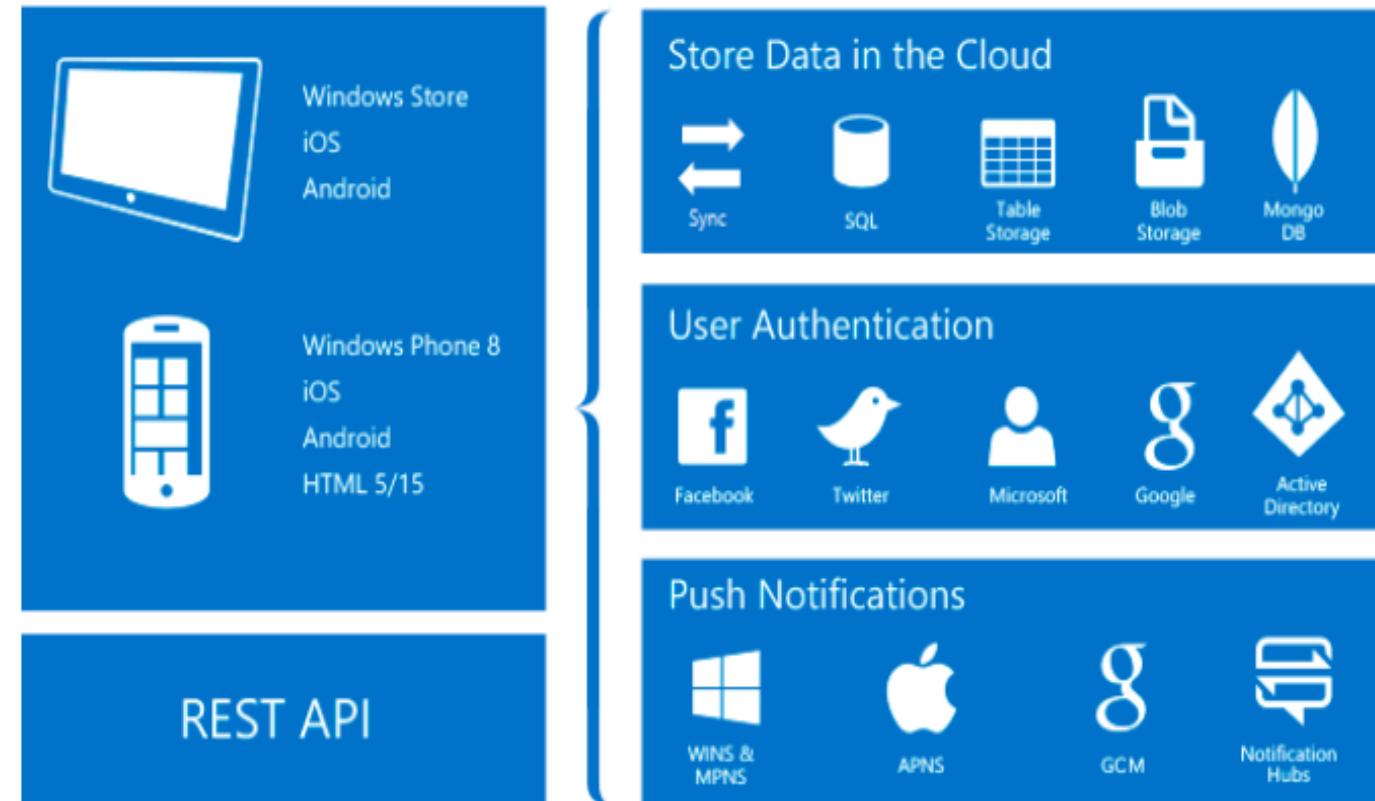


Web Apps

Mobile Apps in Azure App Service offer:

- Highly scalable
- Globally available, mobile application development platform for Enterprise

Developers and System Integrators that brings a rich set of capabilities to mobile developers





App Services

1 Mobile Apps

2 Logic Apps

3 API Apps

4 Web Apps

With Mobile Apps you can:

- Build native and cross platform apps
- Connect to your enterprise systems
- Build offline-ready apps with data sync
- Push Notifications to millions in seconds





App Services

- 1 Mobile Apps
- 2 Logic Apps
- 3 API Apps
- 4 Web Apps

Logic Apps provide a way to simplify and implement scalable integrations and workflows in the cloud

It provides a visual designer to model and automate your process as a series of steps known as a workflow

A logic app begins with a trigger (like 'When an account is added to Dynamics CRM') and after firing can begin many combinations actions, conversions, and condition logic



App Services

- 1 Mobile Apps
- 2 Logic Apps
- 3 API Apps
- 4 Web Apps

The advantages of using Logic Apps include the following:

1

Designing complex processes using easy to understand design tools

2

Implementing patterns and workflows seamlessly

3

Getting started quickly from templates

4

Customizing with your own custom APIs, code, and actions

5

Connect and synchronise disparate systems across on-premises and the cloud

6

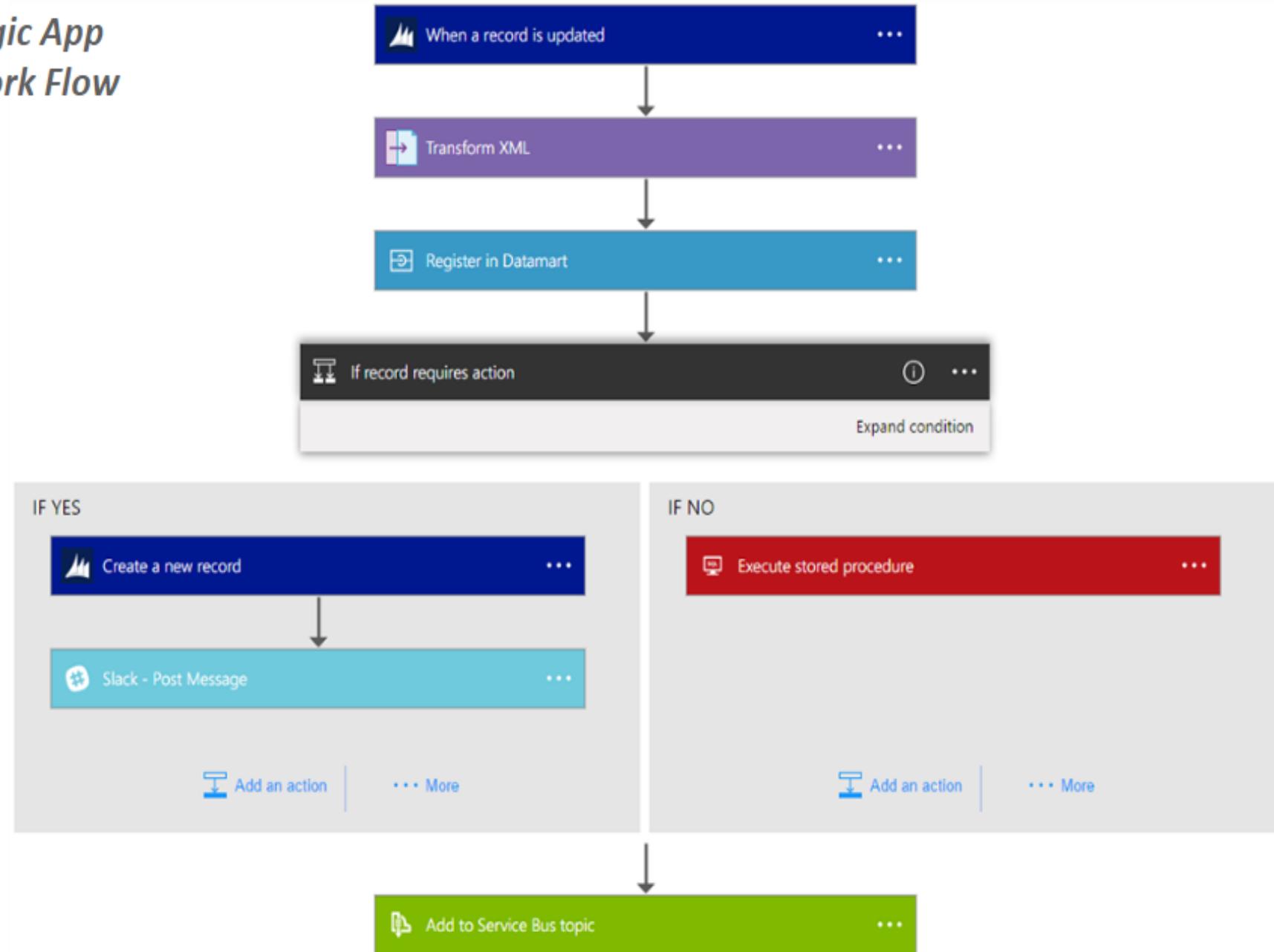
Build off of BizTalk server, API Management, Azure Functions, and Azure Service Bus



App Services

- 1 Mobile Apps
- 2 Logic Apps
- 3 API Apps
- 4 Web Apps

Logic App Work Flow



Azure App Services – Walk through



App Services

- 1 Mobile Apps
- 2 Logic Apps
- 3 API Apps
- 4 Web Apps

- API apps in Azure App Service offer features that make it easier to develop, host, and consume APIs in the cloud and on-premises.
- With API apps you get enterprise grade security, simple access control, hybrid connectivity, automatic SDK generation, and seamless integration with Logic Apps.
- Azure App Service is a fully managed platform for web, mobile, and integration scenarios.

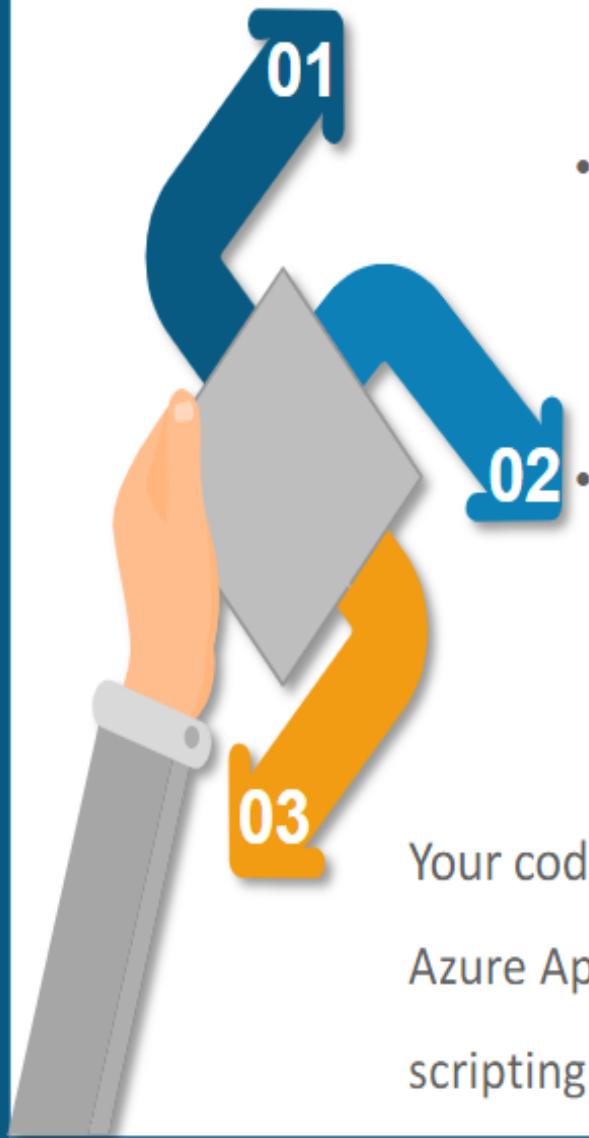




App Services

- 1 Mobile Apps
- 2 Logic Apps
- 3 API Apps
- 4 Web Apps

A web app is the compute resources that Azure provides for hosting a website or web application



- The compute resources may be on shared or dedicated virtual machines (VMs). Depending on the pricing tier that you choose
- Your application code runs in a managed VM that is isolated from other customers

Your code can be in any language or framework that is supported by Azure App Service, and also run scripts that use PowerShell and other scripting languages in a web app

Types of Web App Services

Web Apps on
Windows

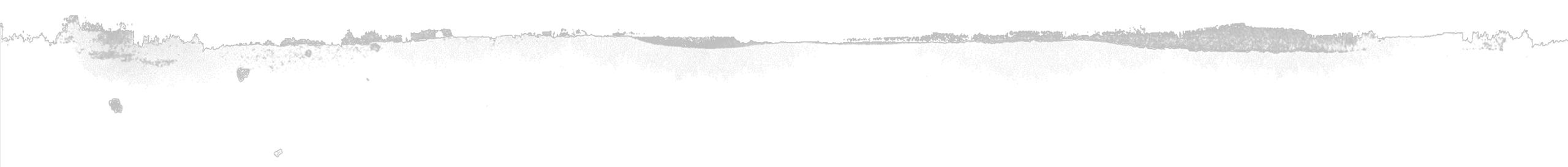
Web Apps on
Linux

Web Apps on
Containers

Azure Functions

Function Apps

- A Function App lets you to execute your Azure Functions
- Azure Functions enables you to execute your code in a serverless environment without creating a VM or publishing a web application



Serverless Workloads – Azure Functions and Logic App

1

Functions and Logic Apps are Azure services that enable serverless workloads

2

Azure Functions is a *Serverless compute service*, while Azure Logic Apps provides *Serverless workflows*

3

Complex *orchestrations* can be created by both

4

An orchestration is a collection of *functions* or *steps*, called *actions* in Logic Apps, that are executed to accomplish a complex task

5

Example, to process a batch of orders you might execute many instances of a function in parallel, wait for all instances to finish, and then execute a function that computes a result on the aggregate

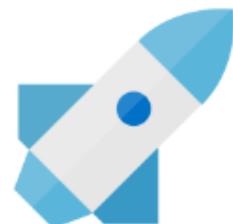
Azure Functions and Logic App – Orchestration

For Azure Functions, you develop orchestrations by *writing code* and using the [Durable Functions extension](#) (in preview)

For Logic Apps, you create orchestrations by using a *GUI* or *editing configuration files*

You can mix and match services when you build an orchestration, **calling functions from logic apps and calling logic apps from functions**

Choose how to build each ***orchestration*** based on the services capabilities or your personal preference



Azure Batch

Azure Batch

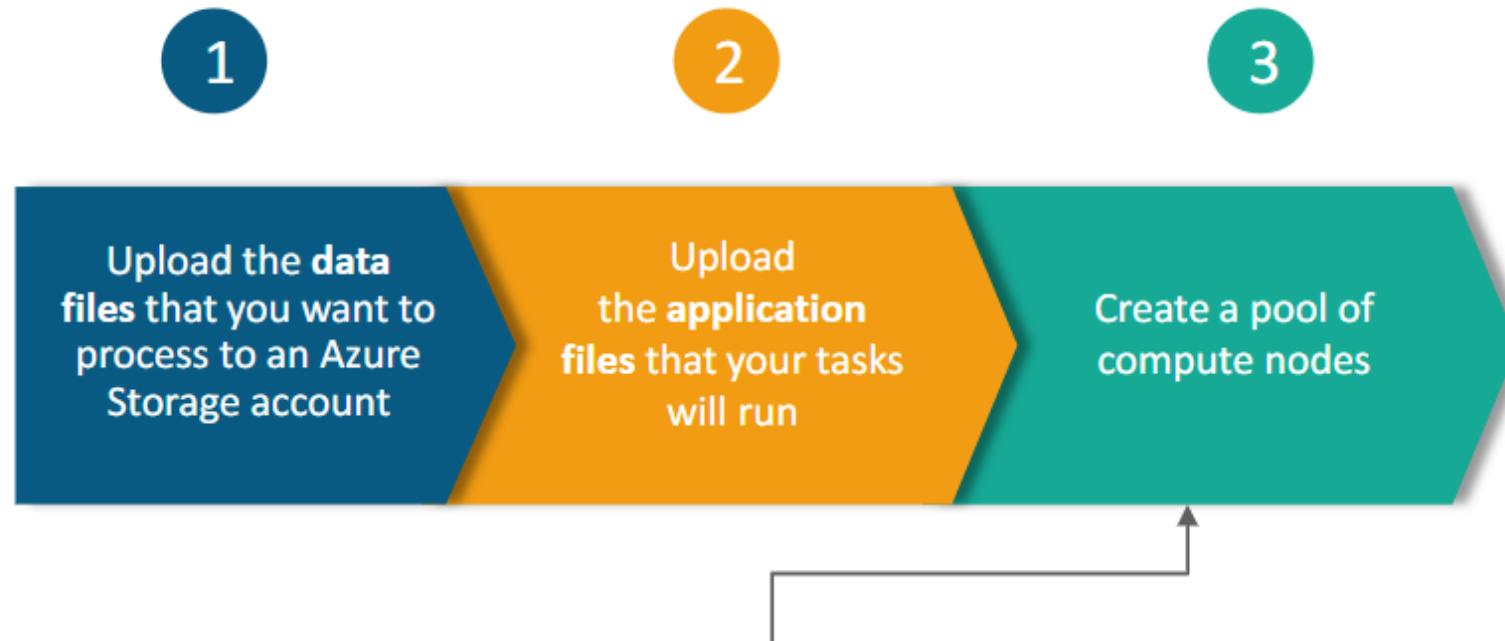


Azure Batch

- Run **large-scale** parallel jobs efficiently
- Batch service can be identified by a **unique** Batch account
- Batch account is associated with the processes
- Multiple Batch workloads can run using single Batch account
- Workloads can be **distributed** among Batch
- Uses Azure Storage for storing resource and output files

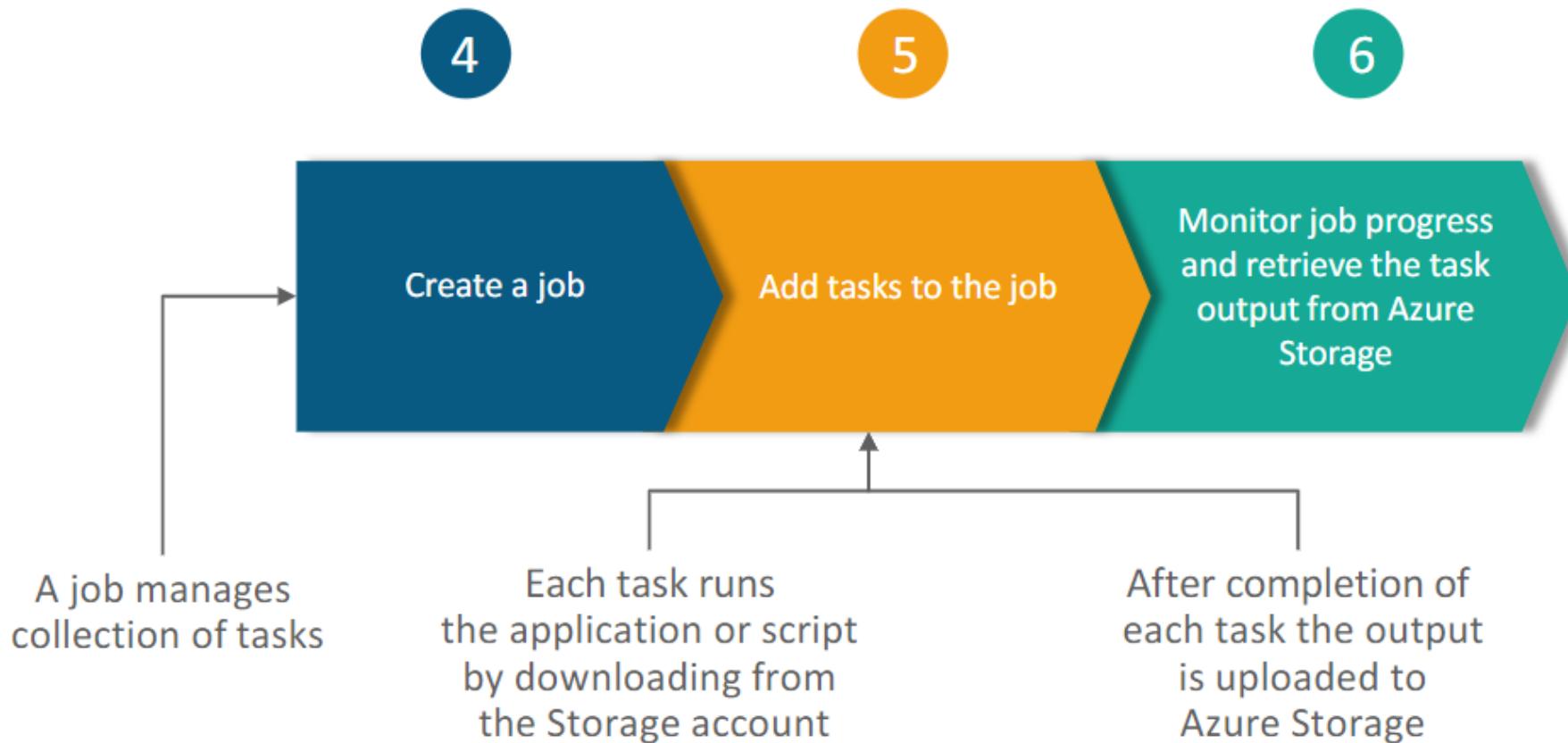


Batch Service Workflow



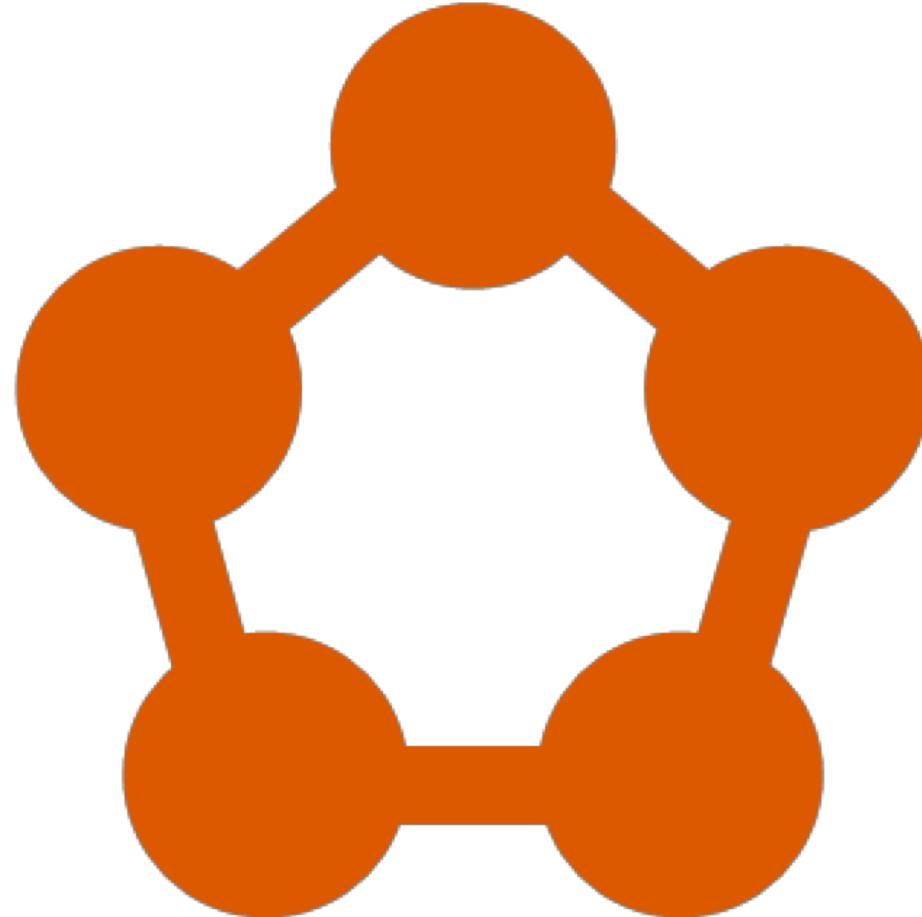
Specify the number of compute nodes for the pool with their size and the operating system as, when each task in your job runs, one of the node from the pool gets assigned to it

Batch Service Workflow



Azure Service Fabric

Azure Service Fabric



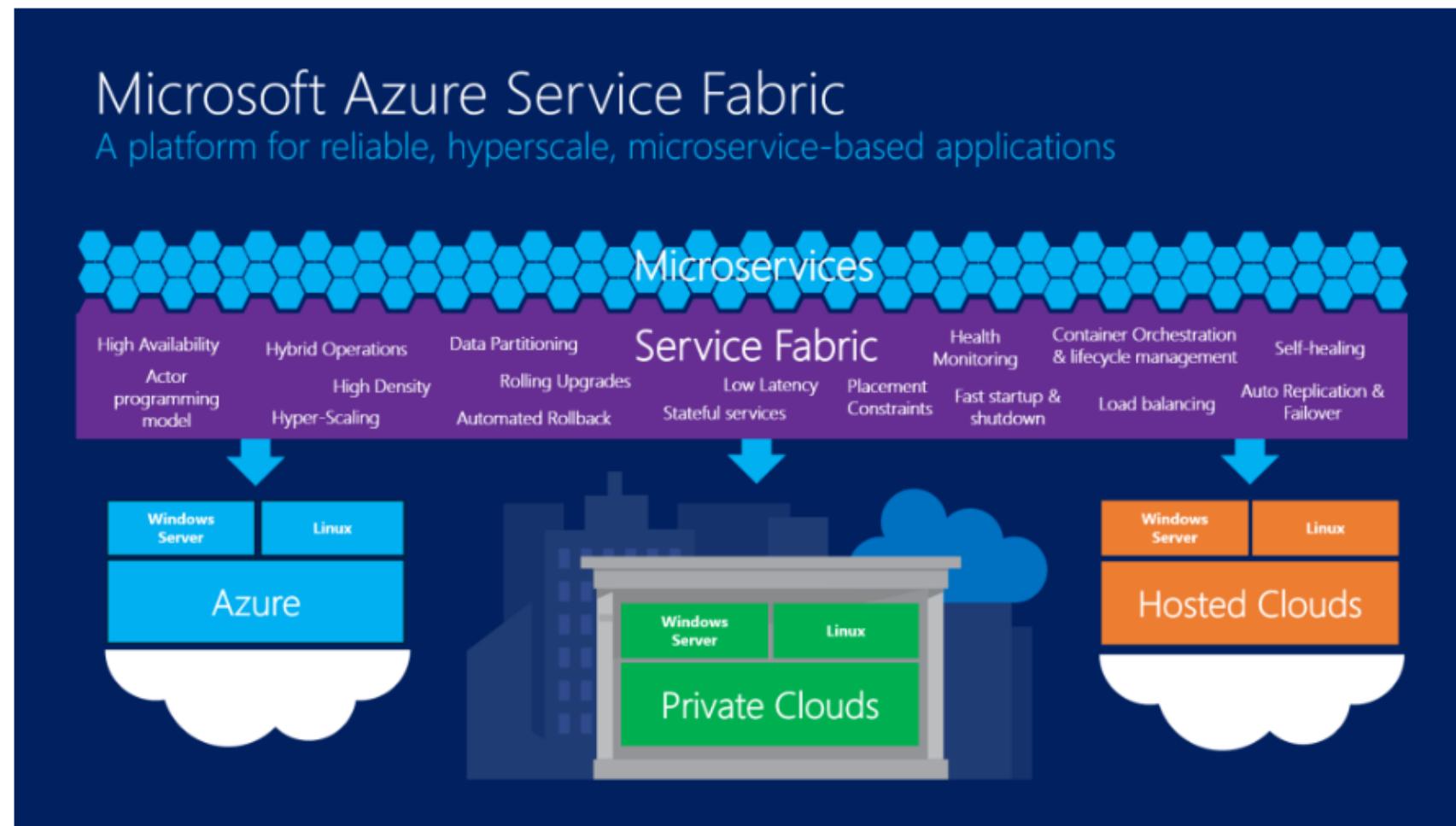
Azure Service Fabric

- Azure Service Fabric is a distributed systems platform that makes it easy to package, deploy, and manage scalable reliable microservices and containers
- Admins can avoid complex infrastructure issues and concentrate on implementing critical, demanding workloads that are **scalable, reliable, and manageable**



Azure Service Fabric

- Used for building and managing enterprise-class, tier-1, cloud-scale applications running in containers
- This enables you to build and manage scalable and reliable applications composed of microservices that run on a cluster



Capabilities of Azure Service Fabric

01

Write once and deploy anywhere with zero code changes

02

Develop scalable applications that are composed of microservices

03

Scale out or scale in the number of nodes in a cluster; As you scale nodes, your applications automatically scale

04

Deploy applications in seconds, at high density with thousands of applications or containers per machine

05

Deploy different versions of the same application side by side, and upgrade them independently

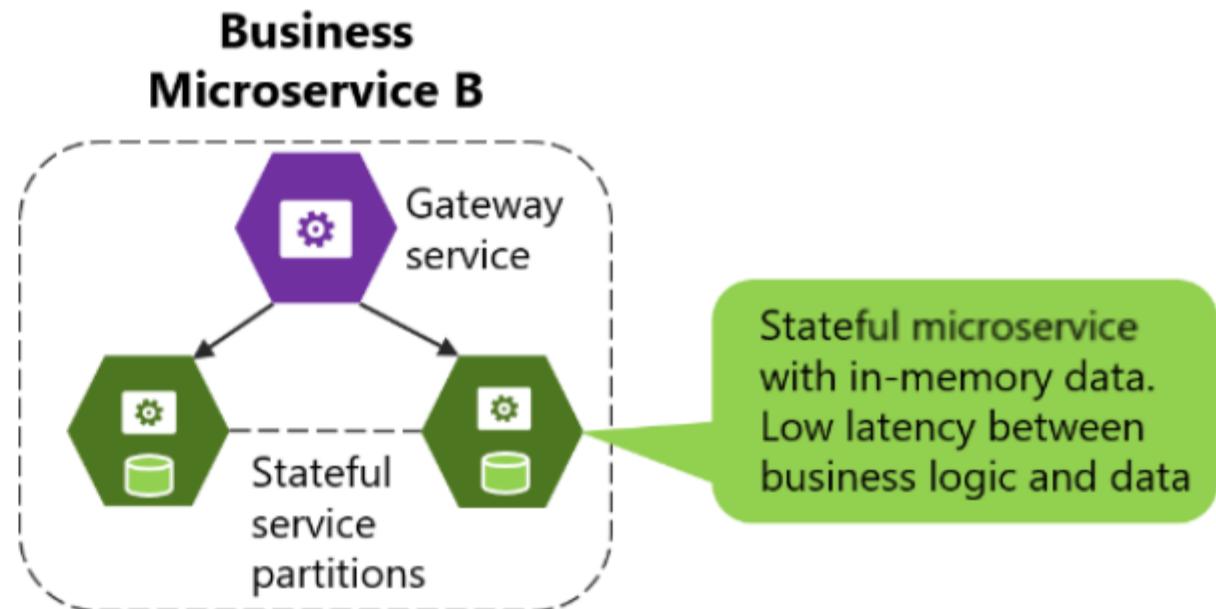
06

Monitor and diagnose the health of your applications and set policies for performing automatic repairs

Types of Services – Stateful

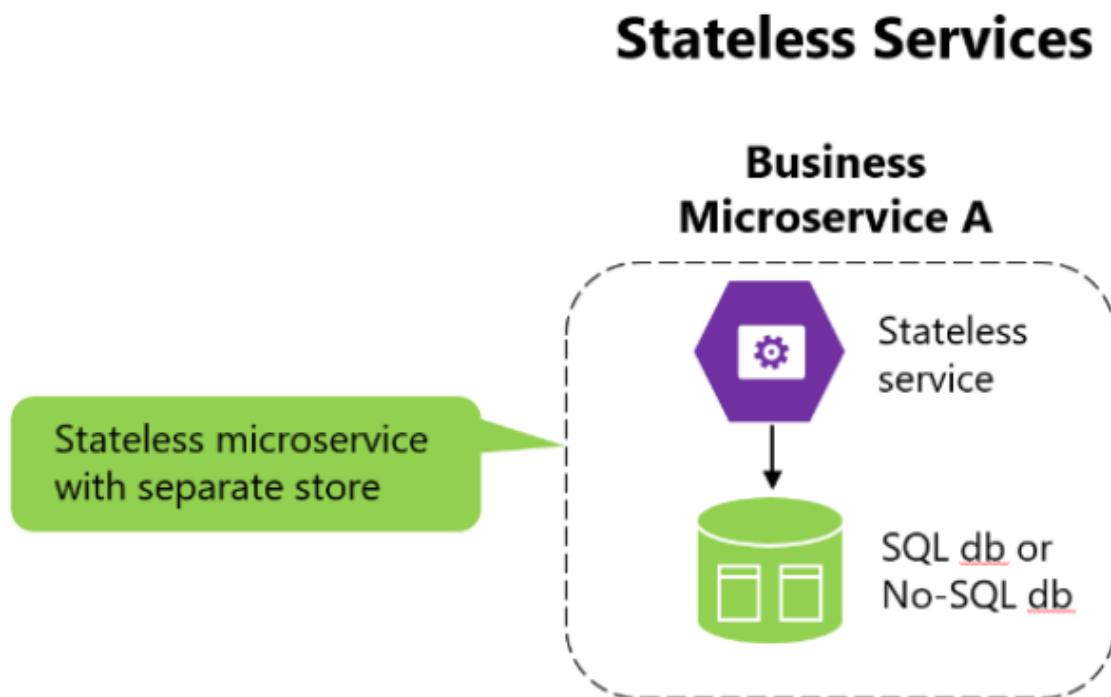
- This is used when Service Fabric is needed to **manage** your service's state
- When you create a **named** service
 - specify the number of partitions
 - number of replications for your state across nodes
- Each named service has
 - a single **primary** replica
 - multiple secondary replicas

Stateful Services



Types of Services – Stateless

- This may be used when the service's persistent state is stored in an external storage service, such as Azure Storage or when the service has no persistent storage.
- For example, for a calculator service where values are passed to the service, a computation is performed that uses these values, and then a result is returned.



Azure Container Service - Walk through

Azure Container Service



Azure Container Service (ACS)

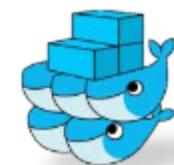
- User can use existing skills or community expertise for deploying and managing **container-based** applications on Azure
- **Fully portable** application containers
- **Enterprise grade** features of Azure
- ACS supports



Kubernetes



DC/OS
(powered by Apache Mesos)



Docker Swarm

Azure Container Service (ACS)

- Azure Container Service allows you to quickly deploy a **production ready** Docker Swarm cluster
- ACS is a **pre-configured** environment for scalable deployment and management of containerized workloads
- It provides a way to simplify the creation, configuration, and management of a cluster of virtual machines that are preconfigured to run **containerized applications**



ACS Docker Swarm

- A Docker Swarm is a collection of virtual machines (VMs) running on Docker Engine and includes other resources such as:



Load Balancers



VM Scale Sets



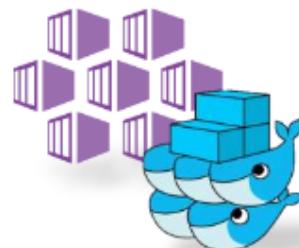
Availability Sets



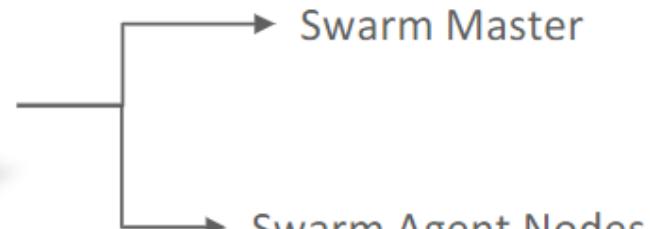
Storage



Network



Docker Swarm on
Azure Container Service



Kubernetes

- Open-source orchestration engine from Google
- Provides a robust framework for container orchestration, yet remains lightweight and scalable
- Supported by Azure Container Service and tightly integrated with ACS, allowing Kubernetes to modify deployments



kubernetes
by Google™



Microsoft

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