



Getting started with Microsoft Azure

VAIBHAV GUJRAL



About Me

- 13+ years of experience across designing and developing enterprise-class applications
- Microsoft Certified Azure Solutions Architect Expert
- Cloud Architect, Kiewit
- Co-organizer, Omaha Azure User Group
- Speaker | Blogger



<http://www.vaibhavgujral.com>
[@vabgujral](https://twitter.com/vabgujral)



Agenda

- What is Cloud Computing?
- Cloud service models
- What is Microsoft Azure?
- Azure Regions and Data Centers
- How to create an Azure Account?
- Azure core services – Compute / Networking / Storage
- Application hosting in Azure



Agenda

- Azure Pricing Calculator
- Azure Cost Management
- Azure Deployment Models
- Azure Management Tools
- Demo – Azure Portal
- Resources for further reading

What is cloud computing?

What is cloud computing?

Simply put, **cloud computing is the delivery of computing services**—including servers, storage, databases, networking, software, analytics, and intelligence—**over the Internet** (“the cloud”) to offer **faster innovation, flexible resources**, and **economies of scale**. You typically **pay only for cloud services you use**, helping you lower your operating costs, run your infrastructure more efficiently, and scale as your business needs change.

On-demand
self-service

Broad
Network
Access

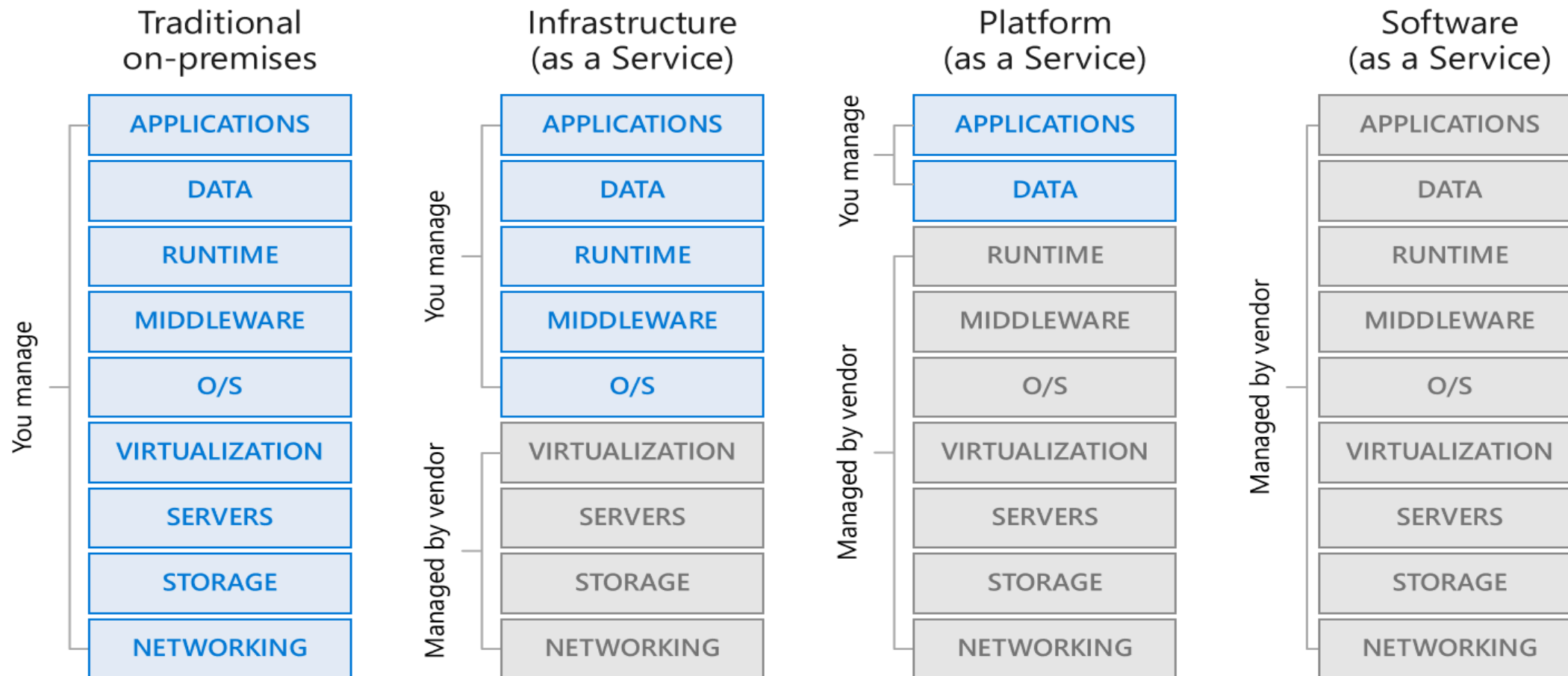
Resource
Pooling /
Multi-tenancy

Elasticity

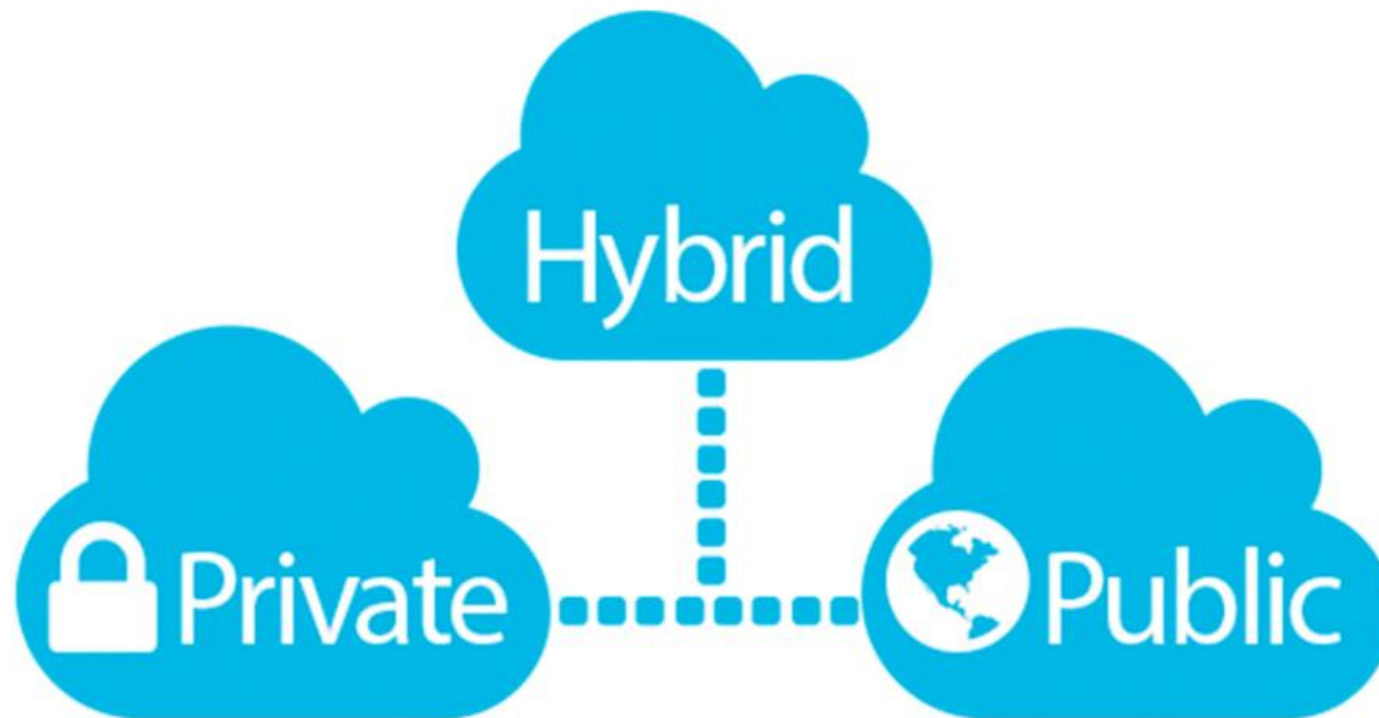
Pay-as-you-
use

Cloud Service Models

Cloud Service Models



Cloud Types



What is Microsoft Azure?





What is Microsoft Azure?

Microsoft's cloud computing platform

Global Presence with 58+ regions

Seamless online portal experience

Azure supports IaaS and PaaS models – Office 365 is SaaS offering

Azure Stack is private cloud offering



Azure Regions and Data Centers



Understanding Azure Regions

Regions

A region is a set of datacenters deployed within a latency-defined perimeter and connected through a dedicated regional low-latency network.

Geographies

A geography is a discrete market, typically containing two or more regions, that preserves data residency and compliance boundaries.

Availability Zones

Availability Zones are physically separate locations within an Azure region. Each Availability Zone is made up of one or more datacenters equipped with independent power, cooling, and networking.

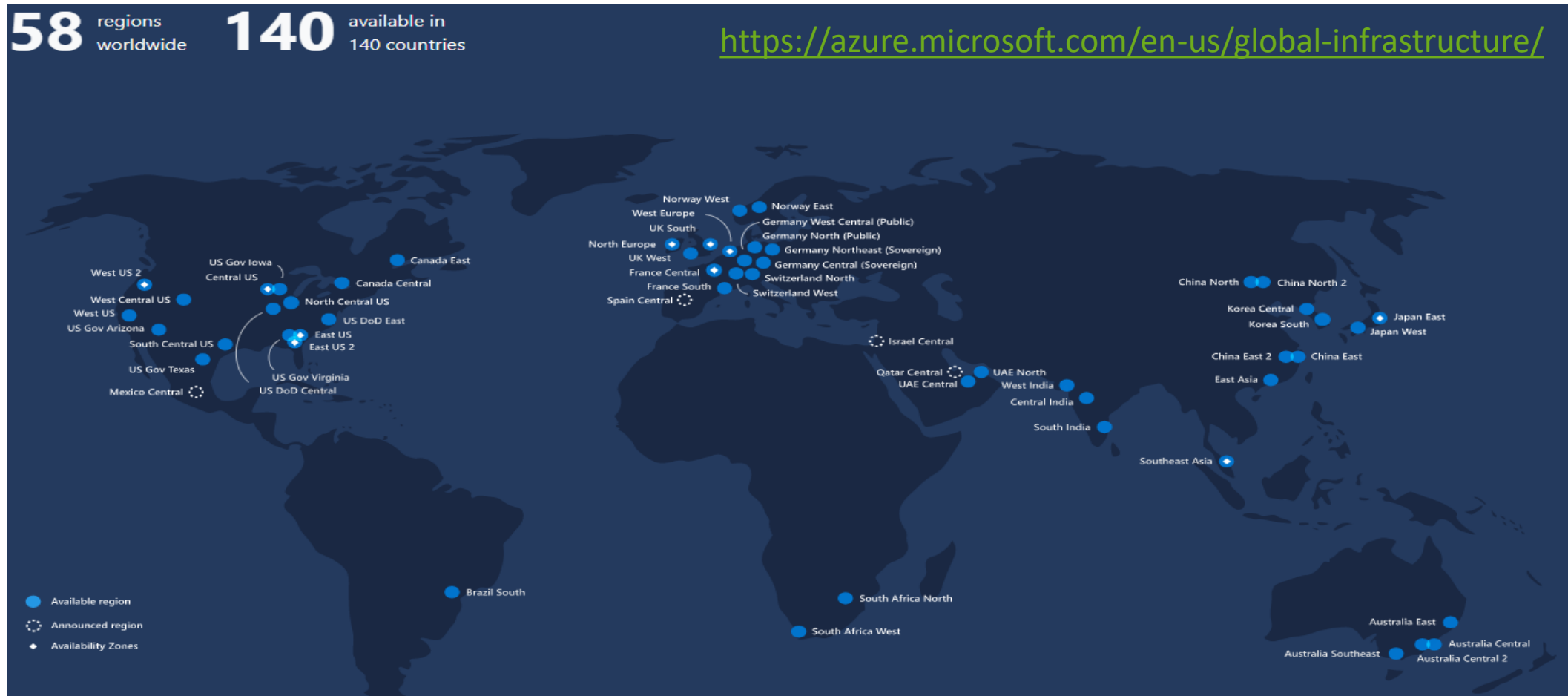
Understanding Azure Regions

Americas	Europe	Asia Pacific	Middle East and Africa	Azure Government	Azure China					
EAST US	EAST US 2	CENTRAL US	NORTH CENTRAL US	SOUTH CENTRAL US	WEST CENTRAL US	WEST US	WEST US 2	CANADA EAST	CANADA CENTRAL	BRAZIL SOUTH

Americas		Europe	Asia Pacific		Middle East and Africa		Azure Government		Azure China					
NORTH EUROPE	WEST EUROPE	FRANCE CENTRAL	FRANCE SOUTH	UK WEST	UK SOUTH	SWITZERLAND NORTH	SWITZERLAND WEST	NORWAY EAST	NORWAY WEST	*GERMANY NORTH (PUBLIC)	*GERMANY WEST CENTRAL (PUBLIC)	*GERMANY NON-REGIONAL	GERMANY CENTRAL (SOVEREIGN)	GERMANY NORTHEAST (SOVEREIGN)

Americas		Europe		Asia Pacific		Middle East and Africa		Azure Government		Azure China		
SOUTHEAST ASIA	EAST ASIA	AUSTRALIA EAST	AUSTRALIA SOUTHEAST	AUSTRALIA CENTRAL	AUSTRALIA CENTRAL 2	CENTRAL INDIA	WEST INDIA	SOUTH INDIA	JAPAN EAST	JAPAN WEST	KOREA CENTRAL	KOREA SOUTH

Global Presence



Demo

How to create an Azure account?



Azure Account Offer Types

Free Account

Sign up for a free trial at <https://azure.microsoft.com/en-us/free/> to receive 200\$ free credit for one month.

Certain services are free for 12 months and 25+ services are always free.

Pay-As-You-Go Account

Create a pay-as-you-go account directly -or- convert your free account to pay-as-you-go account.

Can be cancelled at any time.

Credit card on file is billed on a monthly basis.

Visual Studio Subscribers

\$50 or \$150 credit per month



Azure Account Purchase Options

Purchase Options

<https://azure.microsoft.com/en-us/pricing/purchase-options/>

1. Directly from Azure website
2. Through a Microsoft representative
3. Managed cloud solutions for Azure through a Microsoft partner

Demo



Azure Billing Account Types

Microsoft Online Services Program: A individual billing account for a Microsoft Online Services Program is created when you sign up for Azure through the Azure website.

Enterprise Agreement: A billing account for an Enterprise Agreement is created when your organization signs an Enterprise Agreement (EA) to use Azure.

Microsoft Customer Agreement: A billing account for a Microsoft Customer Agreement is created when your organization works with a Microsoft representative to sign a Microsoft Customer Agreement.



Azure Account vs Azure Subscription?

Azure Billing Account

A billing account is created when you sign up to use Azure.

Billing account is used to manage invoices, payments, and track costs.

You can have access to multiple billing accounts.

Azure Subscription

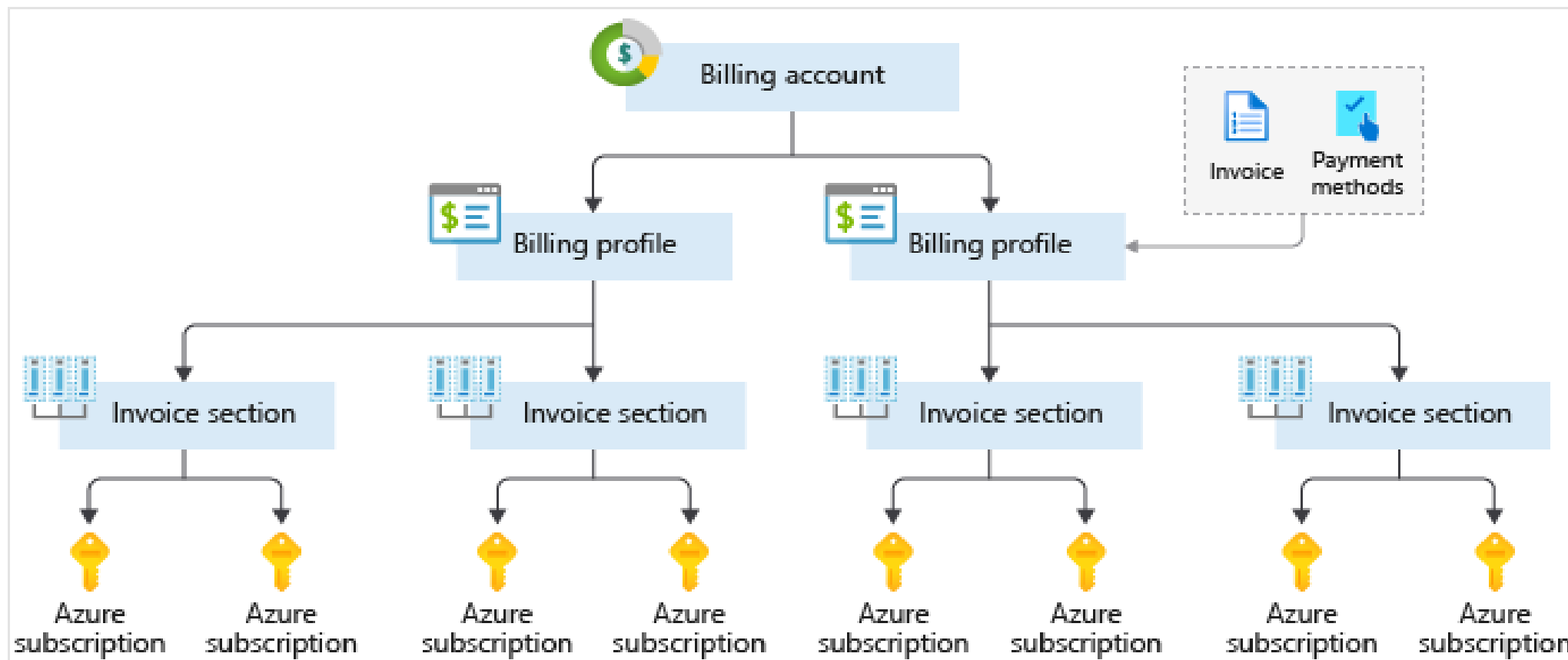
An Azure subscription is a logical container used to provision resources in Azure.

When you sign up for an account, an Azure subscription is created by default.

There can be multiple subscriptions under an account.

Any resource that you create in Azure must be created within a subscription.

Azure Account Structure





Azure Core Services

Azure Core Services



Compute



Networking



Storage



Security and
management

Azure Compute Services

The term *compute* refers to the hosting model for the computing resources that your application runs on.

App Service: A managed service for hosting web apps, mobile app back ends, RESTful APIs, or automated business processes.

Azure Kubernetes Service (AKS): A managed Kubernetes service for running containerized applications.

Batch: A managed service for running large-scale parallel and high-performance computing (HPC) applications

Container Instances: The fastest and simplest way to run a container in Azure, without having to provision any virtual machines and without having to adopt a higher-level service.

Functions: A managed Function-as-a-Service(FaaS) service.

Service Fabric: A distributed systems platform that can run in many environments, including Azure or on premises.

Virtual machines: Deploy and manage VMs inside an Azure virtual network.

Azure Marketplace [See all](#)

Get started

Recently created

AI + Machine Learning

Analytics

Blockchain

Compute

Containers

Databases

Developer Tools

DevOps

Identity

Integration

Internet of Things

Media

Mixed Reality

IT & Management Tools

Networking


Software as a Service (SaaS)


Security


Storage


Web


Featured [See all](#)


 Virtual machine
[Learn more](#)


 SQL Server 2017 Enterprise Windows Server 2016
[Learn more](#)


 Reserved VM Instances
[Quickstarts + tutorials](#)


 Kubernetes Service
[Quickstarts + tutorials](#)


 Service Fabric Cluster
[Quickstarts + tutorials](#)

 Web App for Containers
[Quickstarts + tutorials](#)

 Function App
[Quickstarts + tutorials](#)

 Batch Service
[Quickstarts + tutorials](#)

 Debian 9 "Stretch" with backports kernel
[Learn more](#)

 Ubuntu Server 16.04 LTS
[Quickstarts + tutorials](#)

Azure Networking Services

Azure networking services are built on one of the largest fiber network backbones to enable secure communication between different Azure services over the internet, and on-premises networks..

Connectivity services: Connect Azure resources and on-premises resources using any or a combination of these networking services in Azure - Virtual Network (VNet), Virtual WAN, ExpressRoute, VPN Gateway, Virtual network NAT Gateway, Azure DNS, Peering service, and Azure Bastion.

Application protection services: Protect your applications using any or a combination of these networking services in Azure - Private Link, DDoS protection, Firewall, Network Security Groups, Web Application Firewall, and Virtual Network Endpoints.











Application delivery services: Deliver applications in the Azure network using any or a combination of these networking services in Azure - Content Delivery Network (CDN), Azure Front Door Service, Traffic Manager, Application Gateway, Internet Analyzer, and Load Balancer.

Network monitoring: – Monitor your network resources using any or a combination of these networking services in Azure - Network Watcher, ExpressRoute Monitor, Azure Monitor, or VNet Terminal Access Point (TAP).

Azure Marketplace [See all](#)

- Get started
- Recently created
- AI + Machine Learning
- Analytics
- Blockchain
- Compute
- Containers
- Databases
- Developer Tools
- DevOps
- Identity
- Integration
- Internet of Things
- Media
- Mixed Reality
- IT & Management Tools
- Networking**
- Software as a Service (SaaS)
- Security
- Storage
- Web

Featured [See all](#)

-  **Virtual network**
[Quickstarts + tutorials](#)
-  **CloudGuard IaaS - Firewall & T Prevention (preview)**
[Learn more](#)
-  **Load Balancer**
[Learn more](#)
-  **Application Gateway**
[Learn more](#)
-  **Front Door**
[Learn more](#)
-  **Firewall**
[Learn more](#)
-  **Virtual WAN**
[Learn more](#)
-  **Network security group**
[Quickstarts + tutorials](#)
-  **ExpressRoute**
[Learn more](#)
-  **Connection**
[Learn more](#)

Azure Storage Services

Azure Storage services provide massively scalable, secure cloud storage for your data, apps, and workloads

Disk Storage: Scalable and secure storage for your virtual machines

Blob Storage: Massively scalable, secure storage for unstructured data

Azure Data Lake Storage: – Secure, massively scalable data lake storage.

Archive Storage: Low-cost storage for rarely accessed data

File Storage: Secure cloud file shares

Queue Storage: Secure storage for message-based communication between apps

Data Box: Appliances and solutions for data transfer to Azure and edge compute

Azure NetApp Files: Powerful file shares for enterprise workloads, including open-source/Linux

Azure HPC Cache: File caching for high-performance computing (HPC)

Azure Marketplace [See all](#)

Get started

Recently created

AI + Machine Learning

Analytics

Blockchain

Compute

Containers

Databases

Developer Tools

DevOps

Identity

Integration

Internet of Things

Media

Mixed Reality

IT & Management Tools

Networking


Software as a Service (SaaS)


Security


Storage


Web


Featured [See all](#)


 Storage account - blob, file, table, queue
[Quickstarts + tutorials](#)


 Azure Stack Edge / Data Box Gateway
[Learn more](#)


 Data Lake Storage Gen1
[Quickstarts + tutorials](#)

 Azure Data Box
[Learn more](#)

 Backup and Site Recovery
[Quickstarts + tutorials](#)

 AltaVault AVA-c4, version 4.4.1 (preview)
[Learn more](#)

 Cloudian HyperCloud for Azure (preview)
[Learn more](#)

 Veeam Cloud Connect for the Enterprise (preview)
[Learn more](#)

Azure Database Services

Azure Cosmos DB: Build applications with guaranteed low latency and high availability anywhere, at any scale, or migrate Cassandra, MongoDB, and other NoSQL workloads to the cloud.

Azure SQL Database: Migrate your SQL Server applications, with no code changes, to experience the benefits of a fully managed and intelligent service. Or build for future app growth and scale up to 100 TB with Hyperscale.

SQL Server on VM: Run your SQL Server apps in the cloud with seamless scaling and pay-per-minute pricing or migrate SQL Server or Oracle workloads to the cloud.

Azure Synapse Analytics: Limitless analytics service with unmatched time to insight

Azure Cache for Redis: Power fast, scalable applications with an open-source-compatible in-memory data store.

Table Storage: Rapidly develop with massive semi-structured datasets using a NoSQL key-value store.

Azure Database for MySQL / PostgreSQL / MariaDB: Deliver high availability and elastic scaling to open-source mobile and web apps with a managed NoSQL database service.

Azure Marketplace

See all

Get started

Recently created

AI + Machine Learning

Analytics

Blockchain

Compute

Containers

Databases

Developer Tools

DevOps

Identity

Integration

Internet of Things

Media

Mixed Reality

IT & Management Tools

Networking

Software as a Service (SaaS)


Security


Storage


Web


Featured


See all


 Azure SQL Managed Instance
[Quickstarts + tutorials](#)


 SQL Database
[Quickstarts + tutorials](#)


 Azure Synapse Analytics (formerly SQL DW)
[Quickstarts + tutorials](#)


 Azure Database for MariaDB
[Learn more](#)


 Azure Database for MySQL
[Quickstarts + tutorials](#)

 Azure Database for PostgreSQL
[Quickstarts + tutorials](#)

 Azure Cosmos DB
[Quickstarts + tutorials](#)

 SQL Server 2017 Enterprise Windows Server 2016
[Learn more](#)

 Azure Cache for Redis
[Quickstarts + tutorials](#)

 Azure Database Migration Service
[Learn more](#)

Application hosting in Azure

Application hosting in Azure

Web Apps: HTTP-based service for hosting web applications, REST APIs, and mobile back ends.

Web Apps for Containers: deploy and run containerized applications on Windows and Linux










Function Apps: A managed Function-as-a-Service(FaaS) service.

Logic Apps: Schedule, automate, and orchestrate tasks, business processes, and workflows when you need to integrate apps, data, systems, and services across enterprises or organizations.

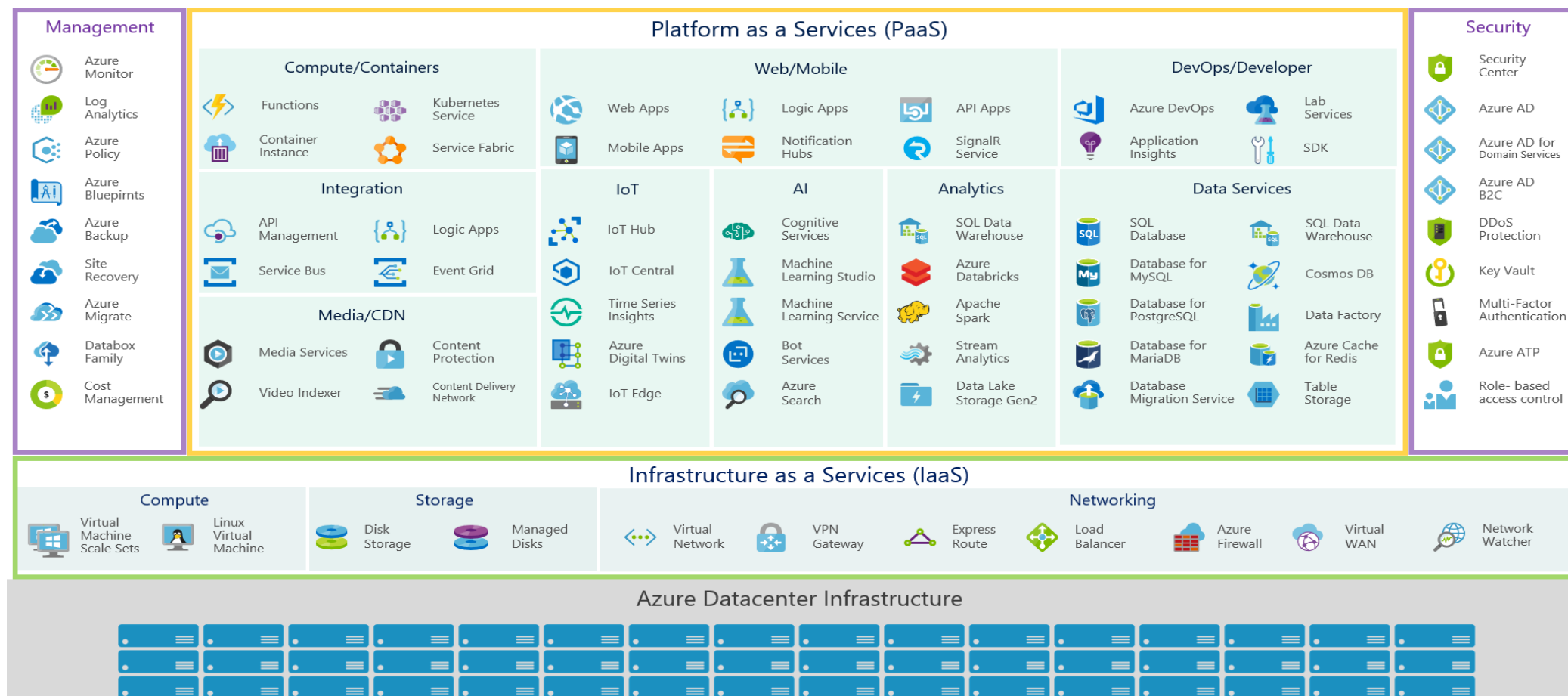
App Service Environments: Fully isolated and dedicated environment for securely running apps at high scale.

Content Delivery Network (CDN): Global CDN solution for delivering high-bandwidth content.

Azure Cognitive Search: AI-powered cloud search service for mobile and web app development

Azure Marketplace See all	Featured See all
Get started	 Web App Quickstarts + tutorials
Recently created	
AI + Machine Learning	 Logic App Quickstarts + tutorials
Analytics	
Blockchain	 App Service Plan Learn more
Compute	
Containers	 App Service Environment Learn more
Databases	
Developer Tools	 API Management Quickstarts + tutorials
DevOps	
Identity	 CDN Quickstarts + tutorials
Integration	
Internet of Things	 Media Services Quickstarts + tutorials
Media	
Mixed Reality	 Azure Cognitive Search Quickstarts + tutorials
IT & Management Tools	
Networking	 ClickCompliance (preview) Learn more
Software as a Service (SaaS)	
Security	

Azure Services



Demo



Azure Pricing Calculator

Billing/Pricing

Pricing for Azure services can be estimated by using the pricing calculator found at <http://azure.microsoft.com/pricing/calculator/>

Your Estimate



Virtual Machines

1 D4 v3 (4 vCPU(s), 16 GB RAM) x 730 H...

\$305.19



Virtual Machines

REGION:

West US

OPERATING SYSTEM:

Windows

TYPE:

(OS Only)

TIER:

Standard

INSTANCE:

D4 v3: 4 vCPU(s), 16 GB RAM, 100 GB Temporary storage, \$0.418/hour

Clone

Delete

More info

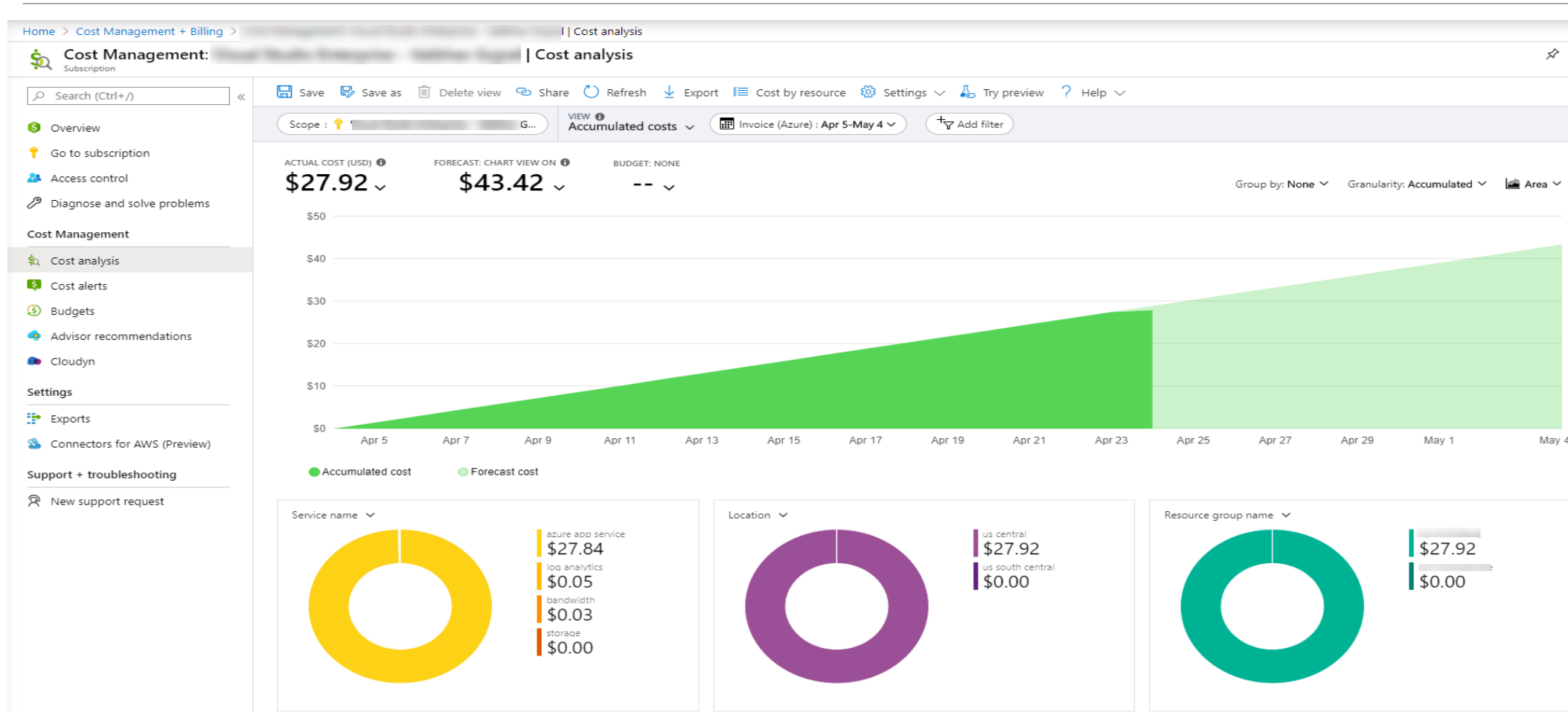
\$ Pricing details

i Product details

Documentation

Azure Cost Management

Azure Cost Management



Azure Cost Management



Accumulated costs

[Check current trend](#)



Cost by resource

[Find expensive resources](#)



Daily costs

[Discover anomalies](#)



Cost by service

[Compare last 3 months](#)



Invoice details

[View last month's invoice](#)

Azure Advisor

The screenshot displays the Azure Advisor dashboard in a web browser. The interface includes a top navigation bar with the Microsoft Azure logo and a search bar. Below this, a left-hand navigation pane lists various categories: Overview, Recommendations (with sub-items like High Availability, Security, Performance, Operational Excellence, Cost, and All recommendations), Monitoring (with Alerts (Preview)), and Settings (with Configuration). The main content area shows a summary of recommendations across five categories, each with a bar chart indicating the number of recommendations by impact level (High, Medium, Low) and the total number of impacted resources.

Category	High Impact	Medium Impact	Low Impact	Total Recommendations	Impacted Resources
High Availability	0	4	0	4	122
Security	20	7	4	31	218
Performance	0	0	0	0	0
Operational Excellence	0	0	1	1	1
Cost	1	2	0	3	14

Additional details visible in the interface include a search bar at the top, a 'Create Advisor Alerts' button, and a 'Subscriptions: 2 of 40 selected' filter. The bottom of the screen shows a Windows taskbar with various application icons and a system clock indicating 7:40 PM on 10/28/2019.

Azure Advisor

Microsoft Azure

Advisor recommendations

Search resources, services and docs

jerryf@contoso.com

MICROSOFT

Advisor recommendations

Download as CSV

Download as PDF

Configure

Subscriptions: 4 of 25 selected

4 subscriptions

All types

Active

No grouping

Overview


High Availability (6)

Security (15)

Performance (0)

Cost (2)

All (23)



Total recommendations

6

Recommendations by impact

High 0

Medium 6

Low 0

Impacted Resources

10

IMPACT	DESCRIPTION	POTENTIAL BENEFITS	IMPACTED RESOURCES	UPDATED AT
Medium	Add more virtual machines for improved fault tolerance	Ensure business continuity through virtual machine resilience	1 Availability set	10/17/2017, 8:26:52 AM
Medium	Add more virtual machines for improved fault tolerance	Ensure business continuity through virtual machine resilience	2 Availability sets (classic)	10/17/2017, 12:17:27 PM
Medium	Enable virtual machine backup to protect your data from corruption and accidental deletion	Improved data resilience and performance	4 Virtual machines	10/17/2017, 12:59:46 PM
Medium	Use availability sets for improved fault tolerance	Ensure business continuity through virtual machine resilience	4 Virtual machines	10/17/2017, 8:26:40 AM
Medium	Use Premium Disks to improve I/O performance	Improved data resilience and performance	5 Virtual machines (classic)	10/17/2017, 12:17:47 PM
Medium	Use availability sets for improved fault tolerance	Ensure business continuity through virtual machine resilience	3 Virtual machines (classic)	10/17/2017, 12:17:27 PM

Demo



Azure Deployment Models

Classic Model - ASM

Azure originally provided only the classic deployment model

Each resource exists independently and cannot be grouped

Each resource had its own life-cycle

All or nothing access management

Support for Service Management APIs

Azure Resource Manager (ARM)

Resource manager provides template based repeatable deployment model for all Azure resources

Within Resource Manager, resources can be grouped, deployed, managed and monitored as a resource group

Reusable/linkable JSON template

Mark one resource dependable on another

Supports tagging of resources

Microsoft recommends all the new Azure resources should be created using ARM

Resource Groups

Under ARM, all the resources are grouped into a Resource Group

All of the resources in a resource group share the same lifecycle

A resource can only be assigned to one group at a time

Most types of resource can be moved to a different resource group at any time

The resources in a resource group can be in different regions

You can use a resource group to control access for the resources therein

Resource Providers

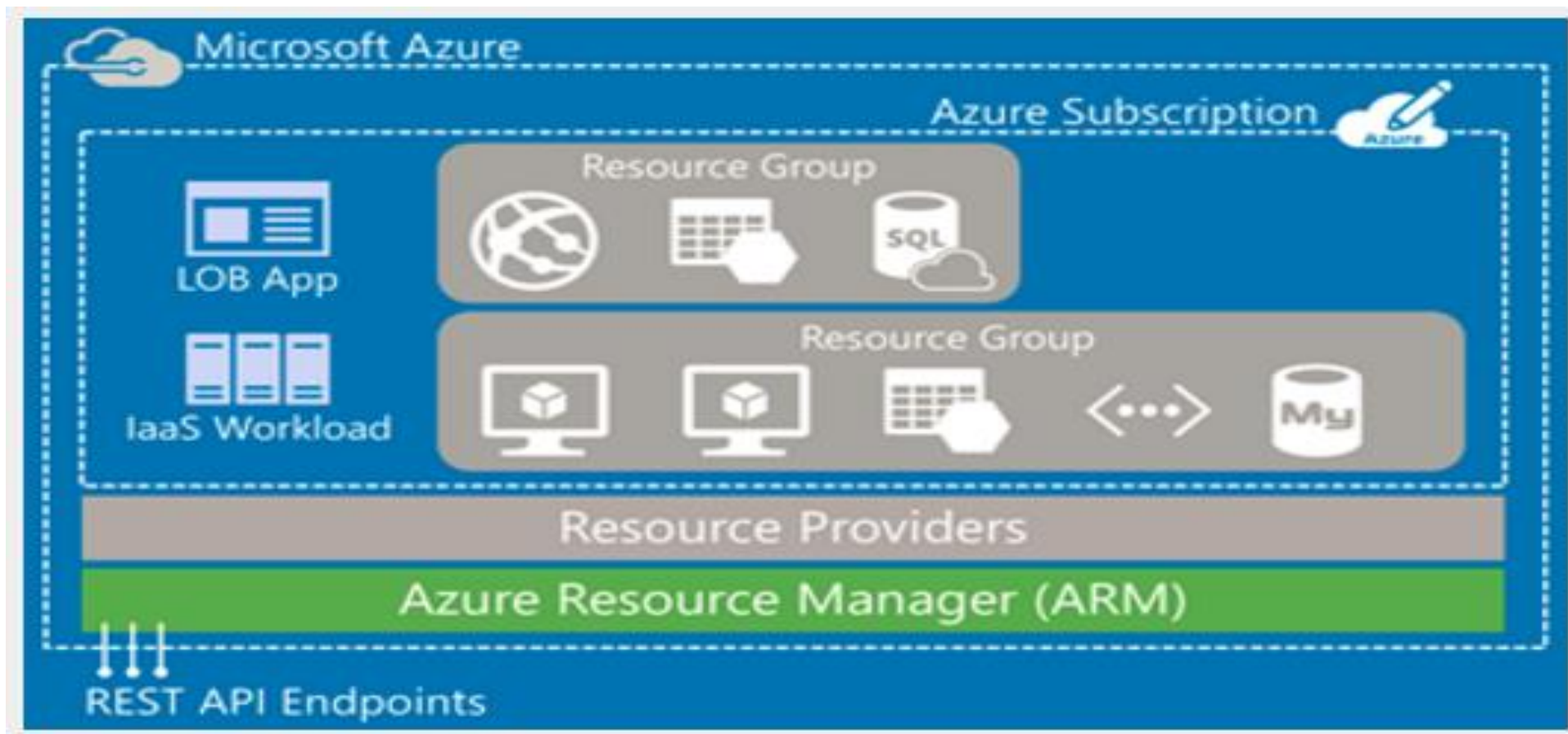
A service that supplies Azure resources.

Resource providers offer a set of resources and operations for working with an Azure service.

- Microsoft.AppService
- Microsoft.AzureActiveDirectory
- Microsoft.Compute
- Microsoft.DocumentDB
- Microsoft.EventHub
- Microsoft.Sql
- Microsoft.Storage
-

A resource provider needs to be registered with your subscription before the resources can be created.

Azure Resource Manager



Resource Manager Template

```
{  
  "$schema": "https://schema.management.azure.com/schemas/2019-04-01/deploymentTemplate.json#",  
  "contentVersion": "",  
  "apiProfile": "",  
  "parameters": {  },  
  "variables": {  },  
  "functions": [  ],  
  "resources": [  ],  
  "outputs": {  }  
}
```


Role based Access Control

Fine-grained control over the operations and scope with which a user can perform an action

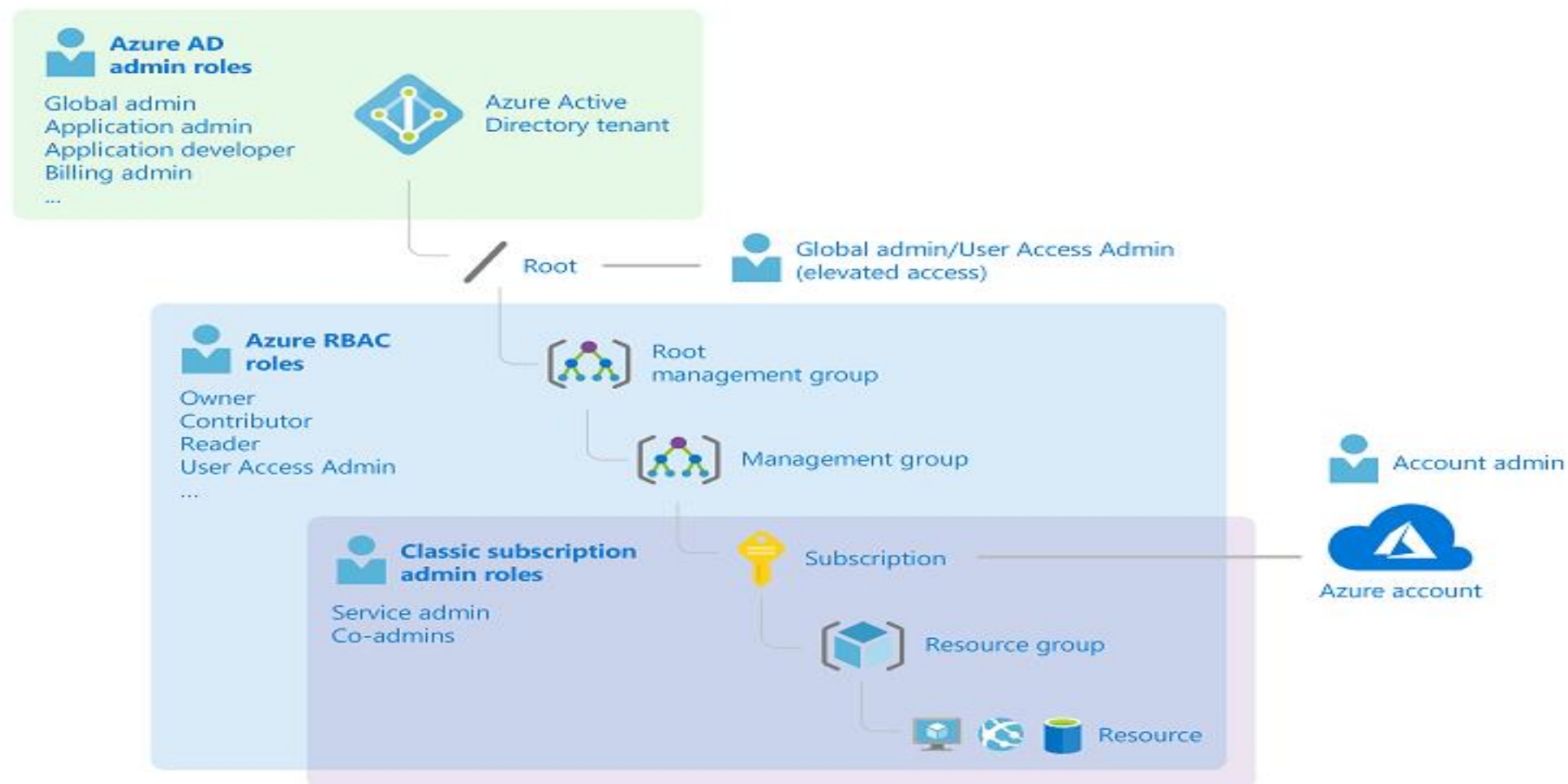
Supported roles-

- Owner
- Reader
- SQL DB contributor
- SQL Security Manager
- Storage Account Contributor
- VM Contributor
- Custom Roles

Applies to any security principal like user, group and service principal

Different roles from Azure Active Directory roles

Role based Access Control



Demo



Azure Management Tools

Azure Management Tools - Overview

Azure Portal

- Full fledged web-based GUI

Azure PowerShell

- AzureRm modules or AZ modules needs to be installed
- PowerShell core is cross platform

Azure CLI

- Cross platform by design
- Az commands

Azure Cloud shell

- Open a shell environment right from azure portal or through <https://shell.azure.com/>

Azure SDKs

Azure Management REST APIs



Azure Standalone Tools

AzCopy – for storage accounts

Azure Storage Explorer – for storage accounts

Azure Data Studio – for databases

Azure SQL Server Management Studio – for SQL databases

Azure Service Bus Explorer – for Service Bus

...

Demo

Resources for further reading



Learning Resources

- Microsoft Azure Documentation - <https://docs.microsoft.com/en-us/azure/>
- Microsoft Learn – <https://docs.microsoft.com/en-us/learn/azure/>
- Azure Architecture Center - <https://docs.microsoft.com/en-us/azure/architecture/>
- Cloud Adoption Framework - <https://azure.microsoft.com/en-us/cloud-adoption-framework/>
- Azure Friday - <https://azure.microsoft.com/en-us/resources/videos/azure-friday/>
- Role-based certifications - <https://www.microsoft.com/en-us/learning/certification-overview.aspx>

thank
you