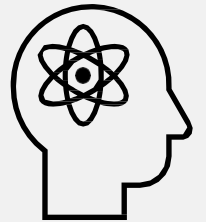


Core Azure Services

Module Outline

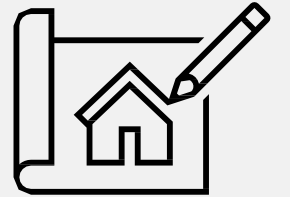


Outline

You will learn the following concepts:

- **Azure Architectural Components**
 - Regions and Availability Zones
 - Subscriptions and Resource Groups
- **Core Azure Resources**
 - Compute
 - Networking
 - Storage
 - Databases

Core Azure architectural components



Core Azure architectural components – Objective Domain

Describe the benefits and usage of:

- Regions and Region Pairs
- Availability Zones
- Azure resources
- Resource Groups
- Azure Resource Manager
- Subscriptions
- Azure Management Groups

Regions

Azure offers more global regions than any other cloud provider with 60+ regions representing over 140 countries



- Regions are made up of one or more datacenters in close proximity.
- Provide flexibility and scale to reduce customer latency.
- Preserve data residency with a comprehensive compliance offering.

Region Pairs

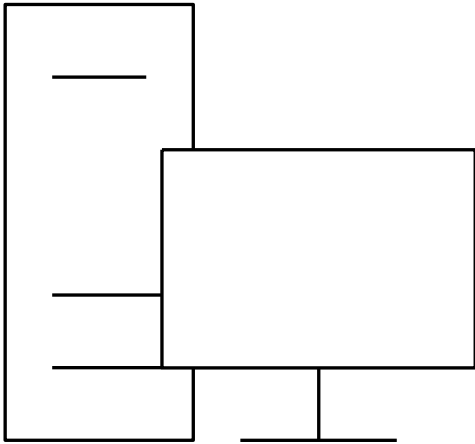
- At least 300 miles of separation between region pairs.
- Automatic replication for some services.
- Prioritized region recovery in the event of outage.
- Updates are rollout sequentially to minimize downtime.

Web Link: <https://aka.ms/PairedRegions>

Region		Region
North Central US		South Central US
East US		West US
West US 2		West Central US
US East 2		Central US
Canada Central		Canada East
North Europe		West Europe
UK West		UK South
Germany Central	↔	Germany Northeast
South East Asia		East Asia
East China		North China
Japan East		Japan West
Australia Southeast		Australia East
India South		India Central
Brazil South (Primary)		South Central US

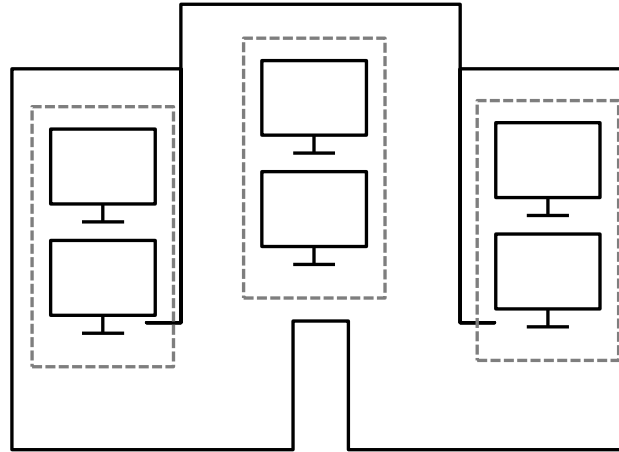
Availability Options

VM SLA
99.9% with Premium Storage



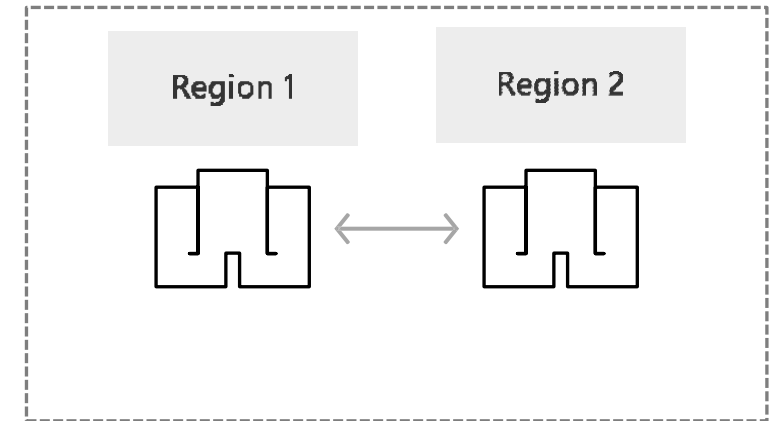
SINGLE VM
Easier lift and shift

VM SLA
99.99%



AVAILABILITY ZONES
Protection from entire datacenter failures

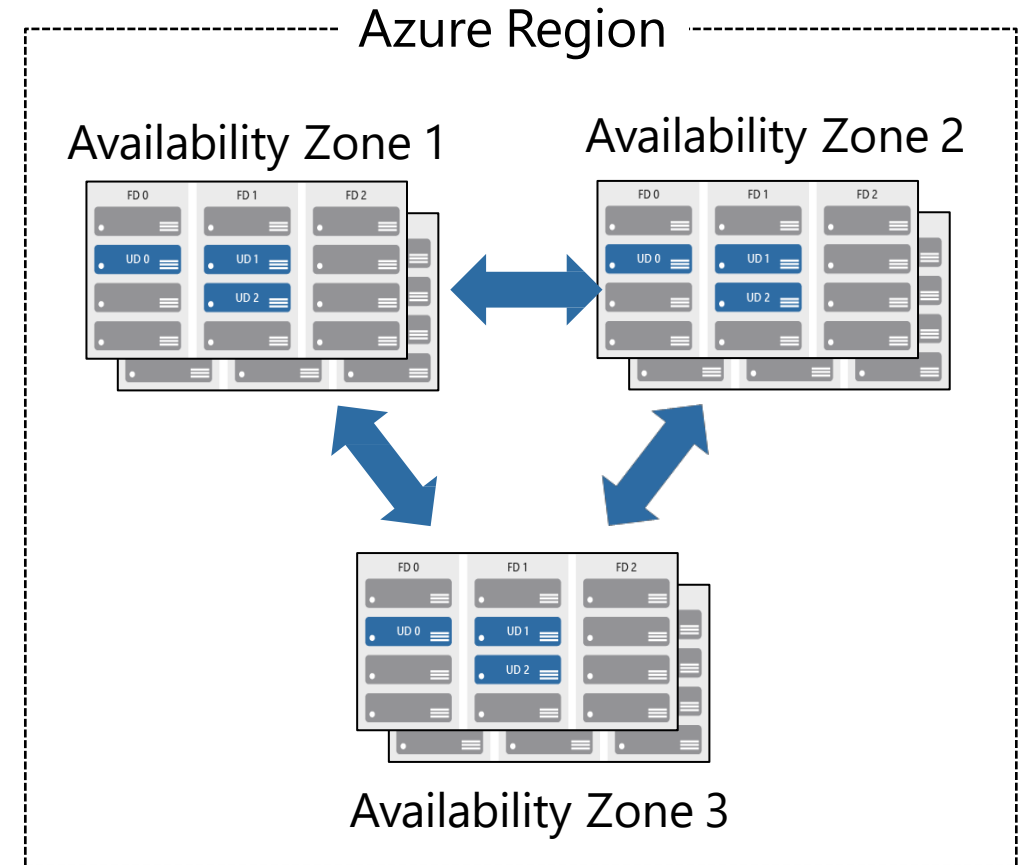
MULTI REGION DISASTER RECOVERY



REGION PAIRS
Regional protection within Data Residency Boundaries

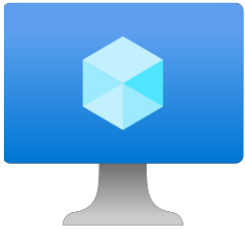
Availability zones

- Provide protection against downtime due to datacenter failure.
- Physically separate datacenters within the same region.
- Each datacenter is equipped with independent power, cooling, and networking.
- Connected through private fiber-optic networks.



Azure Resources

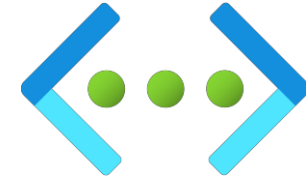
Azure **resources** are components like storage, virtual machines, and networks that are available to build cloud solutions.



Virtual Machines



Storage Accounts



Virtual Networks



App Services



SQL Databases

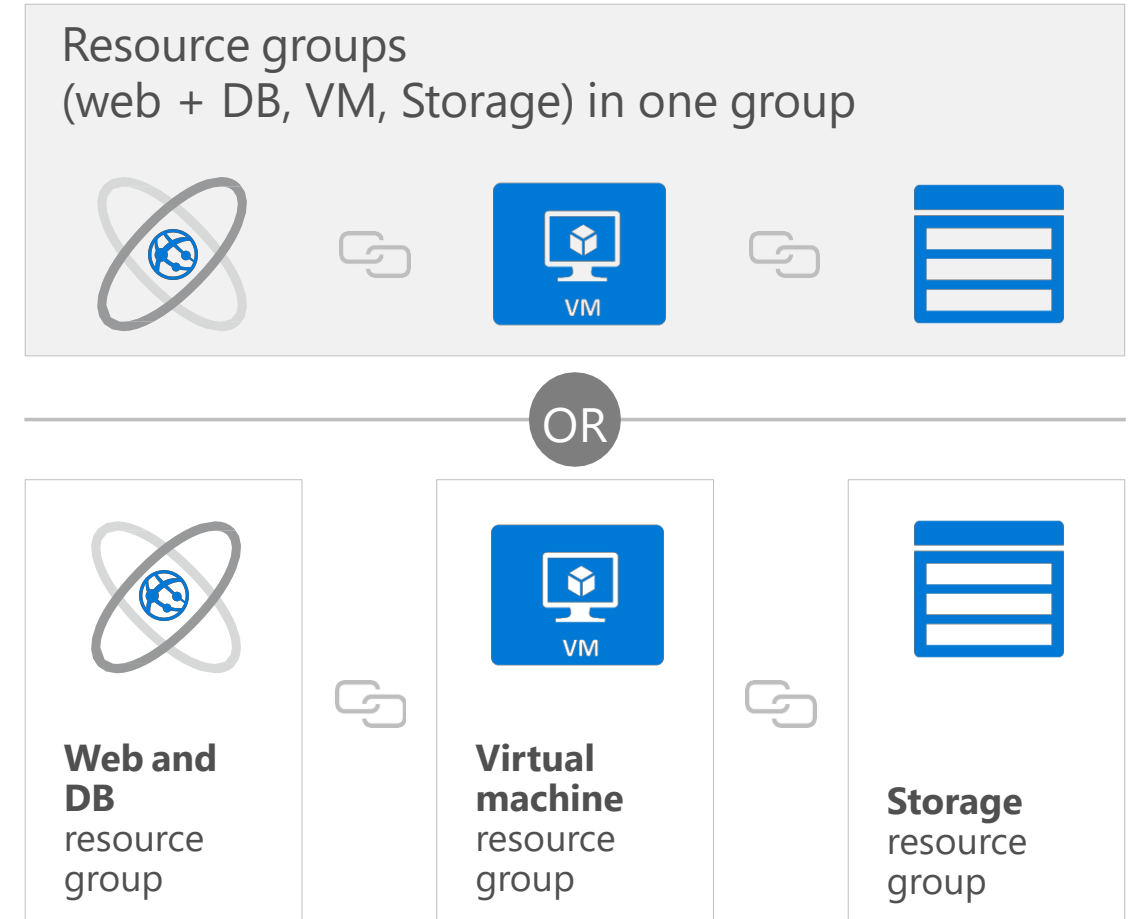


Functions

Resource groups

A **resource group** is a container to manage and aggregate resources in a single unit.

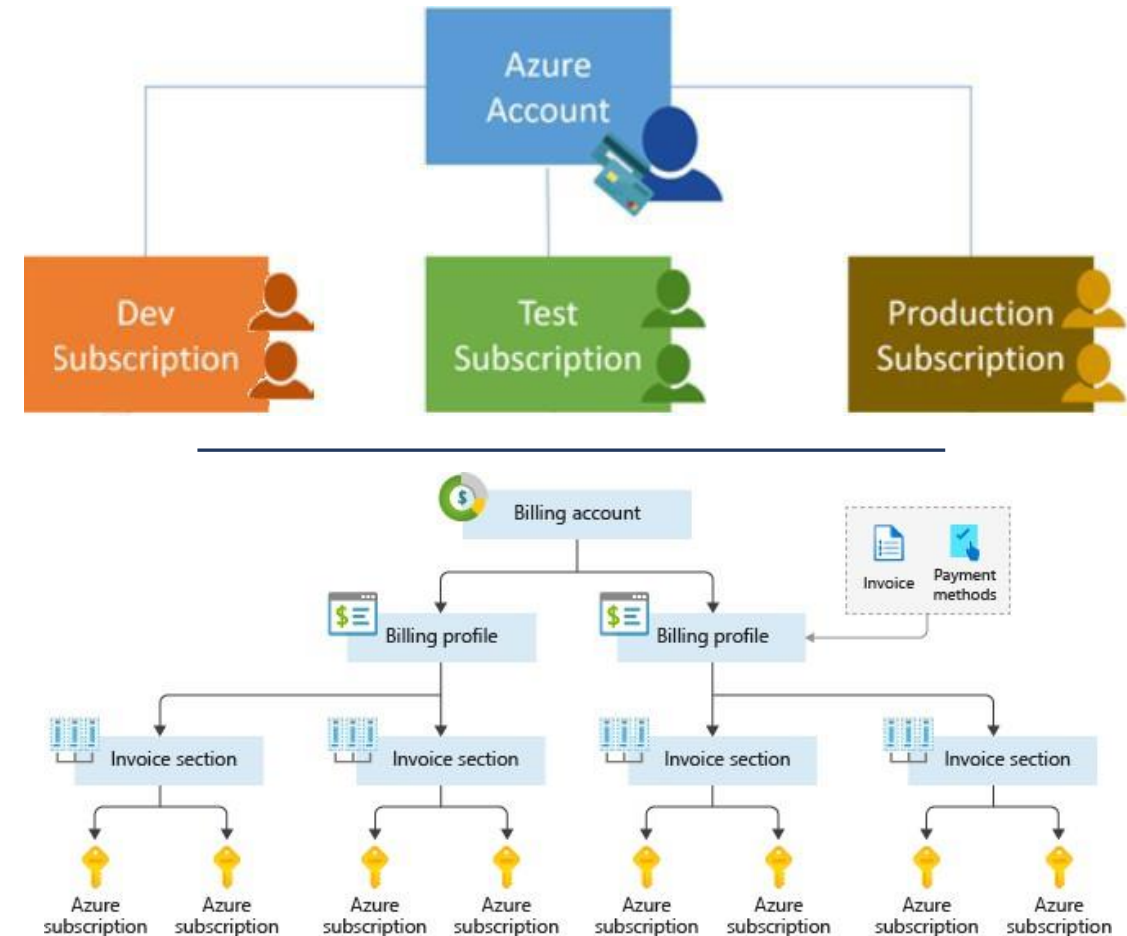
- Resources can exist in only one resource group.
- Resources can exist in different regions.
- Resources can be moved to different resource groups.
- Applications can utilize multiple resource groups.



Azure Subscriptions

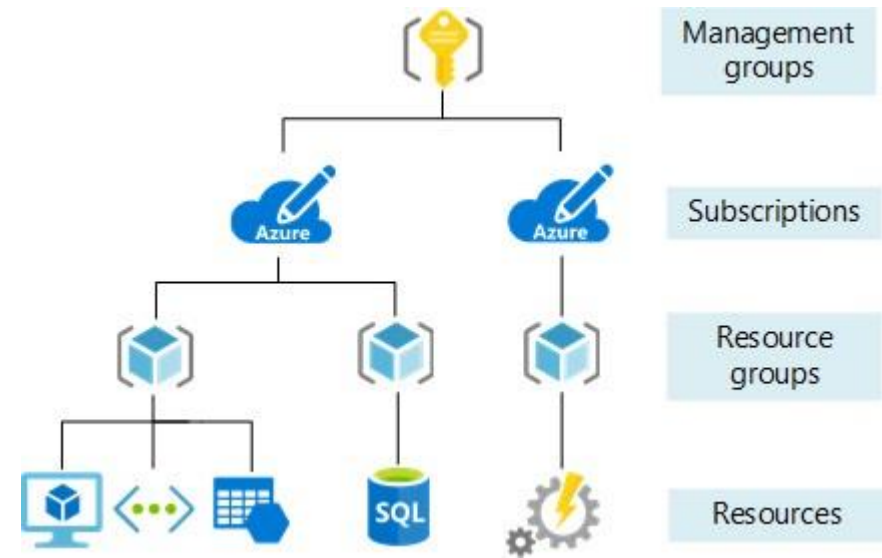
An Azure subscription provides you with authenticated and authorized access to Azure accounts.

- **Billing boundary:** generate separate billing reports and invoices for each subscription.
- **Access control boundary:** manage and control access to the resources that users can provision with specific subscriptions.

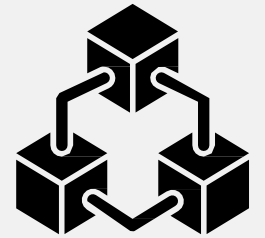


Management Groups

- Management groups can include multiple Azure subscriptions.
- Subscriptions inherit conditions applied to the management group.
- 10,000 management groups can be supported in a single directory.

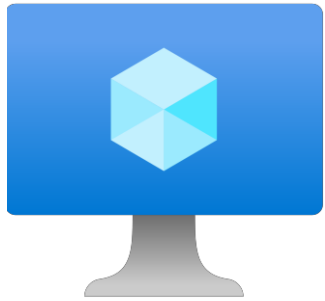


Core Azure workload products



Azure compute services

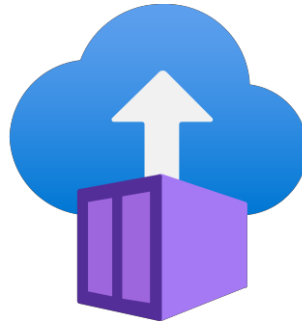
Azure **compute** is an on-demand computing service that provides computing resources such as disks, processors, memory, networking, and operating systems.



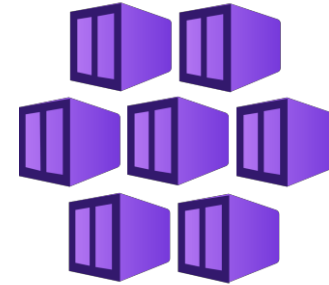
Virtual
Machines



App
Services



Container
Instances



Azure Kubernetes
Services (AKS)

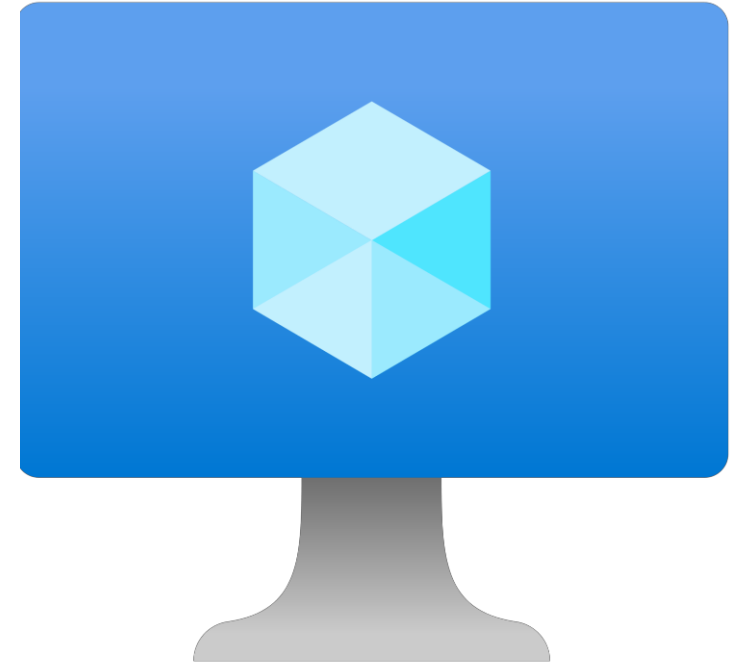


Windows Virtual
Machines

Azure virtual machines

Azure **Virtual Machines (VM)** are software emulations of physical computers.

- Includes virtual processor, memory, storage, and networking.
- IaaS offering that provides total control and customization.



Azure App Services

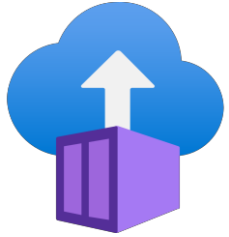


Azure **App Services** is a fully managed platform to build, deploy, and scale web apps and APIs quickly.

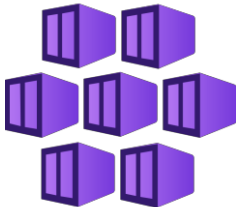
- Works with .Net, .NetC Core, Node.js, Java, Python, or php.
- PaaS offering with enterprise-grade performance, security, and compliance requirements.

Azure Container Services

Azure **Containers** are a light-weight, virtualized environment that does not require operating system management, and can respond to changes on demand.



Azure Container Instances: a PaaS offering that runs a container in Azure without the need to manage a virtual machine or additional services.



Azure Kubernetes Service: an orchestration service for containers with distributed architectures and large volumes of containers.

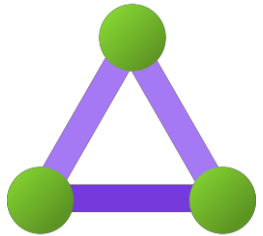
Azure networking services



Azure Virtual Network (VNet) enables Azure resources to communicate with each other, the internet, and on premises networks.



Virtual Private Network Gateway (VPN) is used to send encrypted traffic between an Azure virtual network and an on premises location over the public internet.

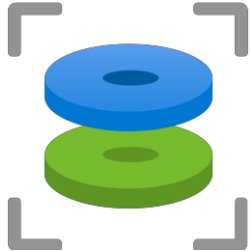


Azure Express Route extends on premises networks into Azure over a private connection that is facilitated by a connectivity provider.

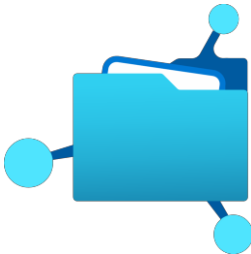
Azure storage services



Container storage (blob) is optimized for storing massive amounts of unstructured data, such as text or binary data.


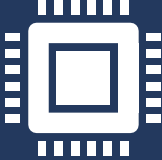



Disk storage provides disks for virtual machines, applications, and other services to access and use.



Azure Files sets up a highly available network file shares that can be accessed by using the standard Server Message Block (SMB) protocol.

Azure storage access tiers

 Hot	 Cool	 Archive
Optimized for storing data that is accessed frequently.	Optimized for storing data that is infrequently accessed and stored for at least 30 days.	Optimized for storing data that is rarely accessed and stored for at least 180 days with flexible latency requirements.

You can switch between these access tiers at any time.

Azure database services



Azure Cosmos Database is a globally distributed database service that elastically and independently scales throughput and storage.



Azure SQL Database is a relational database as a service (DaaS) based on the latest stable version of the Microsoft SQL Server database engine.



Azure Database for MySQL is a fully managed MySQL database service for app developers.



Azure Database for PostgreSQL is a relational database service based on the open source Postgres database engine.

Azure SQL Managed Instance

Azure SQL Managed Instance allows existing SQL Server customers to lift and shift their on-premises applications to the cloud with minimal application and database changes.

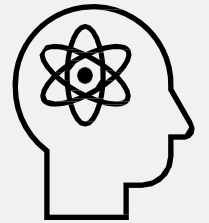
- Fully managed and evergreen platform as a service.
- Preserves all PaaS capabilities (automatic patching and version updates, automated backups, and high availability)
- Exchange existing licenses for discounted rates on SQL Managed Instance using the Azure Hybrid Benefit





Azure Solutions and Management Tools

Module Outline

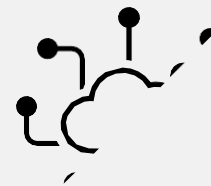


Outline

You will learn the following concepts:

- **Core Azure solutions**
 - IoT to Azure Sphere
 - Synapse Analytics to Databricks
 - AI / ML
- **Azure management tools**
 - Portal, PowerShell, CLI, and others
 - Advisor, Monitor, and Service Health

Azure solutions



Azure Solutions - Objective Domain

Describe the benefits and usage of:

- Internet of Things (IoT) Hub, IoT Central, and Azure Sphere
- Azure Synapse Analytics, HDInsight, and Azure Databricks
- Azure Machine Learning, Cognitive Services, and Azure Bot Service
- Serverless computing solutions that include Azure Functions and Logic Apps
- Azure DevOps, GitHub, GitHub Actions, and Azure DevTest Labs

Azure Internet of Things

Internet of Things (IoT) is the ability for devices to garner and then relay information for data analysis.



Azure IoT Central is a fully managed global IoT SaaS solution that makes it easy to connect, monitor, and manage IoT assets at scale.



Azure IoT Hub is a managed service hosted in the cloud that acts as a central message hub for bi-directional communication between IoT applications and the devices it manages.



Azure Sphere is a secured, high-level application platform with built-in communication and security features for internet-connected devices.

Big data and analytics

Azure Synapse Analytics



A cloud based Enterprise Data Warehouse.

Azure HDInsight



A fully managed, open source analytics service for enterprises.

Azure Databricks



Apache Spark based analytics service.

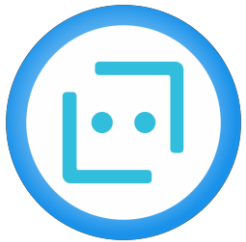
Artificial Intelligence & Machine Learning



Azure Machine Learning: cloud based to develop, train, and deploy machine learning models.



Cognitive Services: quickly enable apps to see, hear, speak, understand, and interpret a user's needs.



Azure Bot Service: develop intelligent, enterprise grade bots.

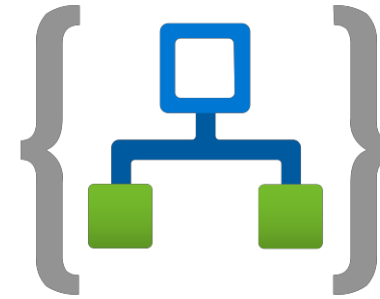
Serverless Computing

Azure Functions



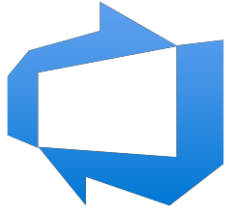
Event based code running your service and not the underlying infrastructure.

Azure Logic Apps



Automate and orchestrate tasks, business processes, and workflows to integrate apps.

Develop your apps with DevOps and GitHub



Azure DevOps: development collaboration tools including pipelines, Kanban boards, and automated cloud based load testing.



GitHub: software development hosting with version control, source code management, and bug/task management.

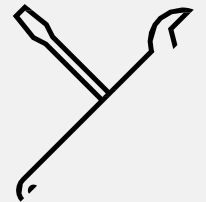


GitHub Actions for Azure: automate software workflow to build, test, and deploy from within GitHub.



Azure DevTest Labs: quickly create environments in Azure while minimizing waste and controlling cost.

Azure management tools

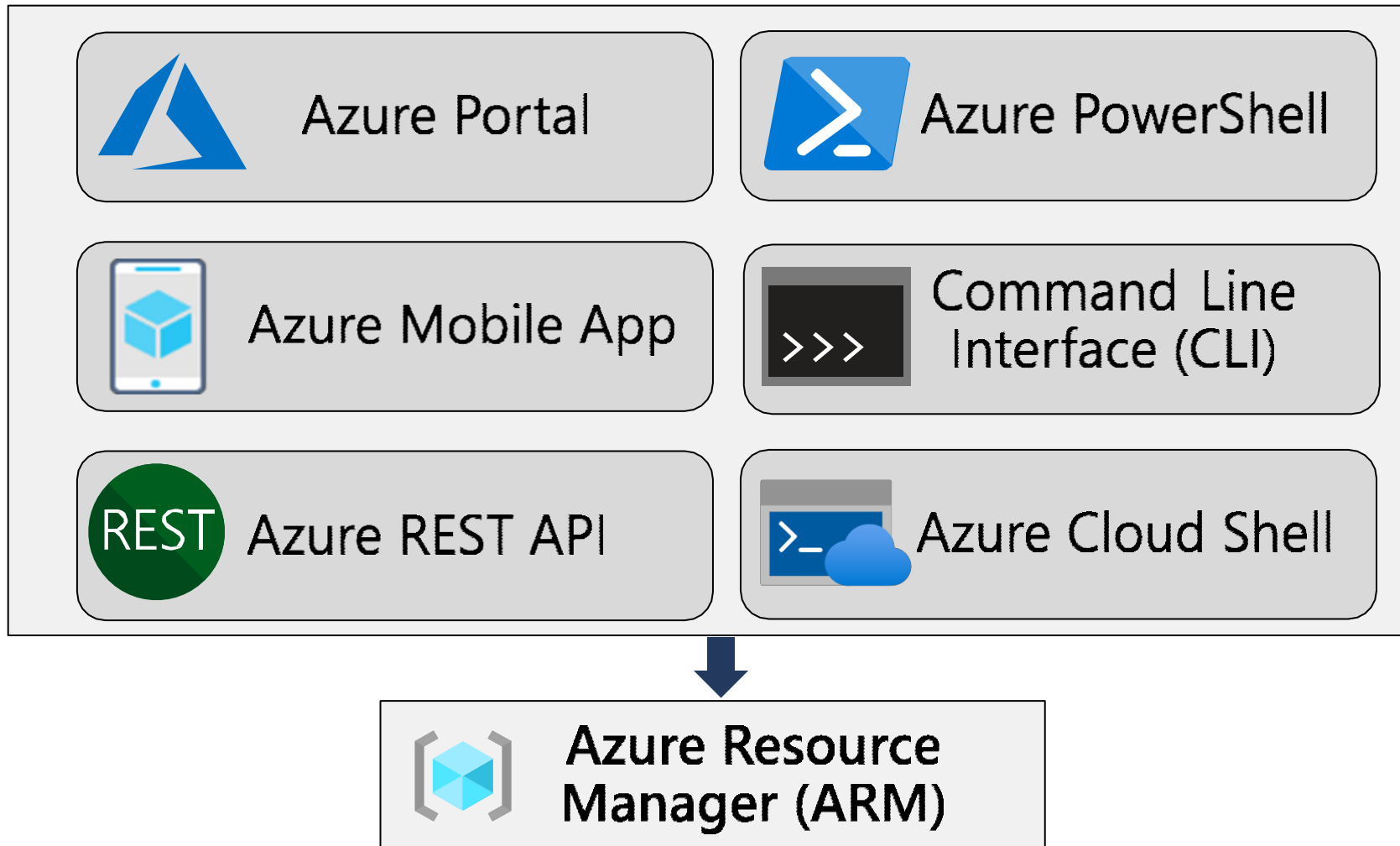


Azure Management Tools - Objective Domain

Describe the functionality and usage of:

- Azure Portal, Azure PowerShell, Azure CLI, Cloud Shell, and Azure Mobile App.
- Azure Advisor.
- Azure Resource Manager (ARM) templates.
- Azure Monitor.
- Azure Service Health.

Azure management tools

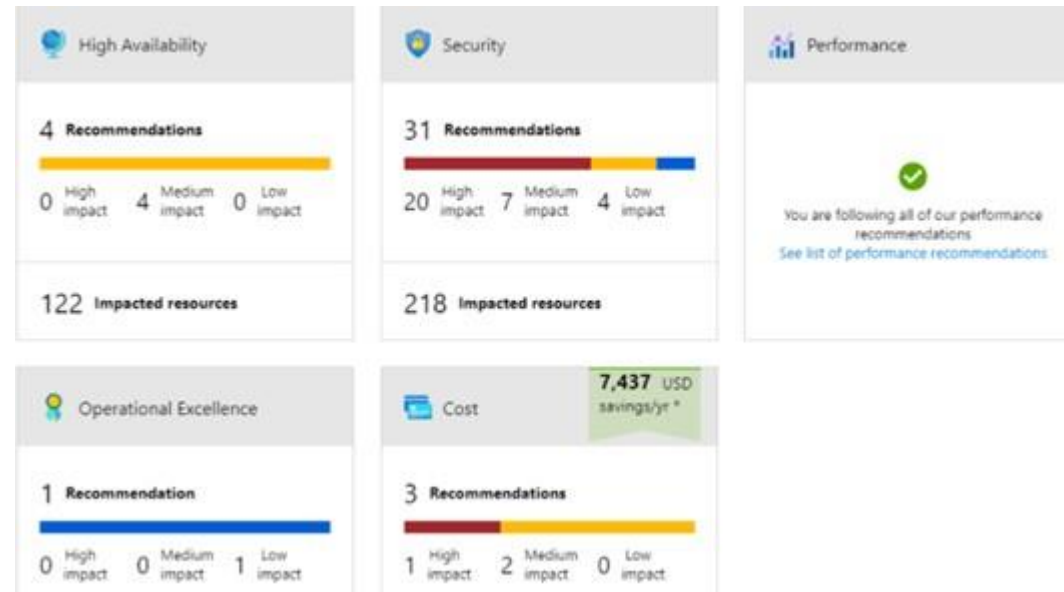


Azure Advisor



Azure Advisor analyzes deployed Azure resources and makes recommendations based on best practices to optimize Azure deployments.

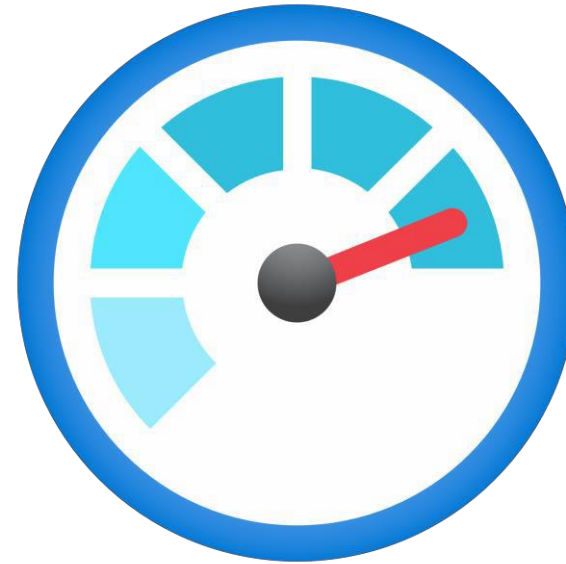
- Reliability
- Security
- Performance
- Cost
- Operational Excellence



Azure Monitor

Azure Monitor maximizes the availability and performance of applications and services by collecting, analyzing, and acting on telemetry from cloud and on-premises environments.

- Application Insights
- Log Analytics
- Smart Alerts
- Automation Actions
- Customized Dashboards



Azure Service Health

Microsoft Azure

Search resources, services, and docs (G+/)

Home

Service Health | Service issues

Search (Ctrl+/)

Save View Delete View Add service health alert

ACTIVE EVENTS

Service issues (4)

Planned maintenance (3)

Health advisories (5)

Security advisories (1)

HISTORY

Health history

RESOURCE HEALTH

Resource health

ALERTS

Health alerts

Subscription

28 selected

Region

28 selected

Service

170 selected

Issue Name	Tracking ID	Service(s)	Region(s)	Start Time	Updated
Availability issues – Storage	DTTL-HP8	Storage	West US, West US 2	2020-06-24T00:00:00Z (6 days ago)	3 hours ago
Allocation Failures – Virtual Machi...	TTTL-H90	SQL Database:Virtual...	East US, West Central...	2020-06-24T00:00:00Z (6 days ago)	3 hours ago

No permissions to read Service Health events for 22 subscription(s). To view Service Health events, users must have the reader role on a subscription. See 2 service issue(s) outside of your filter.

Service issue : Availability issues – Storage

Summary Potential impact Issue updates

Tracking ID

DTTL-HP8

Share the below link with your team or use it for reference in your problem management system

https://app.azure.com/h/DTTL-HP8/76c813

Impacted service(s)

Storage

Impacted region(s)

West US; West US 2

Impacted subscription(s)

Last update (3 hours ago)

Customers may have experience difficulties connecting to resources hosted in Central India. A number of Storage and Compute scale units had gone offline, impacting Virtual Machines and other Azure services with dependencies on these.

See all updates

Potential impact

60 resource(s) in 1 subscription(s)

View details

Download the issue summary as a PDF.

Request root cause

Track this issue on mobile.

Quickly connect with our problem-solving experts. Tweet @AzureSupport

Contact Azure Support if you need additional help with this issue. Create a support request

Was this helpful?



Evaluate the impact of Azure service issues with personalized guidance and support, notifications, and issue resolution updates.

Azure Service Health

Azure Service Health provides a personalized view of the health of Azure services and the regions being used.

- Communication regarding outages
- Planned maintenance
- Other health advisories

Microsoft Azure	Health Advisory Summary	2020-08-22T19:43:35Z
Title:	We have important information regarding your ExpressRoute service	
Tracking ID:	PLWN-F80	
Event type:	Health Advisory	
Status:	Ongoing as of 2020-08-22T19:43:34Z	
Service(s):	ExpressRoute \ ExpressRoute Circuits	
Region(s):	Australia Central, Australia Central 2, Australia East, Australia Southeast, Brazil South, Canada Central, Canada East, Central India, Central US, Central US EUAP, East Asia, East US, East US 2, East US 2 EUAP, France Central, France South, Germany North, Germany West Central, Global, Japan East, Japan West, Korea Central, Korea South, North Central US, North Europe, South Africa North, South Africa West, South Central US, Southeast Asia, South India, Switzerland North, Switzerland West, UAE Central, UAE North, UK South, UK West, West Central US, West Europe, West India, West US, West US 2	
Start time:	2020-08-18T00:00:00Z	
Resolve time:	Ongoing as of 2020-08-22T19:43:34Z	
Last update time:	2020-08-19T07:19:29Z	
Impacted subscriptions:	5733bcb3-7fde-4caf-8629-41dc15e3b352 (Contoso Hotels)	

Azure Resource Manager (ARM) templates

Azure Resource Manager (ARM) templates are JavaScript Object Notation (JSON) files that can be used to create and deploy Azure infrastructure without having to write programming commands.

- Declarative syntax
- Repeatable results
- Orchestration
- Modular files
- Built-in validation
- Exportable code

