

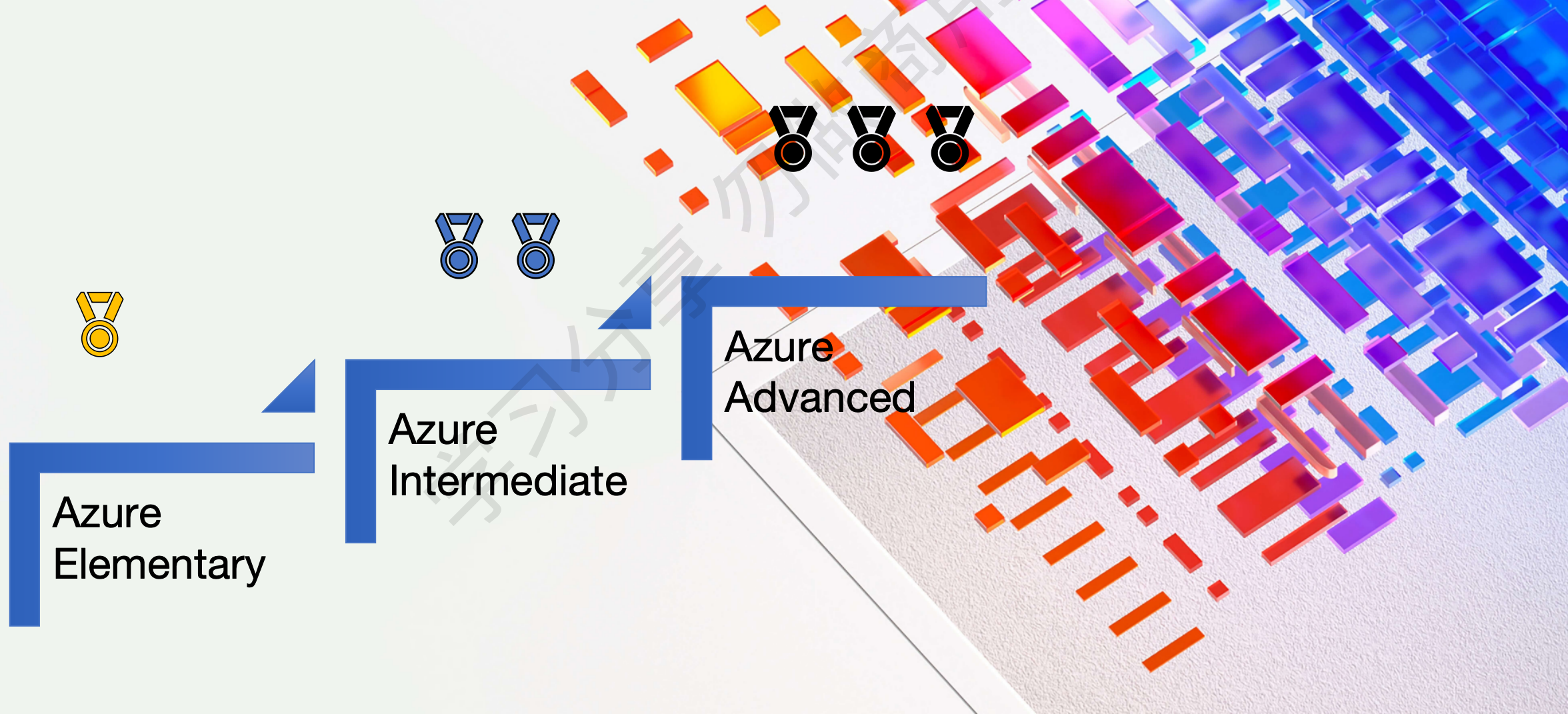
# Azure Elementary

Presenter: Qian Yun





# Siemens Azure Training Series





# Azure Elementary

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Understand Cloud Concepts

---

Azure Introduction

---

Azure Portal & Azure Cloud Shell

---

Azure Core Services - Compute

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Azure Core Services - Networking

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Azure Core Services - Storage

---

More on Azure Core Services

---

Hands-on 1:Virtual Machine

---

Databricks & Synapse Analytics

---

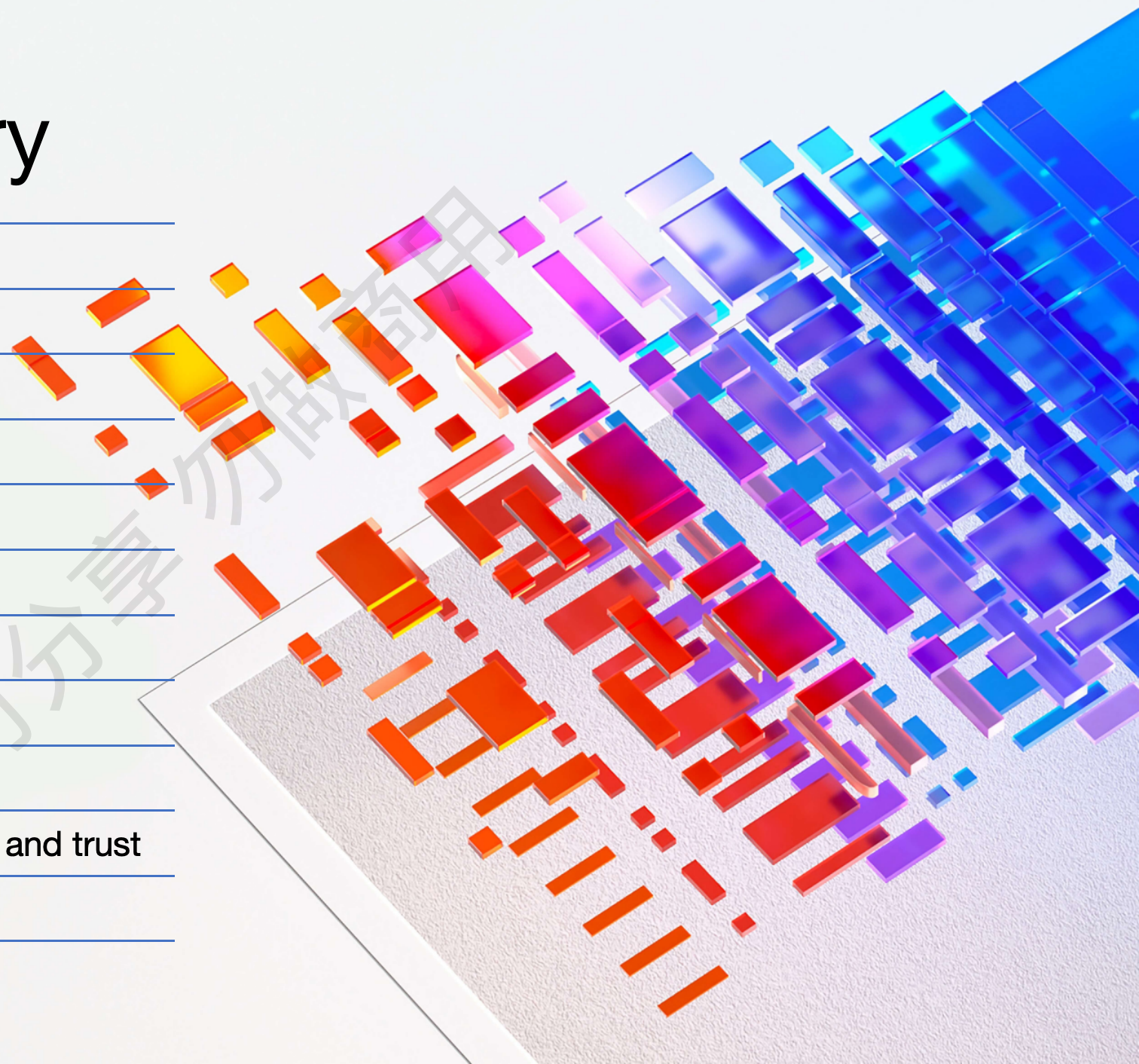
Understand security, privacy, compliance, and trust

---

Optimize Spending & Technical support

---

Hands-on 2:App Service





# Azure Intermediate

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Introduction

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Azure Portal and Cloud Shell

---

Work with Azure Virtual Machines

---

Work with Azure Storage

---

Work with Azure Networking

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VM Availability

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Interconnectivity

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Azure Monitoring

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Data Protection

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Network Traffic Management

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Azure Active Directory

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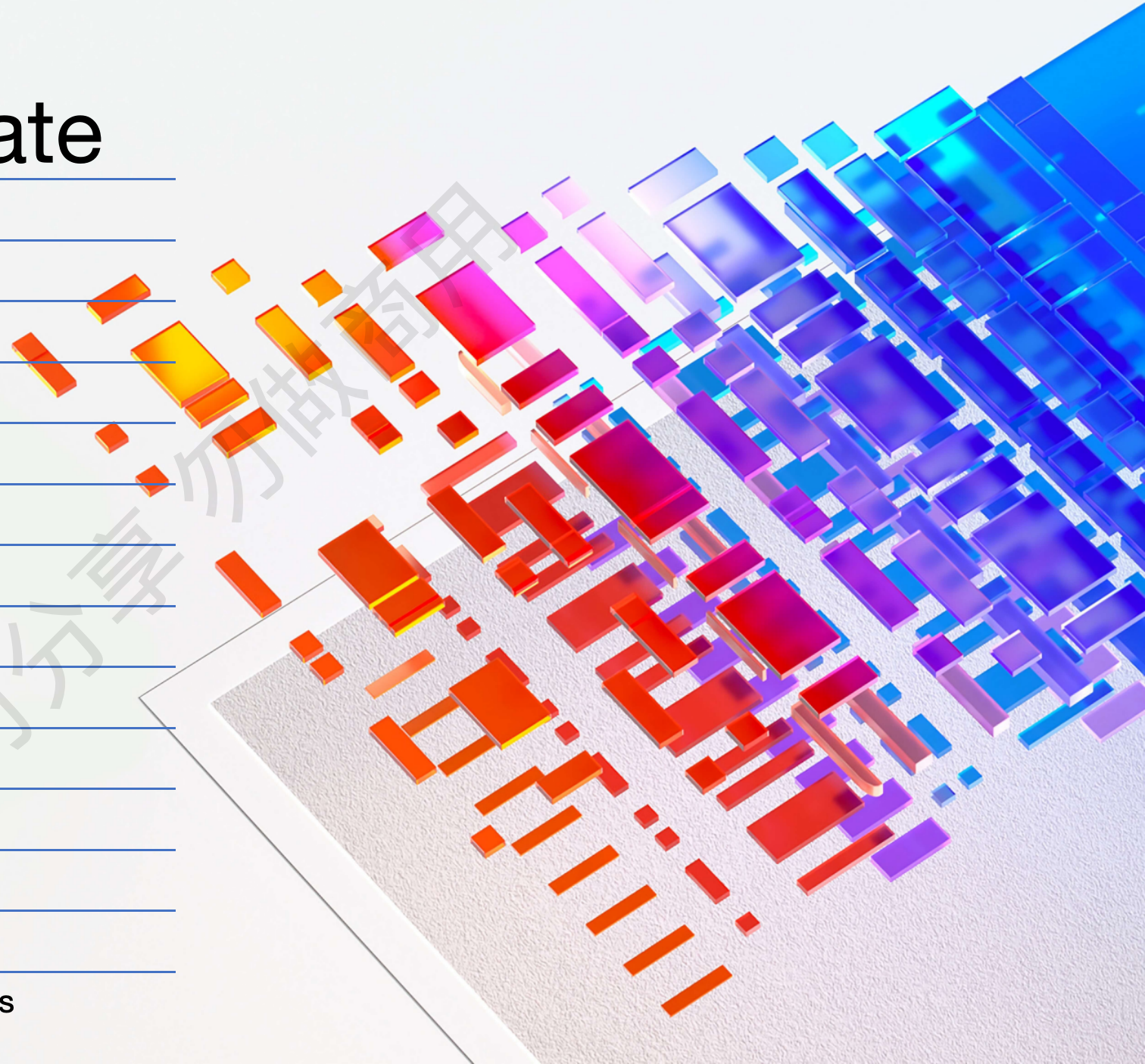
Governance and Compliance

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Data Services

---

Serverless Computing and Container Services





# Azure Advanced

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Mastering Virtual Machines

---

Azure Batch Services

---

Containerized Solutions

---

Azure App Service

---

Mobile Apps

---

API App

---

Function App

---

Azure Storage Accounts

---

CosmosDB

---

SQL Database

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Blob Containers

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Azure Authentication

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Azure Access Control

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Secure Data

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Scaling Apps and Services

---

Caching and Content Delivery Networks

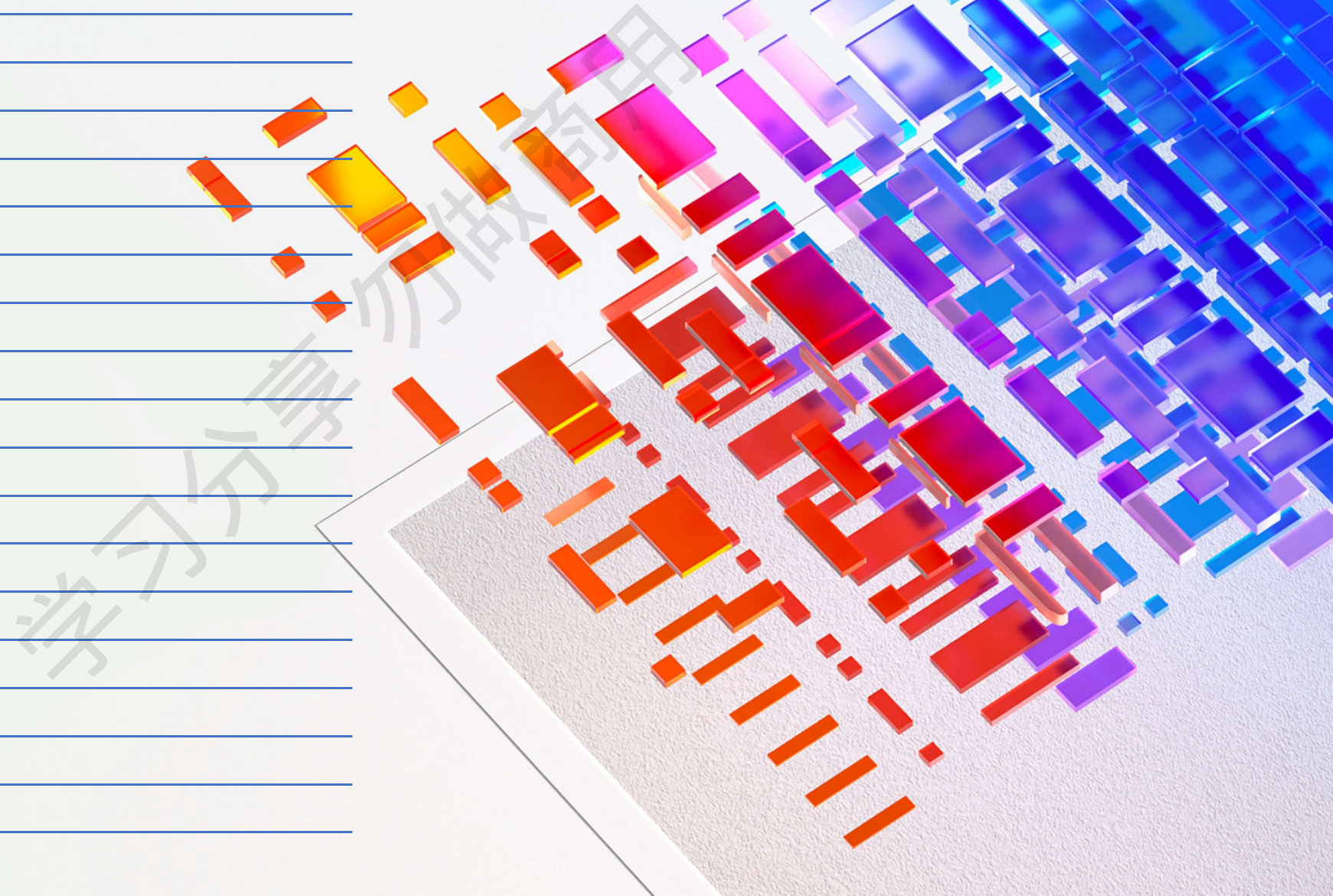
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Monitoring and Logging

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Consuming Azure Services

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# Agenda for Azure Elementary

## Day 1

AM

Azure Introduction

Azure Portal & Azure Cloud Shell

Azure Core Services - Compute

PM

Azure Core Services – Networking

Azure Core Services - Storage

More on Azure Core Services

Hands-on 1: Virtual Machine

## Day 2

Databricks & Synapse Analytics

Understand security, privacy, compliance, and trust

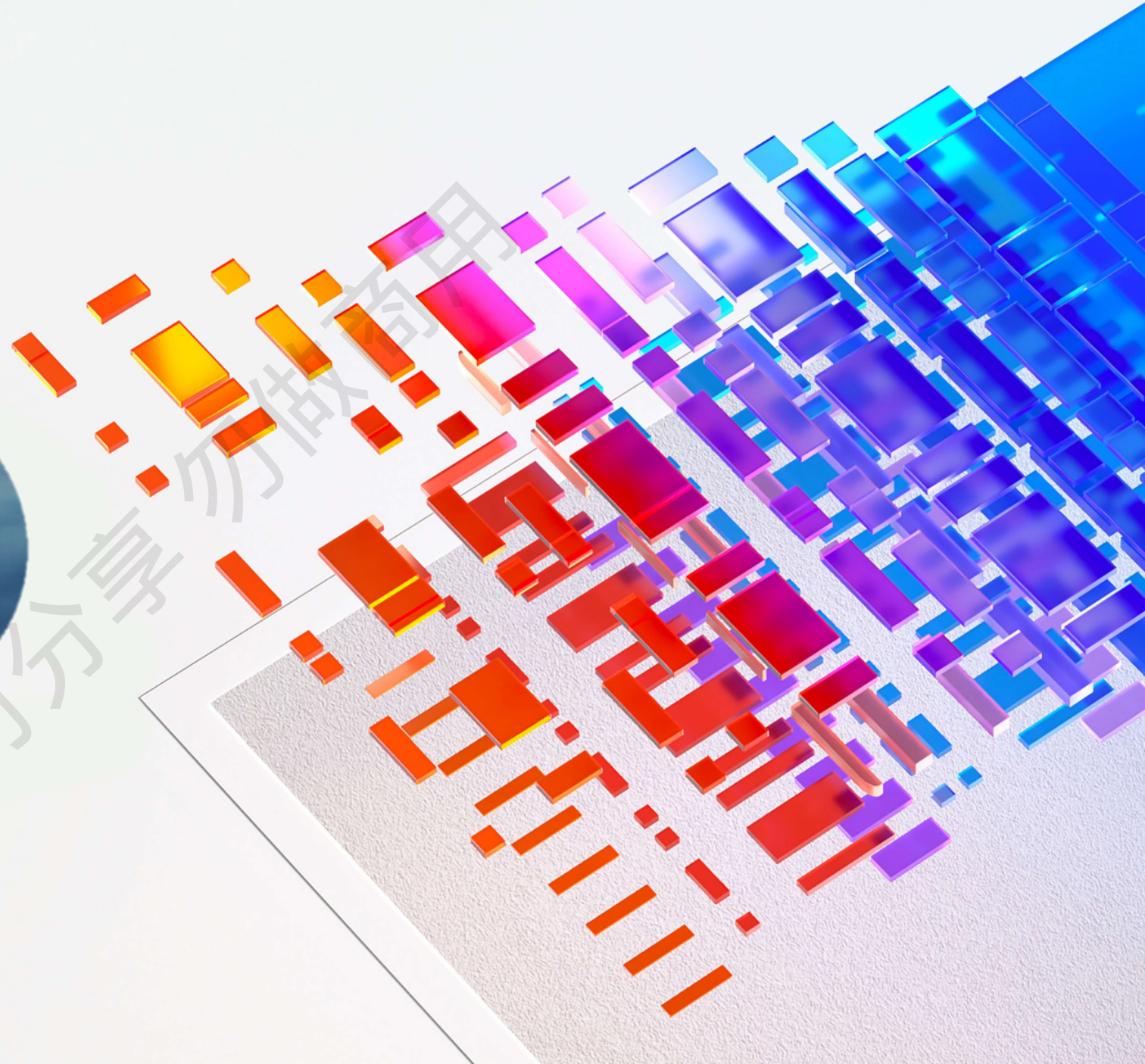
Optimize Spending & Technical support

Hands-on 2: App Service



# Cloud Concepts

**Understand principles of cloud computing**



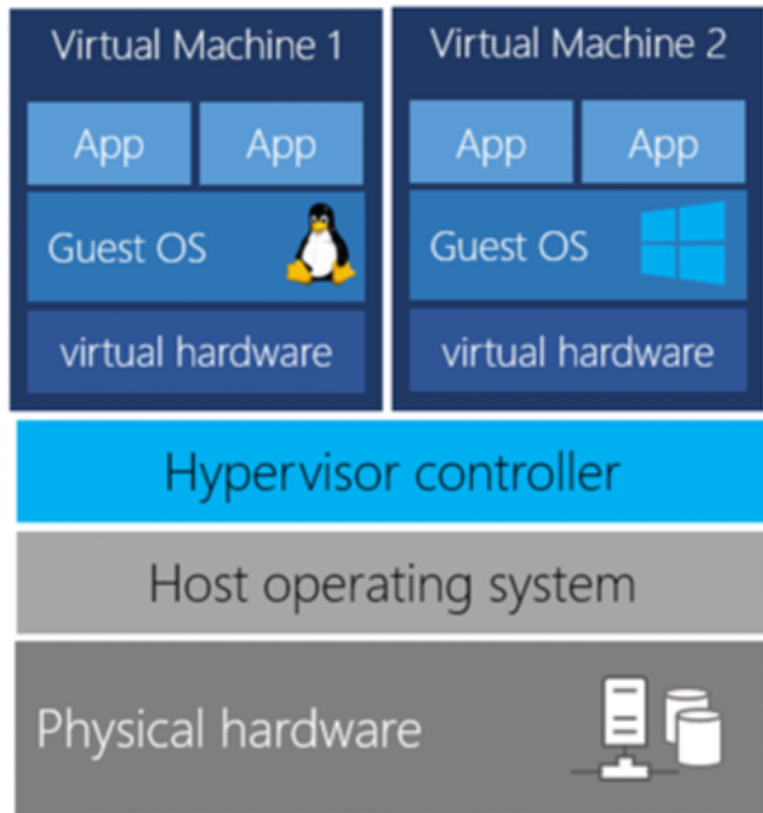
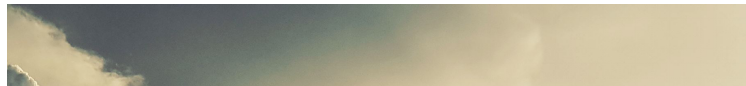
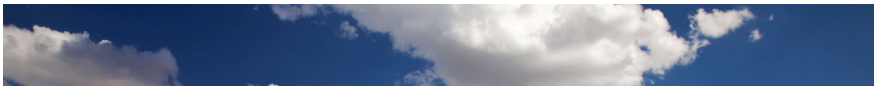


# Module Objectives

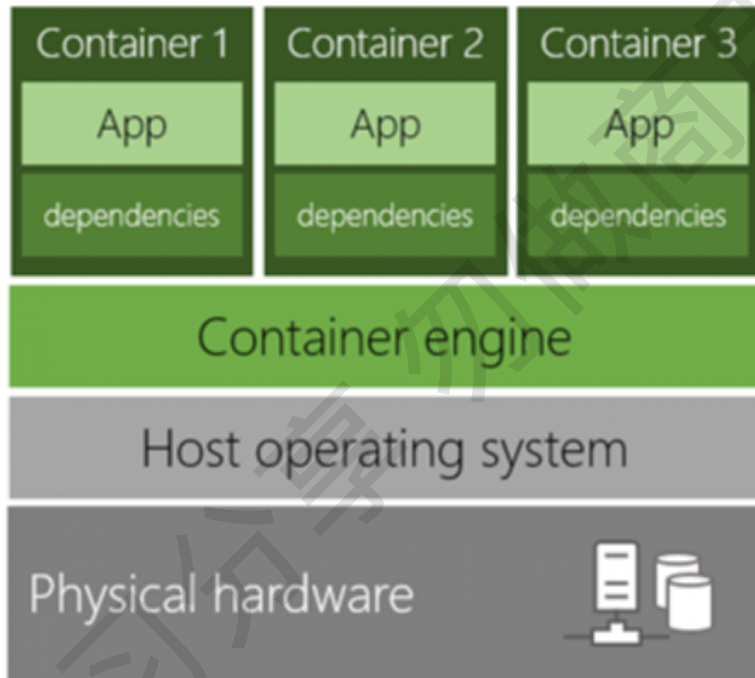
- Explore common cloud computing services

- Explore the benefits of cloud computing

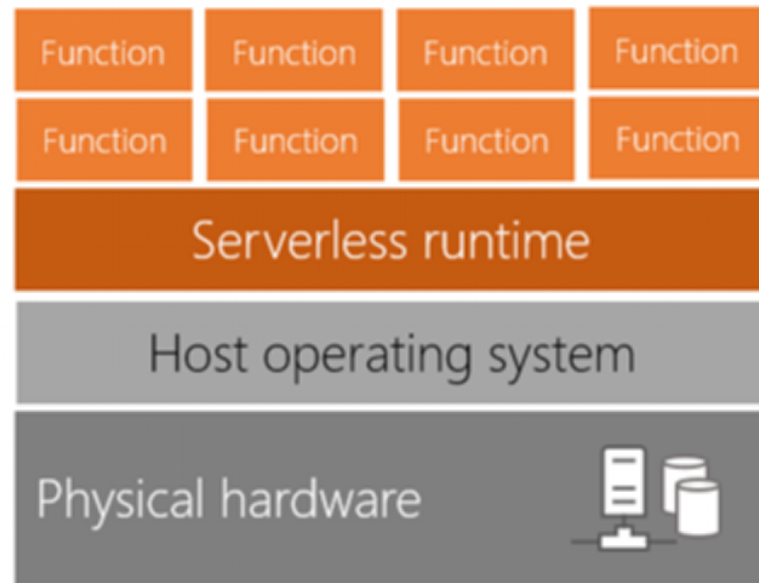
- Decide which cloud deployment model is best for you



Virtual machines



Containers



Serverless





# Benefits of cloud computing



**Cost-effective**

**Salable**

**Elastic**

**Current**

**Reliable**

**Global**

**Secure**

# Benefits of cloud computing

## Rapid Time to Market

*"I deployed my application in five minutes."*

## Fractional IT Consumption

*"I use and pay for just what I need only when I need it."*

## One-Click Simplicity

*"No more time spent on low-level infrastructure management."*

## Continuous Innovation

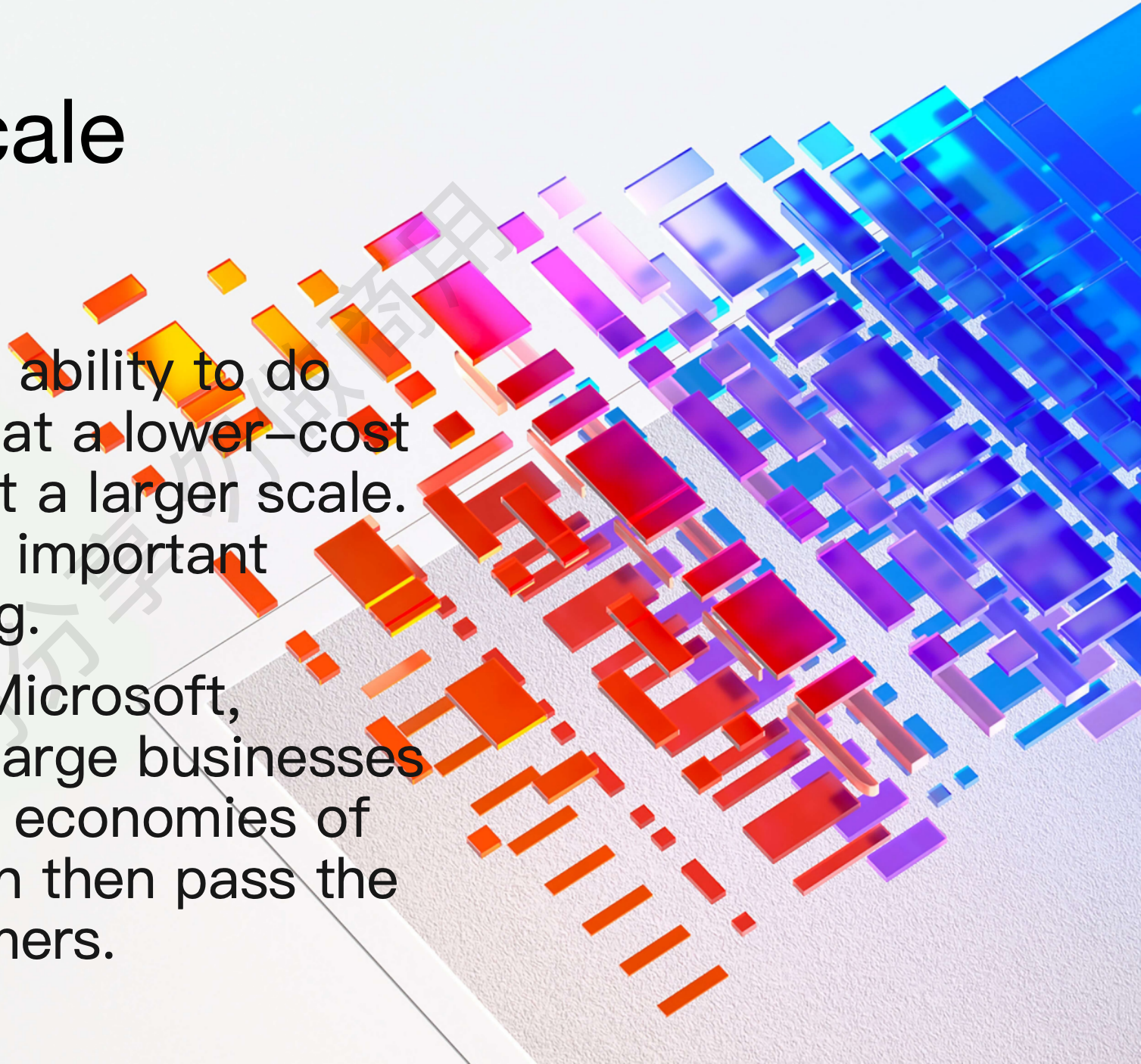
*"New capabilities are available on a regular basis."*





# Economies of scale

- *Economies of scale* is the ability to do things more efficiently or at a lower-cost per unit when operating at a larger scale. This cost advantage is an important benefit in cloud computing.
- Cloud providers such as Microsoft, Google, and Amazon are large businesses leveraging the benefits of economies of scale. These providers can then pass the savings on to their customers.



# CapEx versus OpEx

Capital Expenditure  
(CapEx)

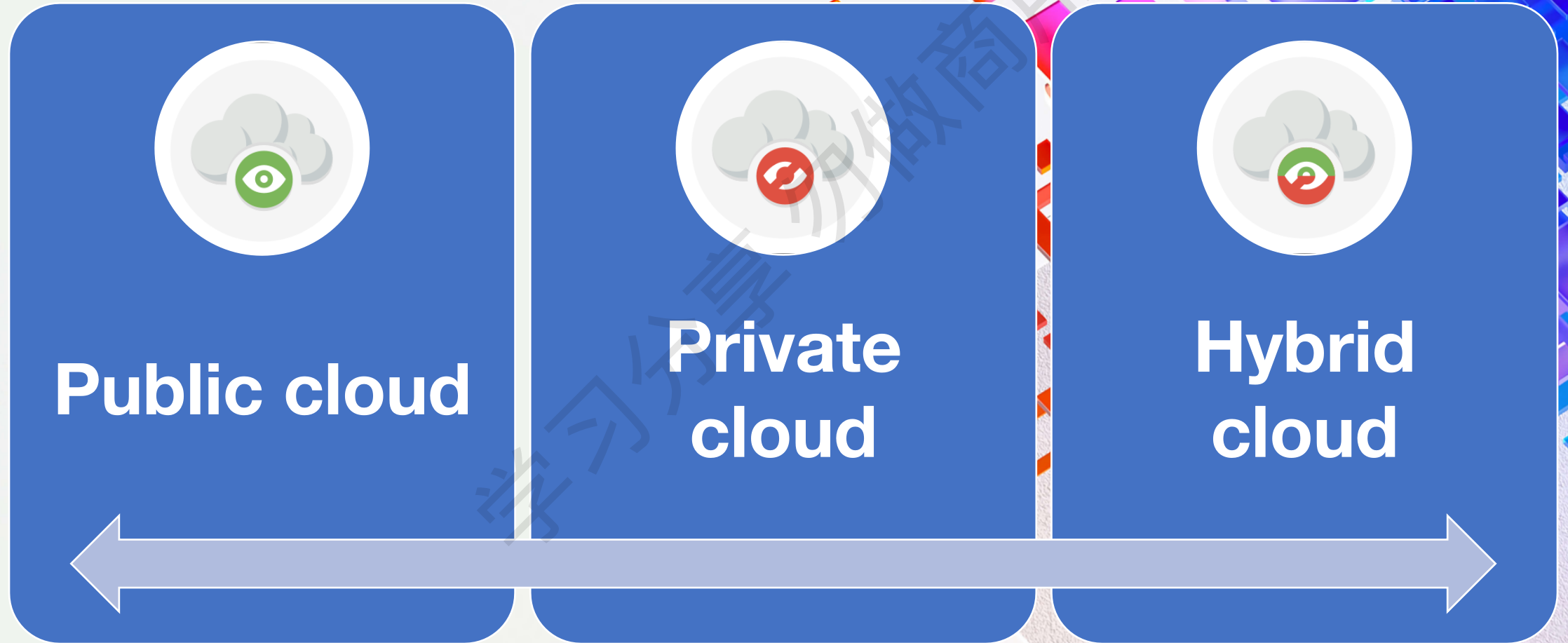
- **Server costs**
- **Storage costs**
- **Network costs**
- **Backup and archive costs**
- **Organization continuity and disaster recovery costs**
- **Datacenter infrastructure costs**
- **Technical personnel**

Operational Expenditure  
(OpEx)

- **Leasing software and customized features**
- **Scaling charges based on usage/demand instead of fixed hardware or capacity**
- **Billing at the user or organization level**



# Cloud deployment models



# Types of cloud services

## Infrastructure as a service (IaaS)

- Migrating workloads
- Test and development
- Storage, backup, and recovery

## Platform as a service (PaaS)

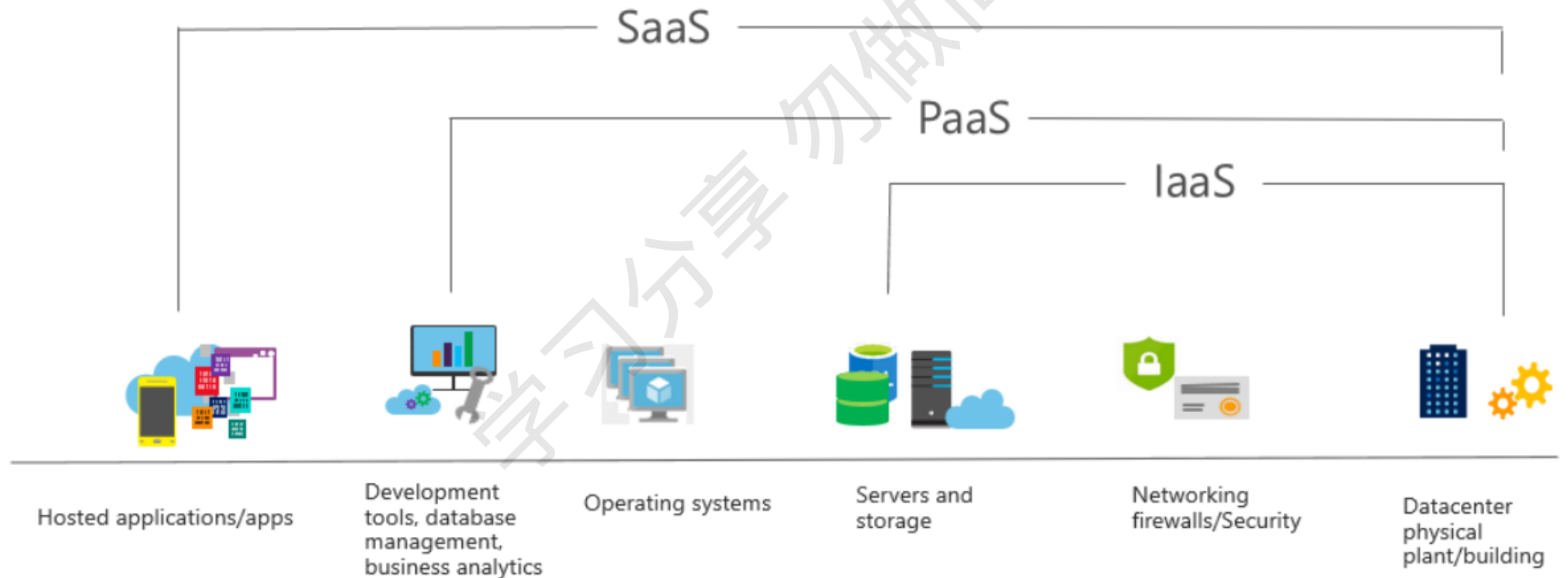
- Development framework
- Analytics or business intelligence

## Software as a service (SaaS)

- Office 365
- Dynamics CRM Online
- Power Platform



# Types of cloud services

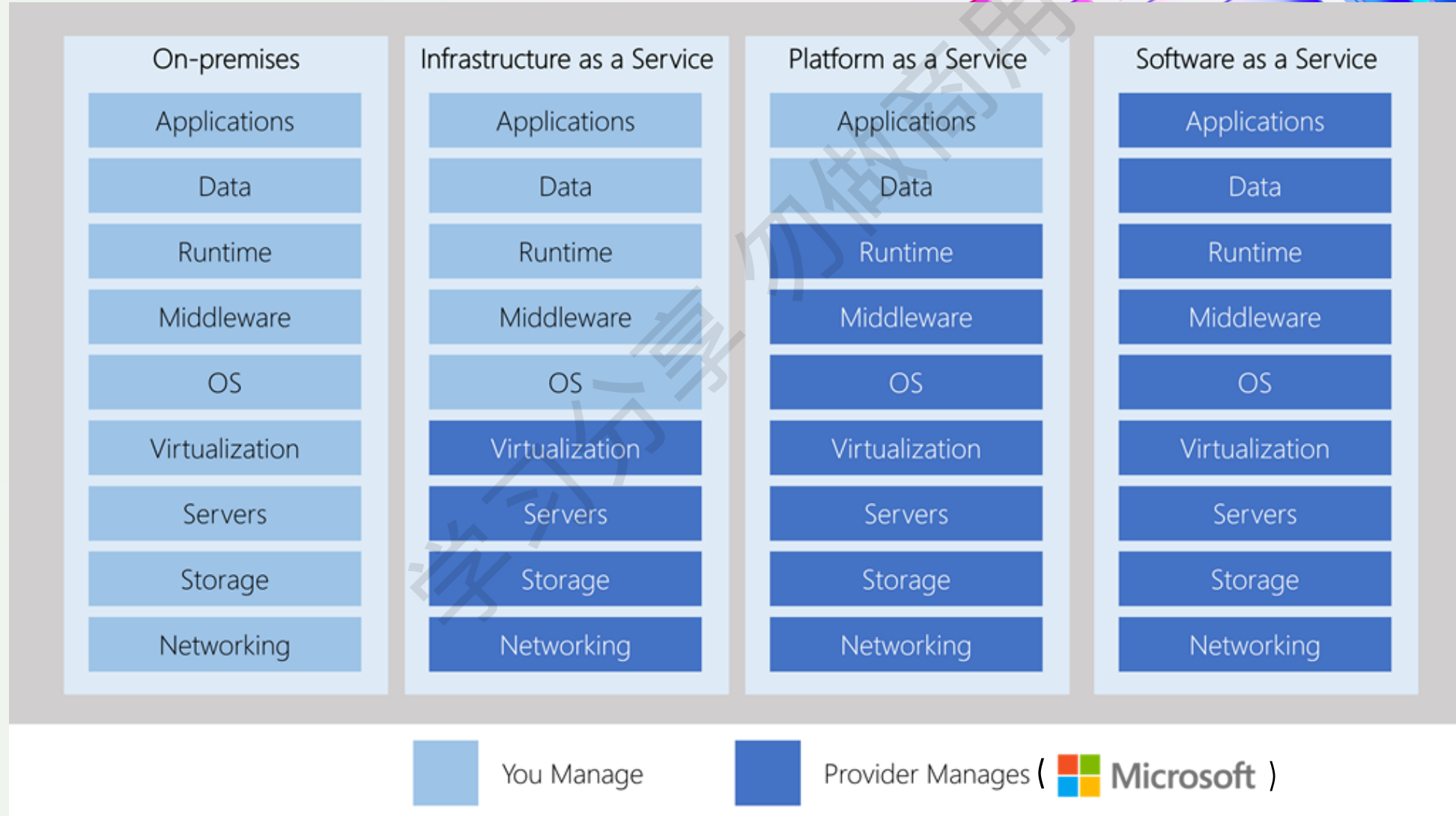


# Cost and Ownership

	IaaS	PaaS	SaaS
Upfront costs	There are no upfront costs. Users pay only for what they consume.	There are no upfront costs. Users pay only for what they consume.	Users have no upfront costs; they pay a subscription, typically on a monthly or annual basis.
User ownership	The user is responsible for the purchase, installation, configuration, and management of their own software, operating systems, middleware, and applications.	The user is responsible for the development of their own applications. However, they are not responsible for managing the server or infrastructure. This allows the user to focus on the application or workload they want to run.	Users just use the application software; they are not responsible for any maintenance or management of that software.
Cloud provider ownership	The cloud provider is responsible for ensuring that the underlying cloud infrastructure (such as virtual machines, storage, and networking) is available for the user.	The cloud provider is responsible for operating system management, network, and service configuration. Cloud providers are typically responsible for everything apart from the application that a user wants to run. They provide a complete managed platform on which	The cloud provider is responsible for the provision, management, and maintenance of the application software.

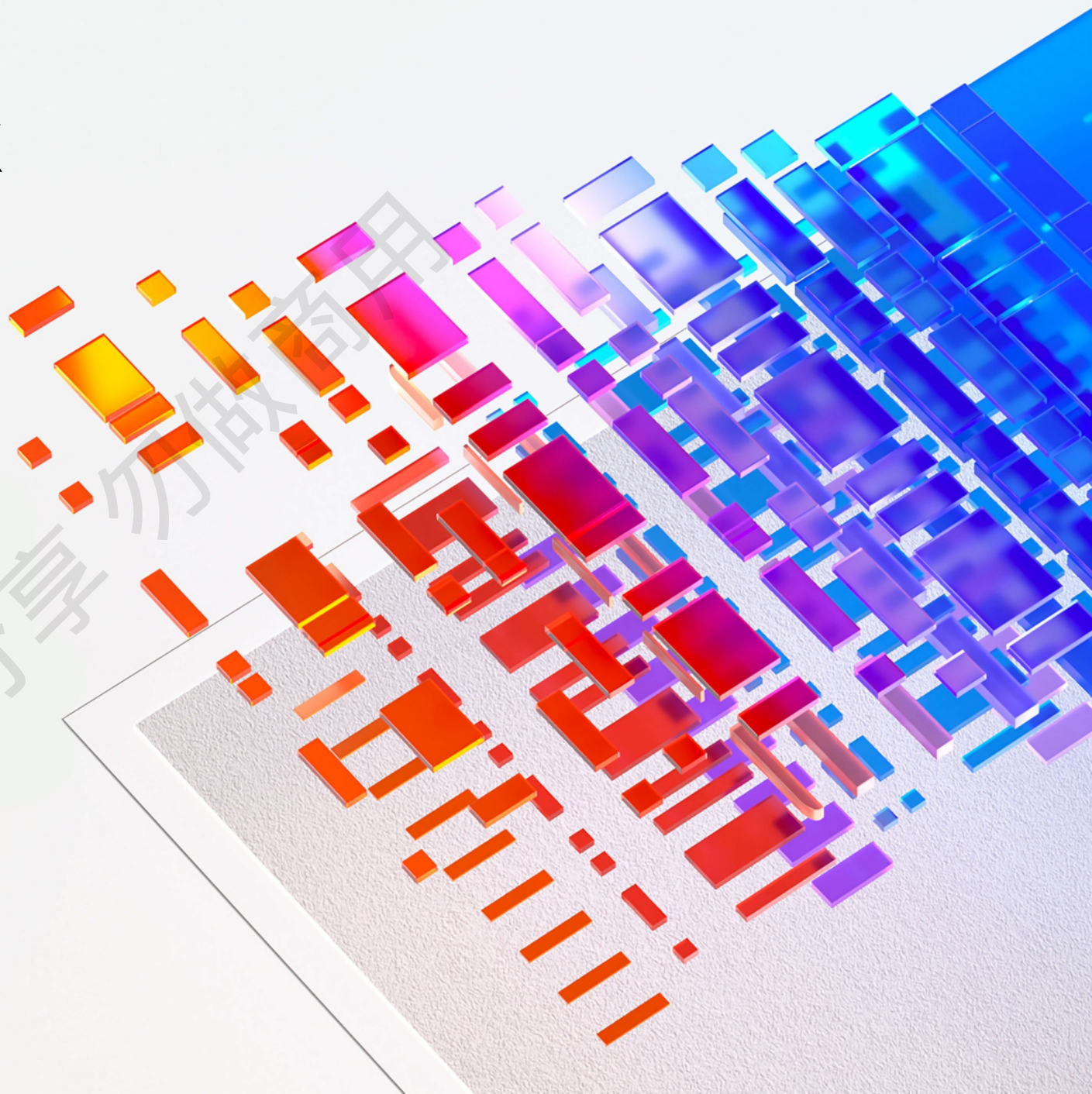


# Management responsibilities



# Knowledge Check

Please scan this QR Code,  
Then submit your answer.





The image features the Microsoft Azure logo on the left, which consists of three overlapping circles in shades of blue and yellow. To the right of the logo is a large, abstract graphic composed of numerous small, rectangular blocks in various colors (red, orange, yellow, green, blue, purple) arranged in a grid-like pattern that recedes into the distance, creating a sense of depth and data flow. The background is a light, neutral color.

# Microsoft Azure

**Azure Introduction**

# Module Objectives

- Learn what Microsoft Azure is and how it relates to cloud computing

- Deploy a website using Azure App Service

- Learn how to scale up your website to give you more compute power

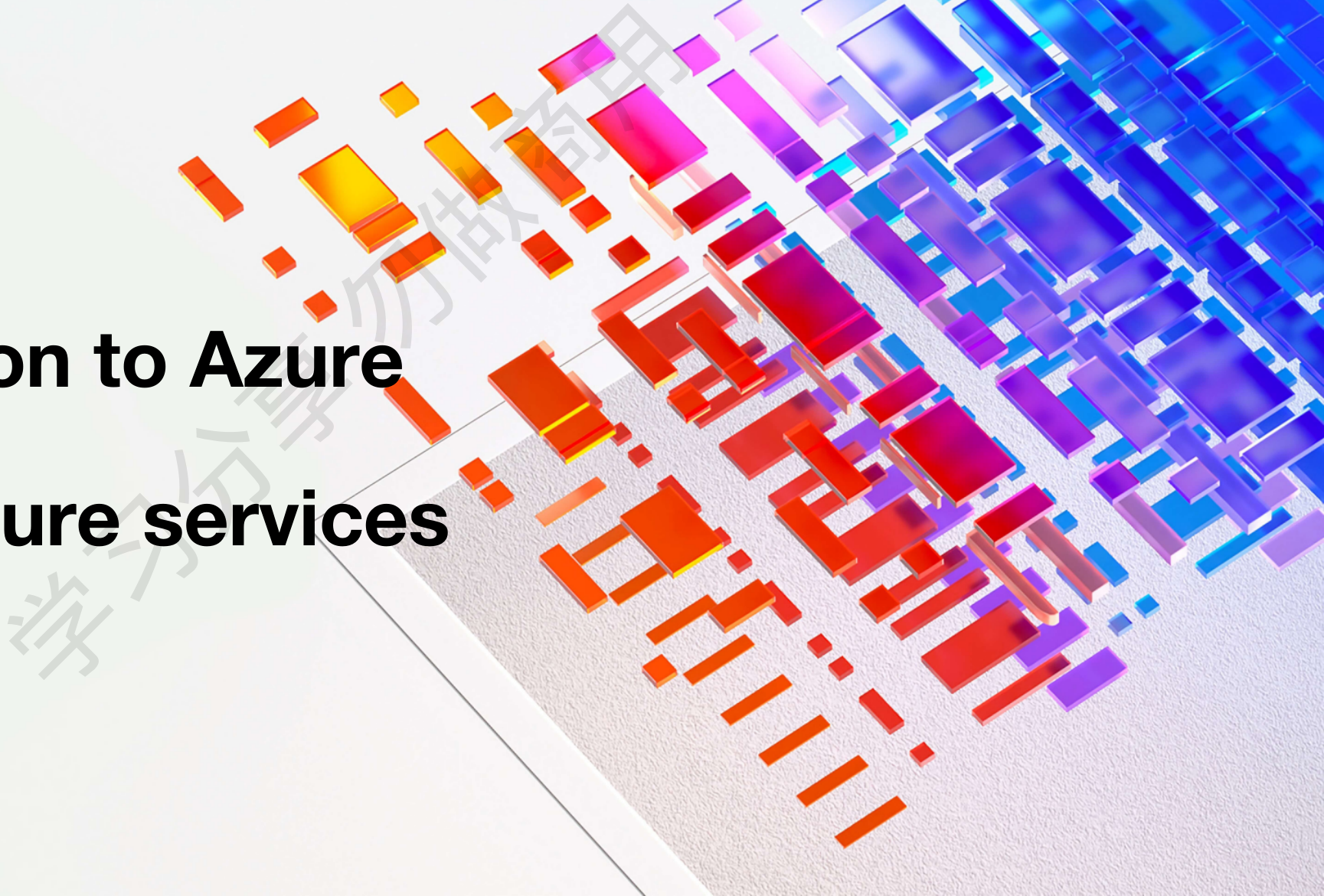
- Use Azure Cloud Shell to interact with your website



# Core Azure Services

**Introduction to Azure**

**Tour of Azure services**



# Microsoft Azure

Azure is Microsoft's cloud computing platform. Azure is a continually expanding set of cloud services that help your organization meet your current and future business challenges. Azure gives you the freedom to build, manage, and deploy applications on a massive global network using your favorite tools and frameworks.







- Available region
- Announced region
- Availability Zones

# Azure: the computer



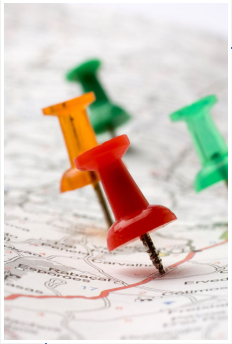
•60+  
Azure  
regions

•Available  
in 140  
countries

•Up to 1.6  
Pbps of  
bandwidth  
in a region



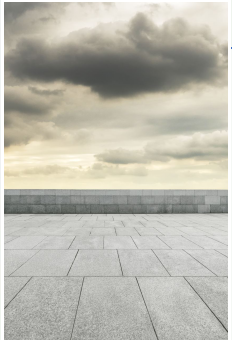
# Azure architecture and service guarantees



Geographies



Regions



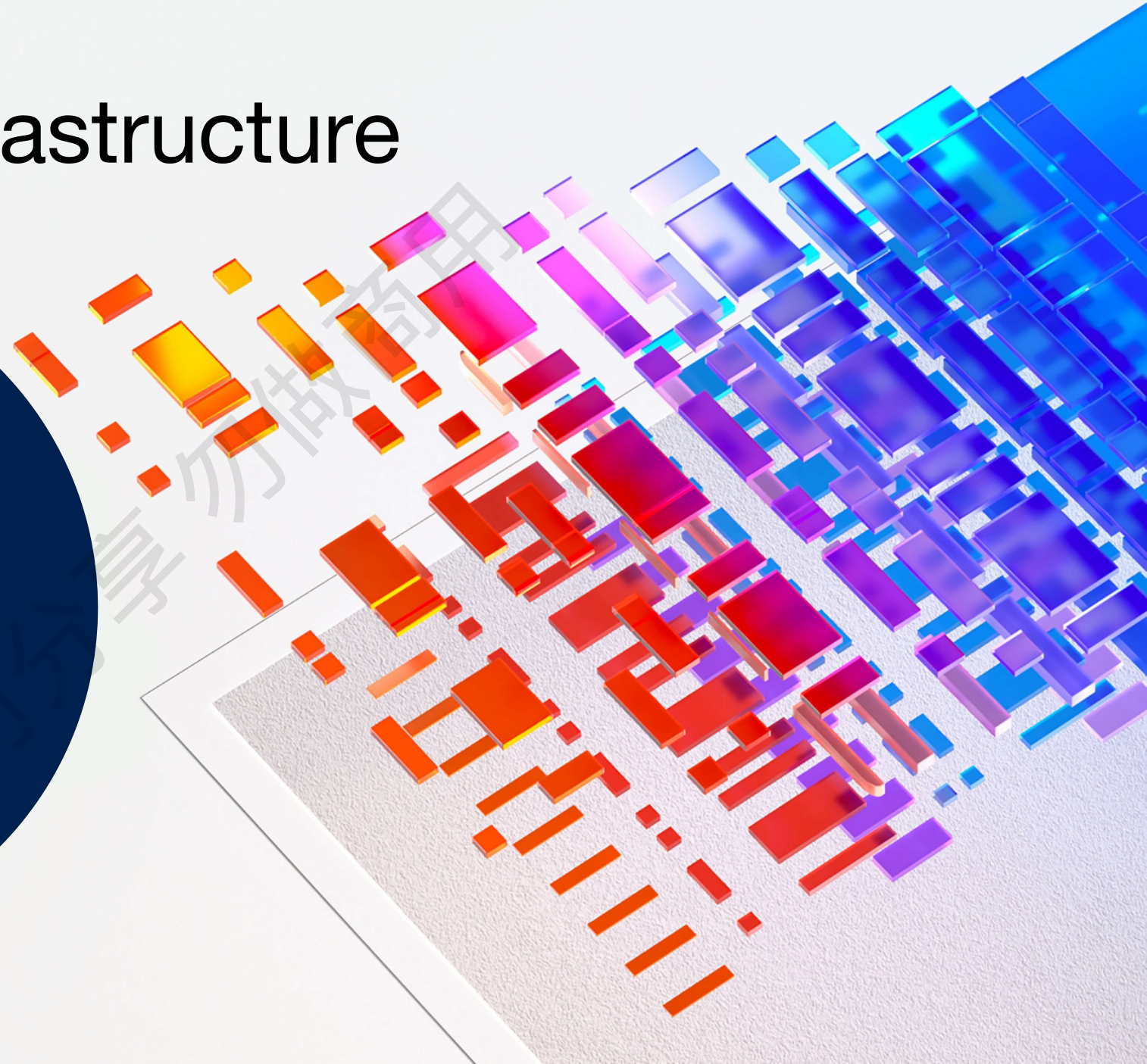
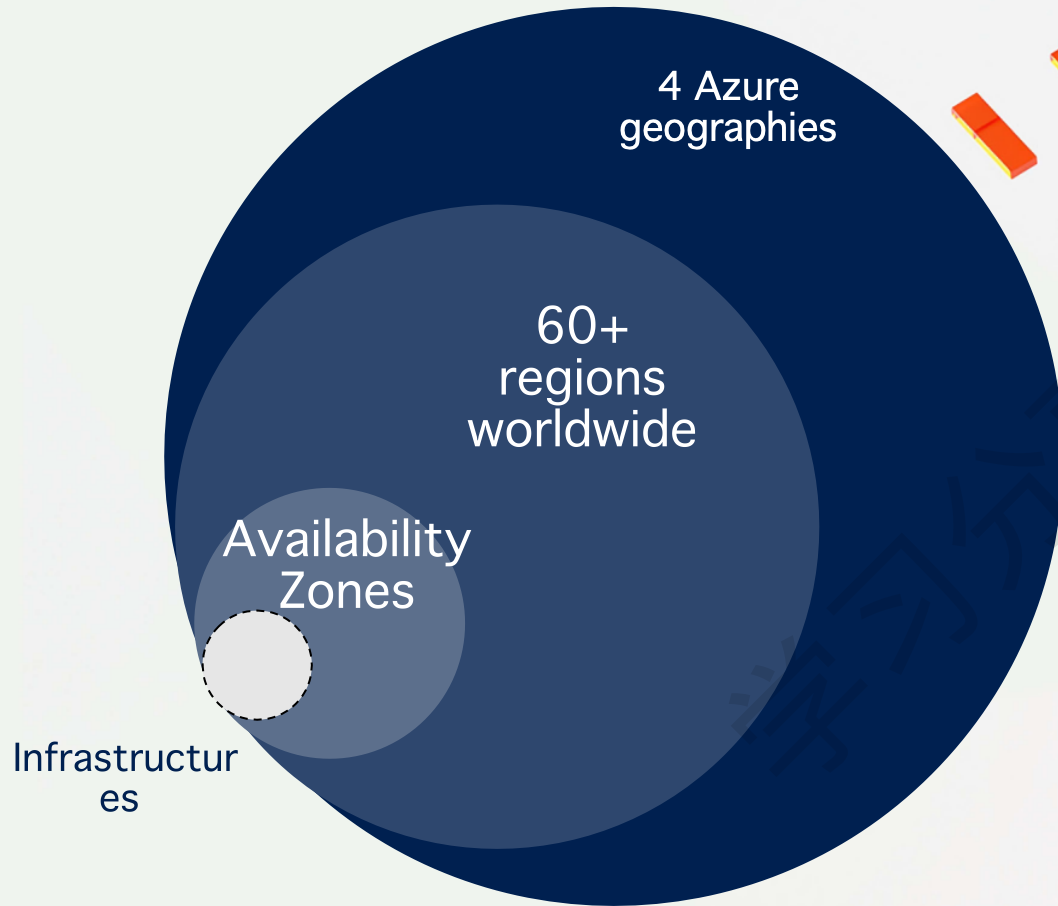
Availability  
Zones



Region Pairs



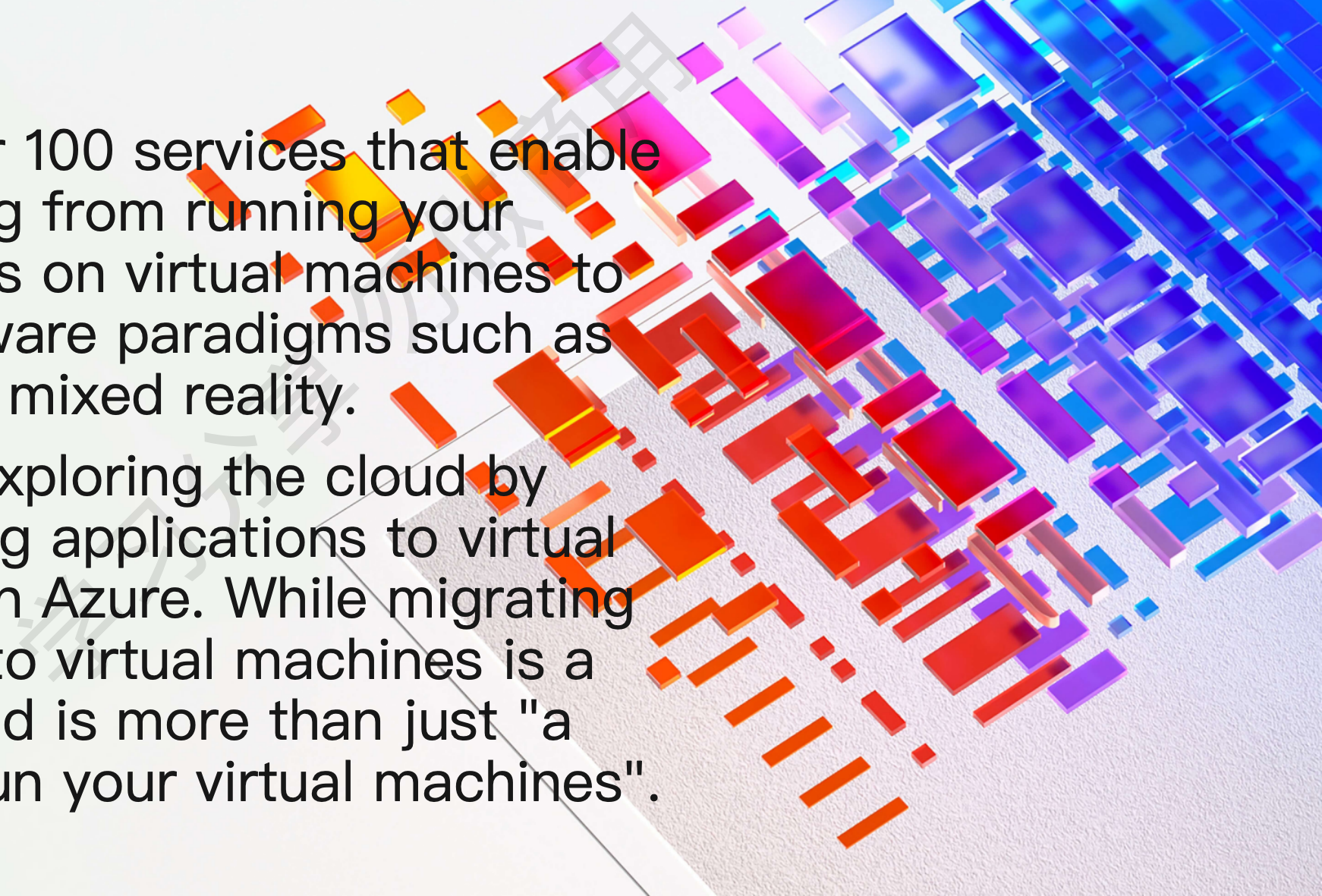
# Azure global infrastructure





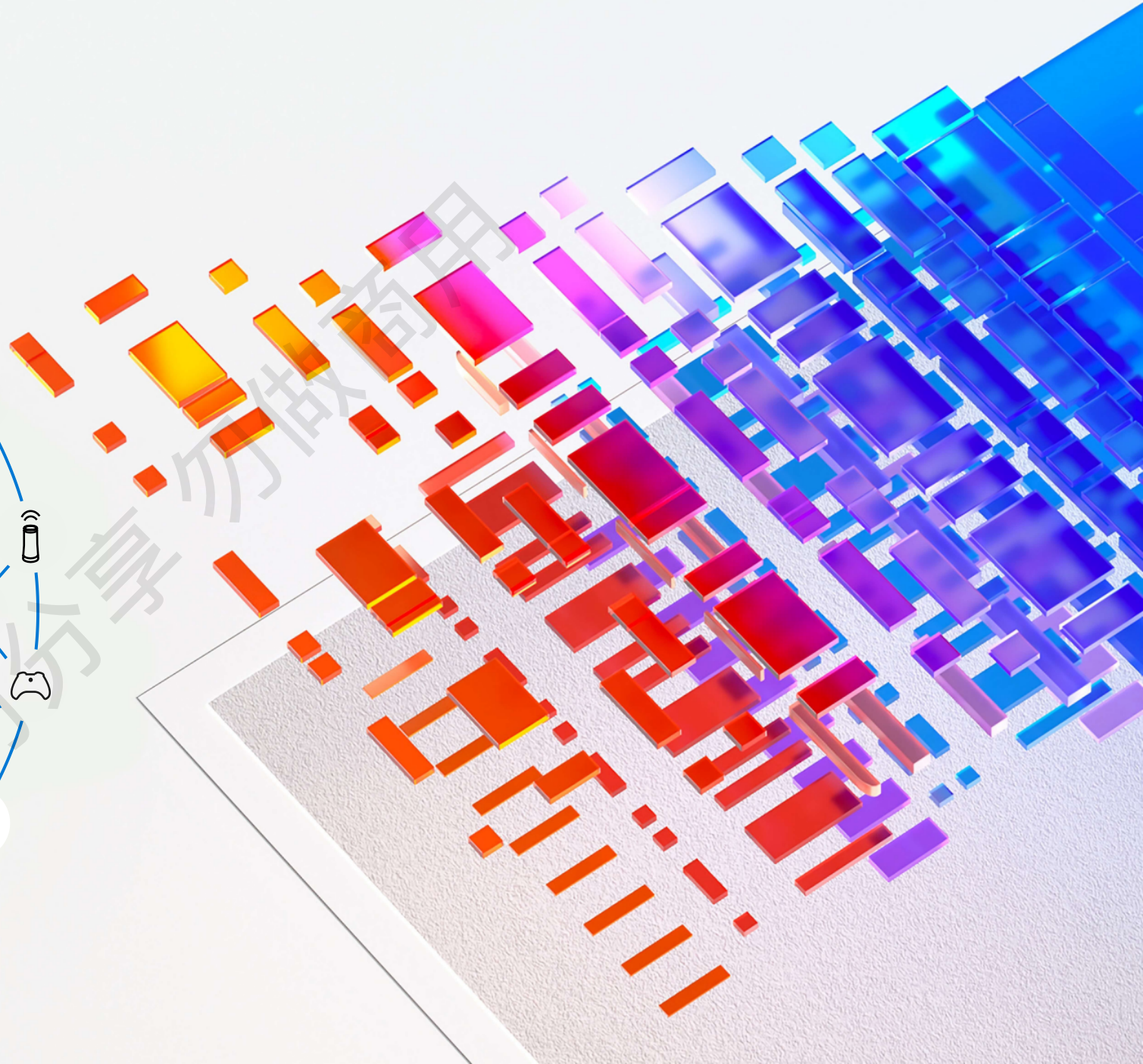
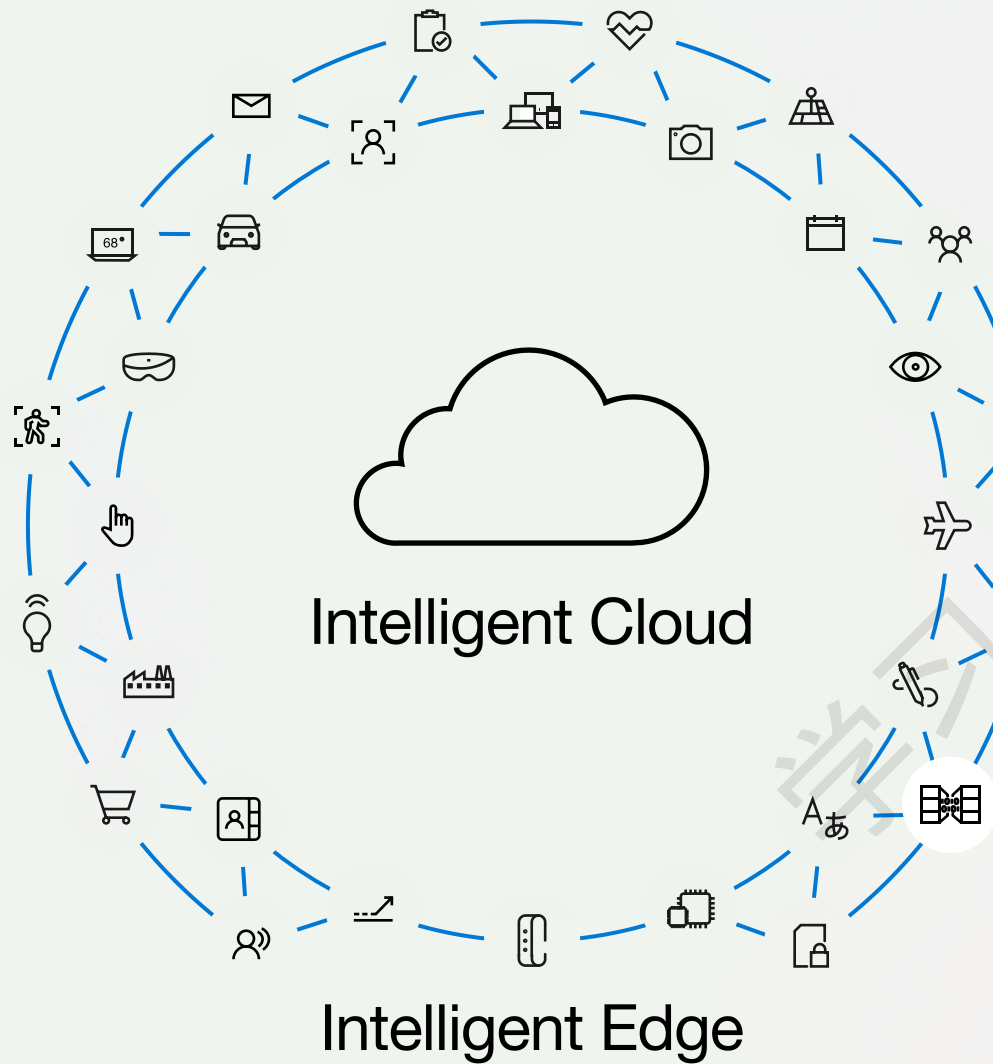
# What can I do on Azure?

- Azure provides over 100 services that enable you to do everything from running your existing applications on virtual machines to exploring new software paradigms such as intelligent bots and mixed reality.
- Many teams start exploring the cloud by moving their existing applications to virtual machines that run in Azure. While migrating your existing apps to virtual machines is a good start, the cloud is more than just "a different place to run your virtual machines".



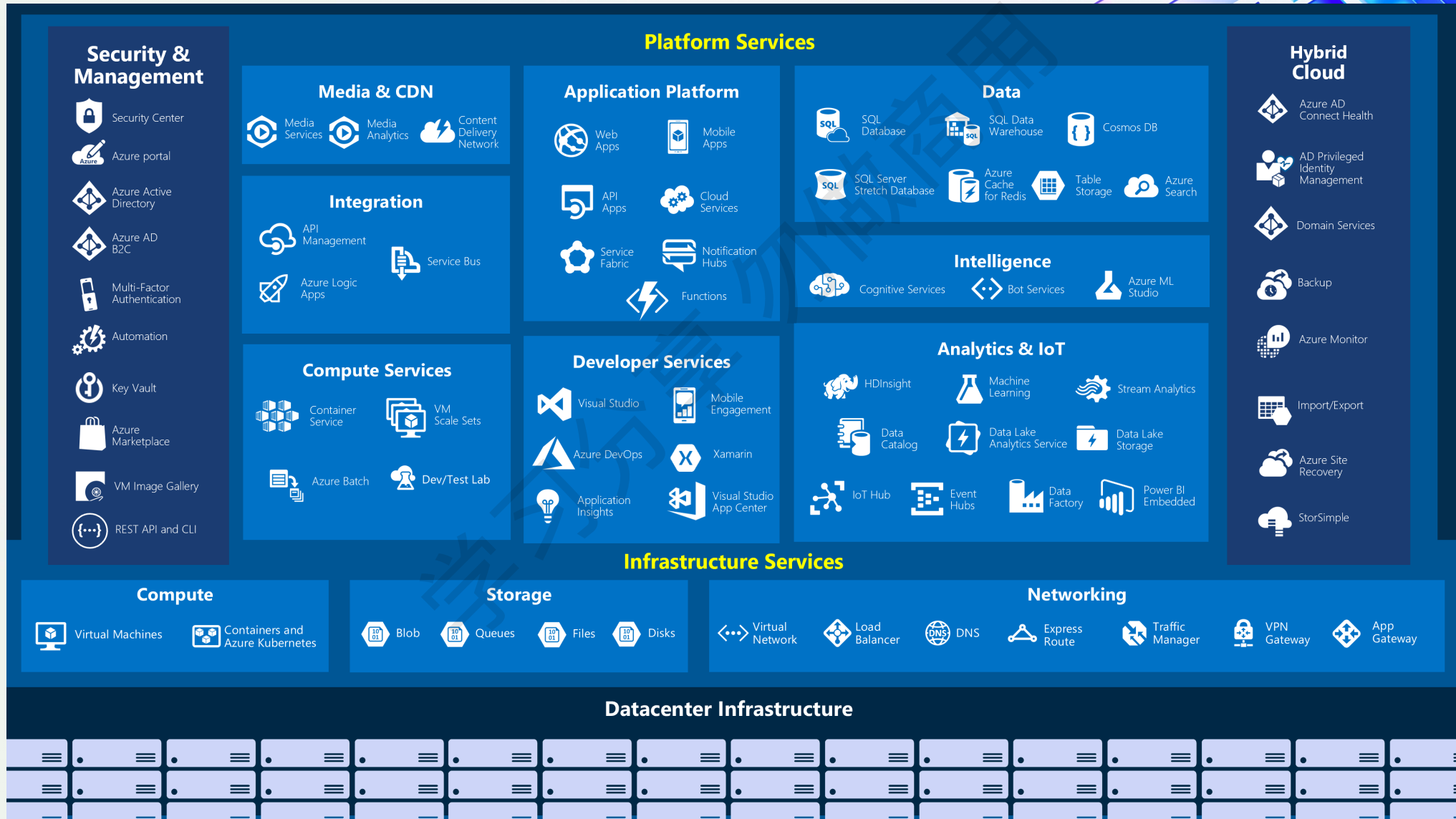


# Microsoft Azure

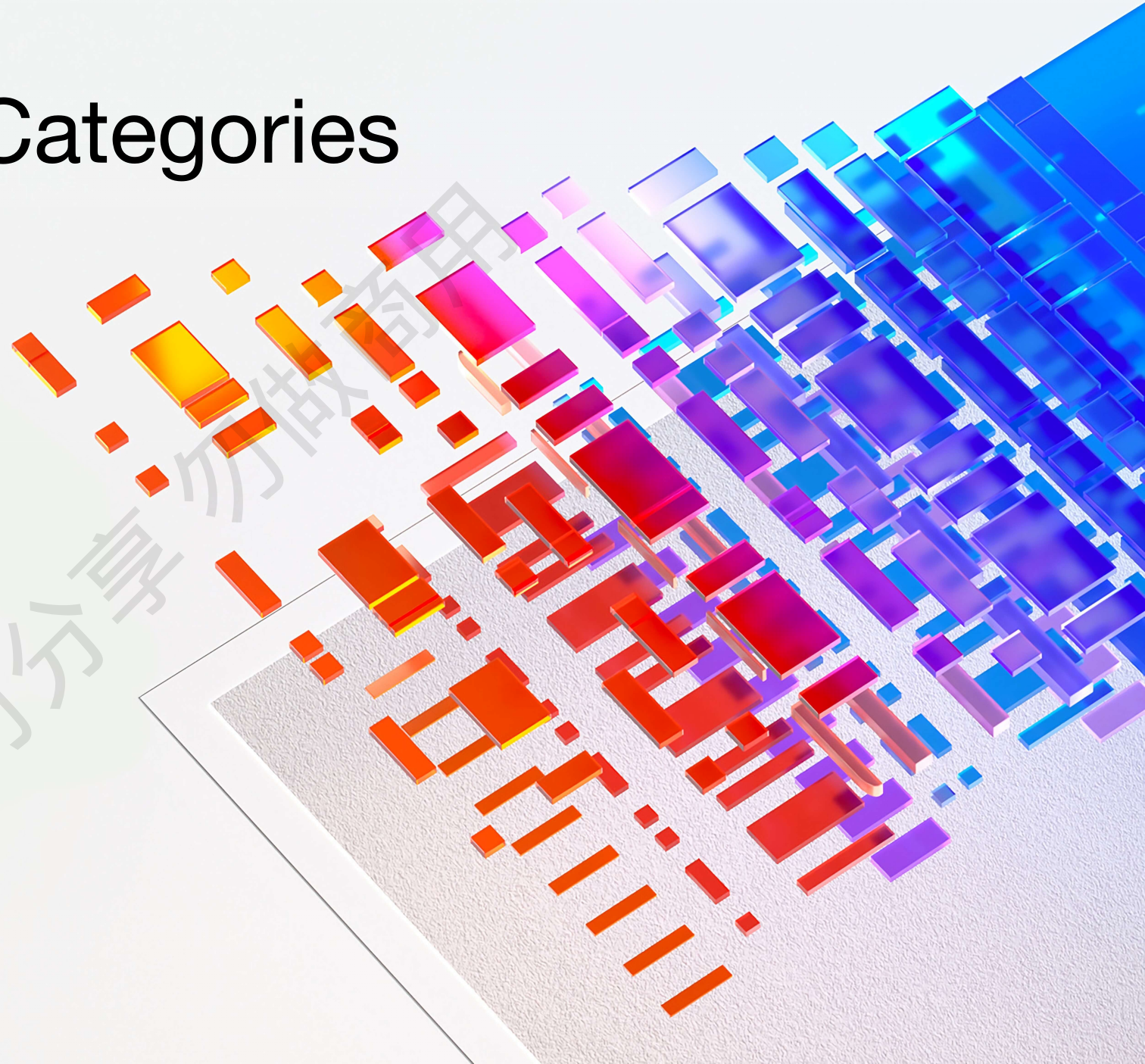
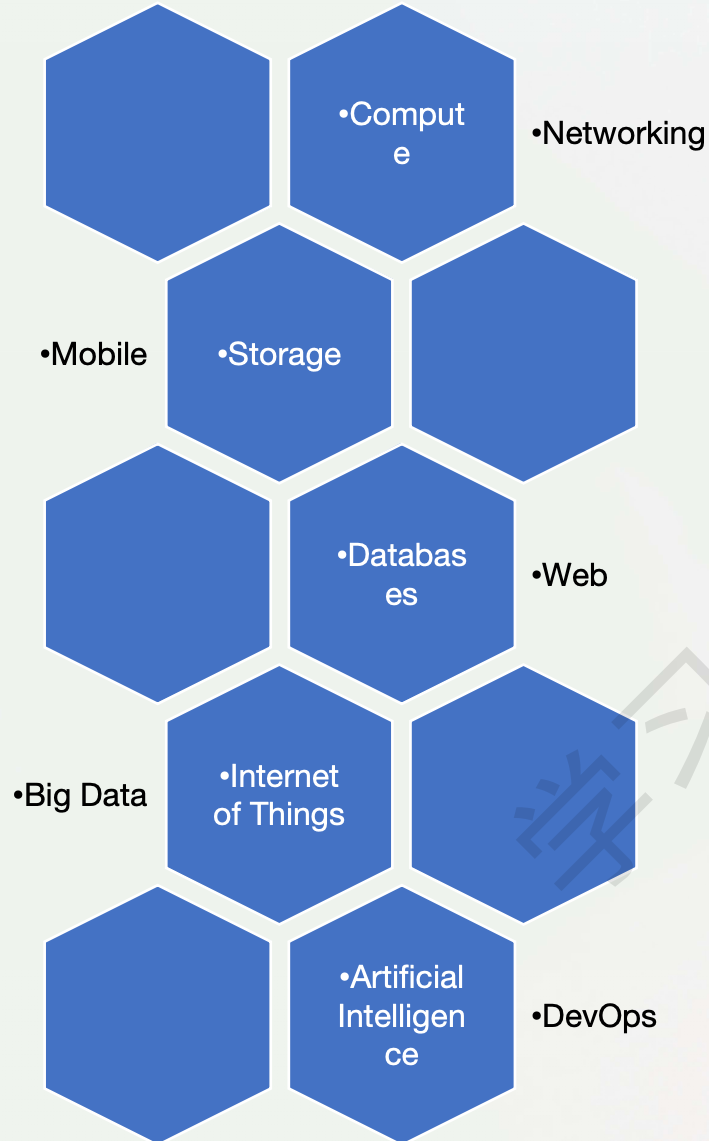




# Azure services



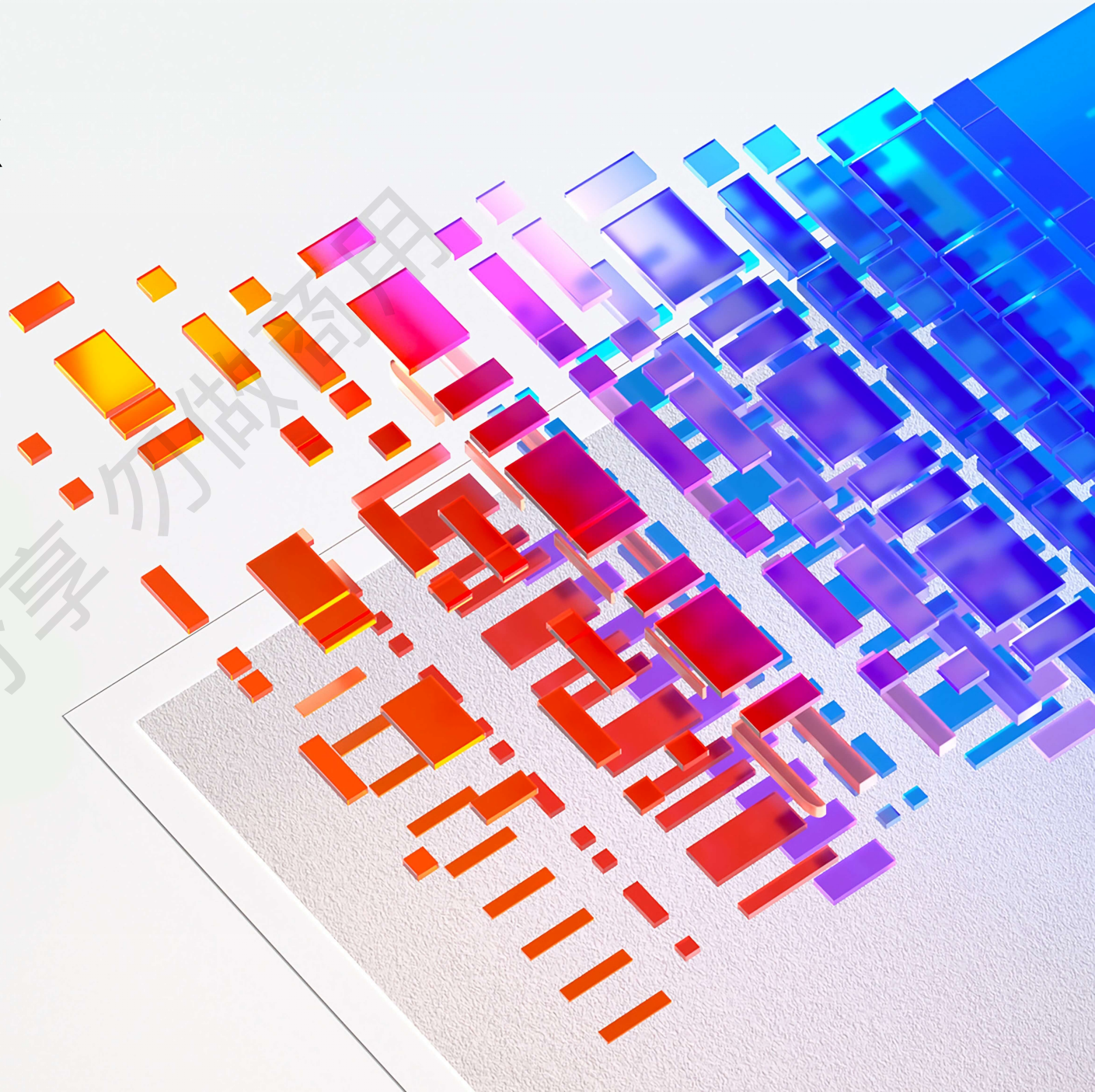
# Azure Services Categories





# Knowledge Check

Please scan this QR Code,  
Then submit your answer.

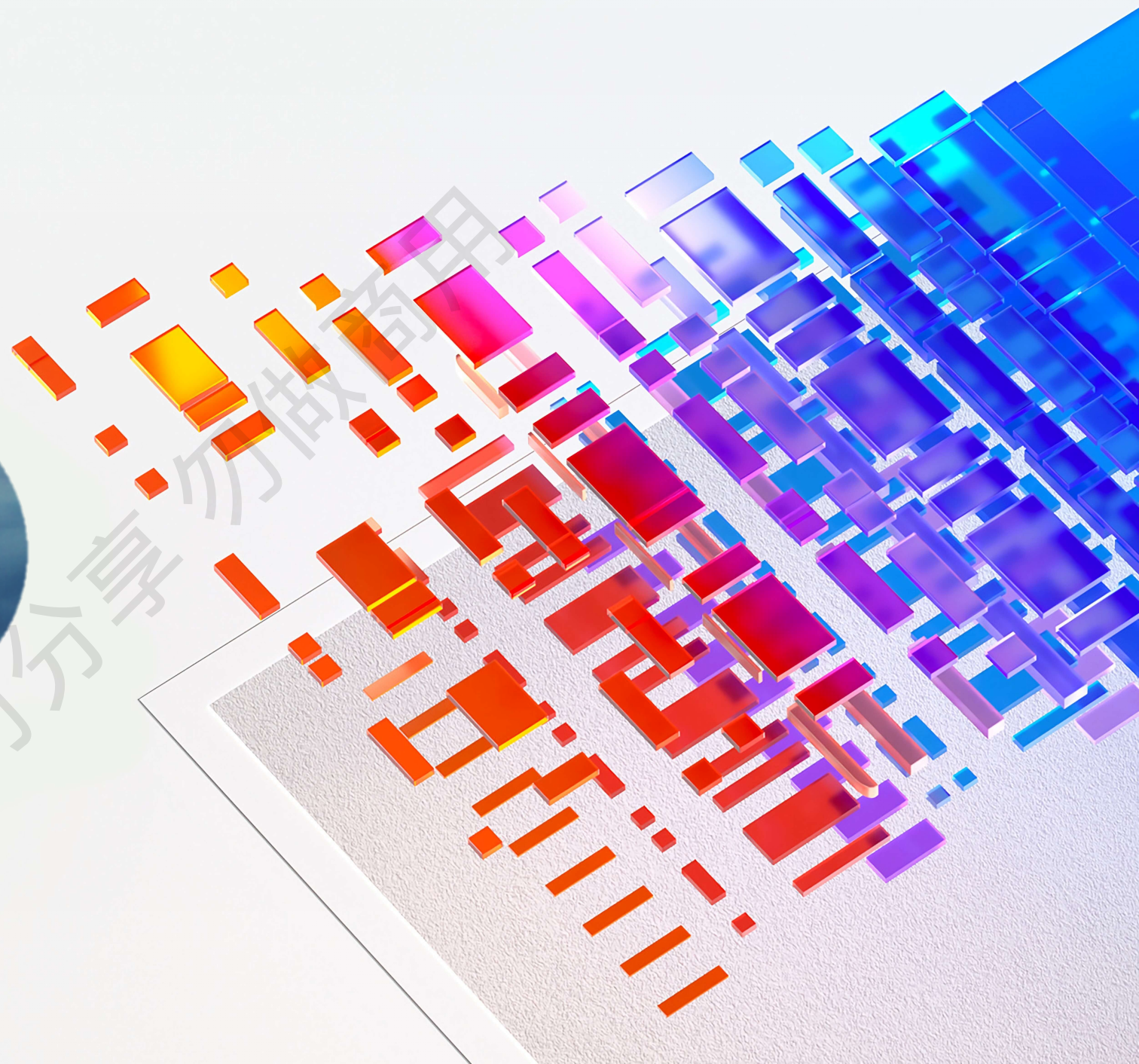






# Microsoft Azure

**Azure Portal & Azure Cloud Shell**





# Manage services with the Azure portal

Management  
Tools

Azure portal

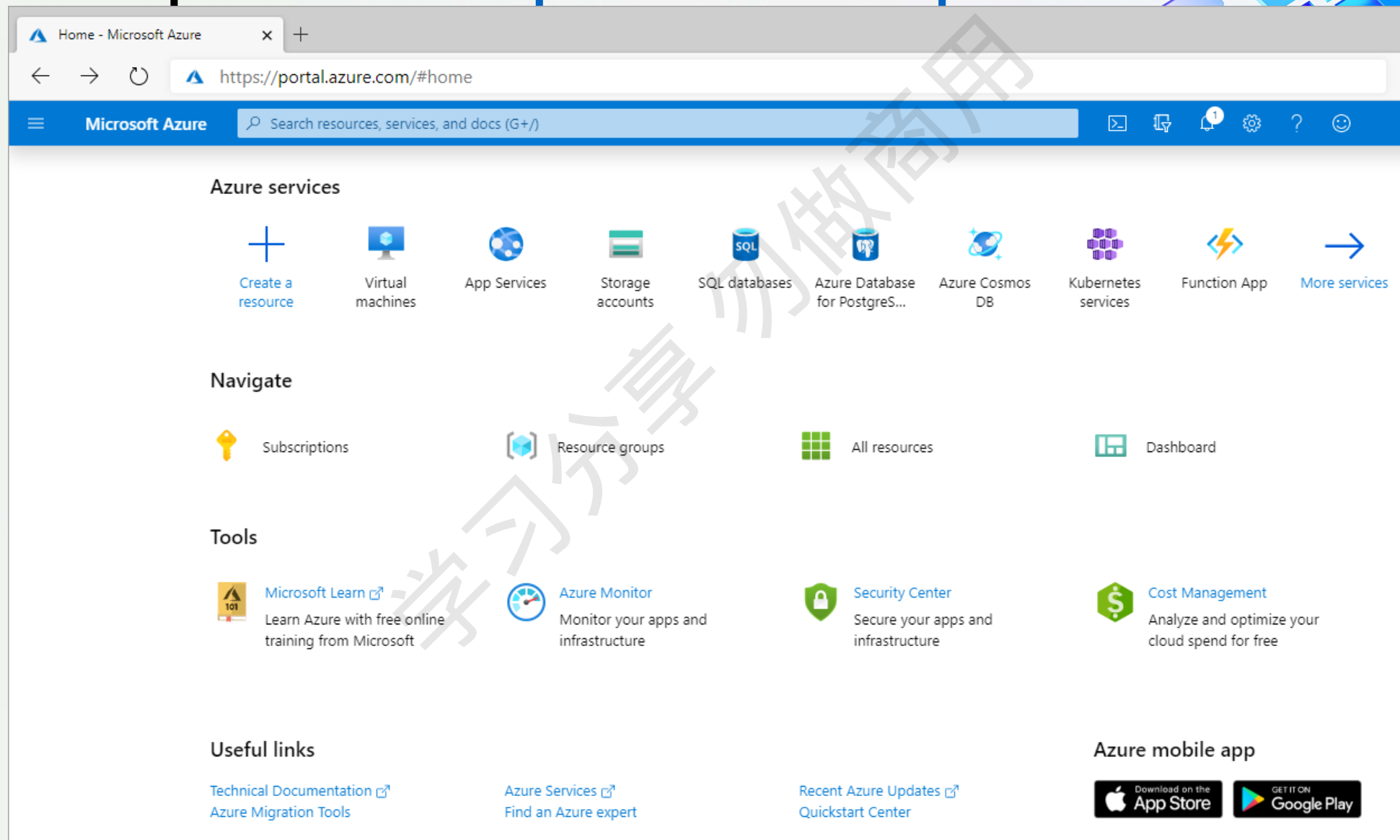
Azure PowerShell & CLI

Azure Cloud Shell

Azure mobile app

Azure SDKs & REST APIs

# Azure portal: <https://azure.portal.com>





# Azure Portal dashboards

Add, pin, move, and resize your tiles. [Done customizing](#)

Tile Gallery

Search tiles

×

All categories

All resource types

206 tiles

All resources

Add

Resource groups

Add

Clock

Add

Service Health

Add

Markdown

Add

User Activity Summary

Add

Users and groups

Add

CPU percentage  
Virtual machines (classic)

Add

Activity Log Analytics Overview

Add

Azure portal

Add

ARM Data

Add

Audit Logs

Add

AD Connect

Add

All resources

All subscriptions

No resources to display

Try changing your filters if you don't see what you're looking for.

[Learn more](#)

Create resources

Quickstarts + tutorials

Windows Virtual Machines

Provision Windows Server, SQL Server, SharePoint VMs

Linux Virtual Machines

Provision Ubuntu, Red Hat, CentOS, SUSE, CoreOS VMs

App Service

Create Web Apps using .NET, Java, Node.js, Python, PHP

Functions

Process events with a serverless code architecture

SQL Database

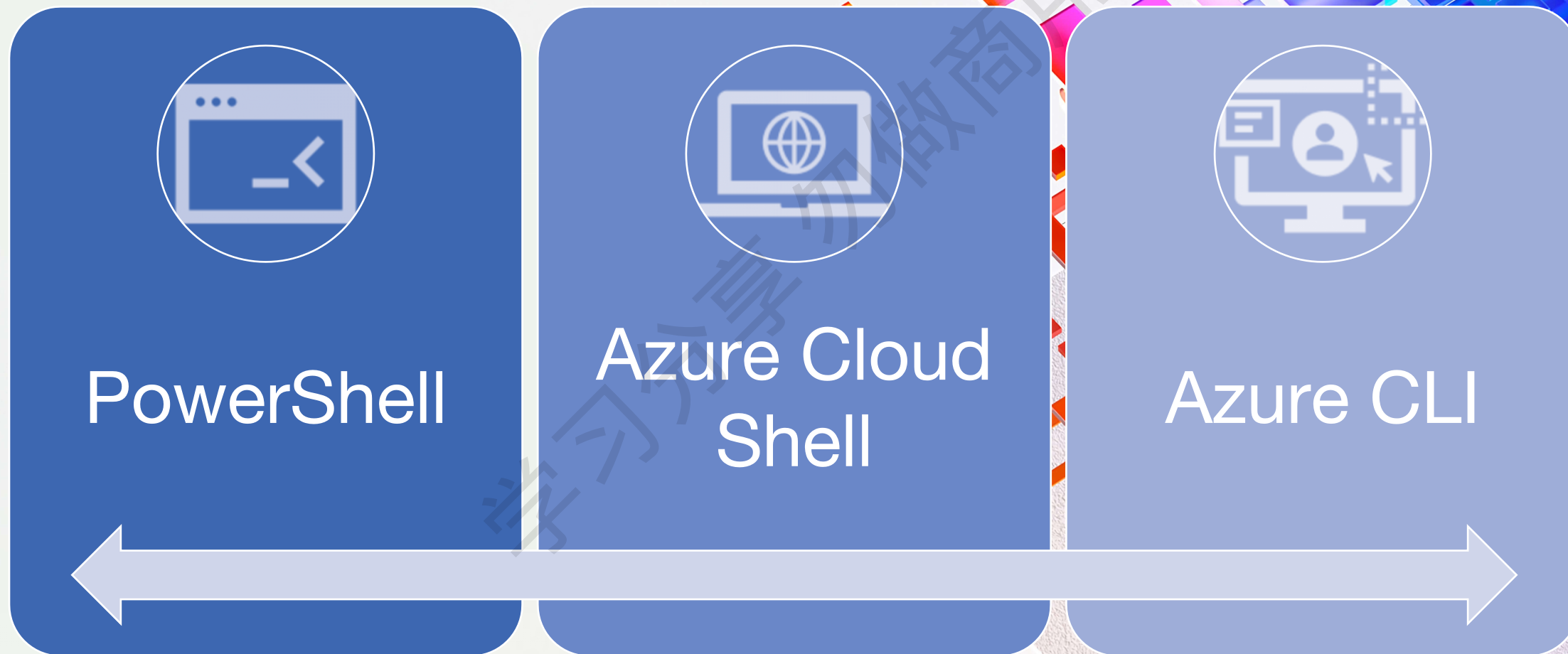
Managed relational SQL Database as a Service

Service Health

Marketplace

An abstract graphic on the right side of the slide. It features a grid of 3D rectangular blocks in various colors including red, orange, yellow, green, and blue. The blocks are arranged in a way that creates a sense of depth and perspective, with some blocks appearing to be floating or stacked. The overall effect is a vibrant, digital-looking pattern.

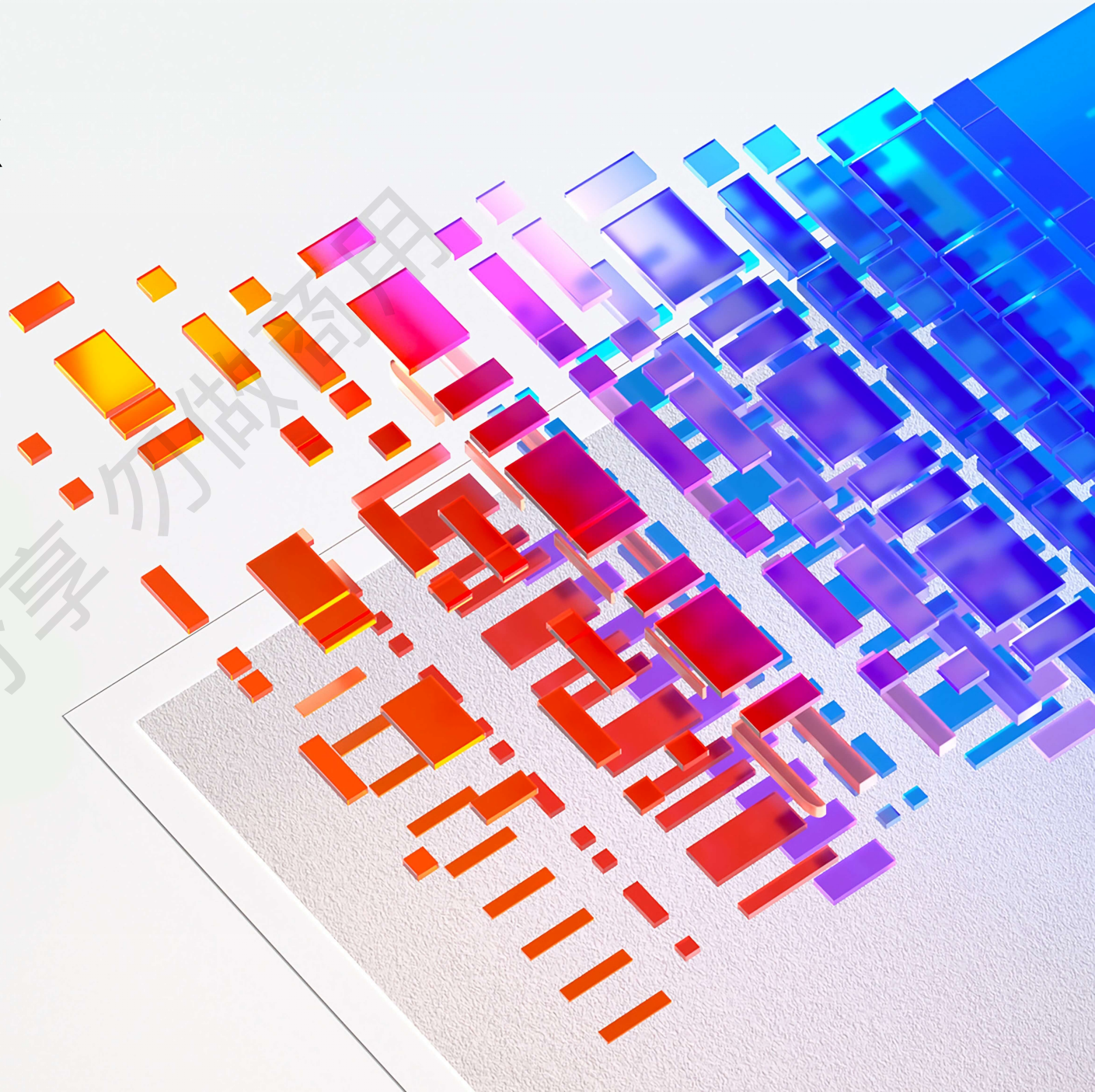
# Azure Cloud Shell & CLI





# Knowledge Check

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Then submit your answer.

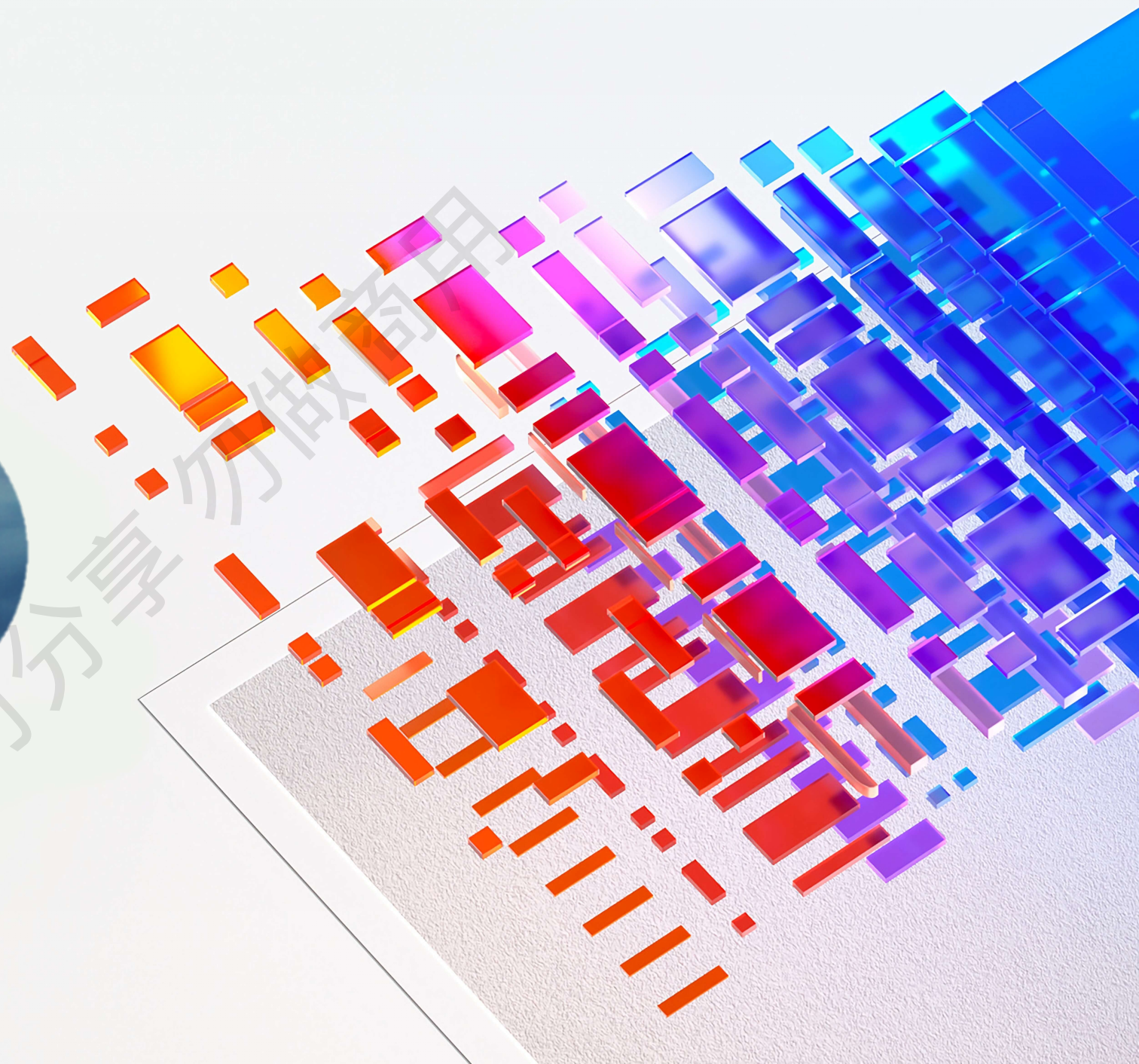






# Microsoft Azure

**Azure Compute Services**





# Module Objectives

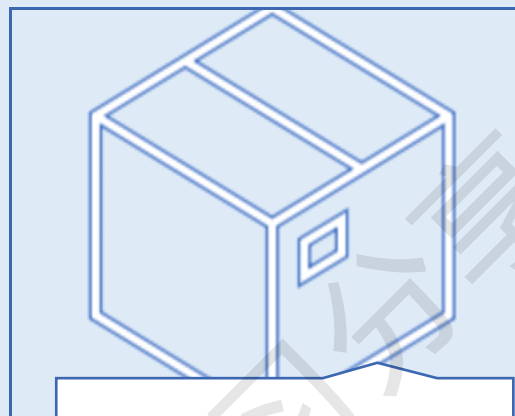
- Identify Azure compute options

- Select compute options that will solve your specific business needs

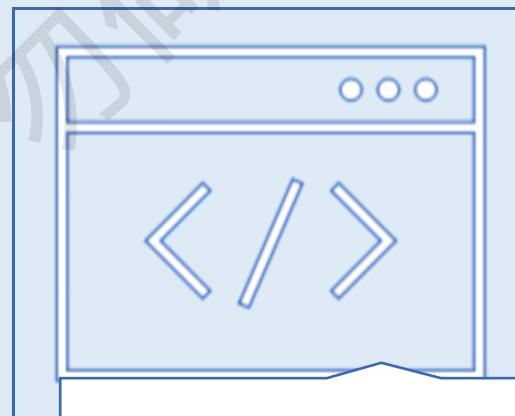
# Azure compute options



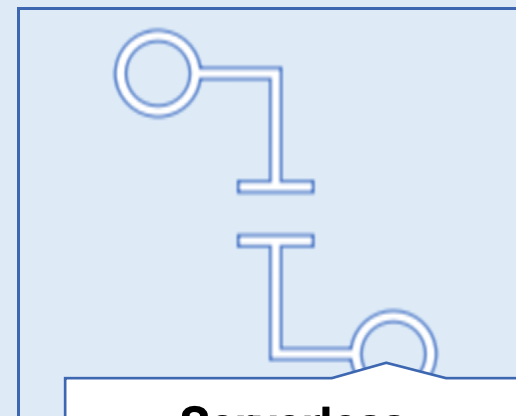
**Virtual Machines**



**Containers**



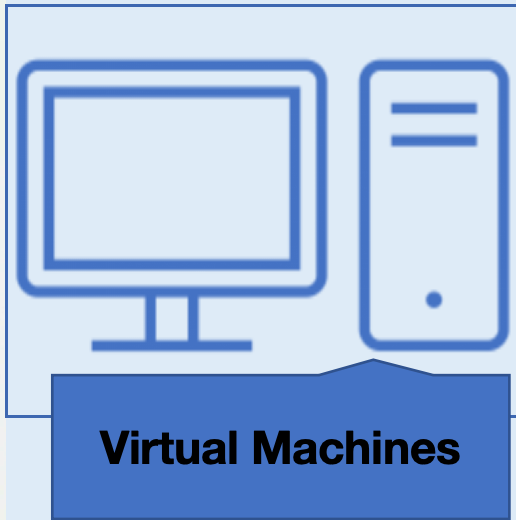
**App Service**



**Serverless  
computing**

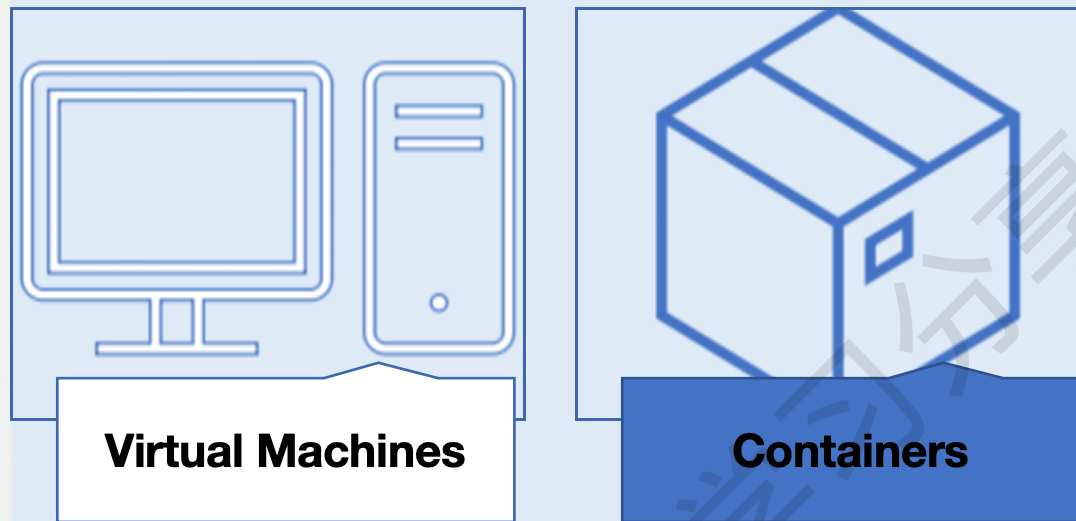


# Azure compute options



**Virtual machines**, or VMs, are software emulations of physical computers. They include a virtual processor, memory, storage, and networking resources. They host an operating system (OS), and you're able to install and run software just like a physical computer. And by using a remote desktop client, you can use and control the virtual machine as if you were sitting in front of it.

# Azure compute options

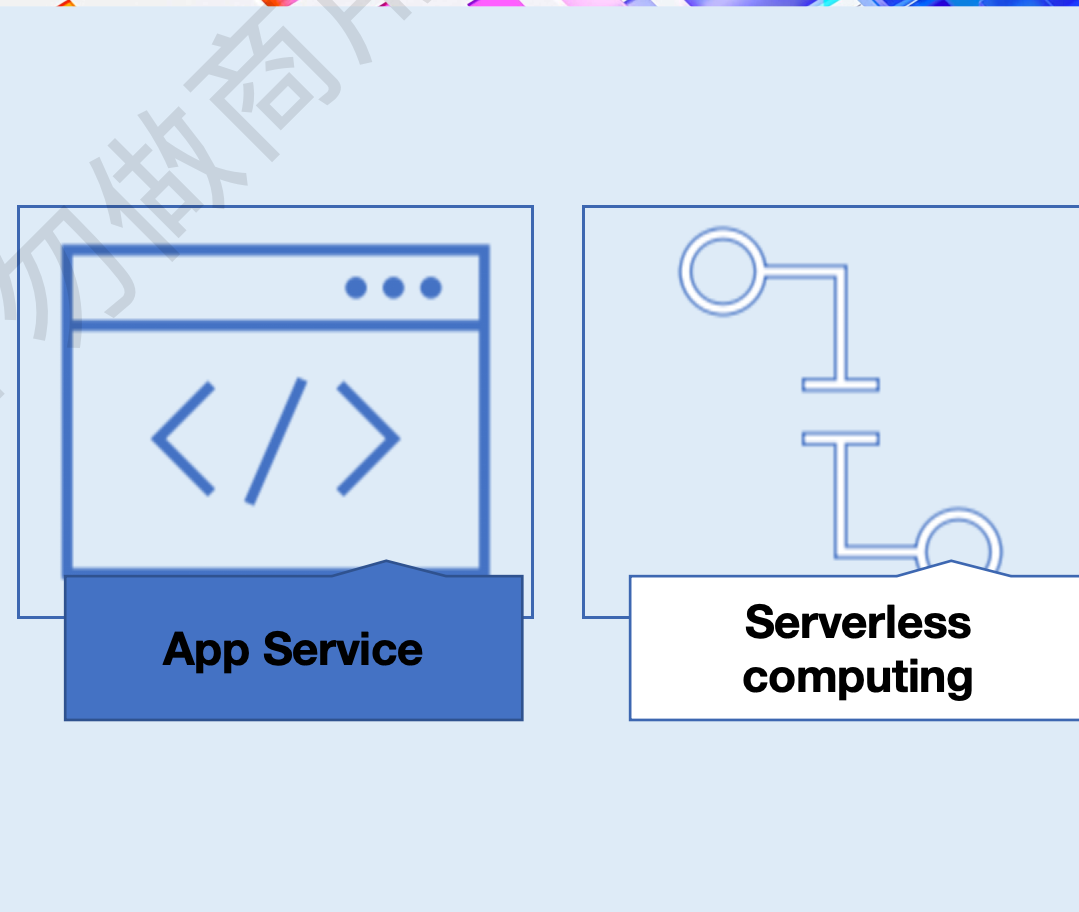


Containers are a virtualization environment for running applications. Just like virtual machines, containers are run on top of a host operating system. But unlike VMs, containers don't include an operating system for the apps running *inside* the container. Instead, containers bundle the libraries and components needed to run the application and use the existing host OS running the container. For example, if five containers are running on a server with a specific Linux kernel, all five containers and the apps within them share that same Linux kernel.



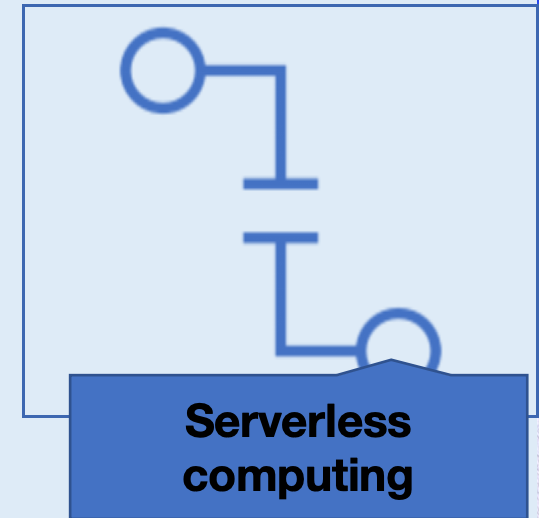
# Azure compute options

Azure App Service is a platform-as-a-service (PaaS) offering in Azure that is designed to host enterprise-grade web-oriented applications. You can meet rigorous performance, scalability, security, and compliance requirements while using a fully managed platform to perform infrastructure maintenance.



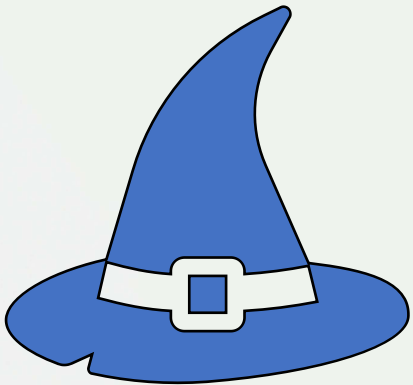
# Azure compute options

Serverless computing is a cloud-hosted execution environment that runs your code but completely abstracts the underlying hosting environment. You create an instance of the service, and you add your code; no infrastructure configuration or maintenance is required, or even allowed.





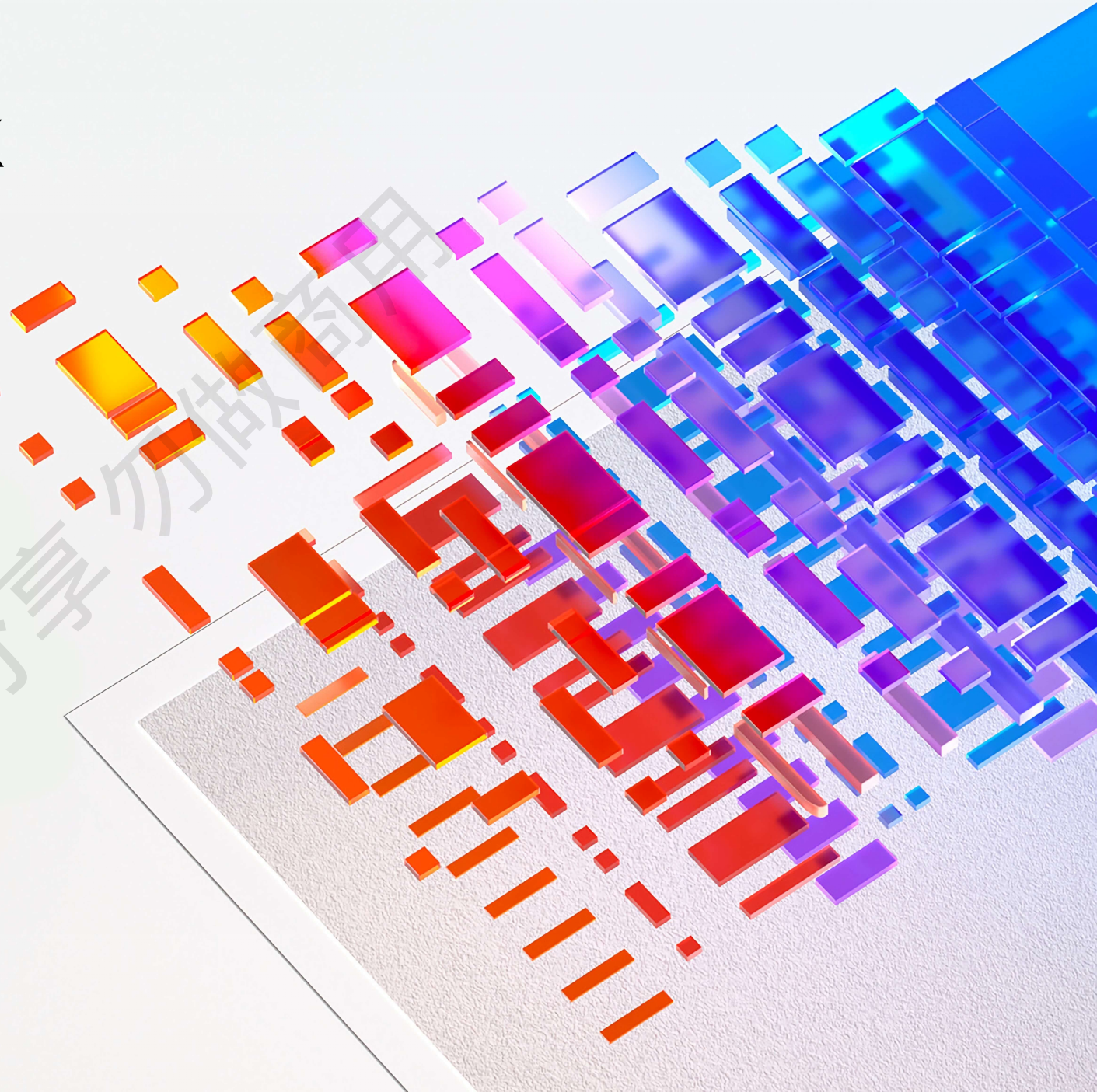
# Which computing strategy is right for me?



- You don't need to take an "all or nothing" approach when choosing a cloud computing strategy. Virtual machines, containers, App Service, and serverless computing each provide benefits as well as tradeoffs against other options.
- For example, although serverless computing removes the need for you to manage infrastructure, serverless computing expects work to be completed quickly; usually within seconds or less. Therefore, you might run your core application on a virtual machine or container but offload some of the data processing onto a serverless app.
- Let's look at each option more closely to help you decide when to use each service.

# Knowledge Check

Please scan this QR Code,  
Then submit your answer.

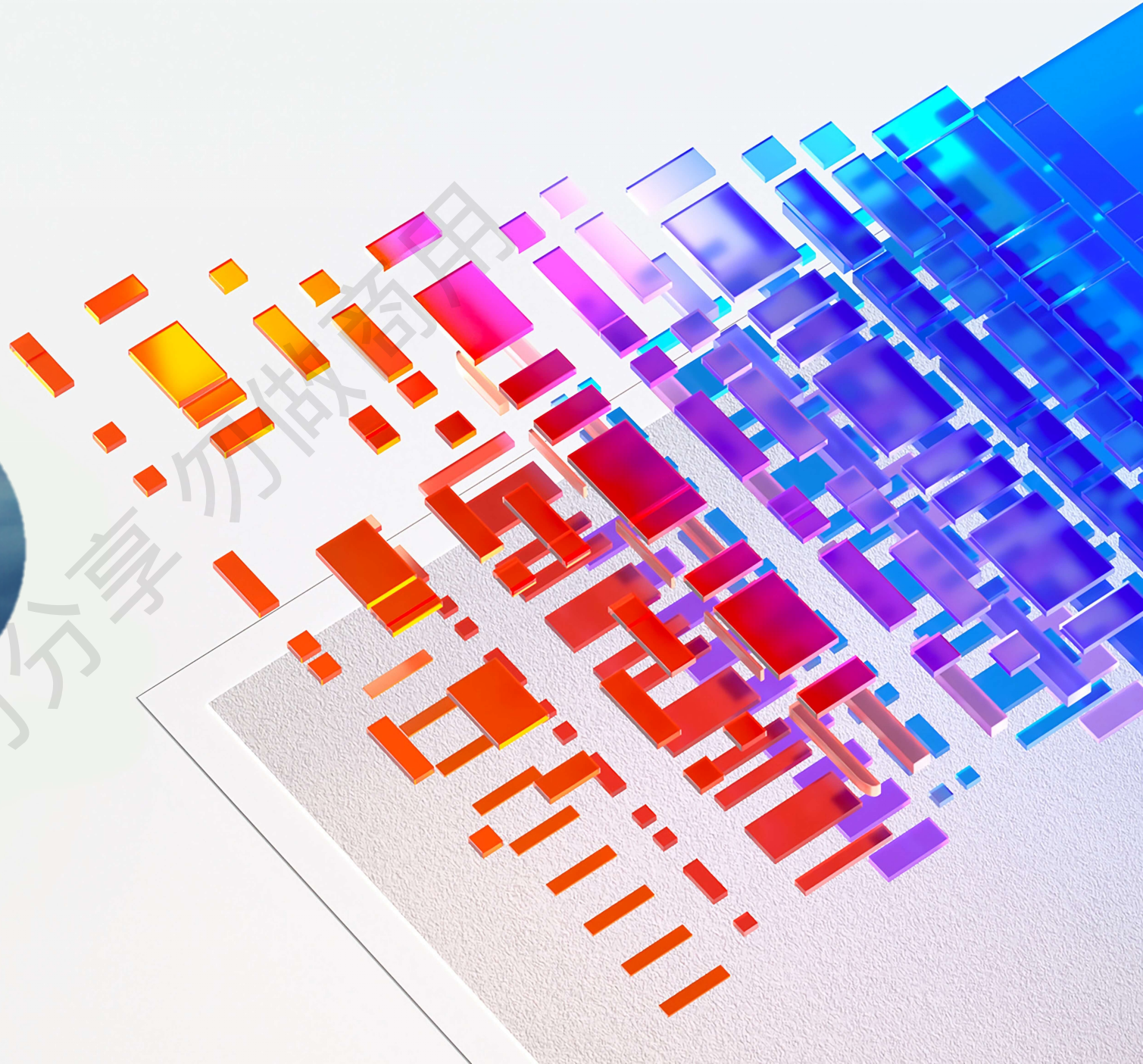




The Microsoft Azure logo, featuring a stylized blue cloud with a yellow sun or moon in the center.

# Microsoft Azure

**Azure Network Services**





# Module Objectives

- Learn how virtual networking helps you isolate network and compute resources

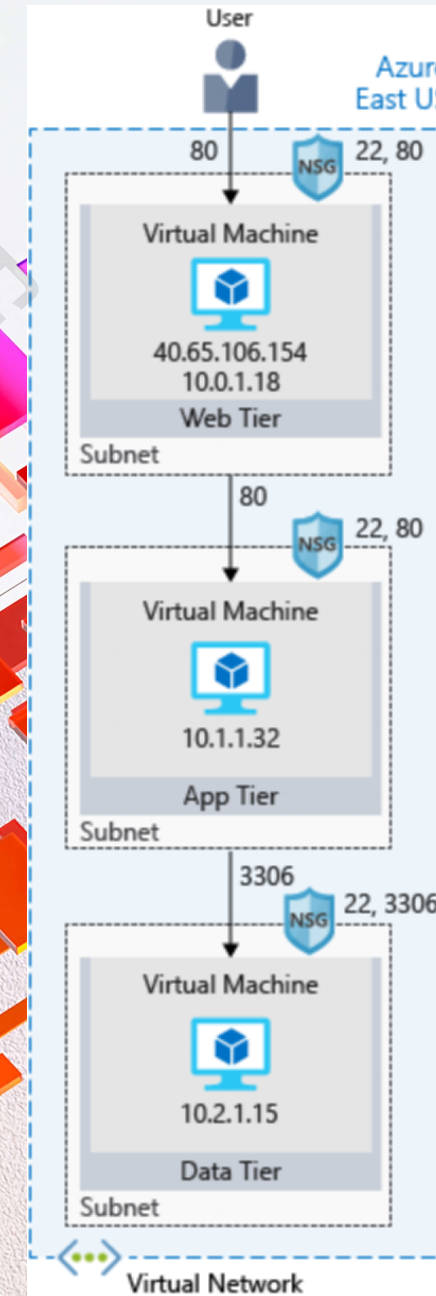
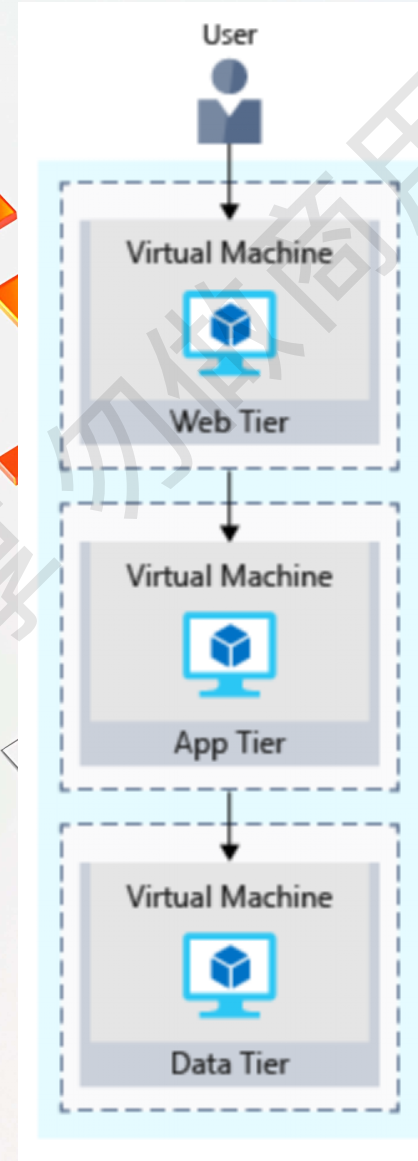
- Learn how Azure Load Balancer helps improve resiliency, or the ability to recover when your service goes down

- Learn how Traffic Manager can route traffic to different endpoints, including the endpoint with the lowest latency to the user

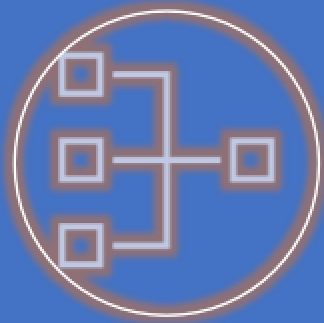


# Your Site on Azure

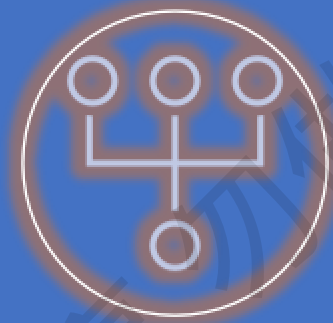
This basic configuration will give you a sense of how networks are configured, and how network traffic moves in and out of Azure.



# Azure networking options



virtual  
network



Load  
Balancer

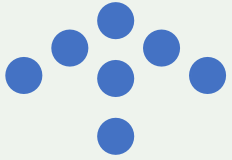


Traffic  
Manager





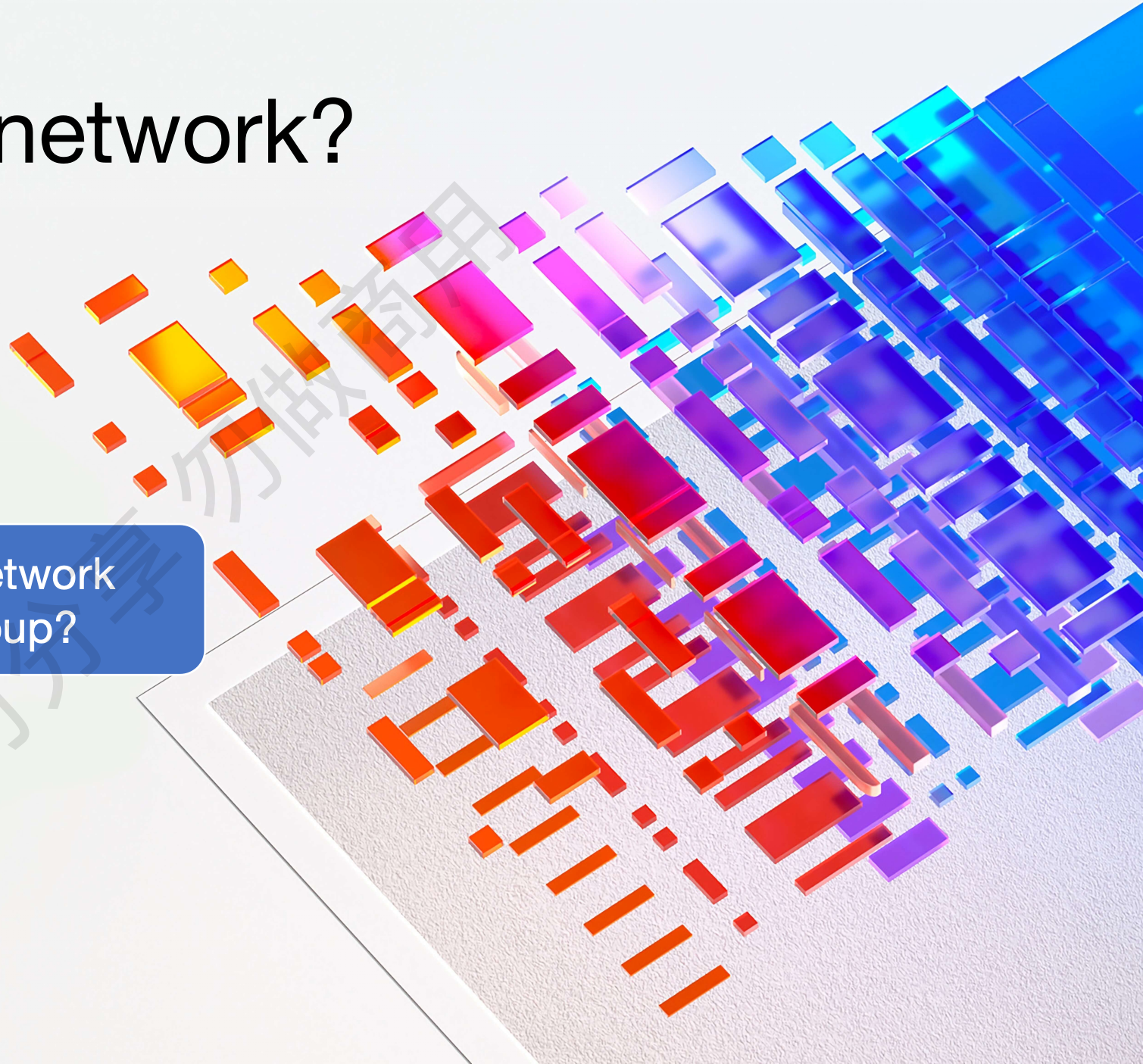
# What's a virtual network?



What's a network security group?

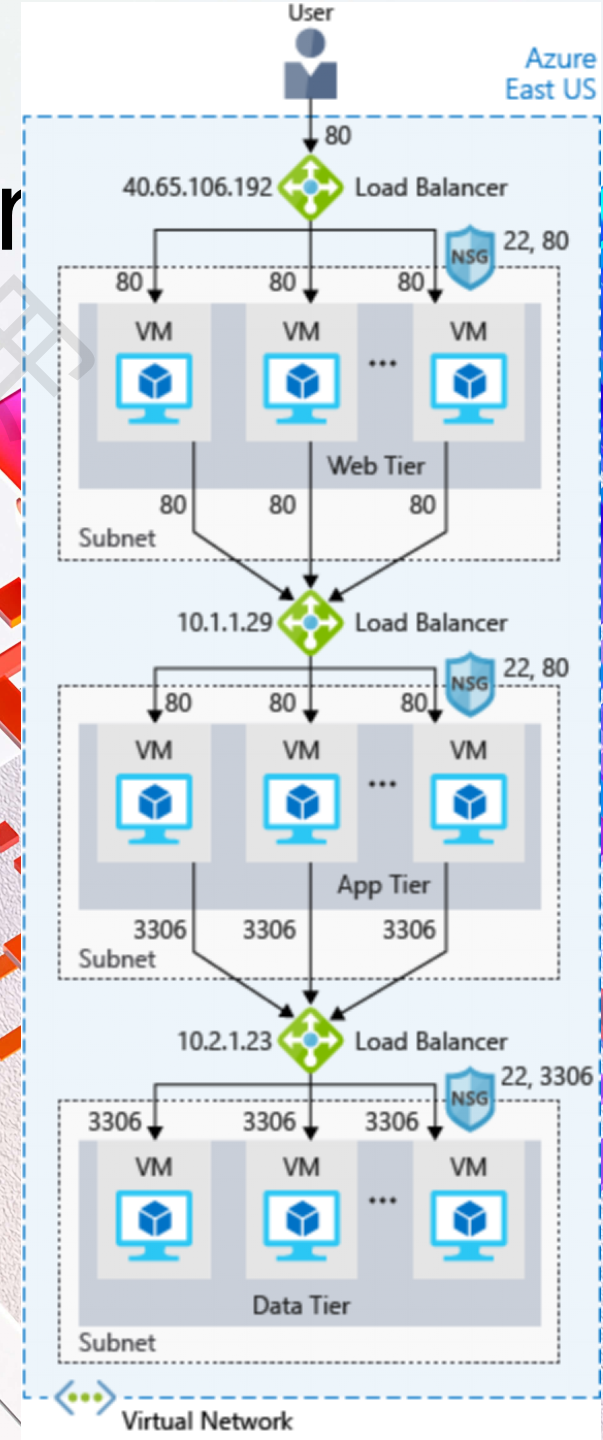
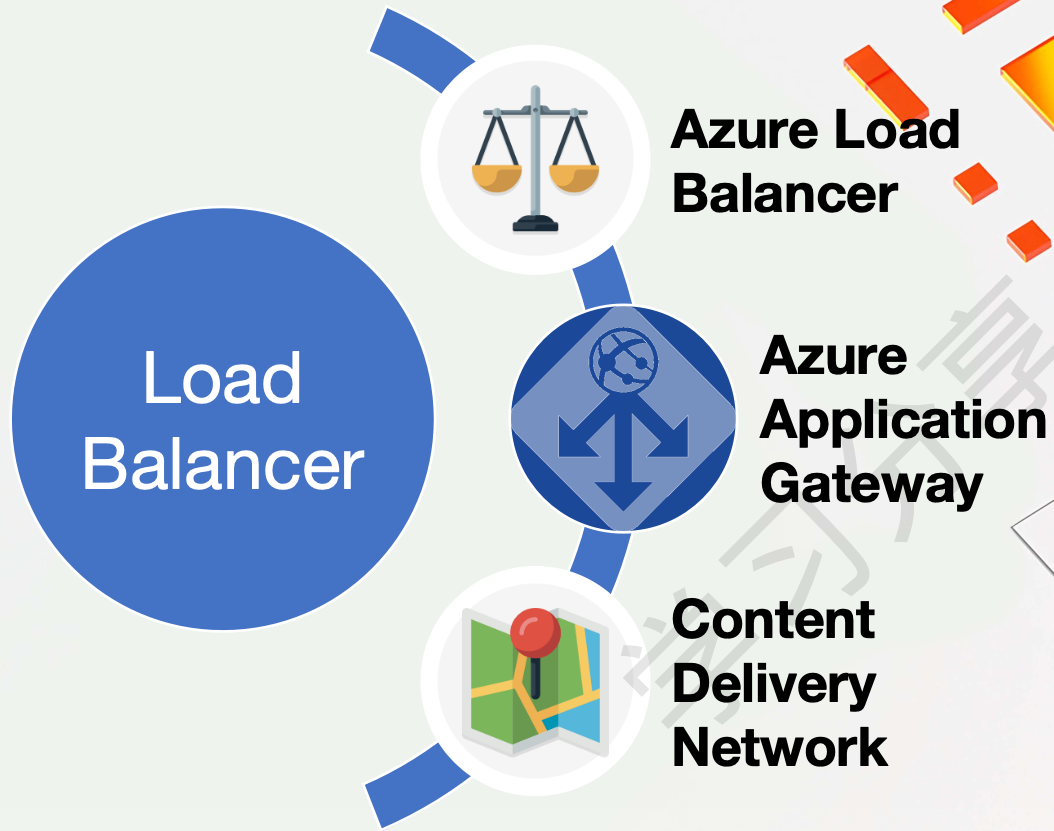


What's a virtual network?





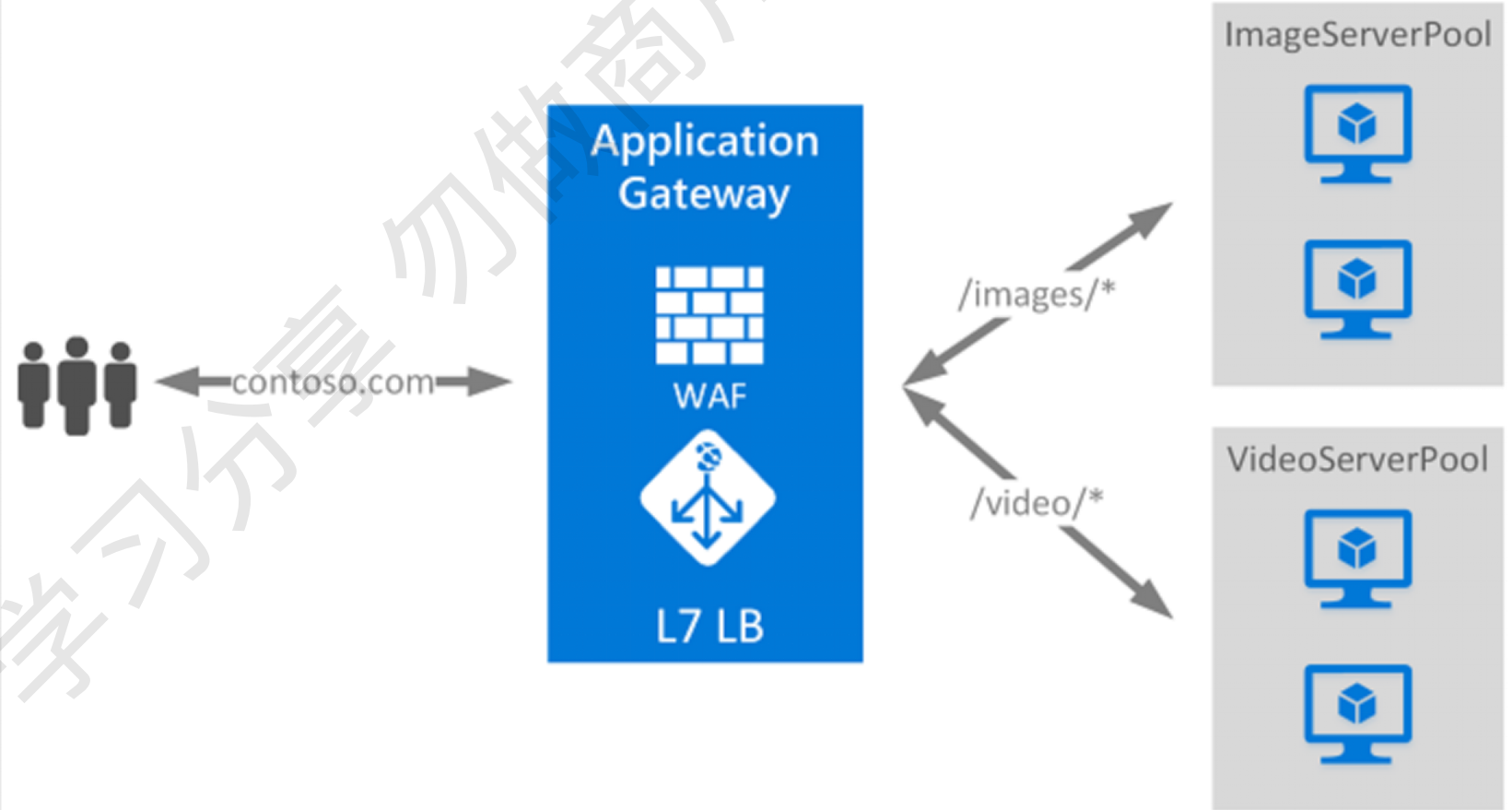
# Scale with Azure Load Balancer



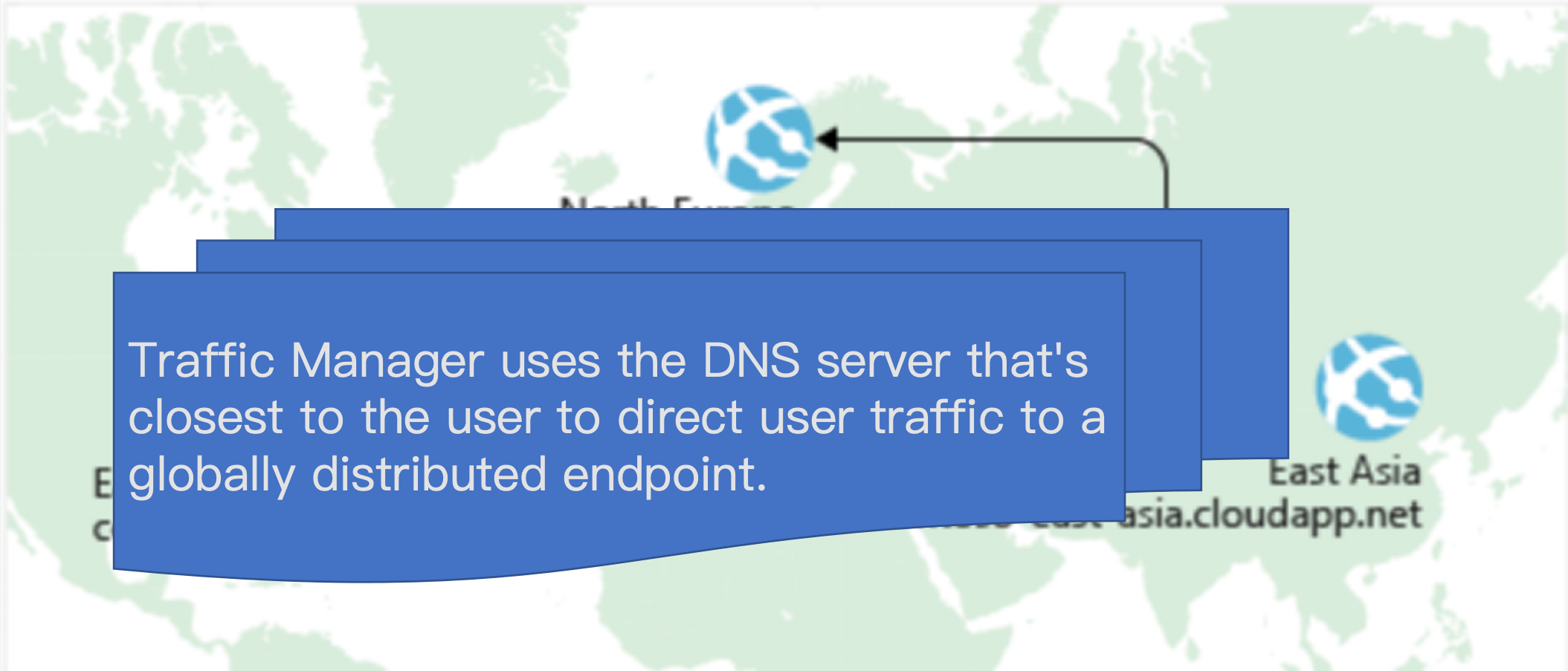


# A better option---Azure Application Gateway

Application Gateway is a balancer designed for applications. It uses Azure Balancer at the transport layer and applies sophisticated application layer based routing rules to handle several advanced scenarios.



# Reduce latency with Azure Traffic Manager



The diagram shows a world map with two Azure Traffic Manager endpoints marked with the Azure logo. One endpoint is in North America, labeled 'North America', and the other is in East Asia, labeled 'East Asia' with the URL 'eastasia.cloudapp.net' below it. A blue callout box with a white border is positioned over the map, containing text. An arrow points from the 'East Asia' endpoint to the callout box. The background of the slide features a blue and purple geometric pattern on the right side.

Traffic Manager uses the DNS server that's closest to the user to direct user traffic to a globally distributed endpoint.



# Compare Load Balancer to Traffic Manager

Azure Load Balancer distributes traffic within the same region to make your services more highly available and resilient. Traffic Manager works at the DNS level, and directs the client to a preferred endpoint. This endpoint can be to the region that's closest to your user.

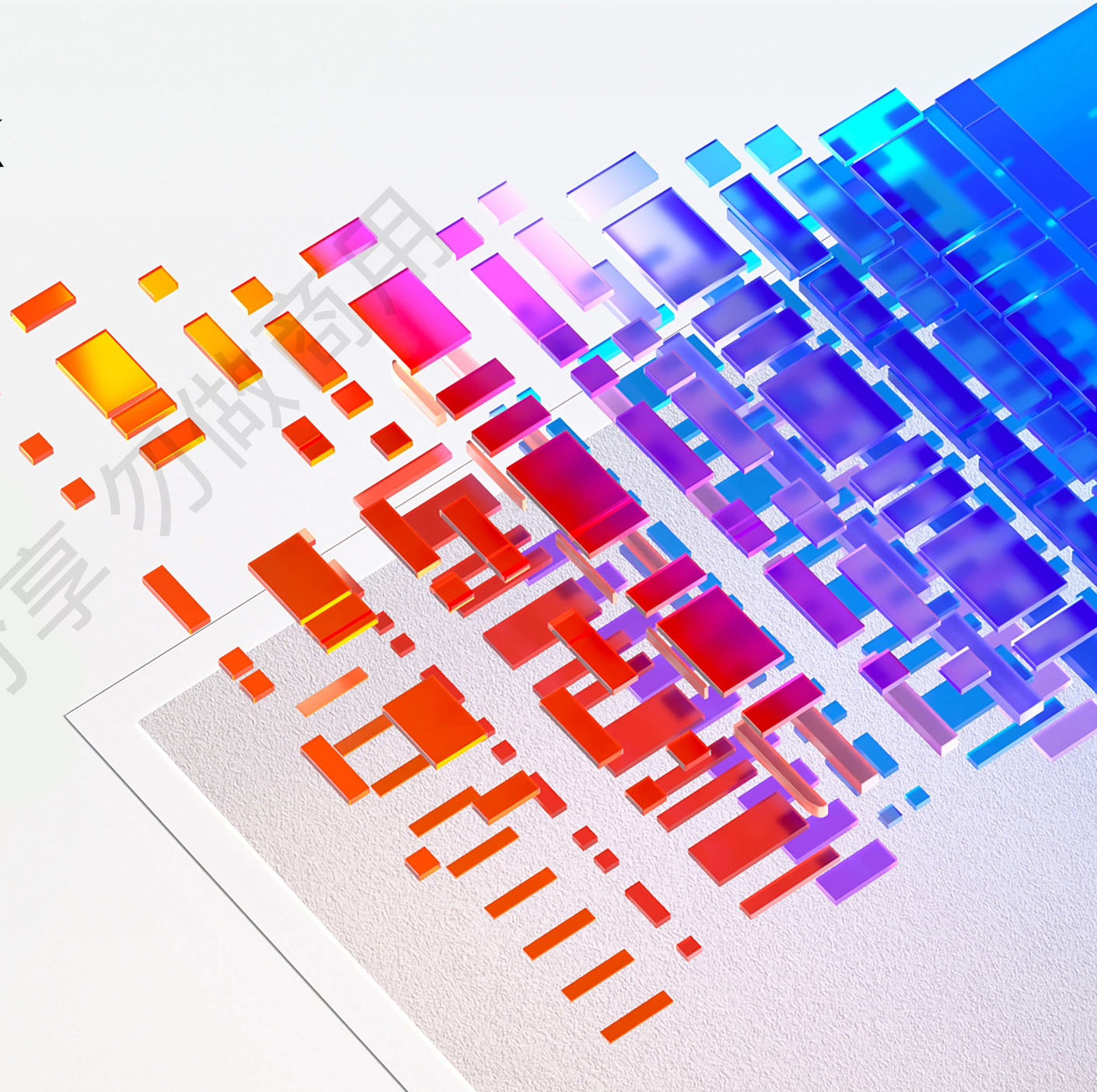
Load Balancer and Traffic Manager both help make your services more resilient, but in slightly different ways.

When Load Balancer detects an unresponsive VM, it directs traffic to other VMs in the pool. Traffic Manager monitors the health of your endpoints. When Traffic Manager finds an unresponsive endpoint, it directs traffic to the next closest endpoint that is responsive.



# Knowledge Check

Please scan this QR Code,  
Then submit your answer.





The image features the Microsoft Azure logo on the left, which consists of three overlapping circles in shades of blue and white. To the right of the logo is a large, abstract 3D visualization of data. This visualization is composed of numerous rectangular blocks of varying sizes, arranged in a grid-like pattern that recedes into the distance. The blocks are colored in a gradient from bright yellow and orange in the foreground to deep blue and purple in the background, creating a sense of depth and digital complexity. The entire scene is set against a light gray background.

# Microsoft Azure

**Azure Storage Services**



# Module Objectives

- Survey the data storage options in Azure

- Explore how Azure can meet your business demands for storing and analyzing data

- Compare Azure data options with on-premises storage



# Azure data storage options



**Azure  
SQL  
Database**



**Azure  
Cosmos  
DB**



**Azure  
Blob  
storage**



**Azure  
Data  
Lake  
Storage**



**Azure  
Files**



**Azure  
Queue**



**Disk  
Storage**



**Azure  
Table**

# Types of data



**Structured data**



**Semi-structured data**



**Unstructured data**



# Comparison between Azure data storage and on-premises storage

Needs	On-premises	Azure data storage
Compliance and security	Dedicated servers required for privacy and security	Client-side encryption and encryption at rest
Store structured and unstructured data	Additional IT resources with dedicated servers required	Azure Data Lake and portal analyzes and manages all types of data
Replication and high availability	More resources, licensing, and servers required	Built-in replication and redundancy features available
Application sharing and access to shared resources	File sharing requires additional administration resources	File sharing options available without additional license
Relational data storage	Needs a database server with database admin role	Offers database-as-a-service options
Distributed storage and data access	Expensive storage, networking, and compute resources needed	Azure Cosmos DB provides distributed access
Messaging and load balancing	Hardware redundancy impacts budget and resources	Azure Queue provides effective load balancing
Tiered storage	Management of tiered storage needs	Azure offers automated tiered

# Benefits of using Azure to store data

**Automated  
backup and  
recovery**

**Replication  
across the  
globe**

**Support for  
data  
analytics**

**Encryption  
capabilities**

**Multiple data  
types**

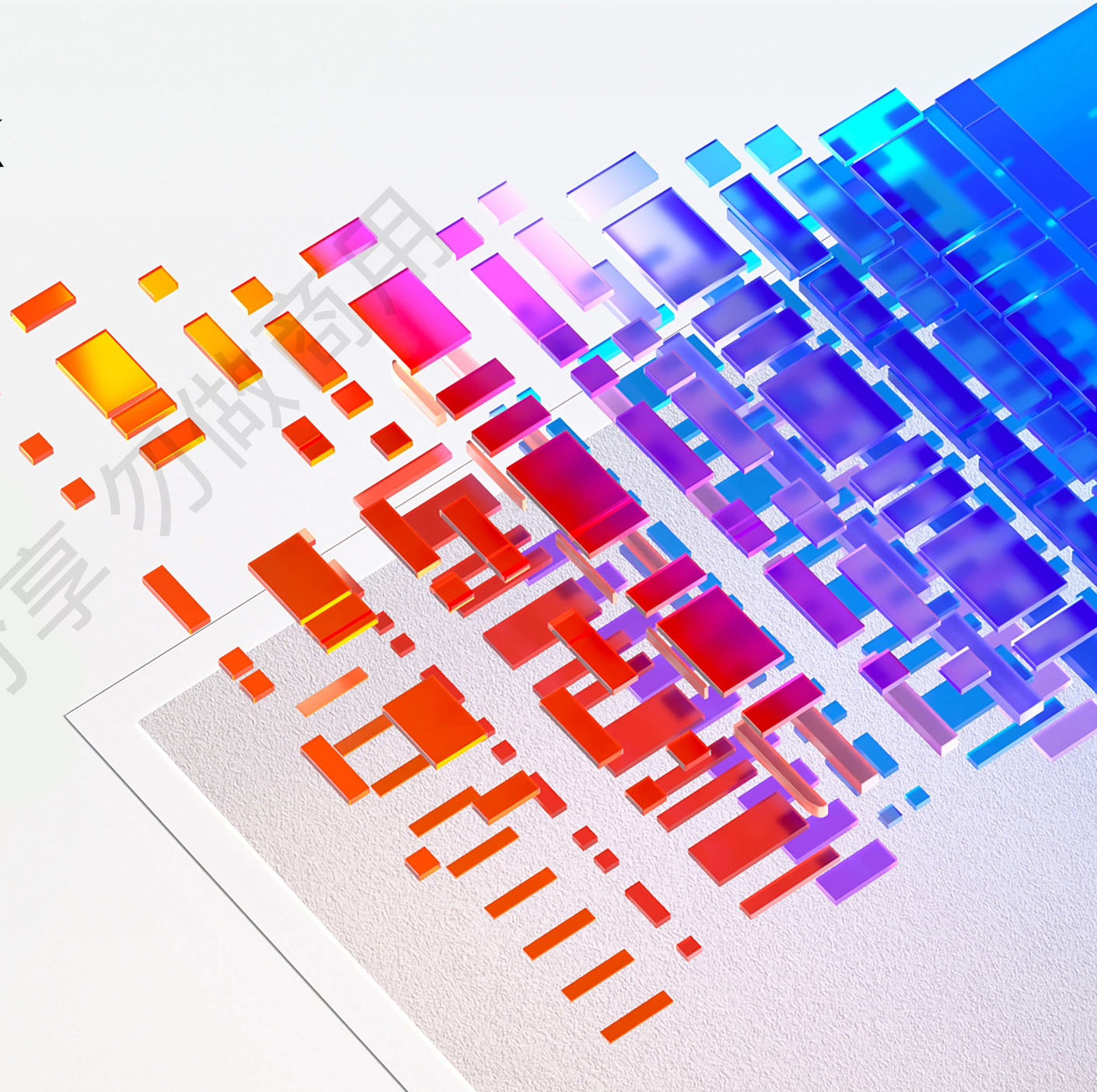
**Data storage  
in virtual  
disks**

**Storage tiers**



# Knowledge Check

Please scan this QR Code,  
Then submit your answer.





The image features the Microsoft Azure logo on the left, which consists of three overlapping circles in shades of blue and yellow. To the right of the logo is a large, abstract geometric shape composed of many small, colorful rectangular blocks in shades of blue, purple, and orange, arranged in a grid-like pattern that recedes into the distance. The background is a light gray gradient.

# Microsoft Azure

**More on Azure Core Services**



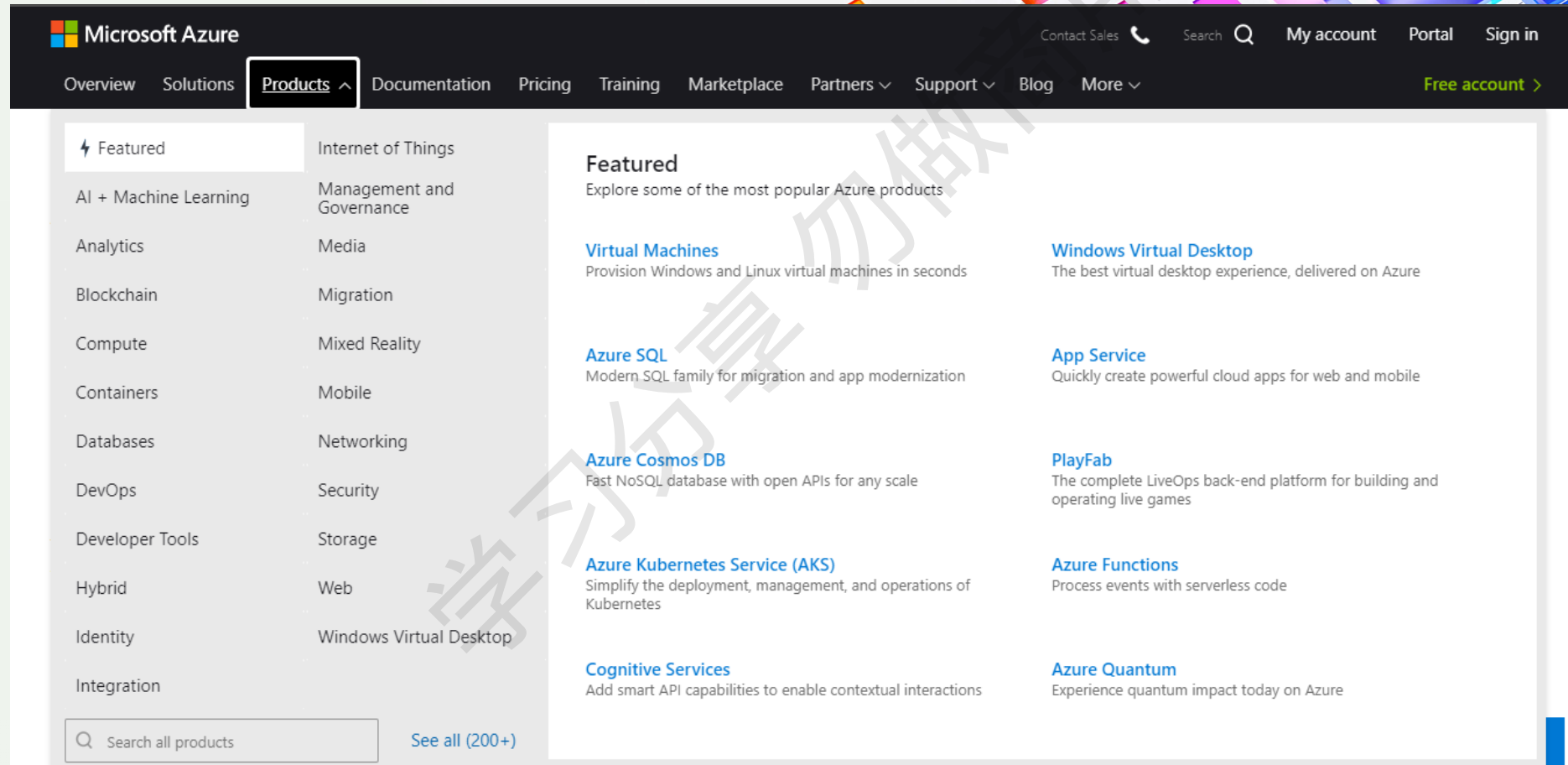
# Module Objectives

- Know much more products on Azure

- Know much more solutions on Azure

- Know about Azure Marketplace

# More products on Azure



The screenshot displays the Microsoft Azure website's 'Products' page. The top navigation bar includes the Microsoft Azure logo, a search icon, and links for 'Contact Sales', 'My account', 'Portal', and 'Sign in'. Below this, a secondary navigation bar lists categories like 'Overview', 'Solutions', 'Products' (which is highlighted with a dropdown arrow), 'Documentation', 'Pricing', 'Training', 'Marketplace', 'Partners', 'Support', 'Blog', and 'More'. A 'Free account >' link is also present.

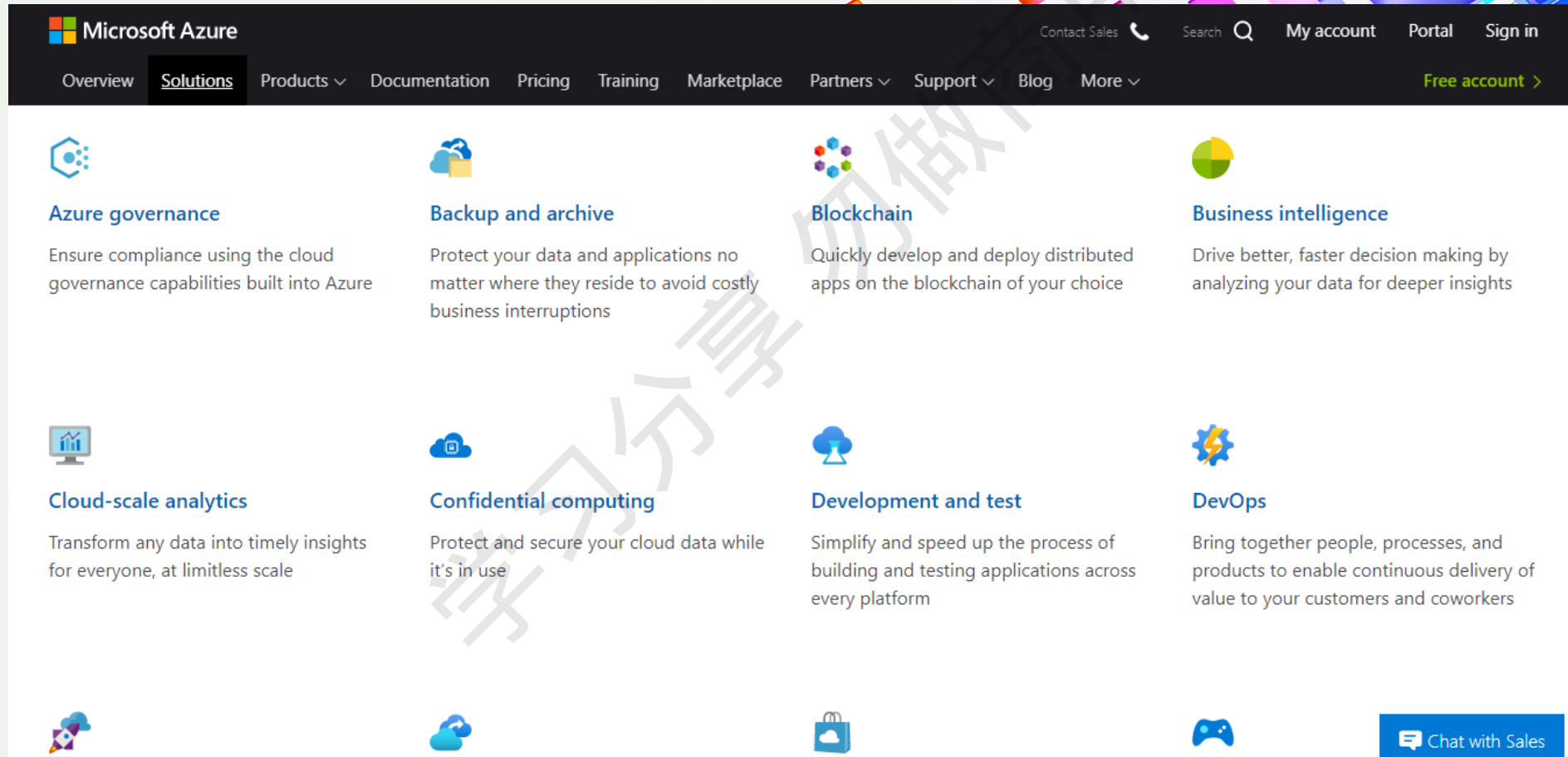
The main content area is divided into two columns. The left column features a 'Featured' section with a lightning bolt icon, followed by a list of product categories: AI + Machine Learning, Analytics, Blockchain, Compute, Containers, Databases, DevOps, Developer Tools, Hybrid, Identity, and Integration. Below this list is a search bar labeled 'Search all products' and a link to 'See all (200+)'. The right column is titled 'Featured' and lists several popular Azure products with brief descriptions:

- Virtual Machines**: Provision Windows and Linux virtual machines in seconds.
- Azure SQL**: Modern SQL family for migration and app modernization.
- Azure Cosmos DB**: Fast NoSQL database with open APIs for any scale.
- Azure Kubernetes Service (AKS)**: Simplify the deployment, management, and operations of Kubernetes.
- Cognitive Services**: Add smart API capabilities to enable contextual interactions.
- Windows Virtual Desktop**: The best virtual desktop experience, delivered on Azure.
- App Service**: Quickly create powerful cloud apps for web and mobile.
- PlayFab**: The complete LiveOps back-end platform for building and operating live games.
- Azure Functions**: Process events with serverless code.
- Azure Quantum**: Experience quantum impact today on Azure.

<https://azure.microsoft.com/en-us/services/>



# More solutions on Azure



The screenshot shows the Microsoft Azure website's 'Solutions' page. The header is dark blue with the Microsoft Azure logo on the left and navigation links (Contact Sales, Search, My account, Portal, Sign in) on the right. Below the header is a secondary navigation bar with links: Overview, Solutions (highlighted), Products, Documentation, Pricing, Training, Marketplace, Partners, Support, Blog, and More. A 'Free account >' link is on the far right. The main content area features eight solution cards arranged in a 2x4 grid. Each card has an icon, a title, and a brief description. The solutions are: Azure governance, Backup and archive, Blockchain, Business intelligence, Cloud-scale analytics, Confidential computing, Development and test, and DevOps. At the bottom right, there is a blue button labeled 'Chat with Sales'.

**Microsoft Azure**

Overview **Solutions** Products Documentation Pricing Training Marketplace Partners Support Blog More

Free account >

**Azure governance**  
Ensure compliance using the cloud governance capabilities built into Azure

**Backup and archive**  
Protect your data and applications no matter where they reside to avoid costly business interruptions

**Blockchain**  
Quickly develop and deploy distributed apps on the blockchain of your choice

**Business intelligence**  
Drive better, faster decision making by analyzing your data for deeper insights

**Cloud-scale analytics**  
Transform any data into timely insights for everyone, at limitless scale

**Confidential computing**  
Protect and secure your cloud data while it's in use

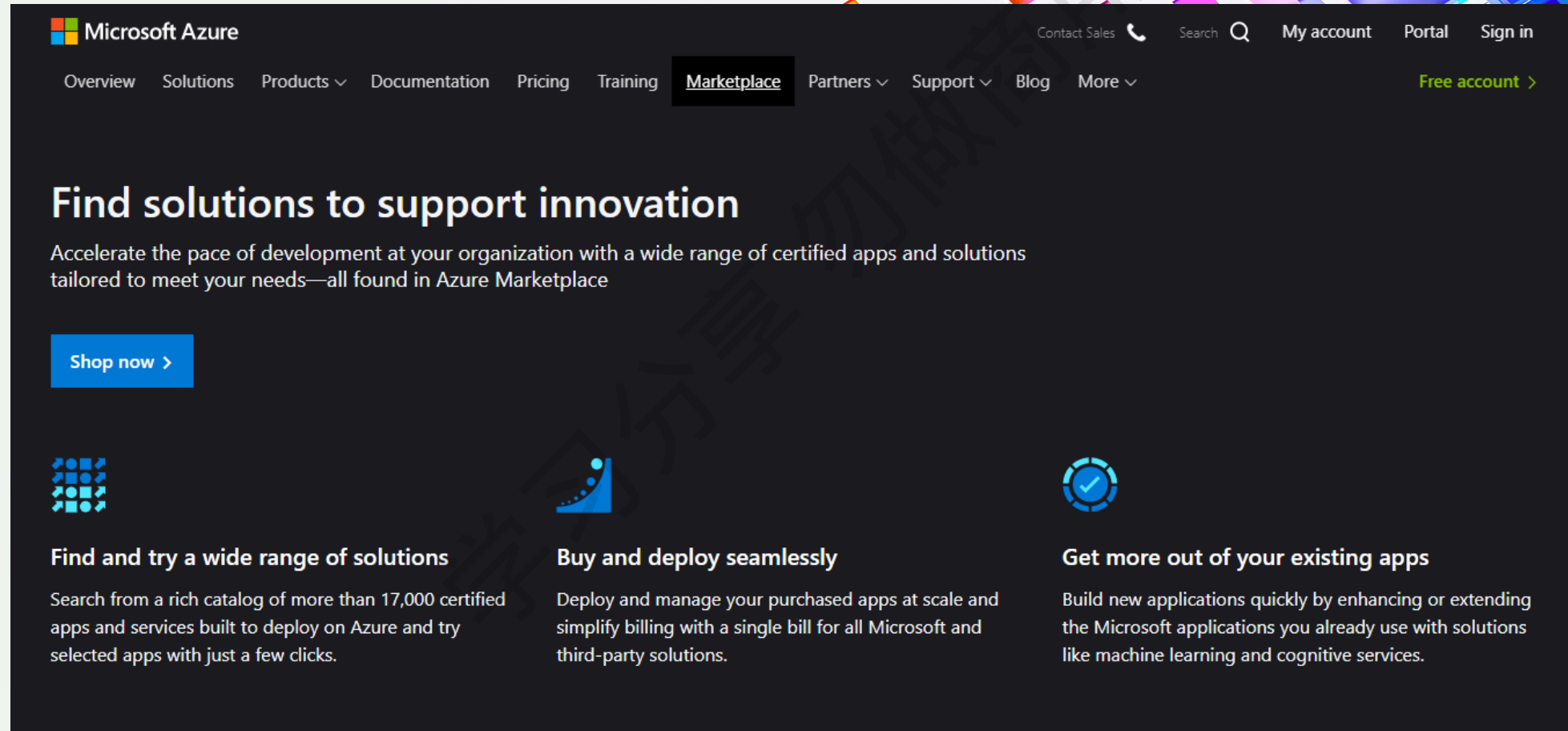
**Development and test**  
Simplify and speed up the process of building and testing applications across every platform

**DevOps**  
Bring together people, processes, and products to enable continuous delivery of value to your customers and coworkers

Chat with Sales

<https://azure.microsoft.com/en-us/solutions/>

# Azure Marketplace



The screenshot shows the Azure Marketplace homepage. At the top, the Microsoft Azure logo is on the left, and navigation links for 'Contact Sales', 'Search', 'My account', 'Portal', and 'Sign in' are on the right. Below this, a secondary navigation bar includes 'Overview', 'Solutions', 'Products', 'Documentation', 'Pricing', 'Training', 'Marketplace' (which is highlighted), 'Partners', 'Support', 'Blog', and 'More'. A 'Free account' link is also present. The main heading reads 'Find solutions to support innovation', followed by a subtext: 'Accelerate the pace of development at your organization with a wide range of certified apps and solutions tailored to meet your needs—all found in Azure Marketplace'. A 'Shop now' button is located below the subtext. The page is divided into three columns, each with an icon, a heading, and a description. The first column features a grid icon, the heading 'Find and try a wide range of solutions', and text about searching a catalog of 17,000+ certified apps. The second column features a bar chart icon, the heading 'Buy and deploy seamlessly', and text about managing purchased apps at scale. The third column features a checkmark icon, the heading 'Get more out of your existing apps', and text about enhancing existing Microsoft applications with services like machine learning.

**Microsoft Azure**

Overview Solutions Products Documentation Pricing Training **Marketplace** Partners Support Blog More


Contact Sales Search My account Portal Sign in

[Free account](#)

## Find solutions to support innovation


Accelerate the pace of development at your organization with a wide range of certified apps and solutions tailored to meet your needs—all found in Azure Marketplace

[Shop now](#)




### Find and try a wide range of solutions

Search from a rich catalog of more than 17,000 certified apps and services built to deploy on Azure and try selected apps with just a few clicks.



### Buy and deploy seamlessly

Deploy and manage your purchased apps at scale and simplify billing with a single bill for all Microsoft and third-party solutions.



### Get more out of your existing apps

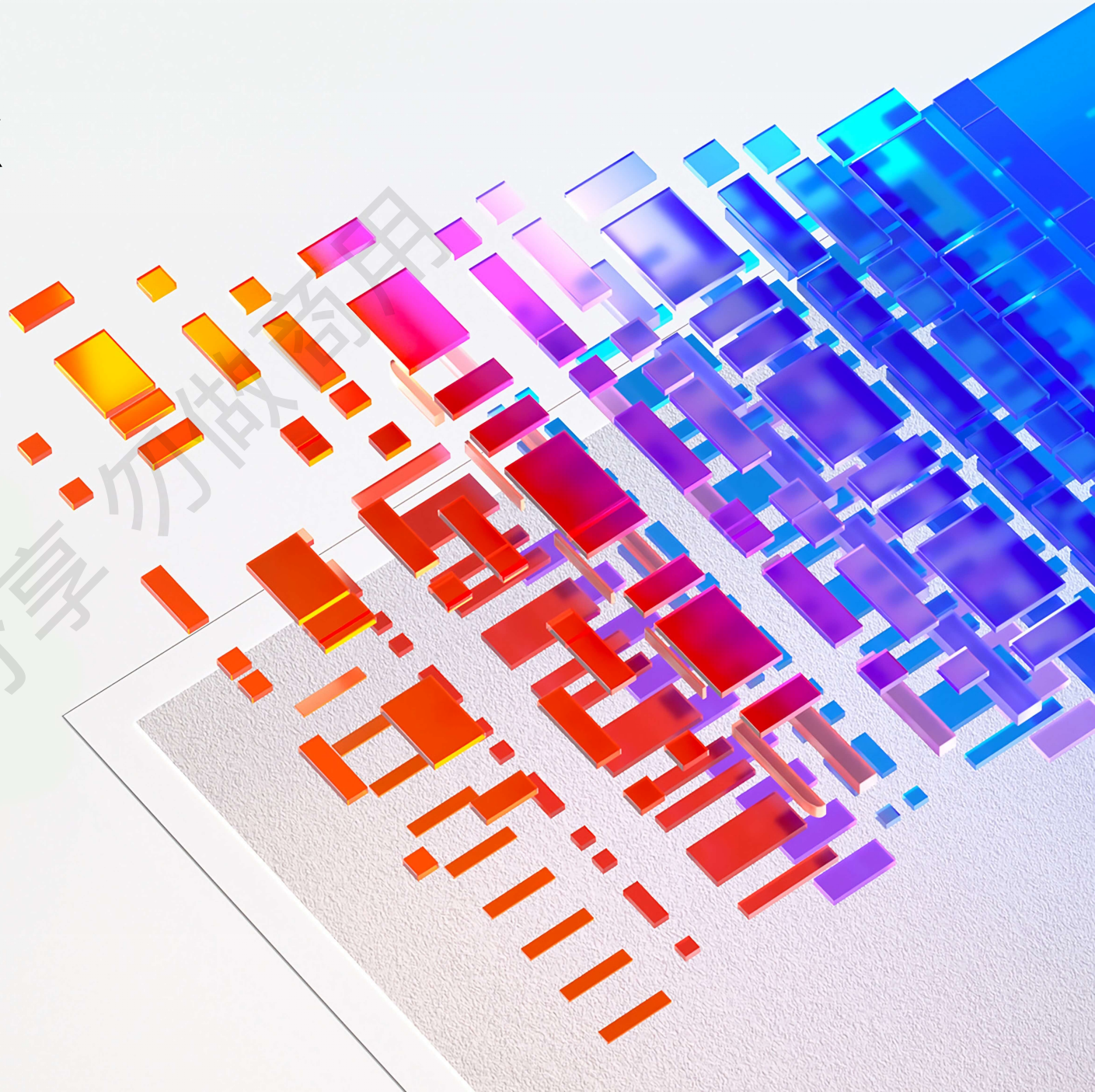
Build new applications quickly by enhancing or extending the Microsoft applications you already use with solutions like machine learning and cognitive services.

<https://azure.microsoft.com/en-us/marketplace/>



# Knowledge Check

Please scan this QR Code,  
Then submit your answer.

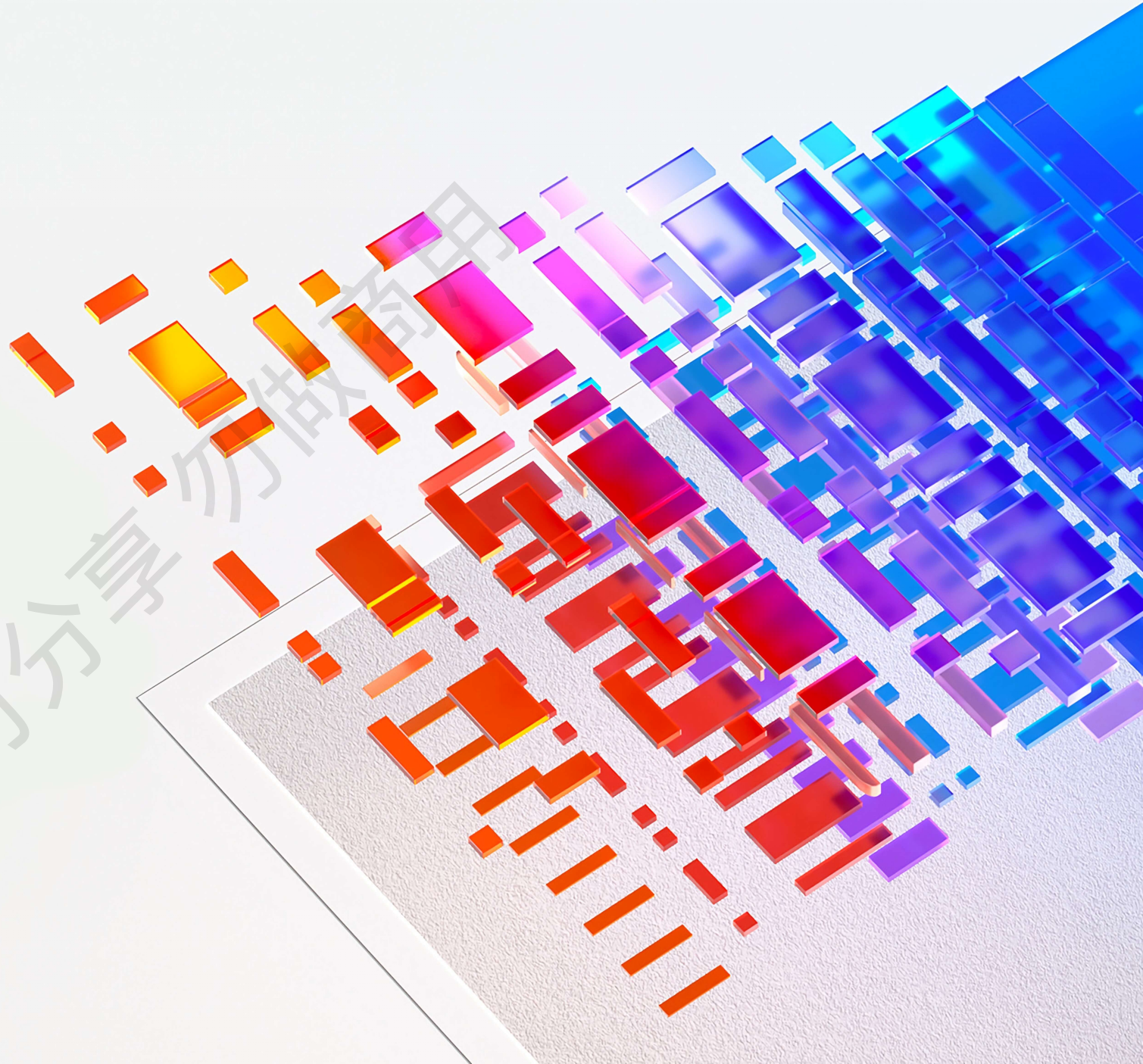




# Hands-on One



Create a Virtual Machine on Azure(IaaS)

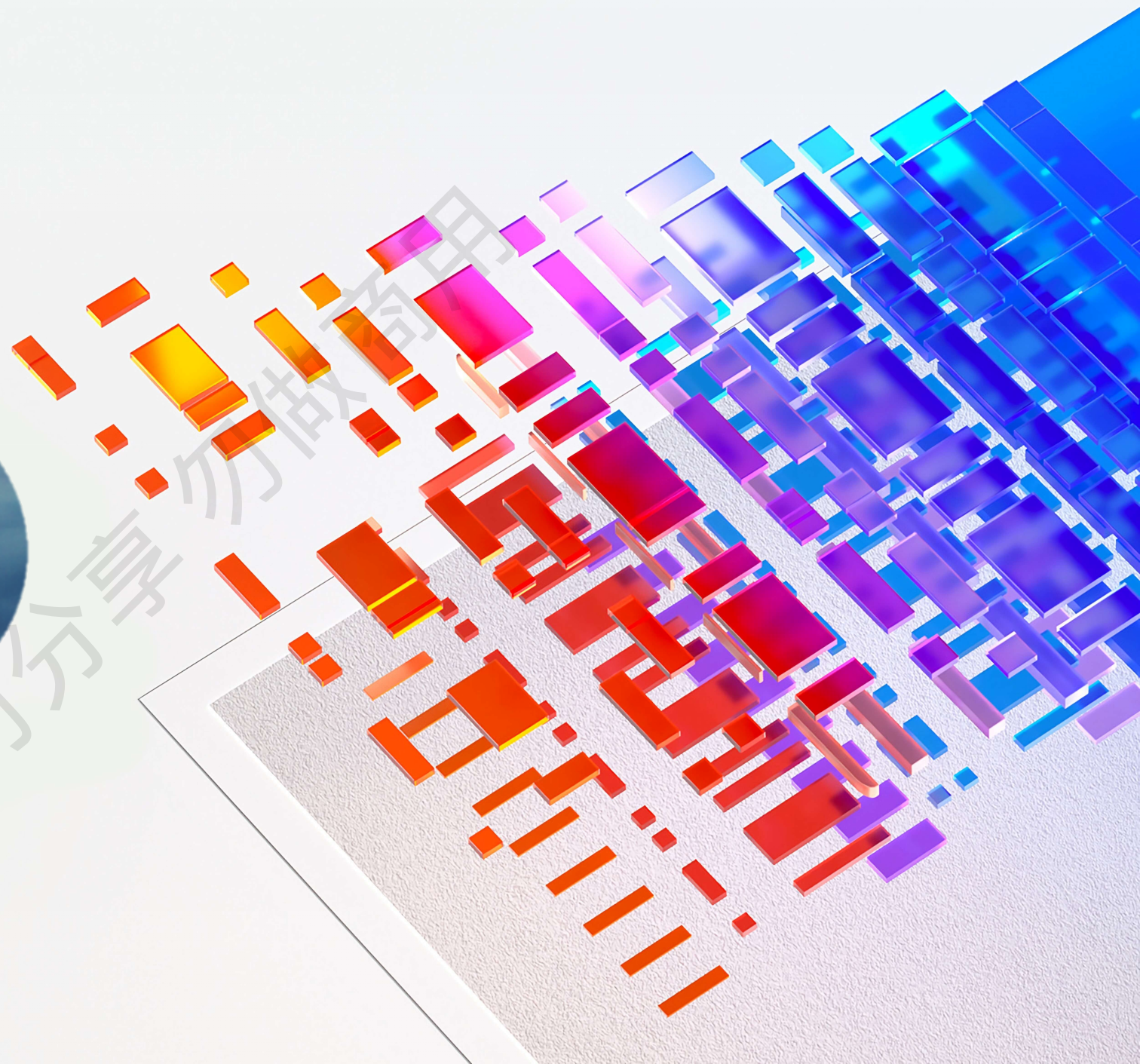






# Microsoft Azure

**Databricks & Synapse Analytics**





# Module Objectives

- Know about Azure Databricks

- Know about Azure Synapse Analytics

- Know more services about Analytics on Azure



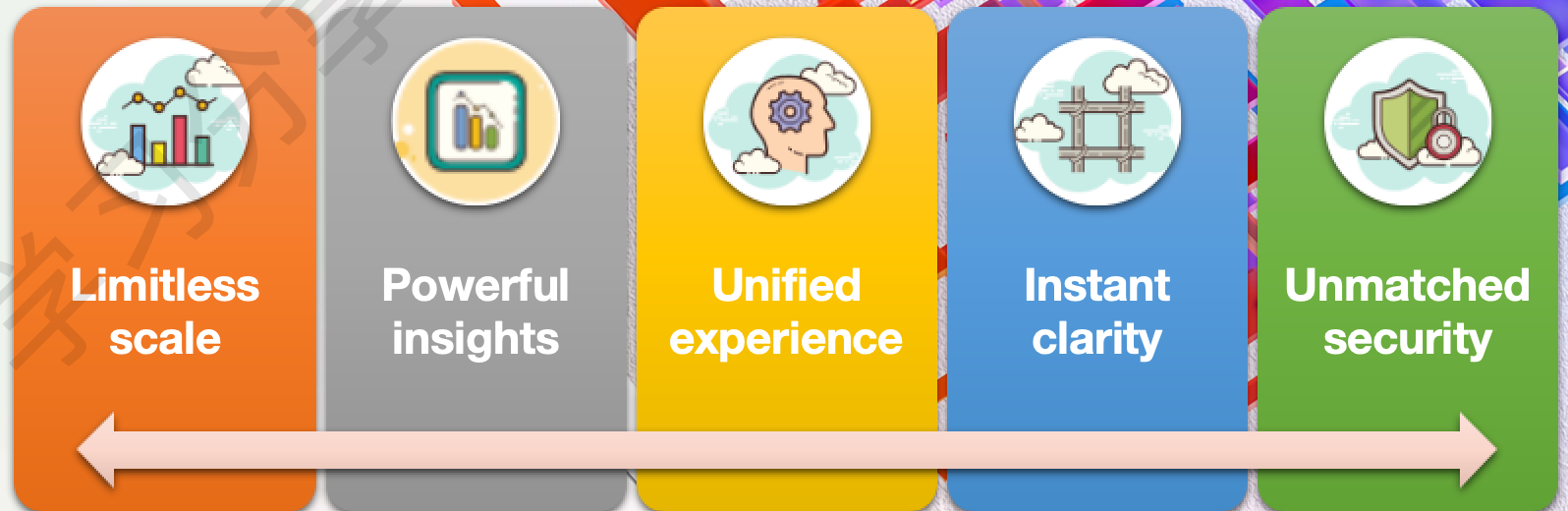
# Azure Databricks

Azure Databricks is a fully-managed version of the open-source Apache Spark analytics and data processing engine. Azure Databricks is an enterprise-grade and secure cloud-based big data and machine learning platform.

Databricks provides a notebook-oriented Apache Spark as-a-service workspace environment, making it easy to manage clusters and explore data interactively.



# Azure Synapse Analytics (formerly SQL Data Warehouse)





# More Analytics on Azure



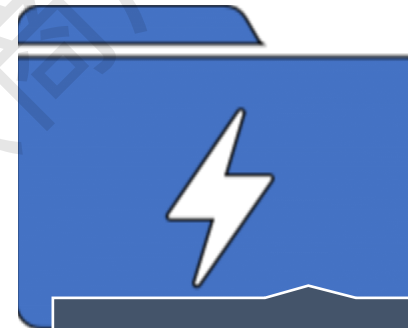
Azure Stream Analytics



HDInsight



Data Factory



Data Lake Analytics



Event Hubs



Power BI Embedded



R Server for HDInsight



Azure Data Explorer



Azure Data Share



Azure Analysis Services

# Knowledge Check

Please scan this QR Code,  
Then submit your answer.





The image features the Microsoft Azure logo on the left, which consists of three overlapping circles in shades of blue and yellow. To the right of the logo is a large, abstract visualization of data or a network. This visualization is composed of numerous small, rectangular blocks in various colors, including red, orange, yellow, green, and blue. These blocks are arranged in a way that suggests a complex, interconnected system, possibly representing a cloud infrastructure or a data network. The background is a light, neutral color, and the overall aesthetic is modern and technological.

# Microsoft Azure

**Security, Privacy, Compliance, Trust**



# Module Objectives

- Learn how security responsibility is shared with Azure
- Learn how identity management provides protection, even outside your network
- Learn how encryption capabilities built into Azure can protect your data
- Learn how to protect your network and virtual networks
- Learn about advanced services and features Azure provides to keep your services and data secure and



# Security, Privacy, Compliance, Trust

**Cloud security is a  
shared responsibility**

**Get tips from Azure  
Security Center**

**Identity and access**

**Encryption**

**Overview of  
Azure certificates**

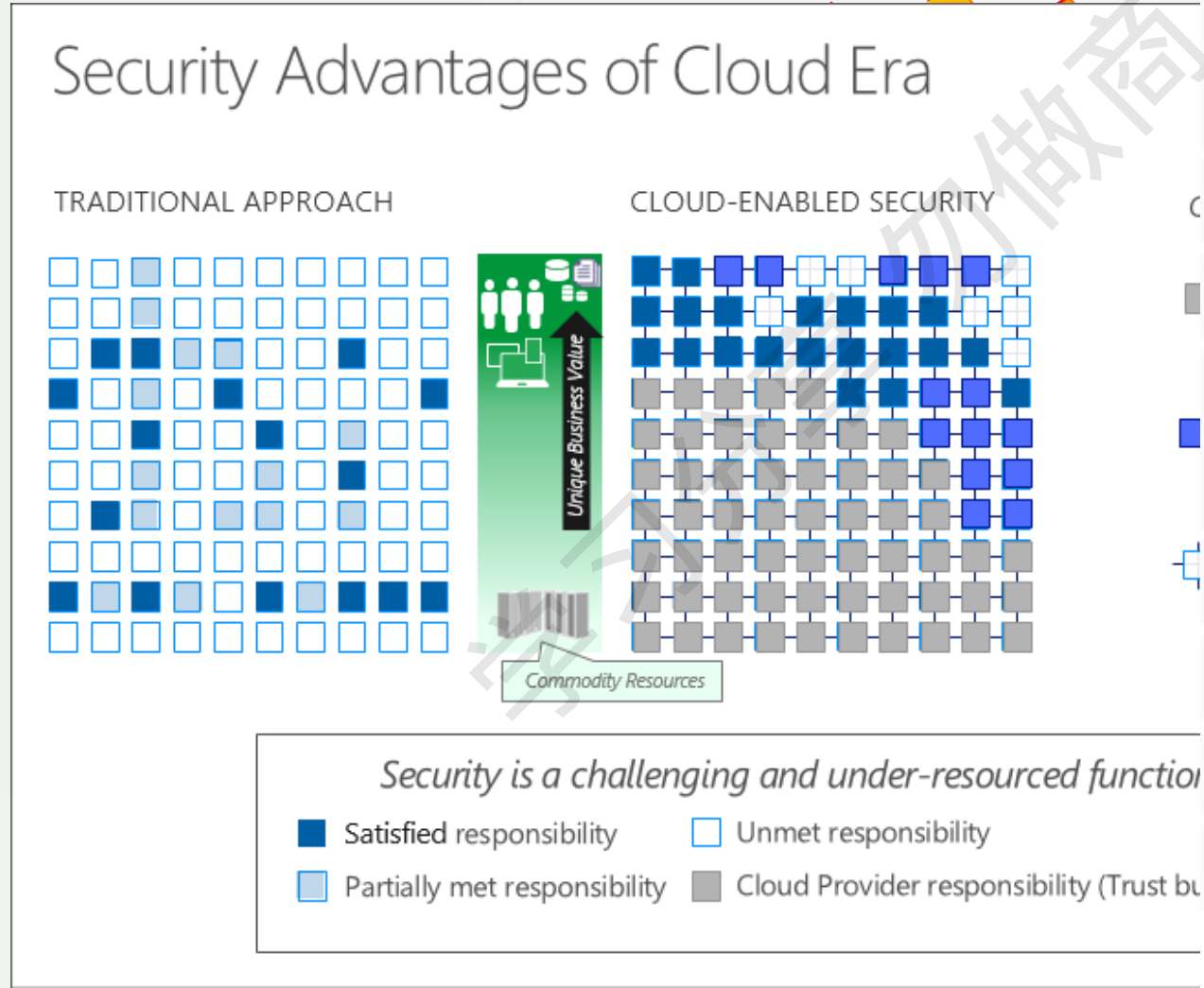
**Protect your network**

**Protect your shared  
documents**

**Azure Advanced  
Threat Protection**

**Understand Security  
Considerations for  
Application Lifecycle  
Management  
Solutions**

# Cloud security is a shared responsibility

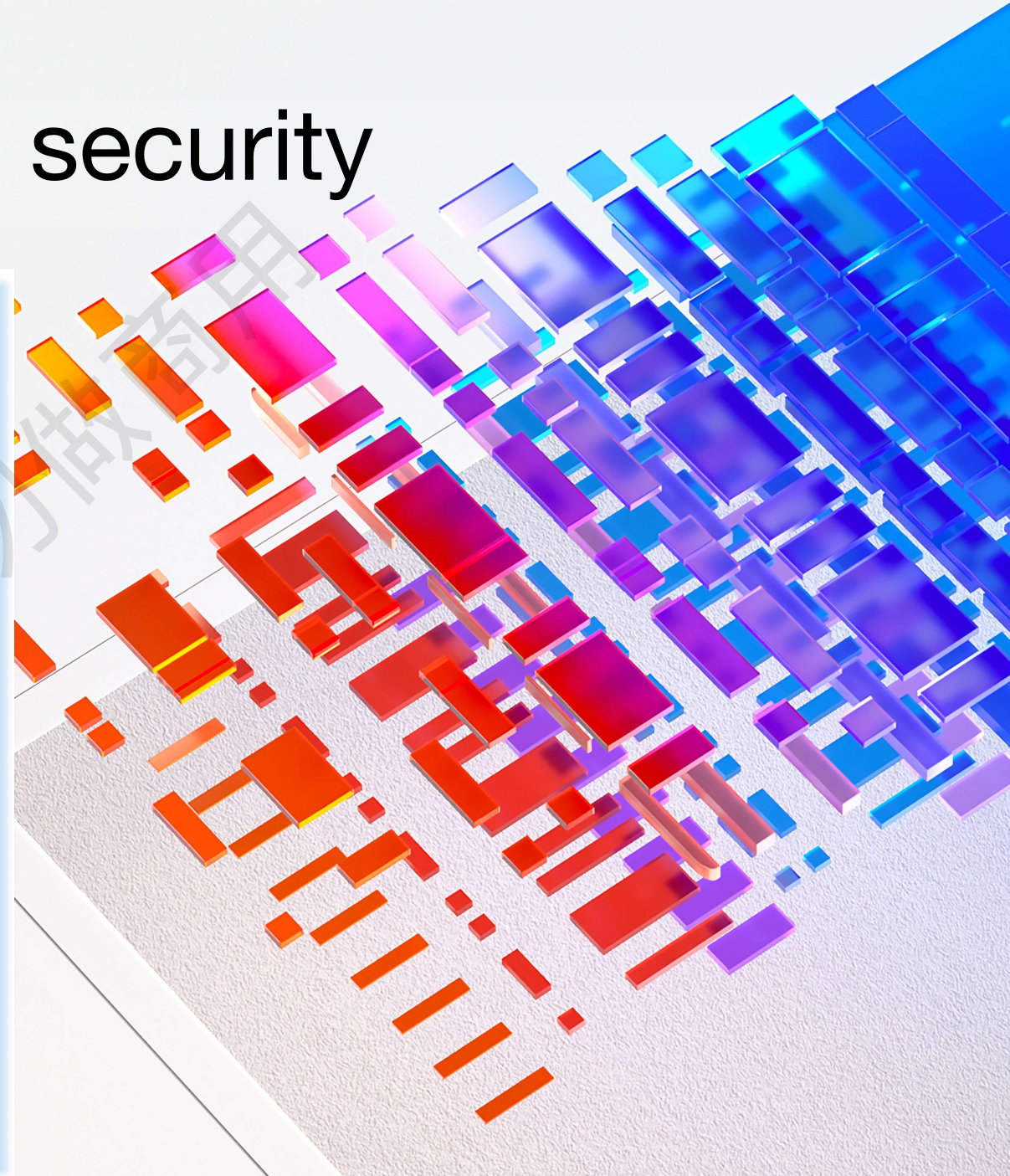
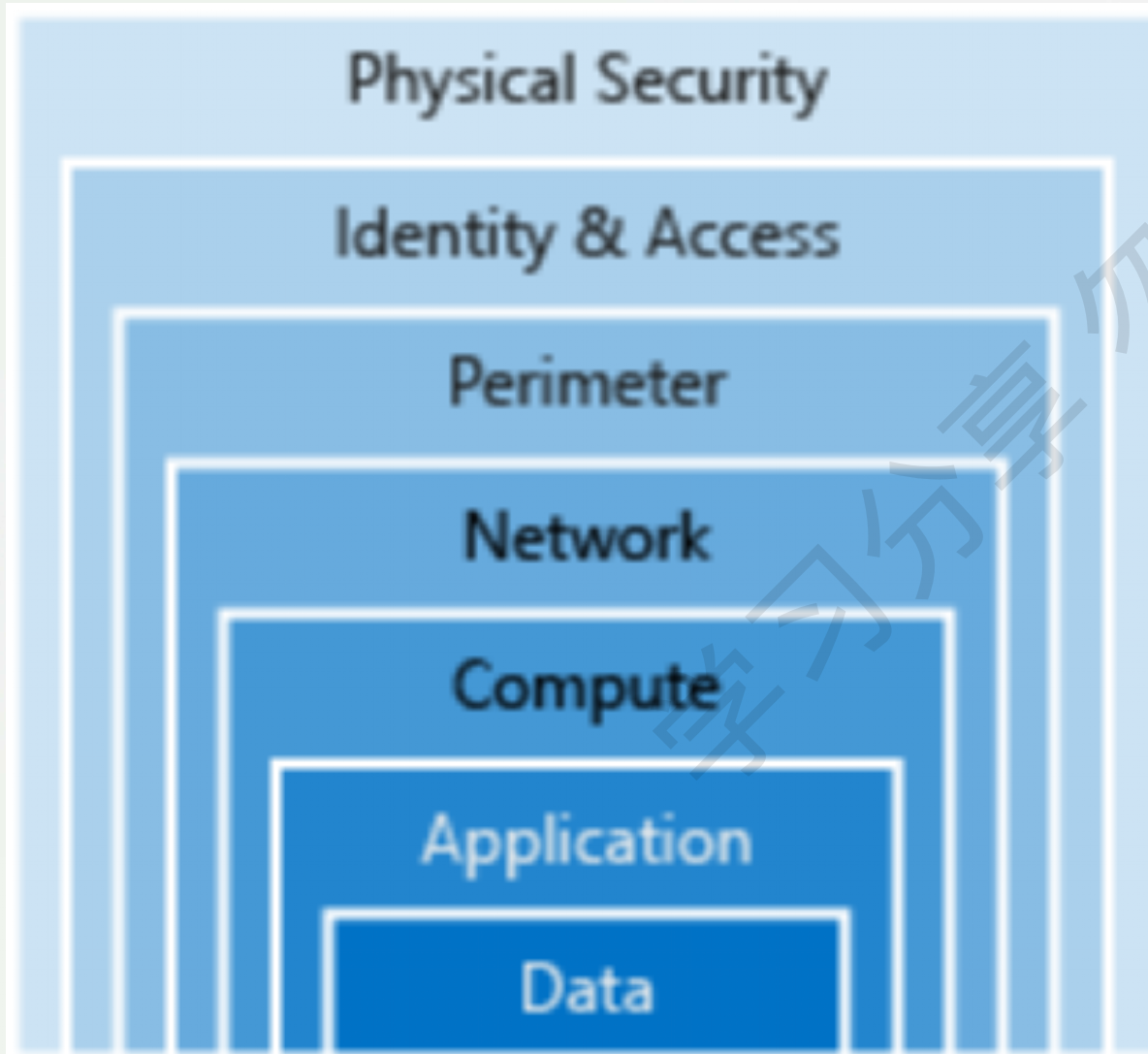


Responsibility	On-prem	IaaS	PaaS	SaaS
Data governance & rights management	Customer	Customer	Customer	Customer
Client endpoints	Customer	Customer	Customer	Customer
Account & access management	Customer	Customer	Customer	Customer
Identity & directory infrastructure	Customer	Customer	Shared	Shared
Application	Customer	Customer	Shared	Microsoft
Network controls	Customer	Customer	Shared	Microsoft
Operating system	Customer	Customer	Microsoft	Microsoft
Physical hosts	Customer	Microsoft	Microsoft	Microsoft
Physical network	Customer	Microsoft	Microsoft	Microsoft
Physical datacenter	Customer	Microsoft	Microsoft	Microsoft

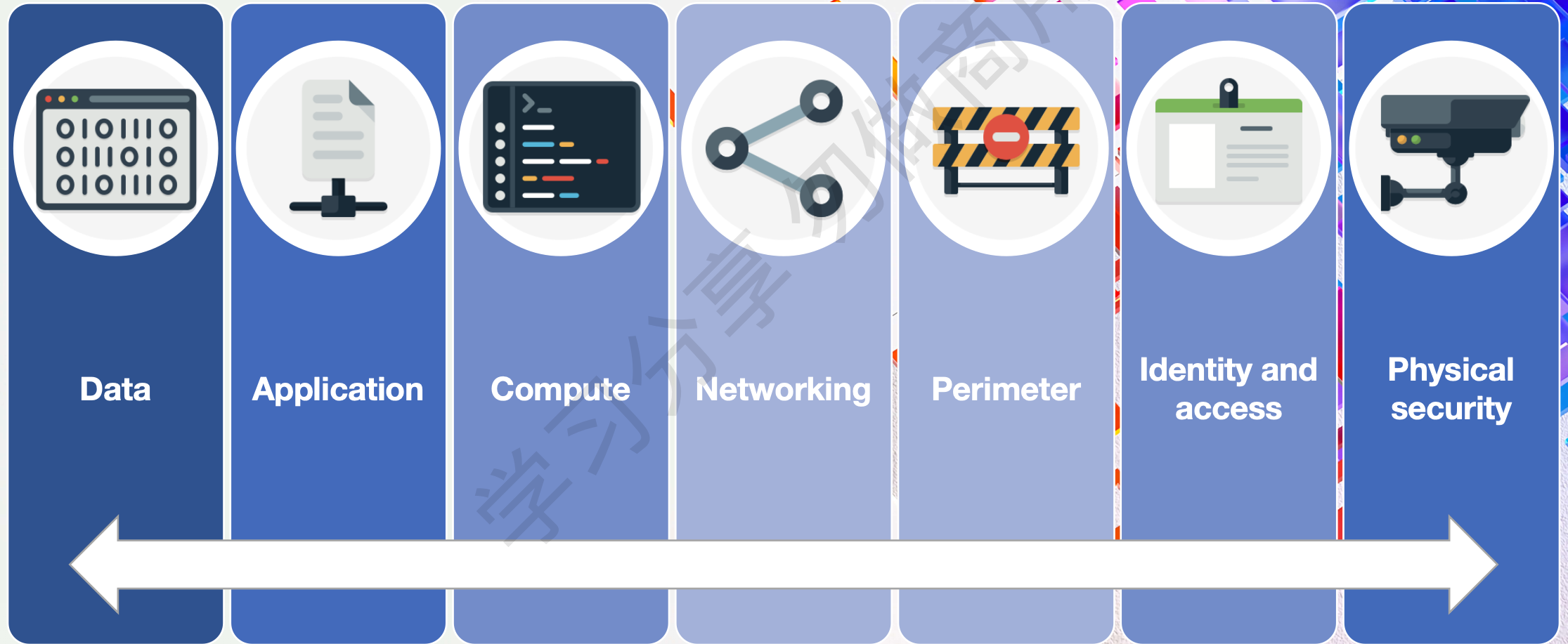
■ Microsoft    ■ Customer



# A layered approach to security



# A layered approach to security





# Get tips from Azure Security Center

- Provide security recommendations based on your configurations, resources, and networks.
- Monitor security settings across on-premises and cloud workloads, and automatically apply required security to new services as they come online.
- Continuously monitor all your services, and perform automatic security assessments to identify potential vulnerabilities before they can be exploited.
- Use machine learning to detect and block malware from being installed on your virtual machines and services. You can also define a list of allowed applications to ensure that only the apps you validate are allowed to execute.
- Analyze and identify potential inbound attacks, and help to investigate threats and any post-breach activity that might have occurred.
- Provide just-in-time access control for ports, reducing your attack surface by ensuring the network only allows traffic that you require.



# Azure Security Center usage scenarios

For incident response

*Detect*

*Assess*

*Diagnose*

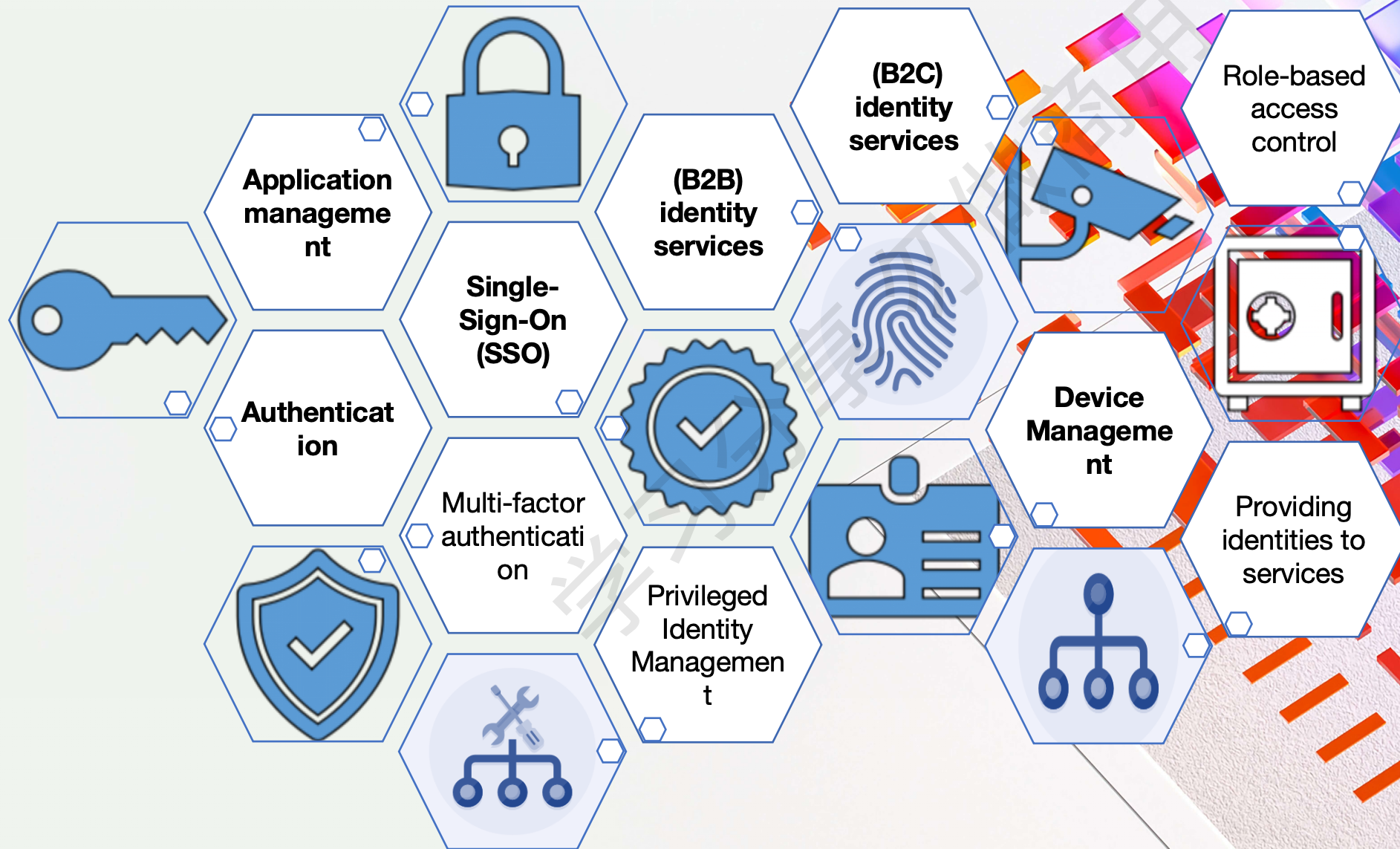
To enhance security

*Security policy*

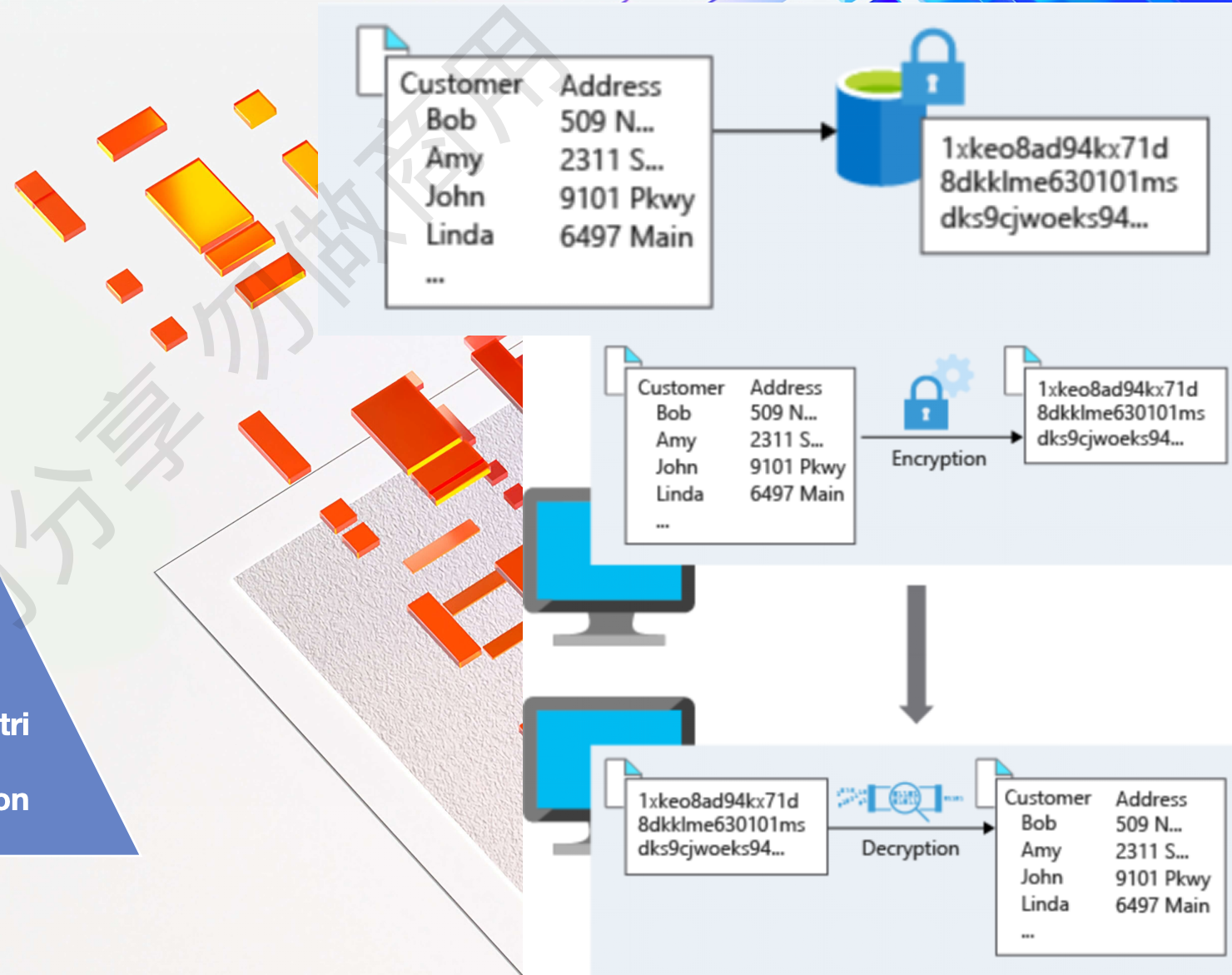
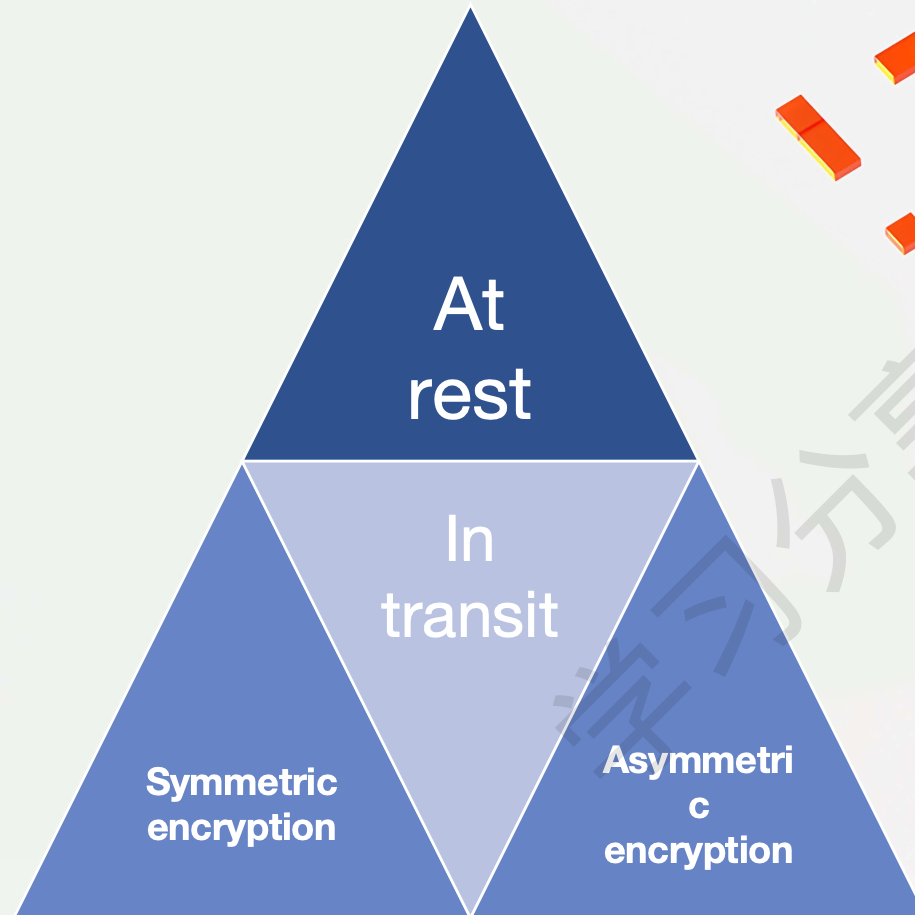
*Recommendations*



# Azure Active Directory

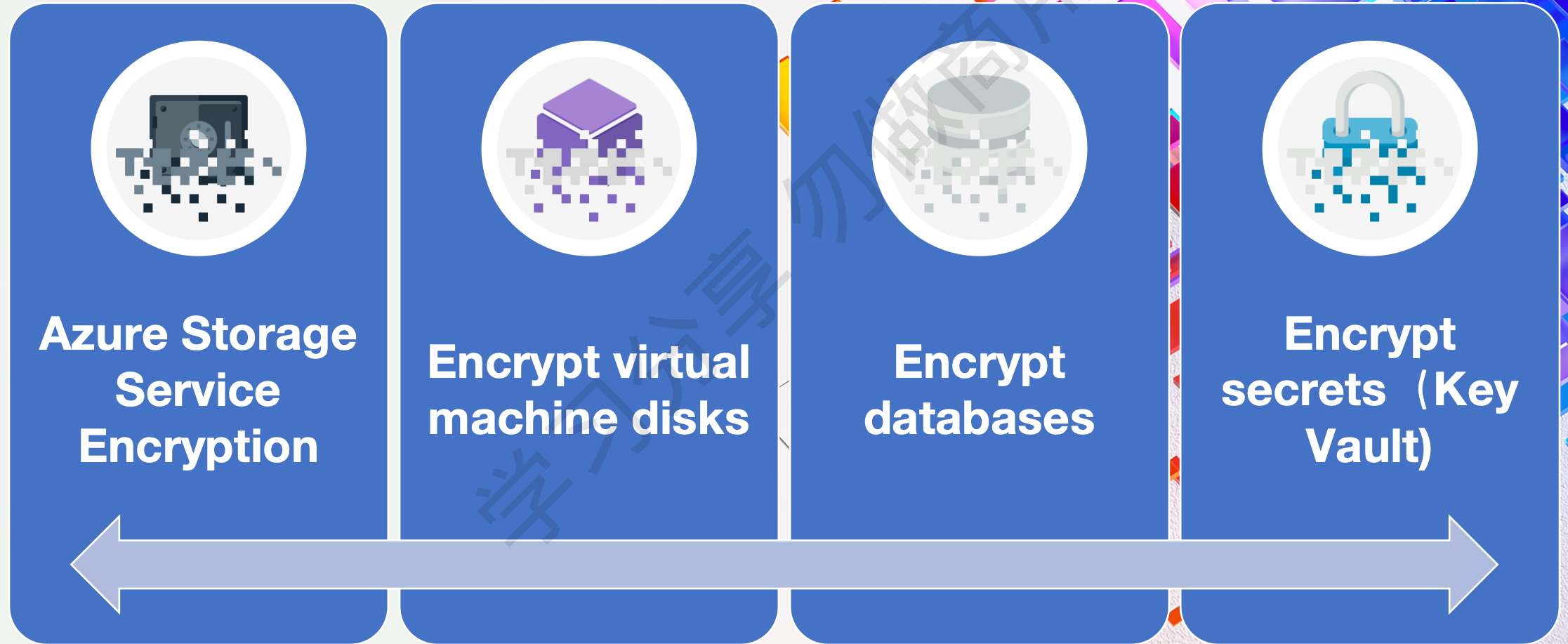


# Encryption on Azure





# Encryption on Azure



# Azure Key Vault

## Scenarios

- *Secrets management*
- *Key management*
- *Certificate management*
- *Store secrets backed by hardware security modules (HSMs)*

## Benefits

- *Centralized application secrets*
- *Securely stored secrets and keys*
- *Monitor access and use*
- *Simplified administration of application secrets*
- *Integrate with other Azure services*



# Protect your network



**Azure Firewall**



**Azure  
Application  
Gateway**



**Network virtual  
appliances**

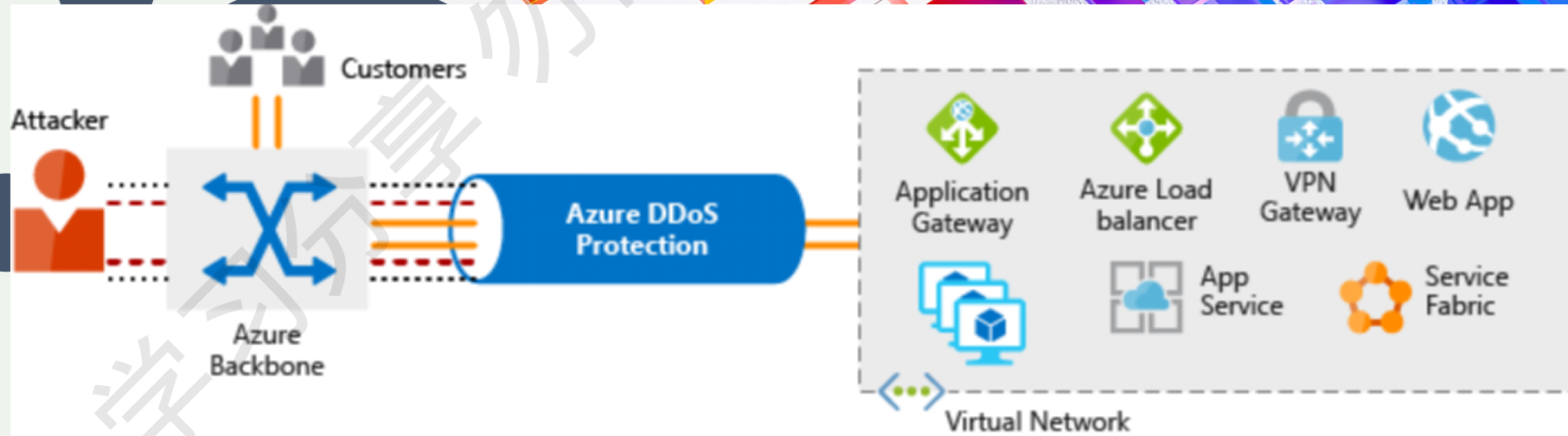


# Stopping DDoS attacks

Volumetric attacks

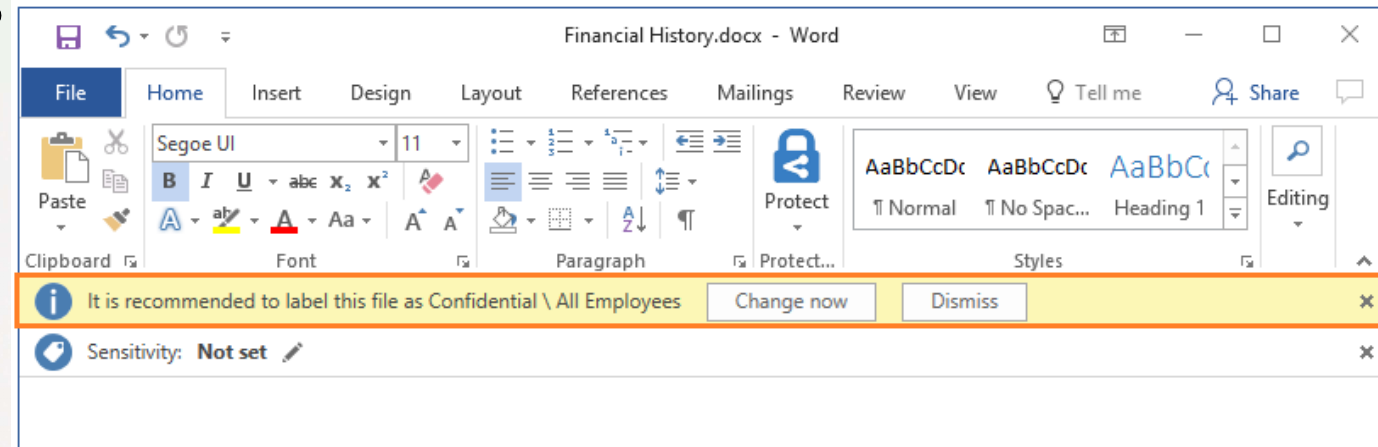
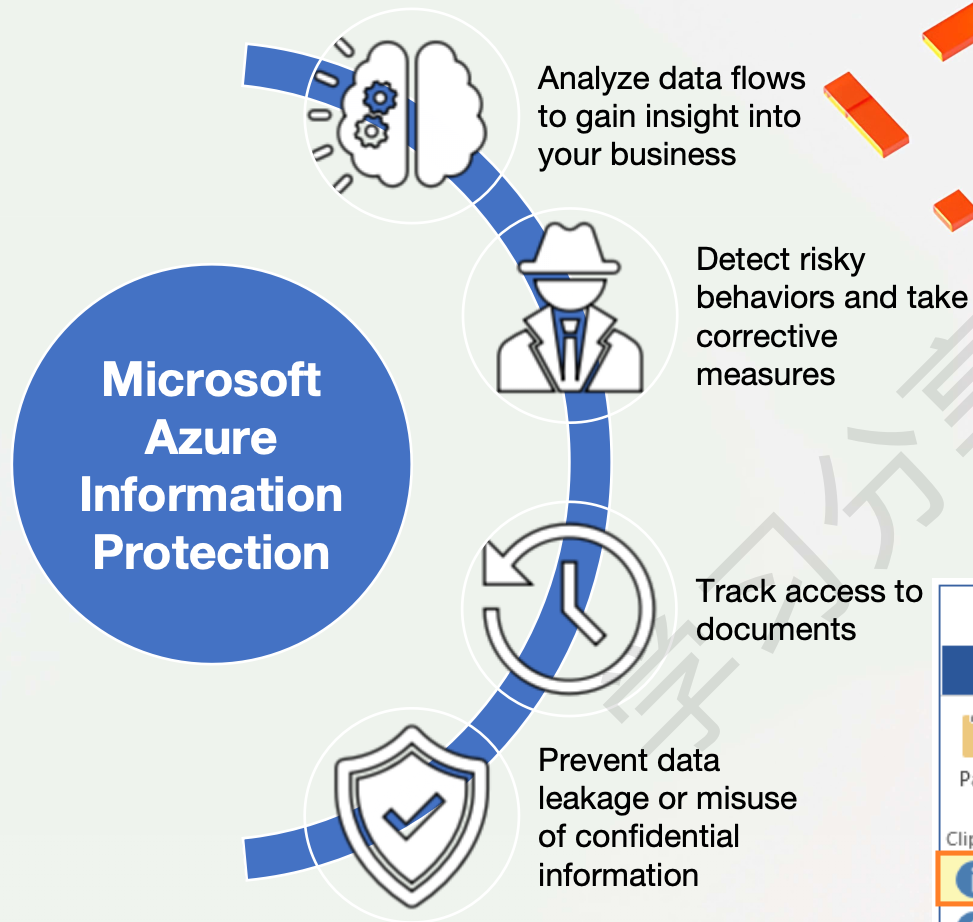
Protocol attacks

Resource (application)  
layer attacks

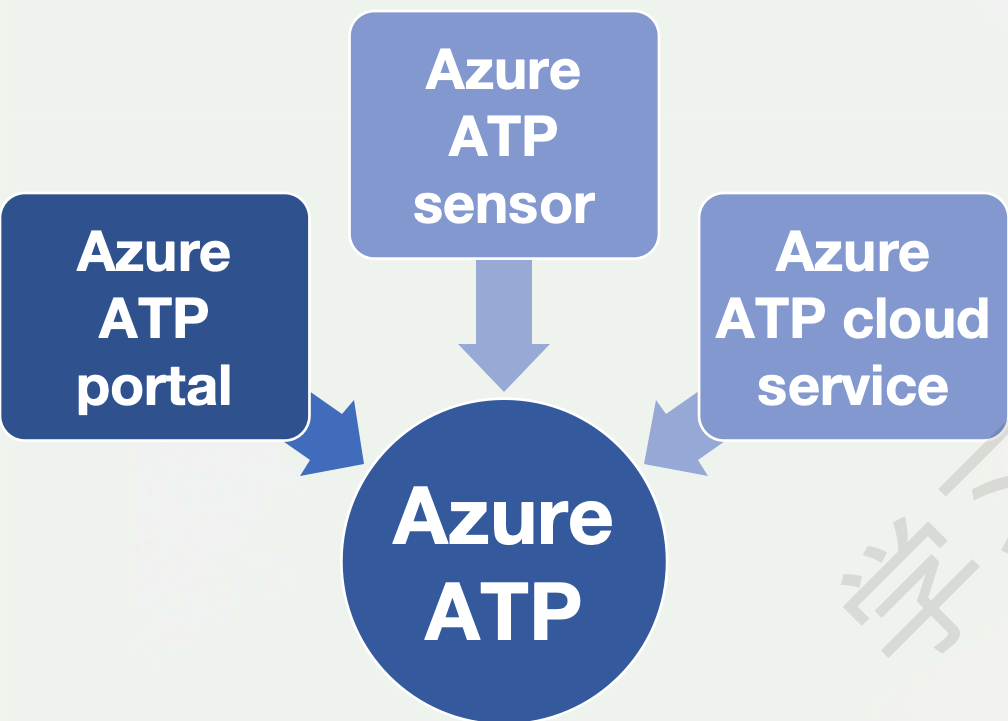




# Protect your shared documents



# Azure Advanced Th



<https://portal.atp.azure.com>

Azure Advanced Threat Protection | contoso-corp | Timeline

4:04 PM Today

**Honeytoken activity** Updated

The following activities were performed by **Bob Minion**:

- Logged in to 2 computers via Contoso-DC.
- Authenticated from 2 computers using Kerberos when accessing 5 resources against Contoso-DC.
- Authenticated from ITARGOET-T470S using NTLM against corporate resources via Contoso-DC.

Started at 3:08 PM Jan 22, 2018

3:23 PM Jan 22, 2018

**Remote execution attempt detected**

The following remote execution attempts were performed on Contoso-DC from ALICE-DESKTOP:

- Attempted remote execution of one or more WMI methods by AdminUser.

3:06 PM Jan 22, 2018

**Suspicious service creation**

AdminUser created 10 services in order to execute potentially malicious commands on Contoso-DC.

3:03 PM Jan 22, 2018

**Brute force attack using LDAP simple bind**

200 password guess attempts were made on 2 accounts from ALICE-DESKTOP. 2 account passwords were successfully guessed.

2:59 PM Jan 22, 2018

**Reconnaissance using account enumeration**

Suspicious account enumeration activity using Kerberos protocol, originating from ALICE-DESKTOP, was detected. The attacker performed a total of 101 guess attempts for account names, 2 guess attempts matched existing account names in Active Directory.

12:38 PM Jan 21, 2018

**Malicious replication of directory services**

Malicious replication requests were attempted by Alice Liddel, from ALICE-DESKTOP against Contoso-DC.

11:59 AM Jan 21, 2018

**Reconnaissance using DNS**

Suspicious DNS activity was observed, originating from ALICE-DESKTOP (which is not a DNS server) against Contoso-DC.



# Define IT compliance with Azure Policy

- An Azure service you use to create, assign and, manage policies.

**Azure  
Policy**



## Create

Create a policy definition

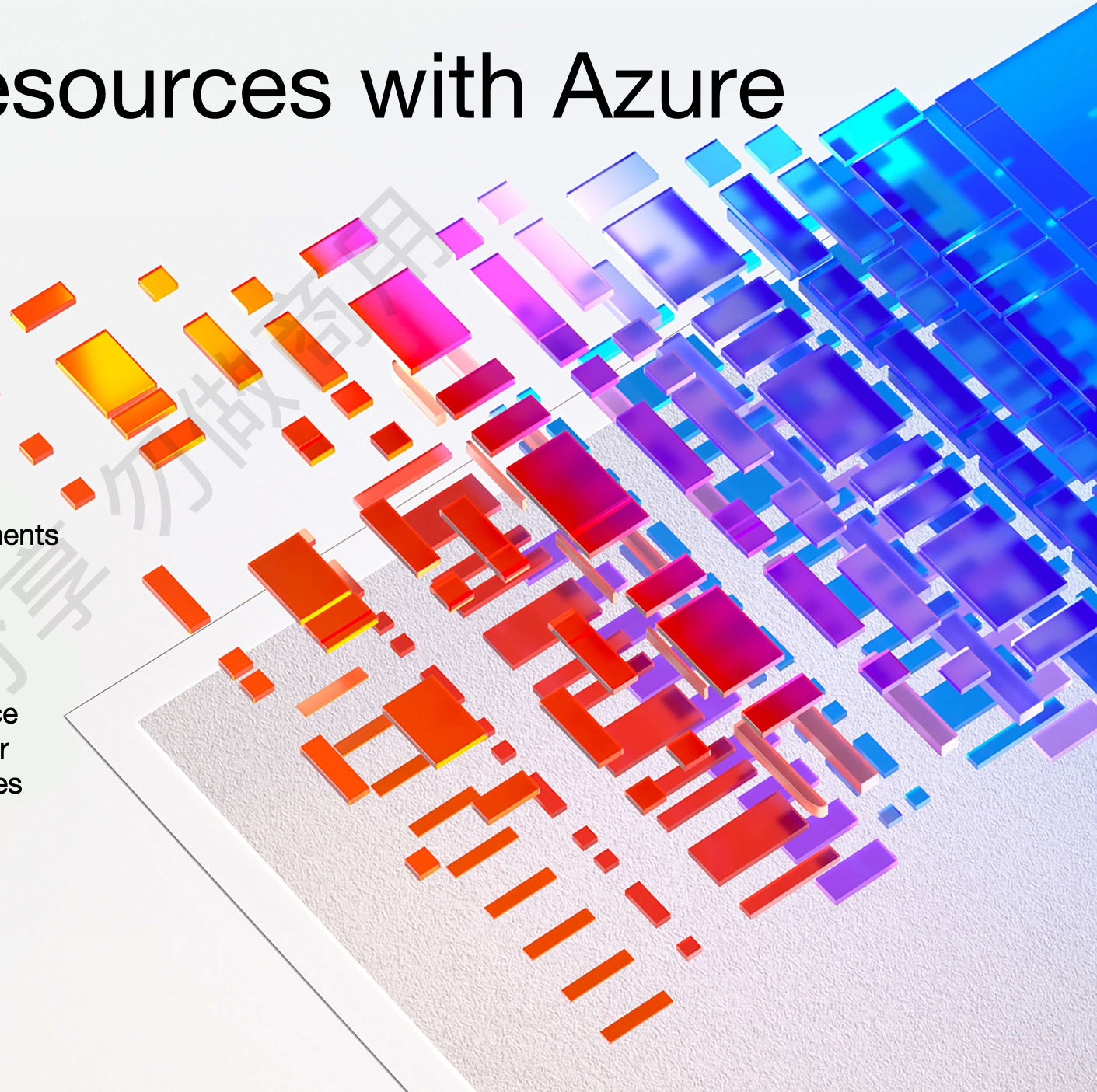
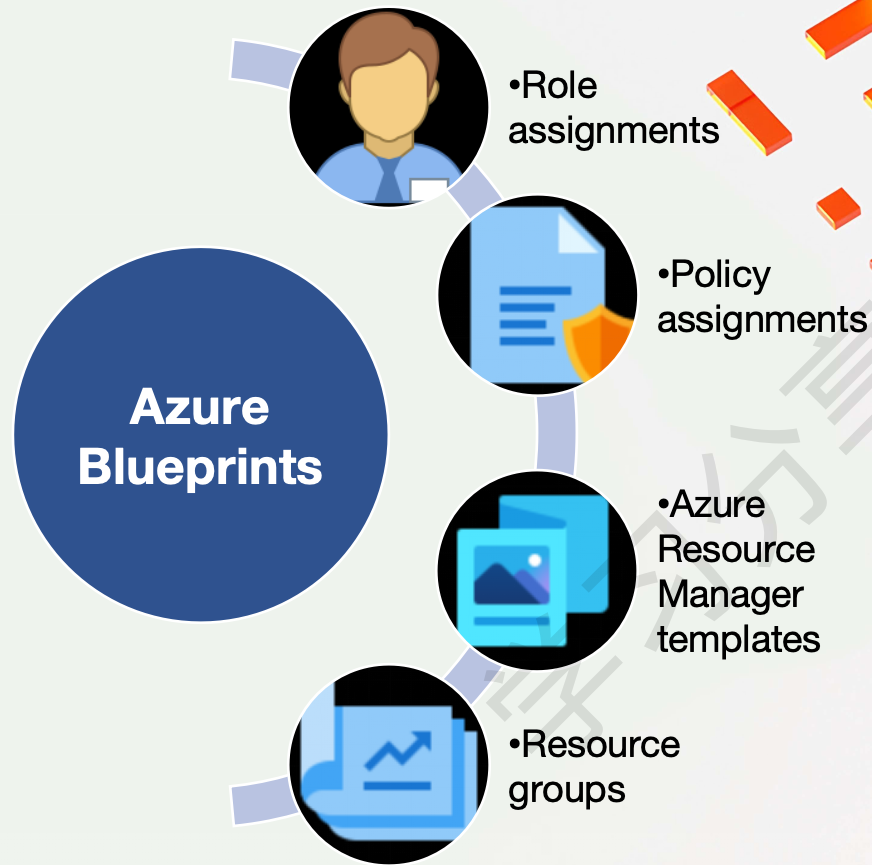
## Assign

Assign a definition to a scope of resources

## View

View policy evaluation results

# Define standard resources with Azure Blueprints





# Compliance terms and requirements

- How compliant is the cloud provider when it comes to handling sensitive data?
- How compliant are the services offered by the cloud provider?
- How can I deploy my own cloud-based solutions to scenarios that have accreditation or compliance requirements?
- What terms are part of the privacy statement for the provider?

# Explore your service compliance



Microsoft  
Privacy  
Statement



Microsoft  
Trust Center



Service  
Trust Portal



Compliance  
Manager





# Explore your service compliance



Trust Center

Compliance ▾

Security ▾

Privacy ▾

Products ▾

Services ▾

More ▾

All Microsoft ▾

Search 🔍

Cart 🛒



Service Trust Portal

Compliance Manager

Trust Documents ▾

Regional Compliance ▾

Privacy ▾

Resources ▾



Service Trust Portal

Compliance Manager

Trust Documents ▾

Regional Compliance ▾

Privacy ▾

Resources ▾



Your Compliance Manager Role: **GUEST**. [Compliance Manager](#) is used by your organization to manage the end-to-end regulation-to-audit compliance process, to perform real-time risk assessments that help your organization better prepare for auditing, and to connect the solutions and features of Microsoft Online Services with your organization's regulatory requirements. Compliance Manager is restricted to those individuals in your organization with a legitimate business need for access. Contact your organization's cloud subscription administrator to request access to Compliance Manager. Information about the permissions model used by Compliance Manager can be found [here](#)

## Compliance Manager

Help ⓘ

Assessments

Action Items

Show Archived ▮ + Add Assessment Filter ▾

Default Group

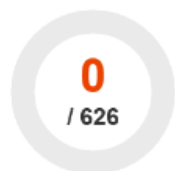
Office 365 - GDPR

Actions ▾

Created  
1/1/1

Modified  
1/1/1

Compliance Score



Customer Managed Actions

0 of 65

Default Group

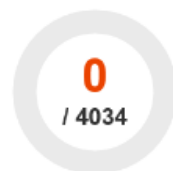
Office 365 - NIST 800-53

Actions ▾

Created  
1/1/1

Modified  
1/1/1

Compliance Score



Customer Managed Actions

0 of 214

Default Group

Azure - ISO 27018:2014

Actions ▾

Created  
1/1/1

Modified  
1/1/1

Assessment Status



Customer Managed Actions

0 of 0

# Azure Compliance Offerings

**Criminal Justice  
Information Services  
(CJIS)**

**Cloud Security Alliance  
(CSA) STAR Certification**

**General Data Protection  
Regulation (GDPR)**

**EU Model Clauses**

**Health Insurance  
Portability and  
Accountability Act (HIPAA)**

**International Organization  
for Standardization (ISO)  
and the International  
Electrotechnical  
Commission (IEC) 27018**

**Multi-Tier Cloud Security  
(MTCS) Singapore**

**Service Organization  
Controls (SOC) 1, 2, and 3**

**National Institute of  
Standards and  
Technology (NIST)  
Cybersecurity Framework  
(CSF)**

**UK Government G-Cloud**

.....



# Knowledge Check

Please scan this QR Code,  
Then submit your answer.

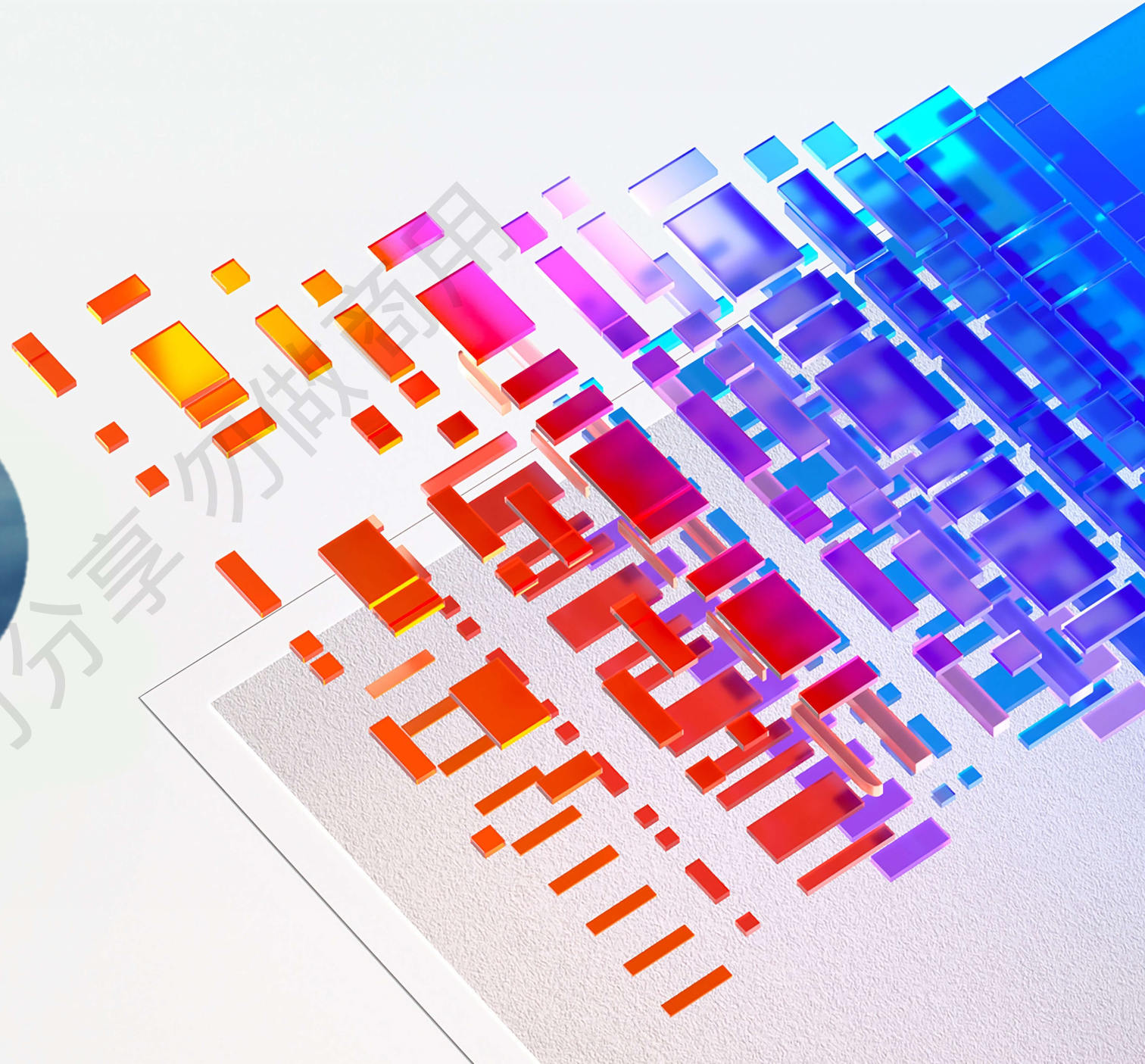






# Microsoft Azure

**Optimize Spending & Technical  
support**





# Module Objectives

- Estimate costs with the Azure pricing calculator










- Predict and optimize costs with Azure Cost Management and Azure Advisor

- Apply best practices for saving on infrastructure costs

- Apply best practices for saving on licensing costs

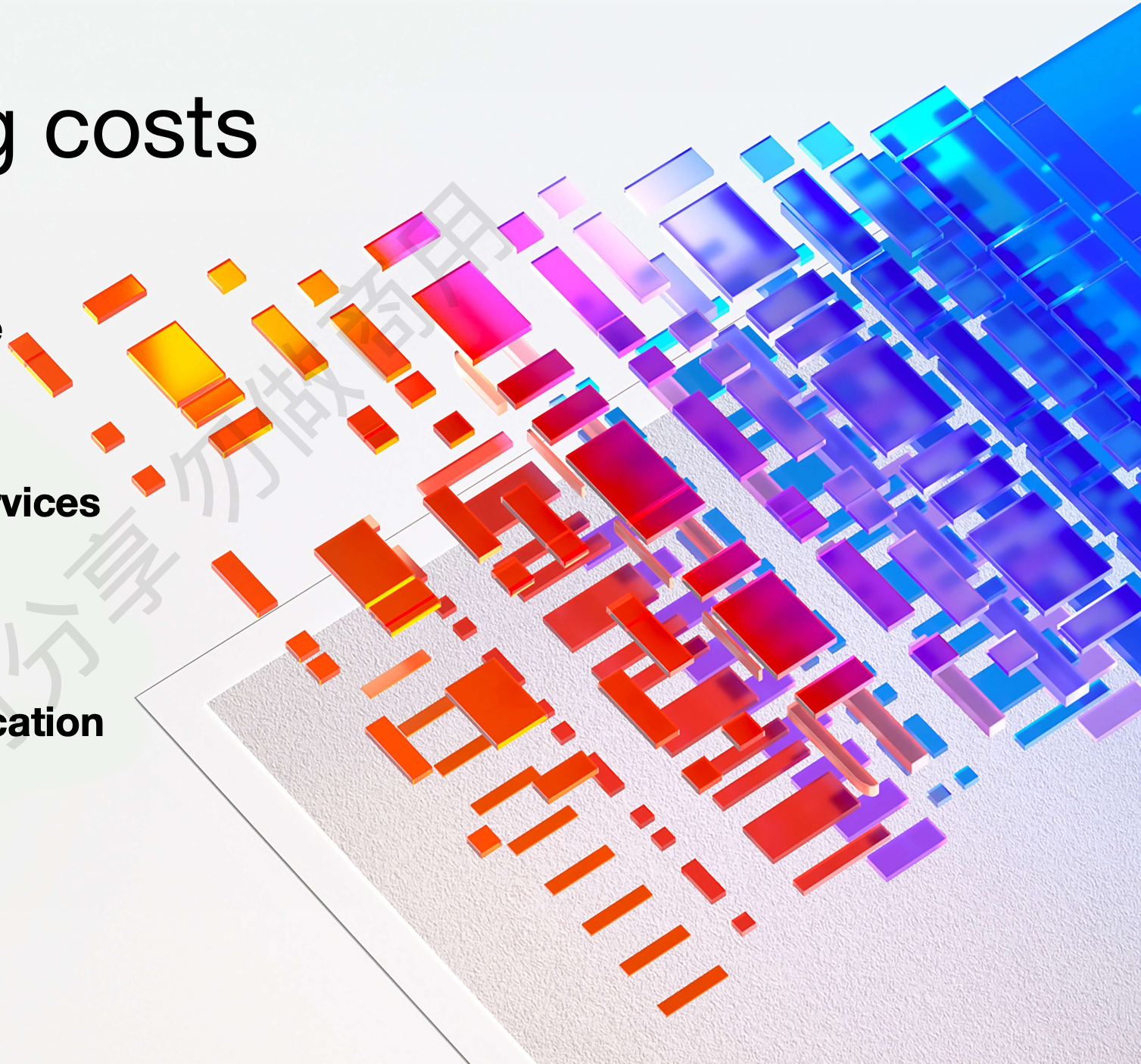
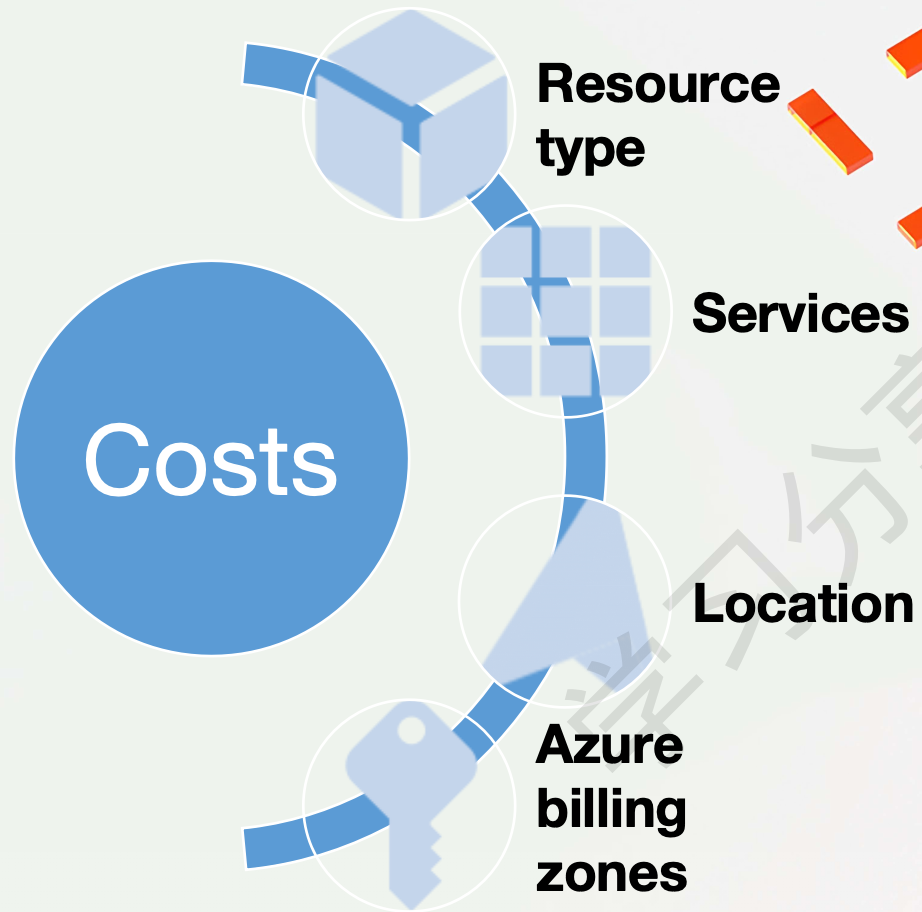
- Learn about different support options

# Products and services in Azure

<b>Featured</b>	 <b>Virtual Machines</b> Provision Windows and Linux virtual machines in seconds	 <b>Storage Accounts</b> Durable, highly available, and massively scalable cloud storage	 <b>Azure SQL Database</b> Managed, intelligent SQL in the cloud
Compute			
Networking			
Storage			
Web	 <b>App Service</b> Quickly create powerful cloud apps for web and mobile	 <b>Azure Cosmos DB</b> Globally distributed, multi-model database for any scale	 <b>Azure Kubernetes Service (AKS)</b> Simplify the deployment, management, and operations of Kubernetes
Mobile			
Containers			
Databases			
Analytics	 <b>Azure Functions</b> Process events with serverless code	 <b>Cognitive Services</b> Add smart API capabilities to enable contextual interactions	 <b>Cost Management + Billing</b> Optimize what you spend on the cloud, while maximizing cloud potential
AI + Machine Learn...			
Internet of Things			



# Factors affecting costs





# Estimate costs with Azure pricing calculator



## Azure pricing calculator


- Region
- Tier
- Billing Options
- Support Options
- Programs and Offers
- Azure Dev/Test Pricing



## Shut down or resize your virtual machine

 Feedback
  Download as CSV
  Download as PDF
  Configure recommendation rule

### Recommendation details

We've analyzed the usage patterns of your virtual machine over the past 14 days, and identified virtual machines with low usage. While certain scenarios can result in low utilization by design, you can often save money by managing the size and number of virtual machines. [Learn more](#) 

potential monthly savings\*





701.59 USD

Impacted resources

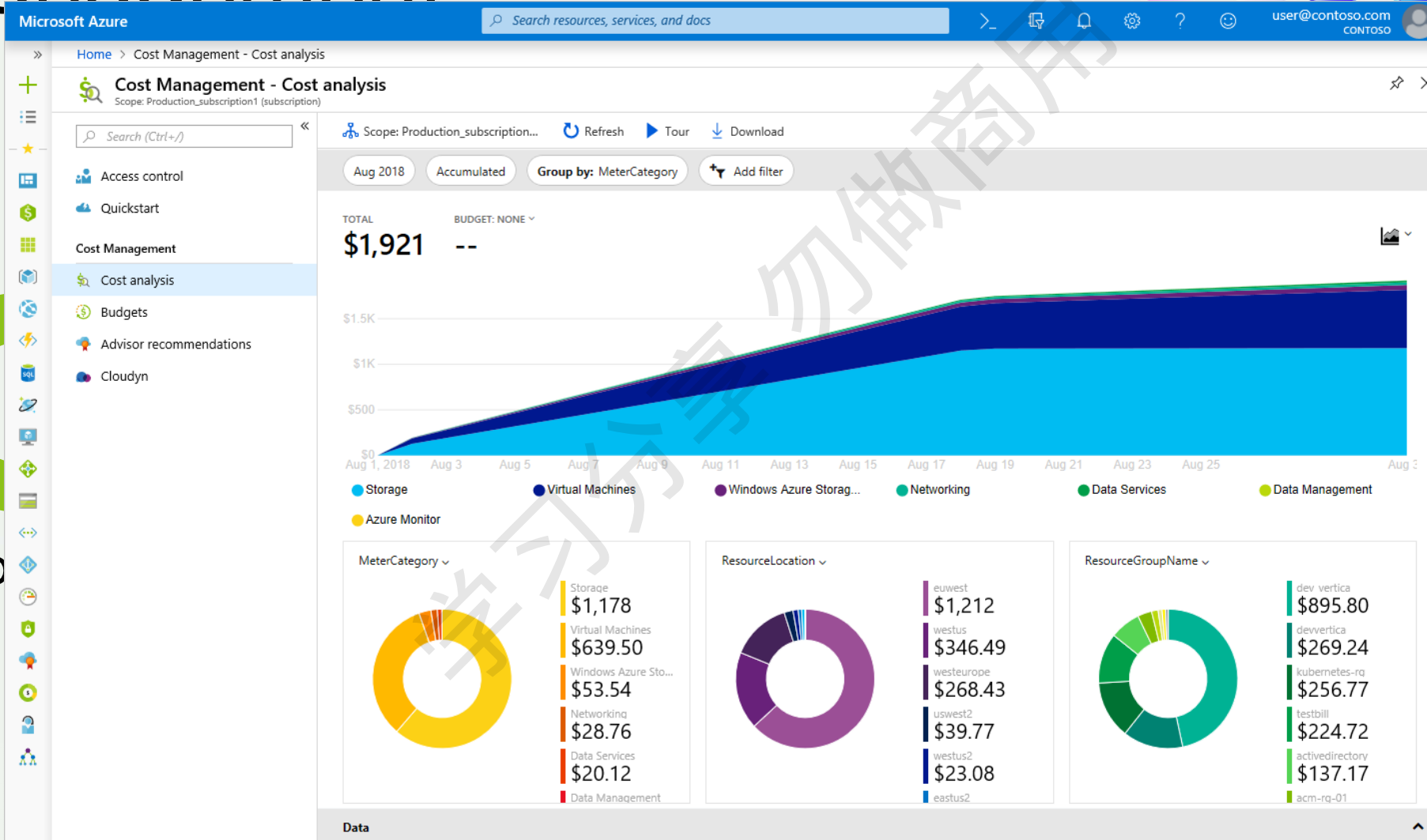
Production\_subscription

No grouping

8 Virtual machines

VIRTUAL MACHINE	RECOMMENDED ACTIONS	POTENTIAL SAVINGS*	SUBSCRIPTION	RECOMMENDATION RULE	UPDATED AT	POSTPONE
 k8s-agent-CC8C9A6-0	<a href="#">Resize the virtual machine</a> <a href="#">View Usage Patterns</a> <a href="#">Shut down the virtual machine</a>	<b>101.18 USD</b>	Production_subscription	Average CPU < 5%	8/3/2018 9:36:41 AM	<a href="#">Postpone</a>
 k8s-agent-CC8C9A6-2	<a href="#">Resize the virtual machine</a> <a href="#">View Usage Patterns</a> <a href="#">Shut down the virtual machine</a>	<b>101.18 USD</b>	Production_subscription	Average CPU < 5%	8/3/2018 9:36:41 AM	<a href="#">Postpone</a>
 k8s-agent-CC8C9A6-1	<a href="#">Resize the virtual machine</a> <a href="#">View Usage Patterns</a> <a href="#">Shut down the virtual machine</a>	<b>101.18 USD</b>	Production_subscription	Average CPU < 5%	8/3/2018 9:36:41 AM	<a href="#">Postpone</a>
 k8s-master-CC8C9A6-0	<a href="#">Resize the virtual machine</a> <a href="#">View Usage Patterns</a> <a href="#">Shut down the virtual machine</a>	<b>124.99 USD</b>	Production_subscription	Average CPU < 5%	8/3/2018 9:36:41 AM	<a href="#">Postpone</a>

# Predict and optimize with Cost Management



And  
into

ights



# Estimate the Total Cost of Ownership with the Azure TCO calculator

Total Cost of  
Ownership  
calculator

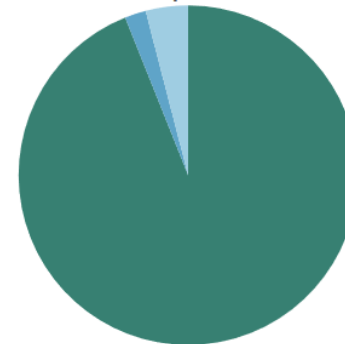
**Open the  
TCO  
calculator**

**Define your  
workloads**

**Adjust  
assumptions**

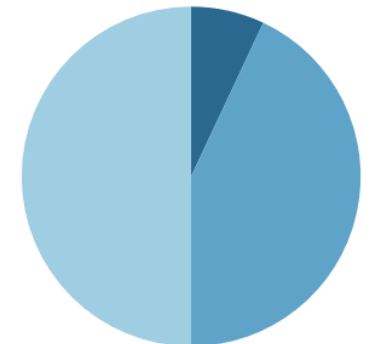
**View the  
report**

\$30,702,495  
Total on-premises cost




0% Compute 93% Datacenter 2% Networking 4% Storage

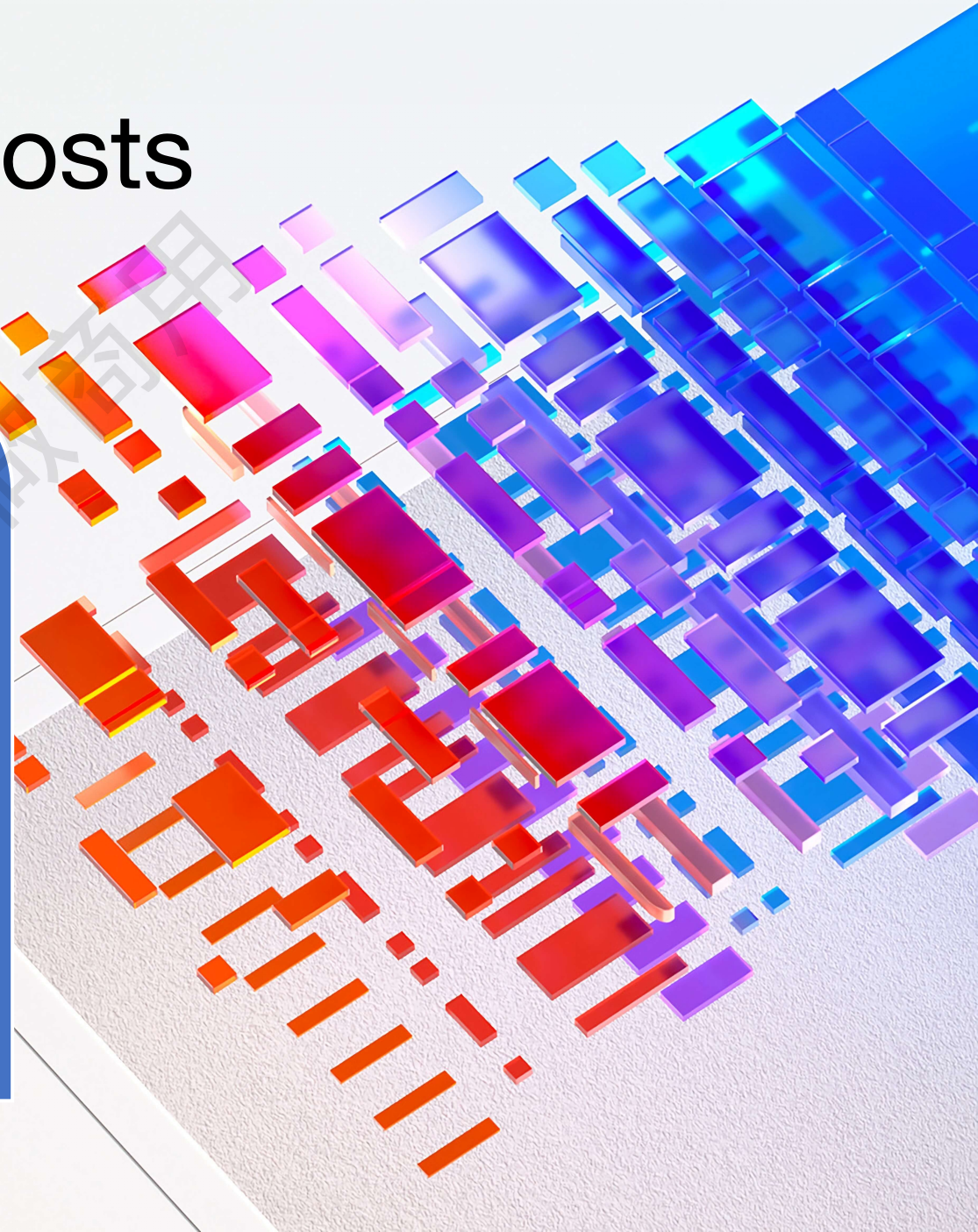
\$595,618  
Total Azure cost



7% Compute 0% Datacenter 43% Networking 50% Storage

# Save on infrastructure costs

- 
- Use Azure credits
  - Use spending limits
  - Use reserved instances
  - Choose low-cost locations and regions
  - Research available cost-saving offers
  - Right-size underutilized virtual machines
  - Deallocate virtual machines in off hours
  - Delete unused virtual machines
  - Migrate to PaaS or SaaS services





# Save on licensing costs



**Azure Hybrid Benefit for Windows Server**



**Azure Hybrid Benefit for SQL Server**



**Use Dev/Test subscription offers**



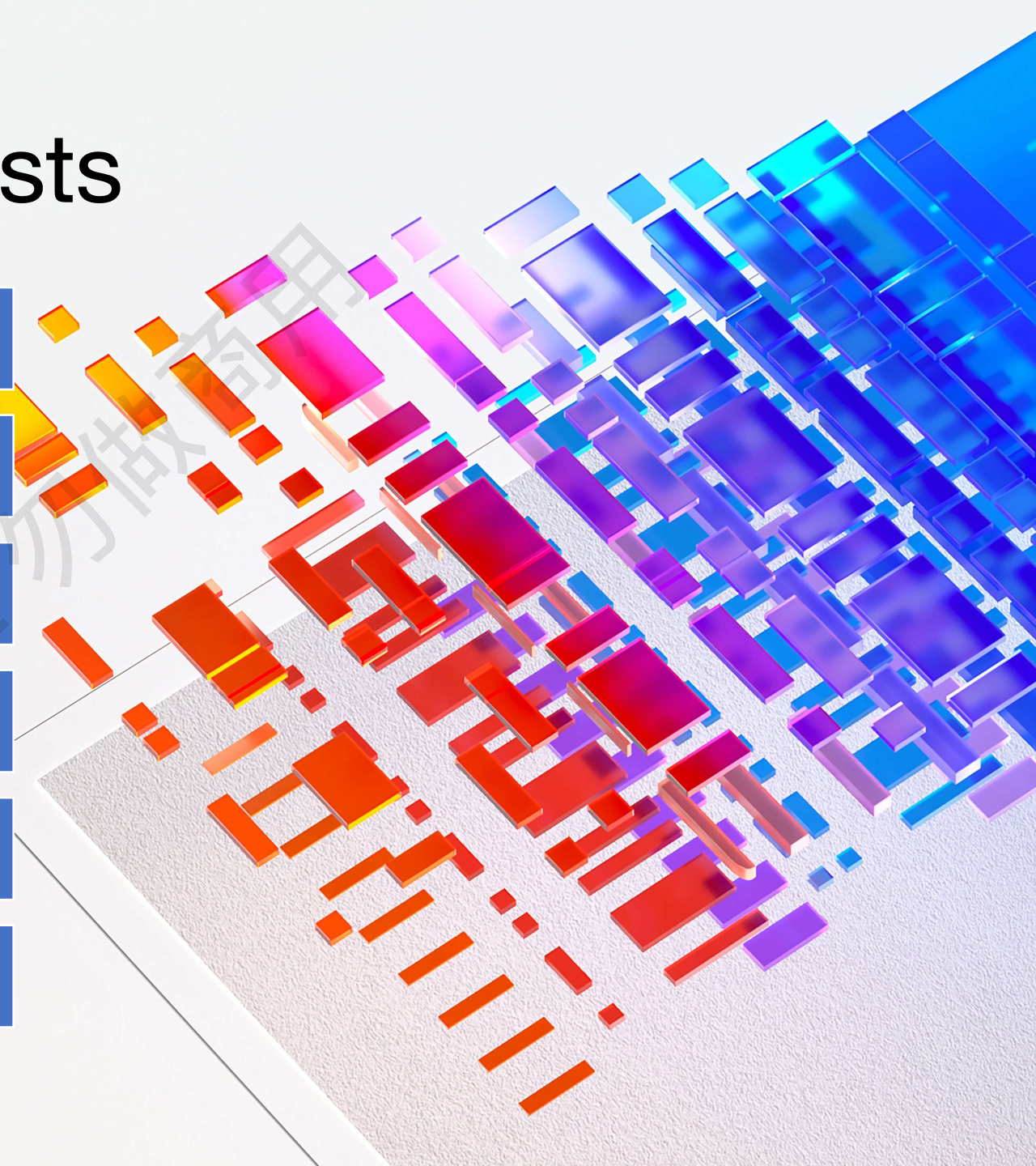
**Bring your own SQL Server license**



**Use SQL Server Developer Edition**



**Use constrained instance sizes for database workloads**



# Azure support options



## Azure free support resources

- Billing and subscription management support
- Azure Quickstart Center
- Azure Service Health
- Azure Advisor



## Azure support plans

- Developer
- Standard
- Professional Direct



## Azure community support

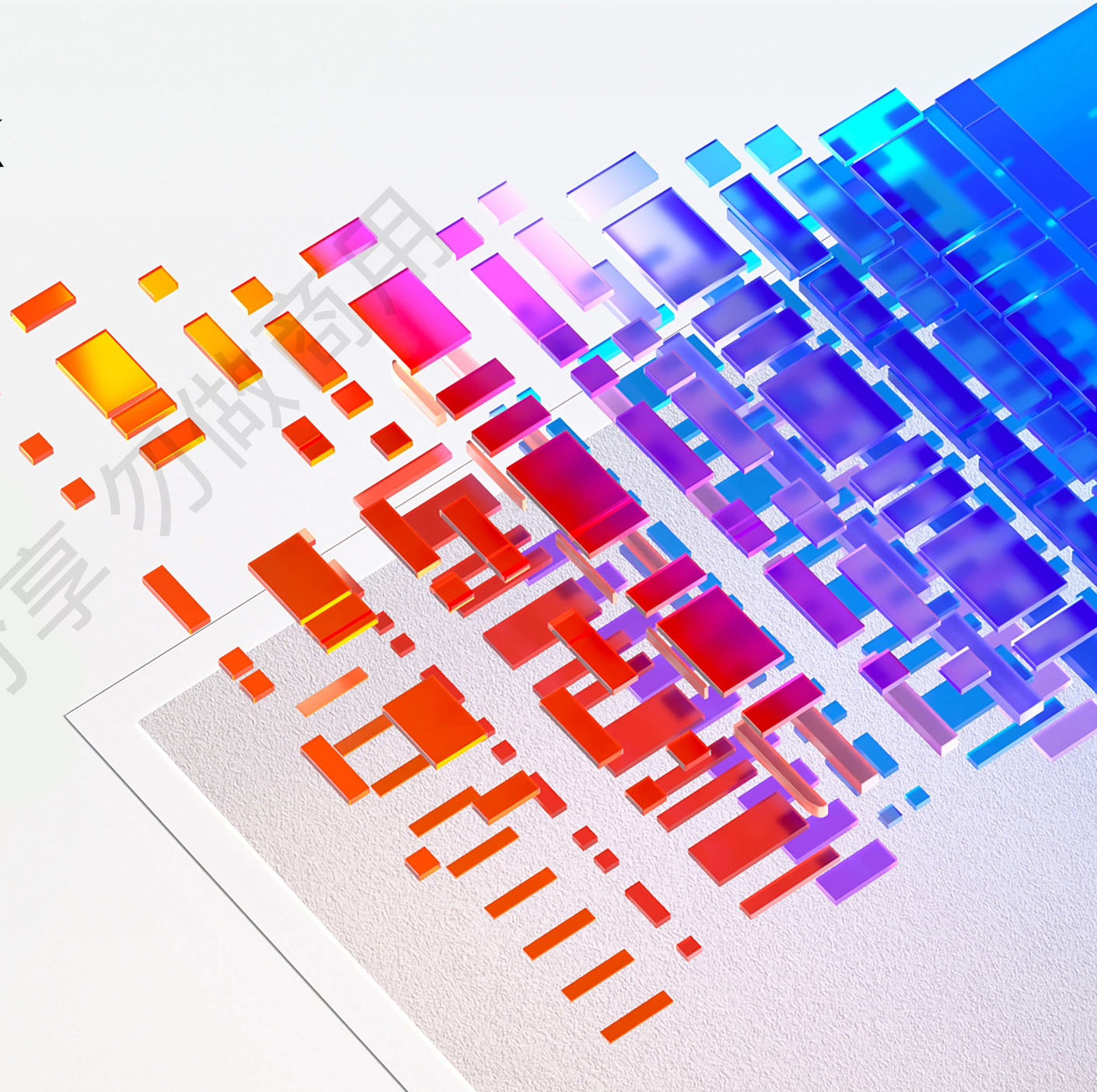
- Azure Knowledge Center
- Microsoft Tech Community
- Stack Overflow





# Knowledge Check

Please scan this QR Code,  
Then submit your answer.

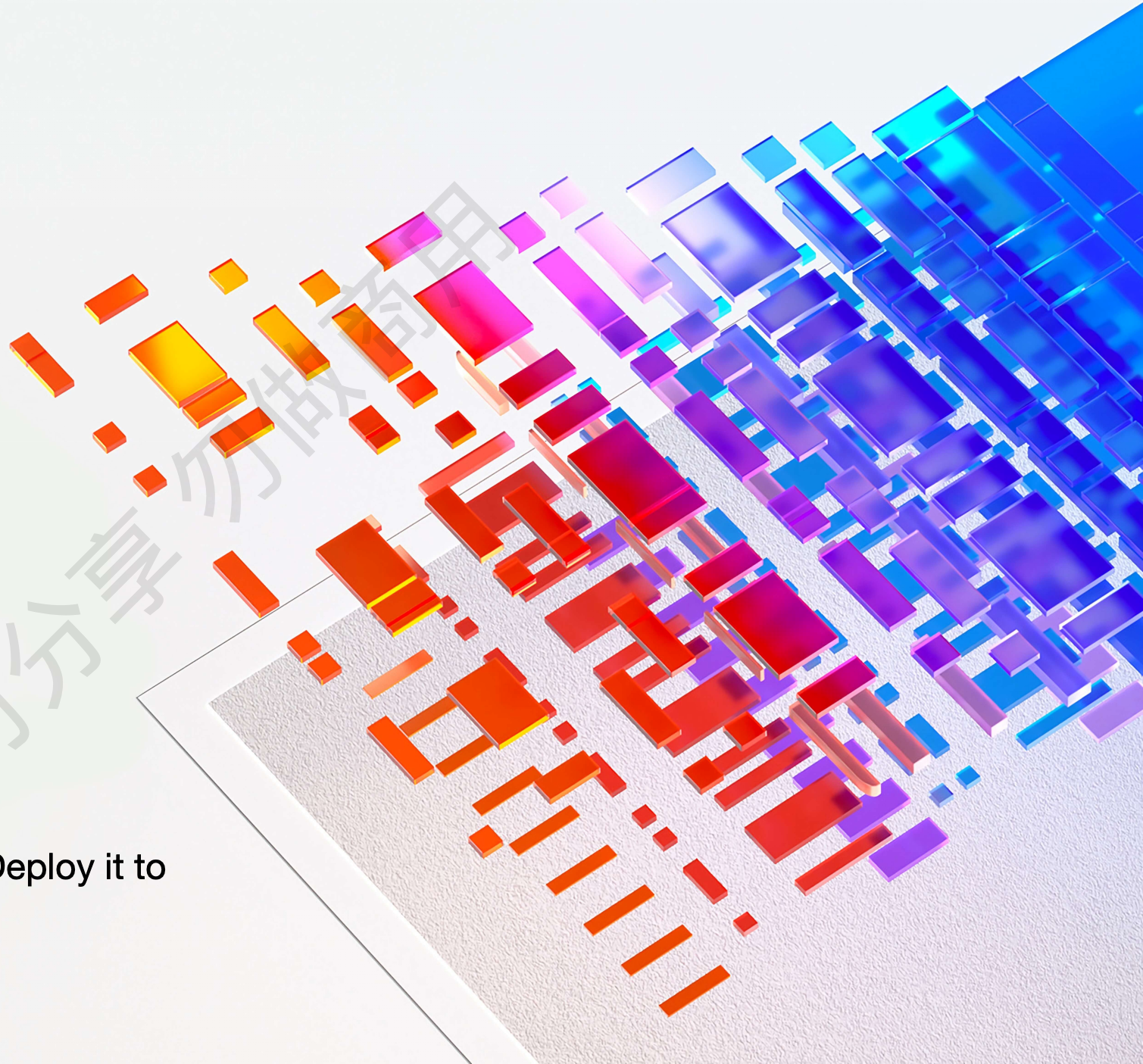




# Hands-on Two

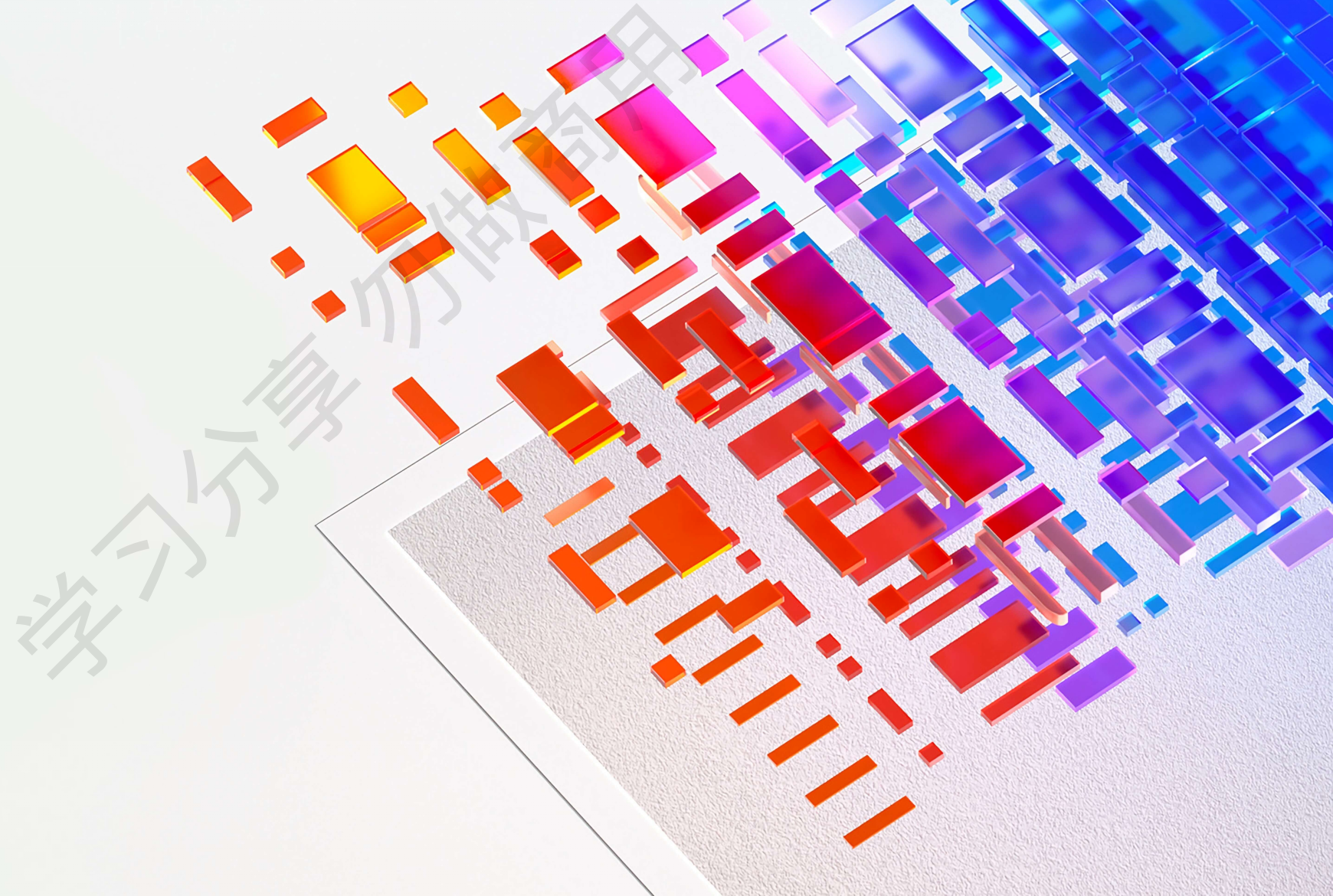


Create a ASP.NET Core Web Application, Deploy it to  
Azure App Service(PaaS)





# Q&A





Thank you!

