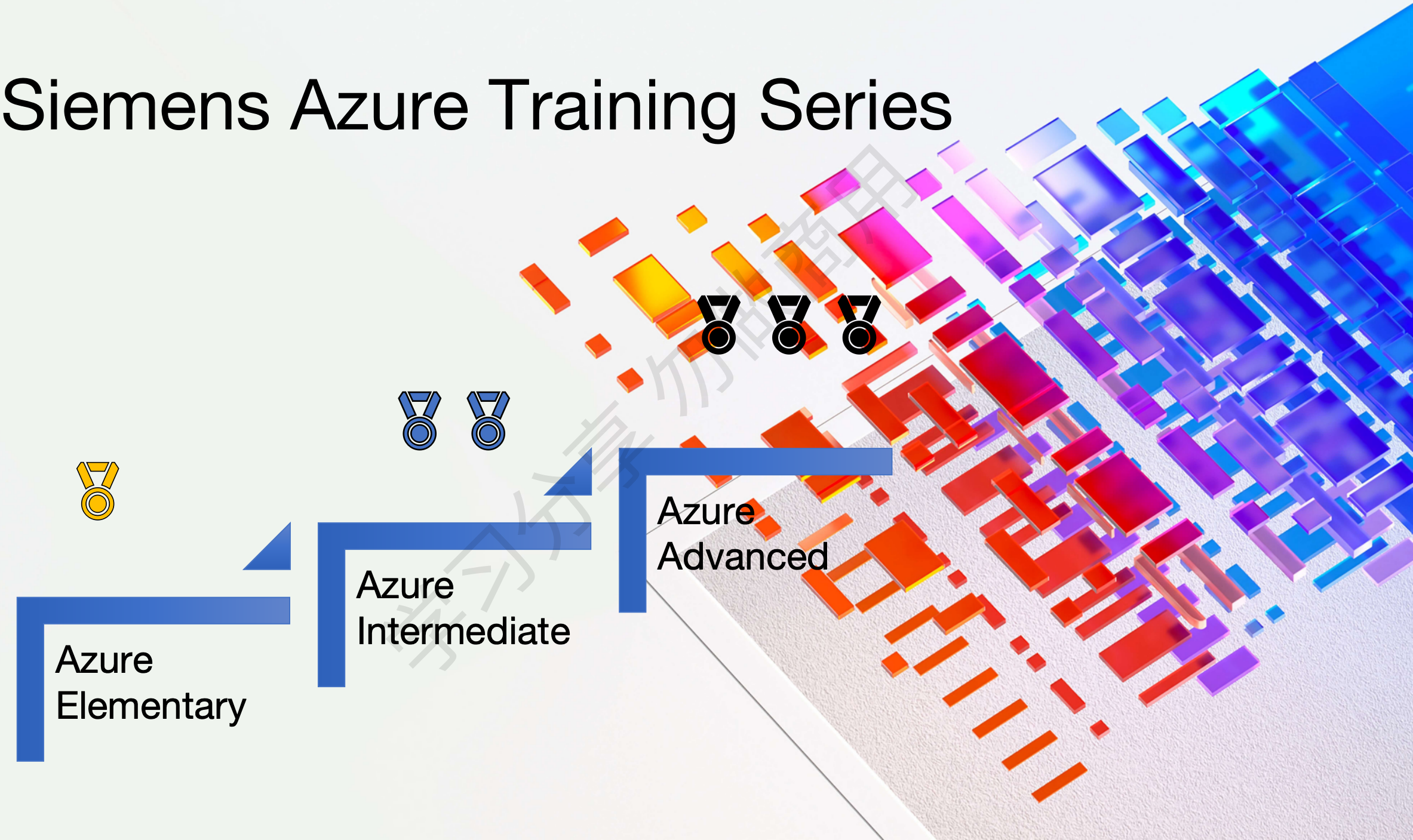
Azure Elementary

Presenter： Qian Yun

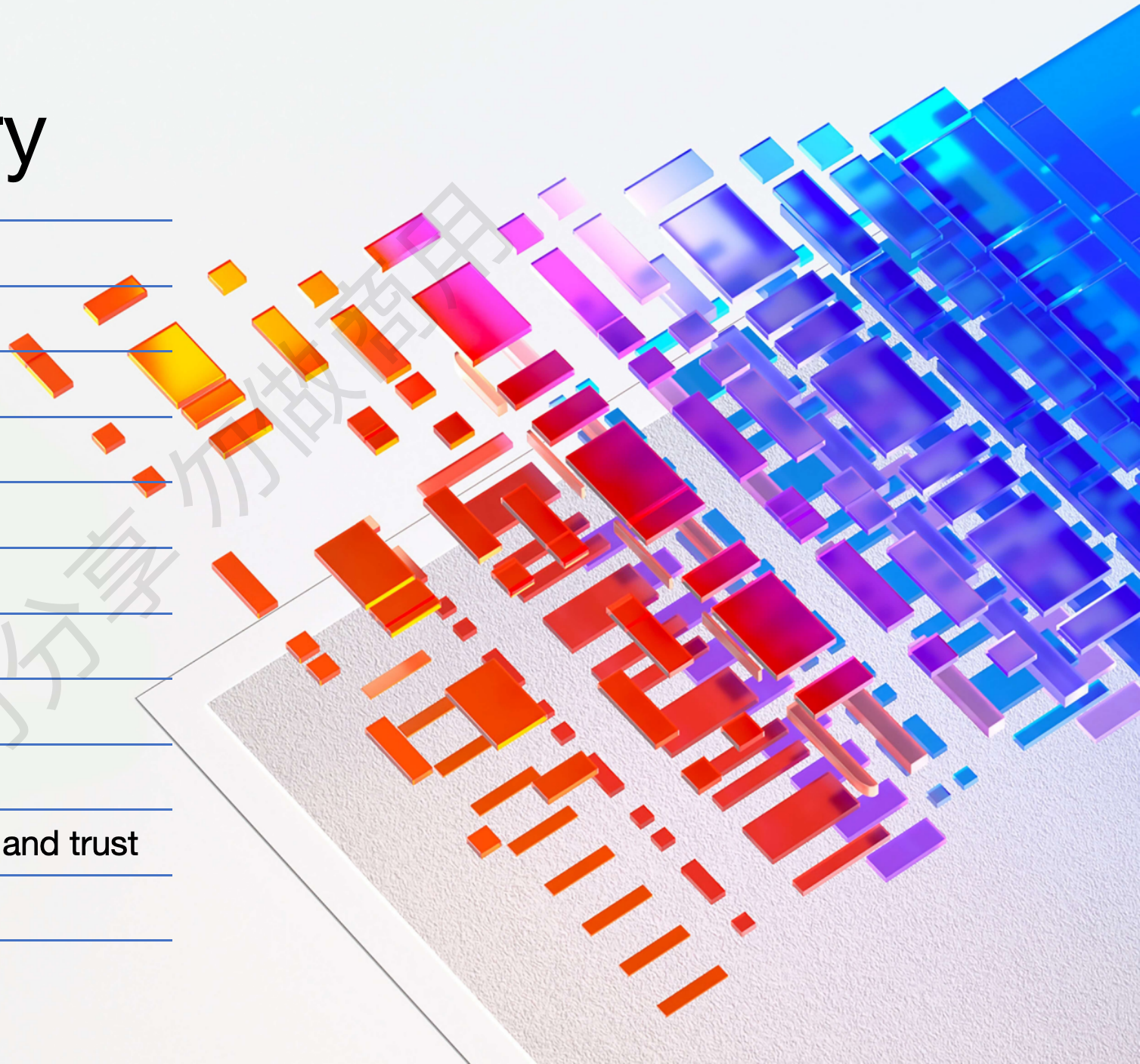
学习分享 勿做商用

Siemens Azure Training Series



Azure Elementary

- Understand Cloud Concepts
- Azure Introduction
- Azure Portal & Azure Cloud Shell
- Azure Core Services - Compute
- Azure Core Services - Networking
- 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



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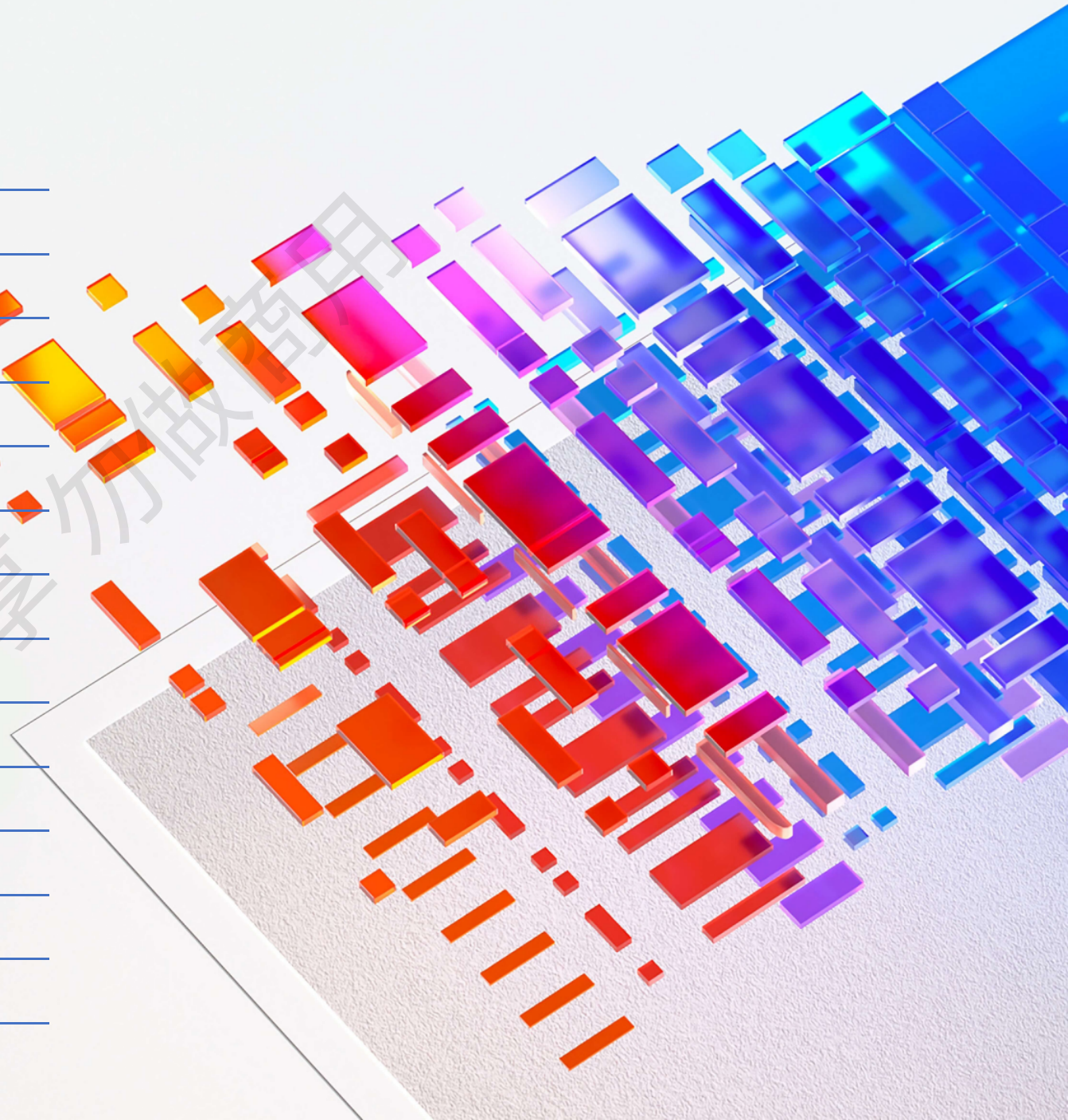
Azure Intermediate

- Introduction
- Azure Portal and Cloud Shell
- Work with Azure Virtual Machines
- Work with Azure Storage
- Work with Azure Networking
- VM Availability
- Interconnectivity
- Azure Monitoring
- Data Protection
- Network Traffic Management
- Azure Active Directory
- Governance and Compliance
- Data Services
- Serverless Computing and Container Services



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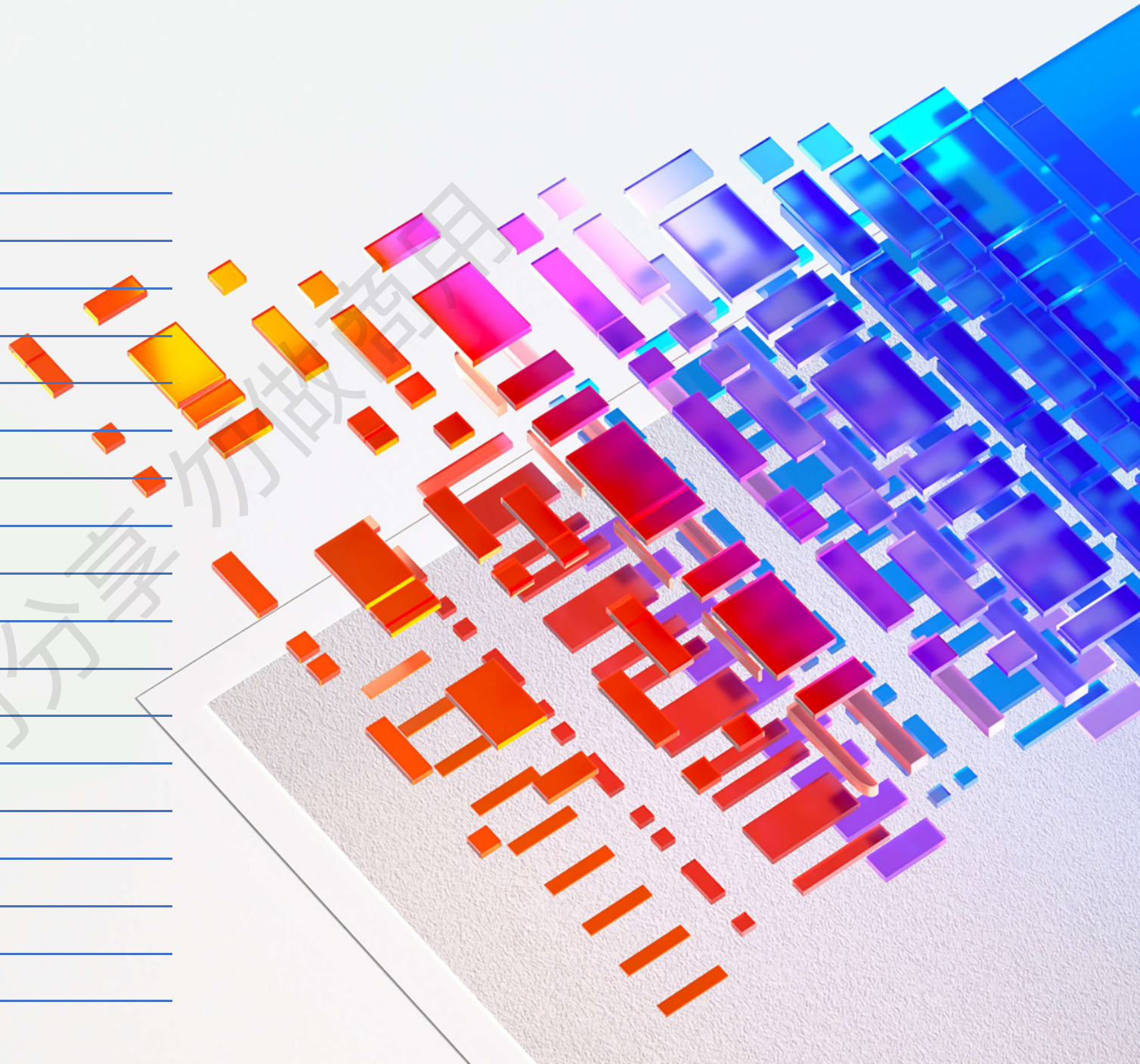
Azure Advanced

- Mastering Virtual Machines
- Azure Batch Services
- Containerized Solutions
- Azure App Service
- Mobile Apps
- API App
- Function App
- Azure Storage Accounts
- CosmosDB
- SQL Database
- Blob Containers
- Azure Authentication
- Azure Access Control
- Secure Data
- Scaling Apps and Services
- Caching and Content Delivery Networks
- Monitoring and Logging
- 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

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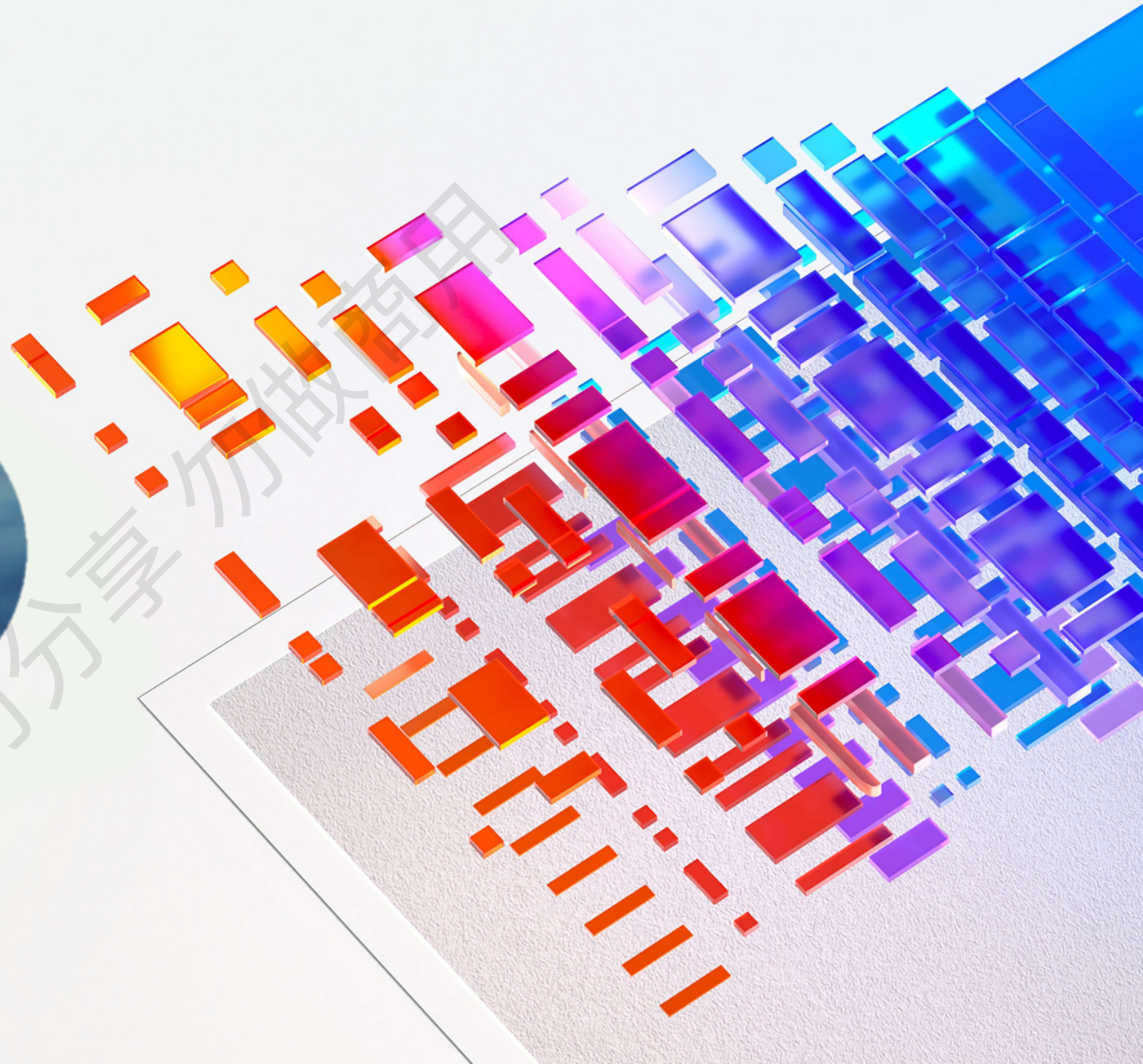
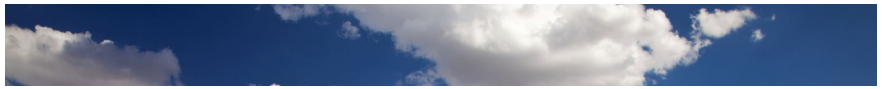
Cloud Concepts

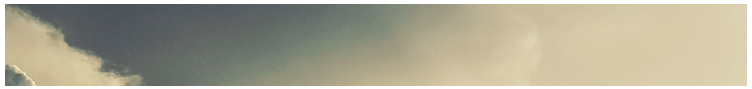
Understand principles of cloud computing

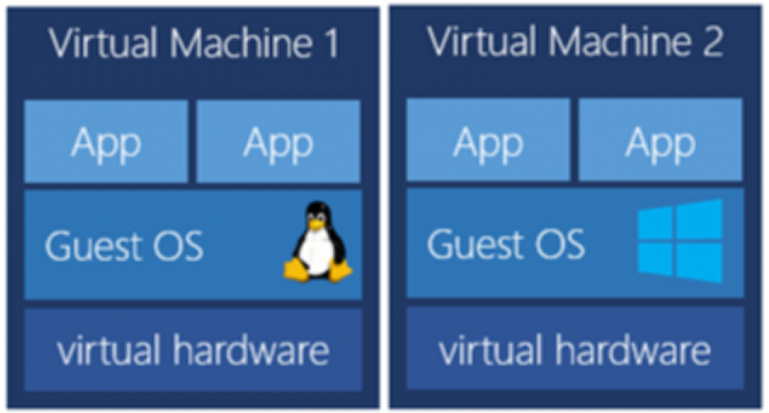


Module Objectives

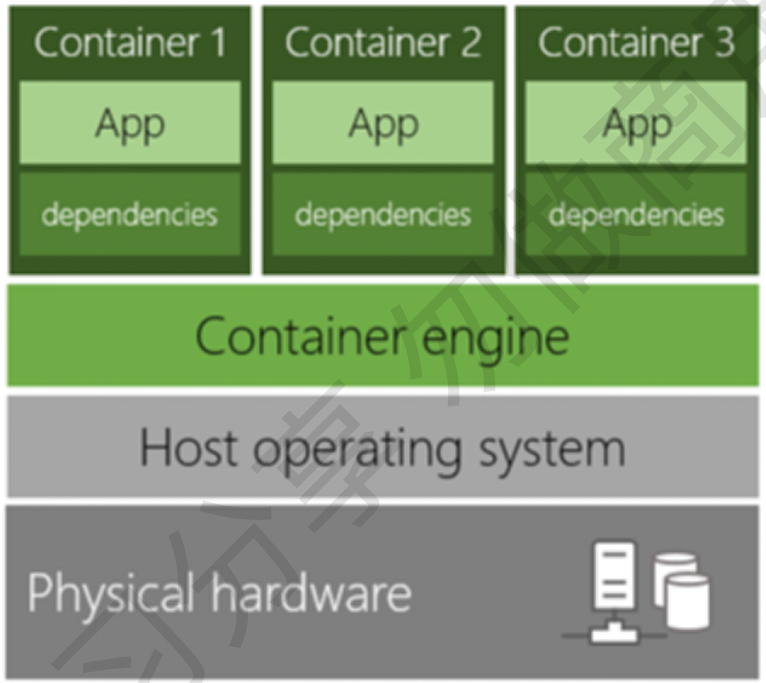
- Explore common cloud computing services
- Explore the benefits of cloud computing
- Decide which cloud deployment model is best for you



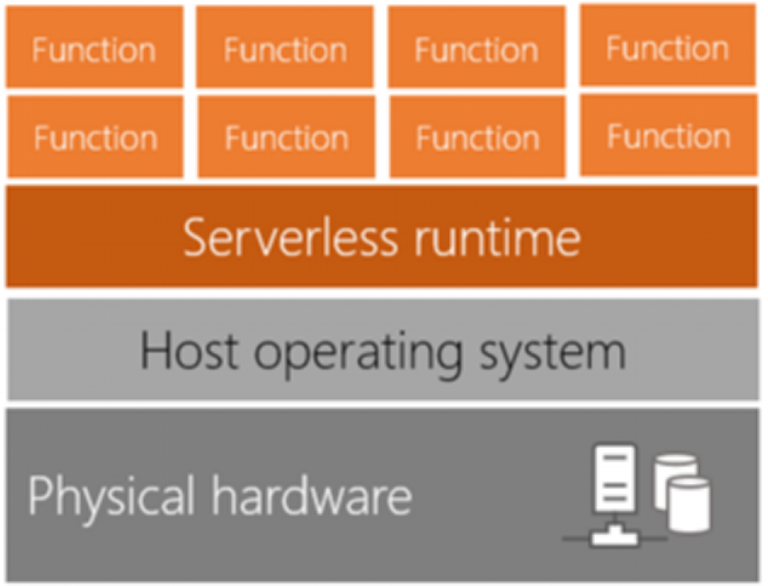




Virtual machines

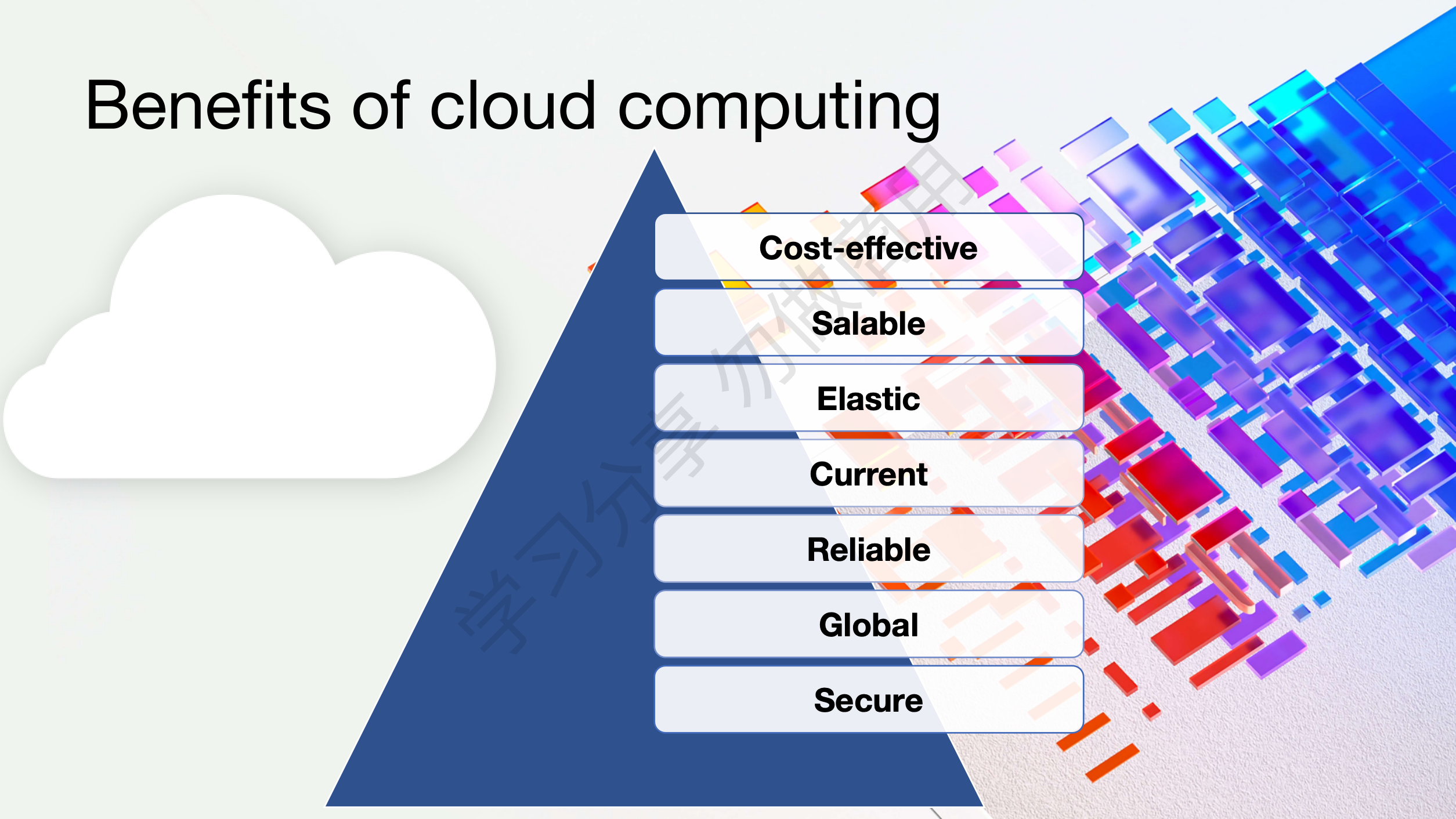


Containers



Serverless

Benefits of cloud computing



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."

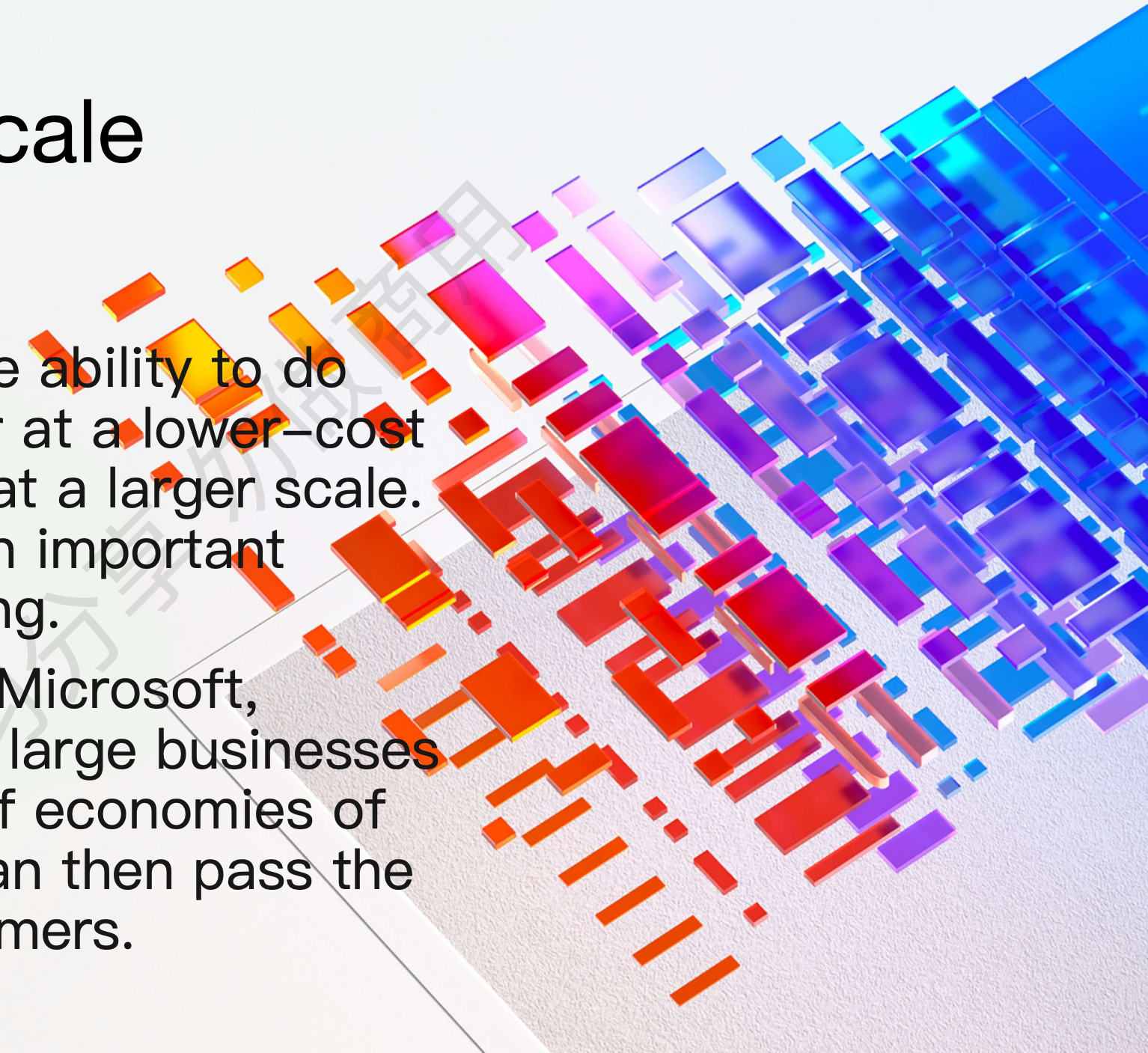
One-Click Simplicity

"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

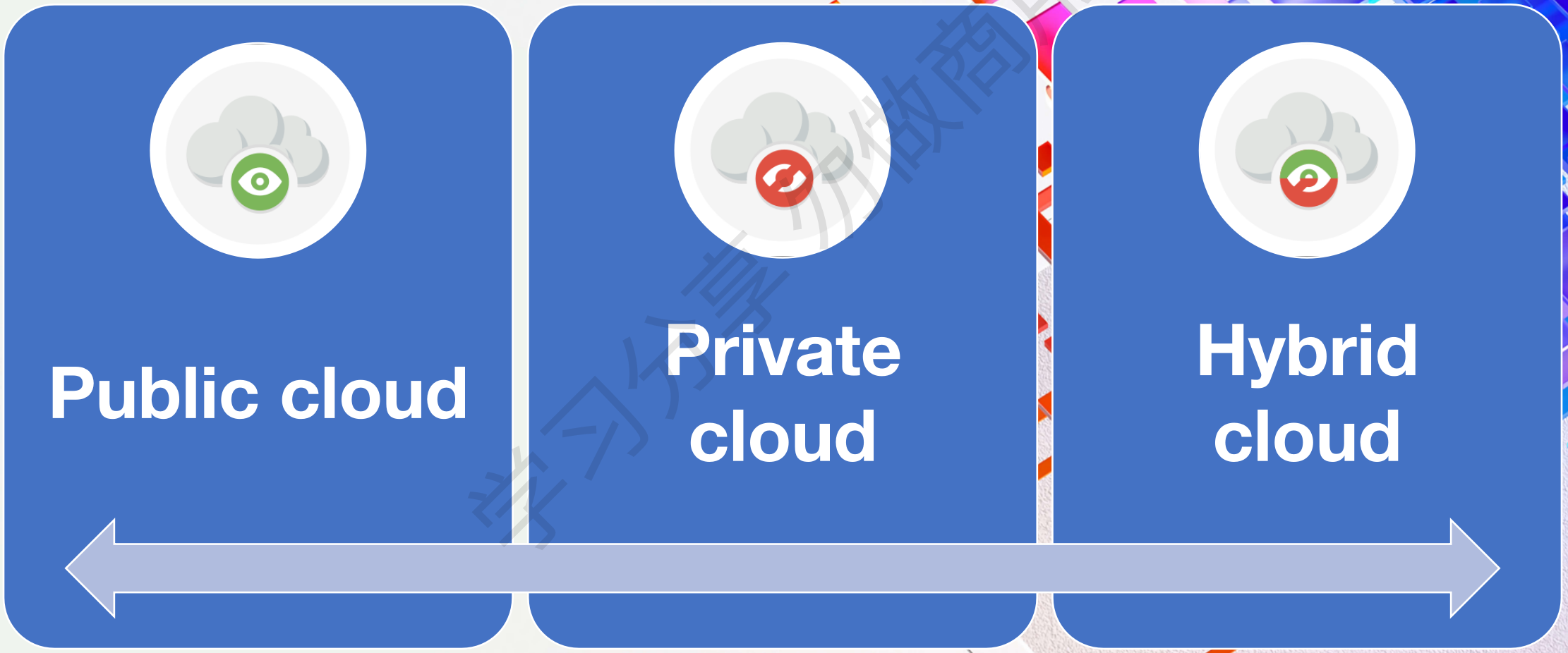
Capital Expenditure (CapEx)

- 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**

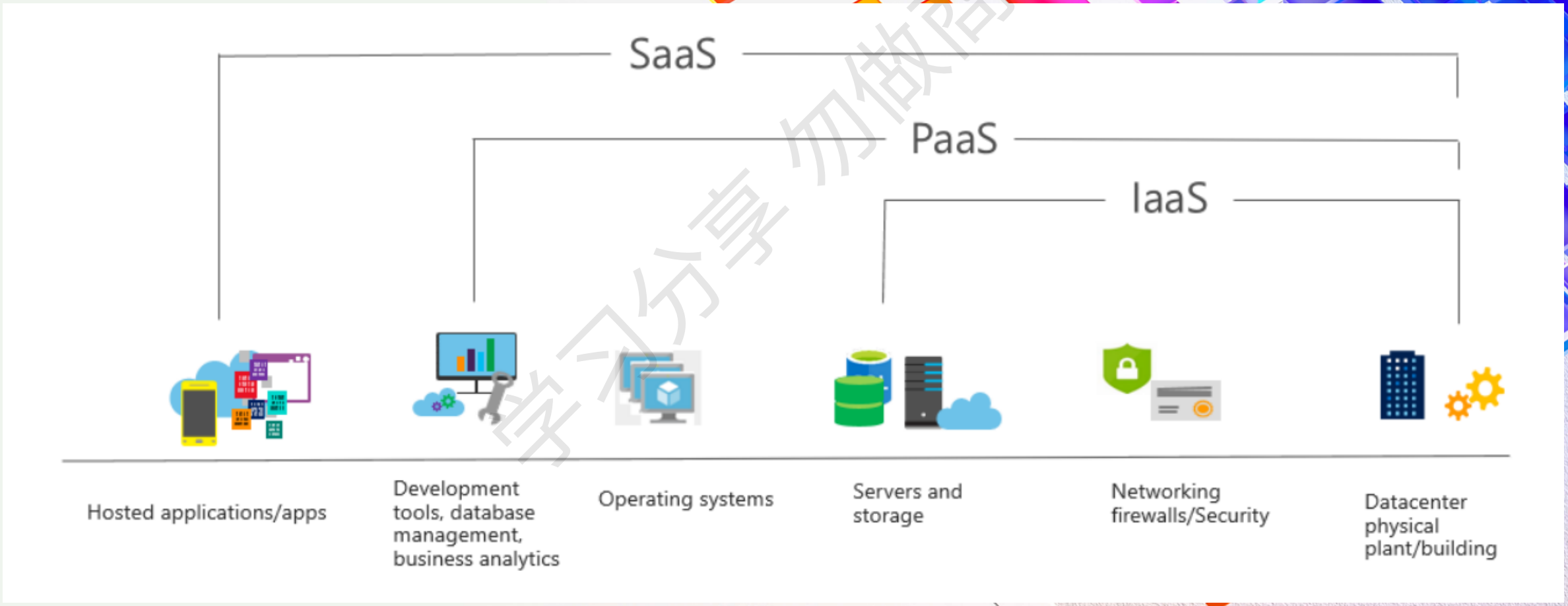
Platform as a service (PaaS)

- **Development framework**
- **Analytics or business intelligence**

Software as a service (SaaS)

- Office 365
- Dynamics CRM Online
- Power Platform

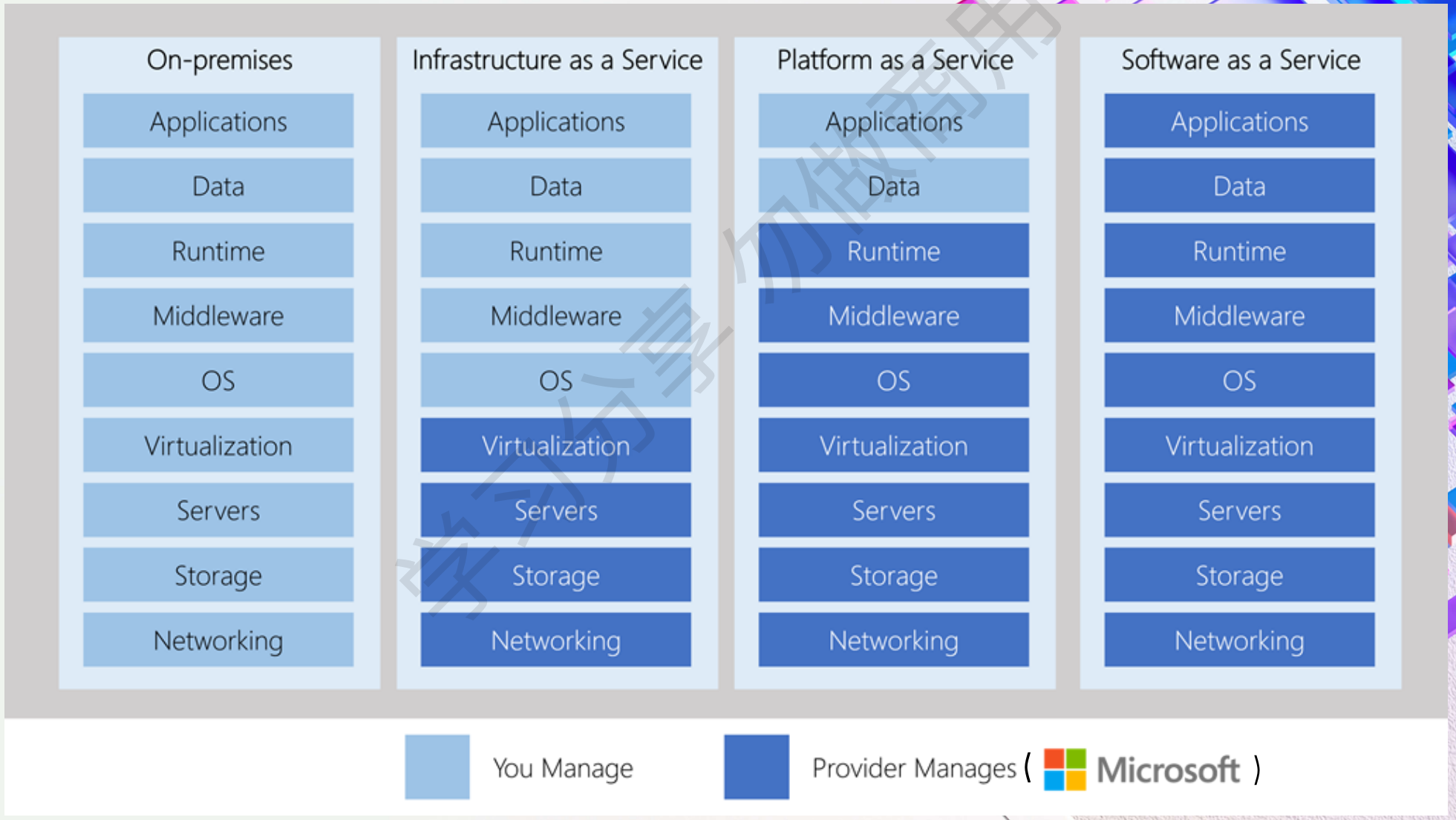
Types of cloud services



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

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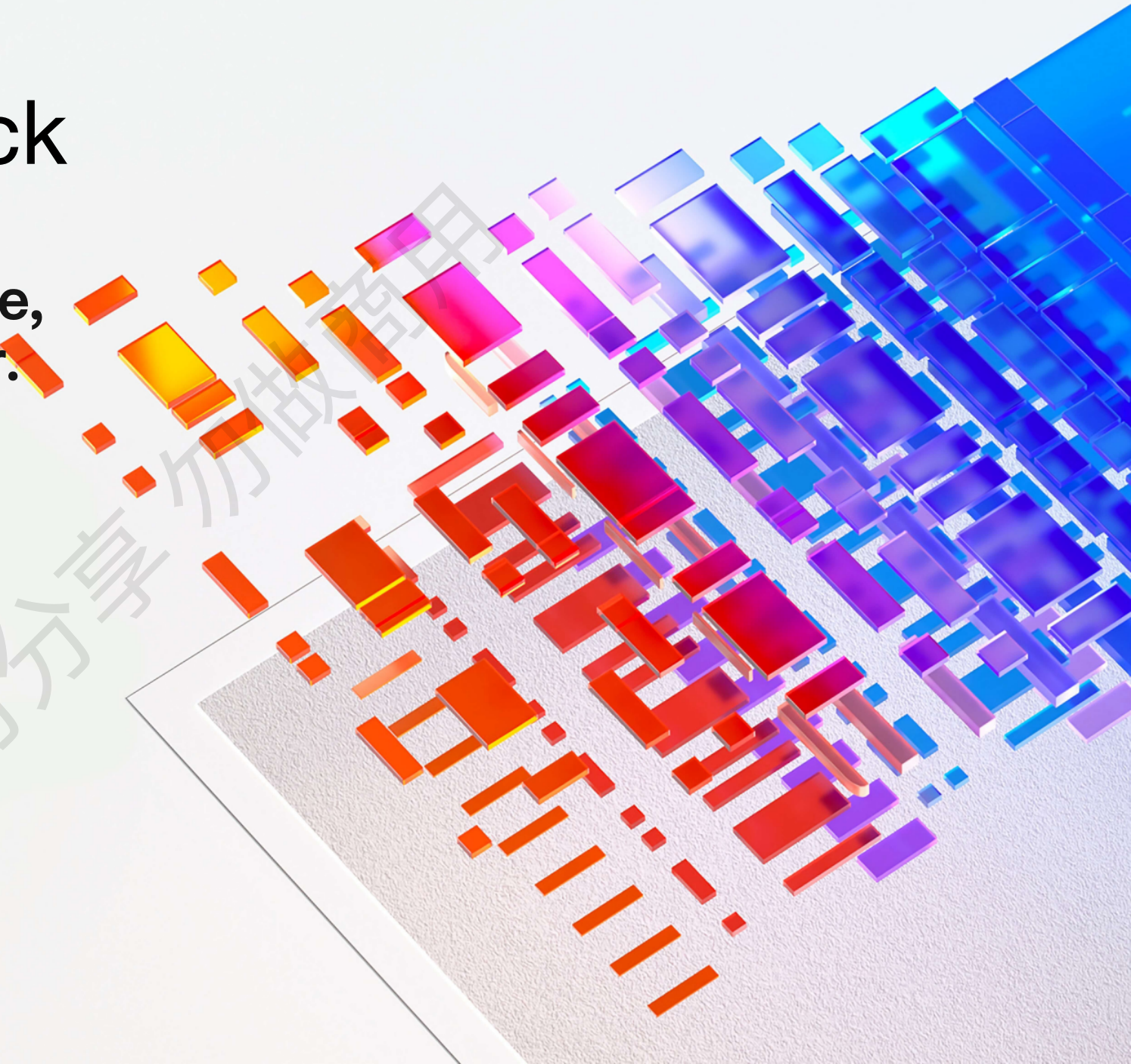
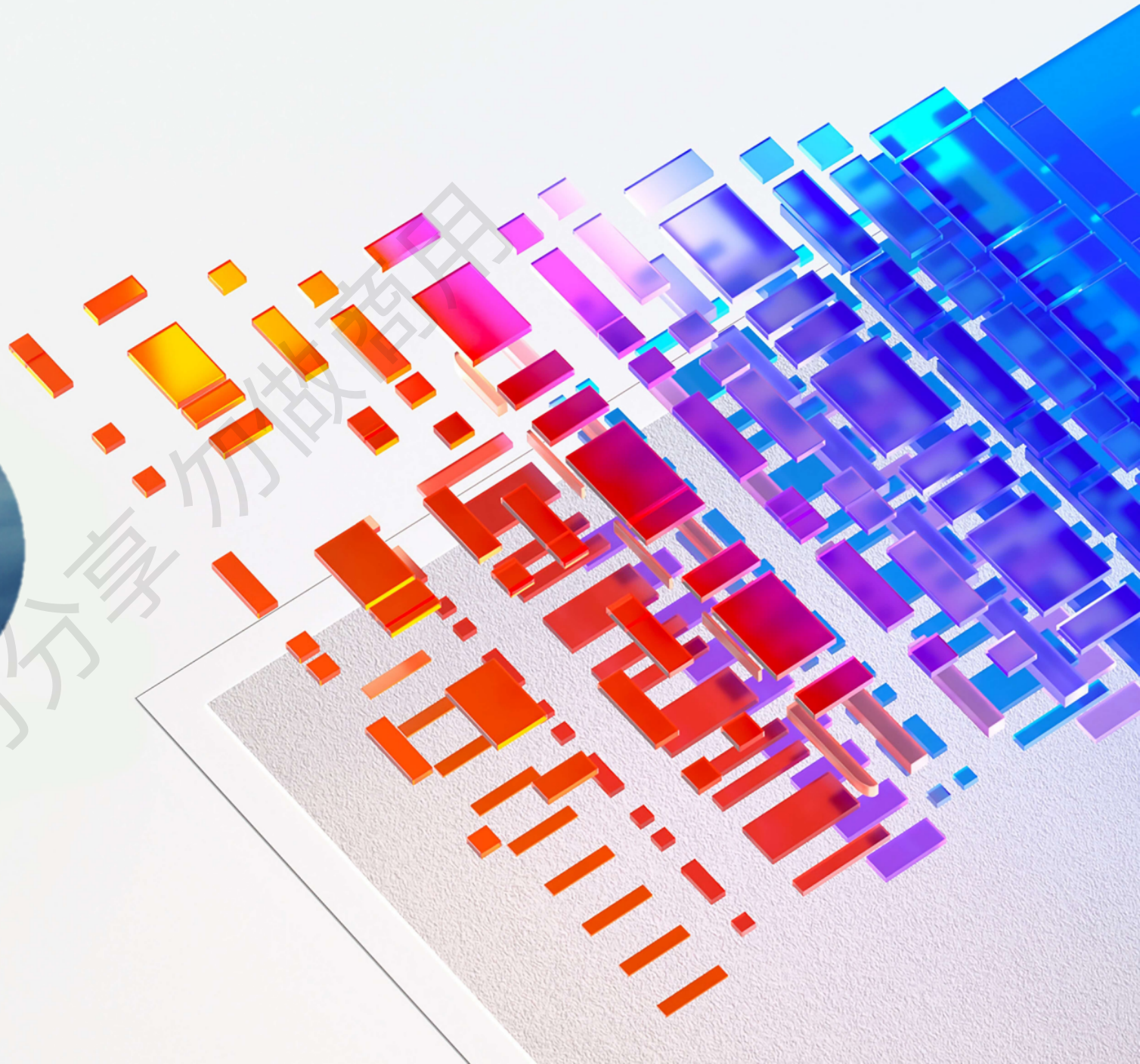


Microsoft Azure

Azure Introduction



学习分享仅供参考

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

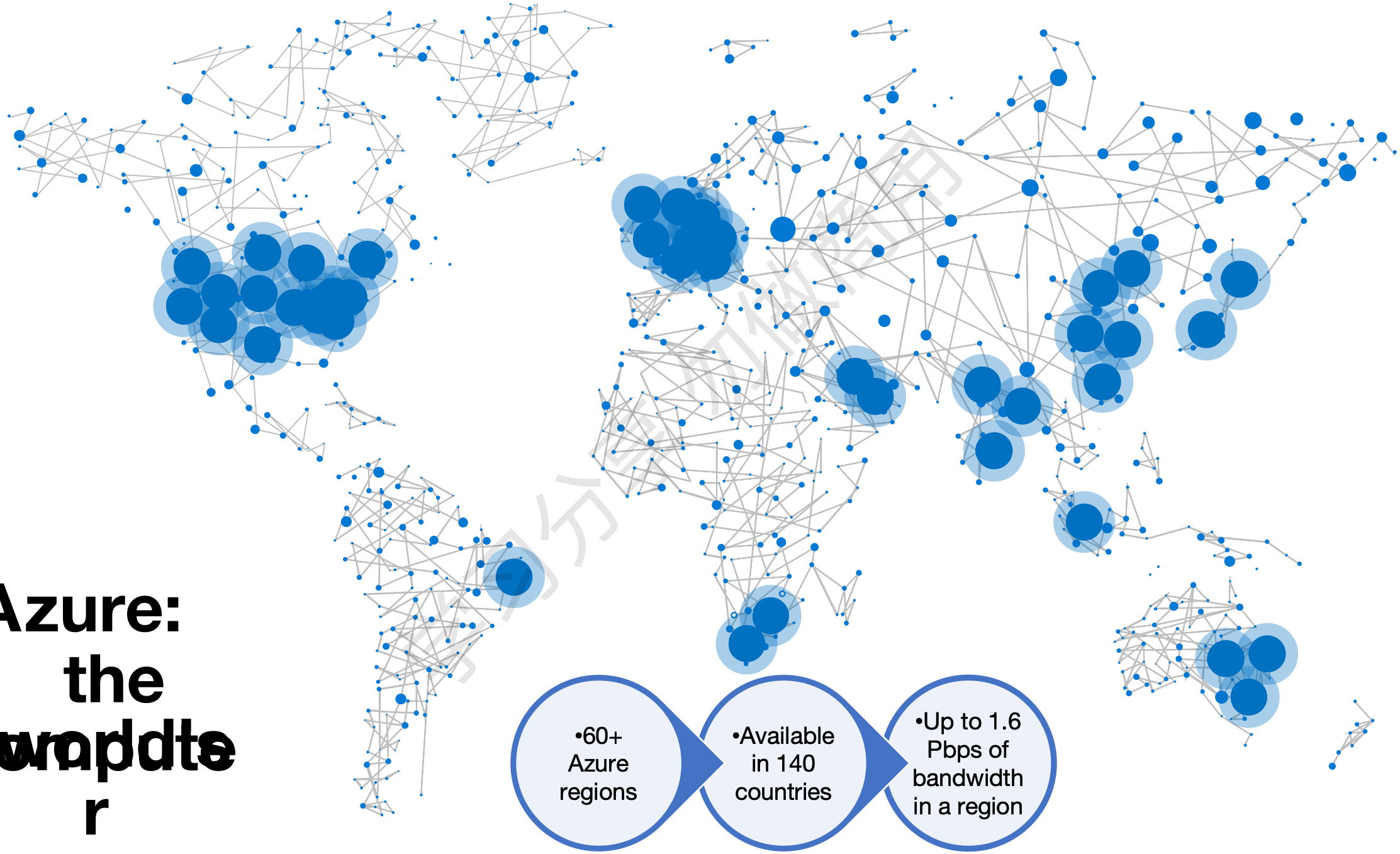
- Introduction to Azure
- Tour of Azure services

Microsoft Azure

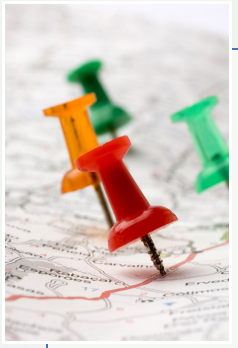
Azure is Microsoft's cloud computing platform. Azure is a continually expanding set of cloud services that help your organization meet your current and future business challenges. Azure gives you the freedom to build, manage, and deploy applications on a massive global network using your favorite tools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

Norway West
Norway East
West Europe
Germany West Central (Public)
Germany North (Public)
UK South
Germany Northeast (Sovereign)
North Europe
Poland Central
UK West
Germany Central (Sovereign)
France Central
Switzerland North
Italy North
France South
Switzerland West
Spain Central
Canada East
West US 2
Canada Central
Central US
West Central US
North Central US
West US
US DoD East
US Gov Arizona
East US
South Central US
East US 2
US Gov Texas
US Gov Virginia
Mexico Central
US DoD Central
Israel Central
Qatar Central
UAE North
UAE Central
West India
Central India
South India
China North
China North 2
Korea Central
Korea South
Japan East
Japan West
China East 2
China East
East Asia
Southeast Asia
Brazil South
South Africa North
South Africa West
Australia East
Australia Central
Australia Southeast
Australia Central 2
New Zealand North
Available region
Announced region
Availability Zones

Azure: the cloud computer

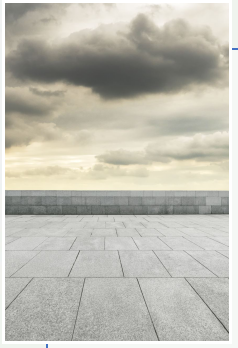


Azure architecture and service guarantees



Geographies

Regions



Availability Zones

Region Pairs

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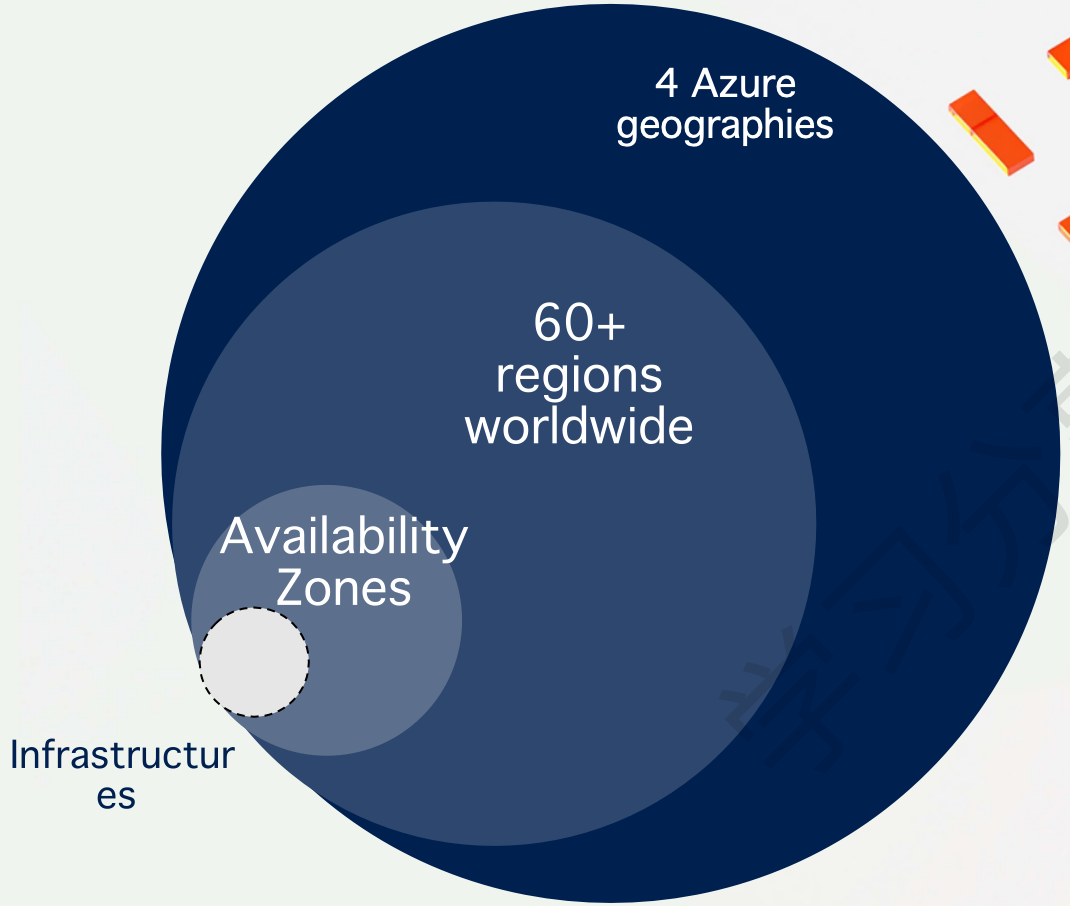
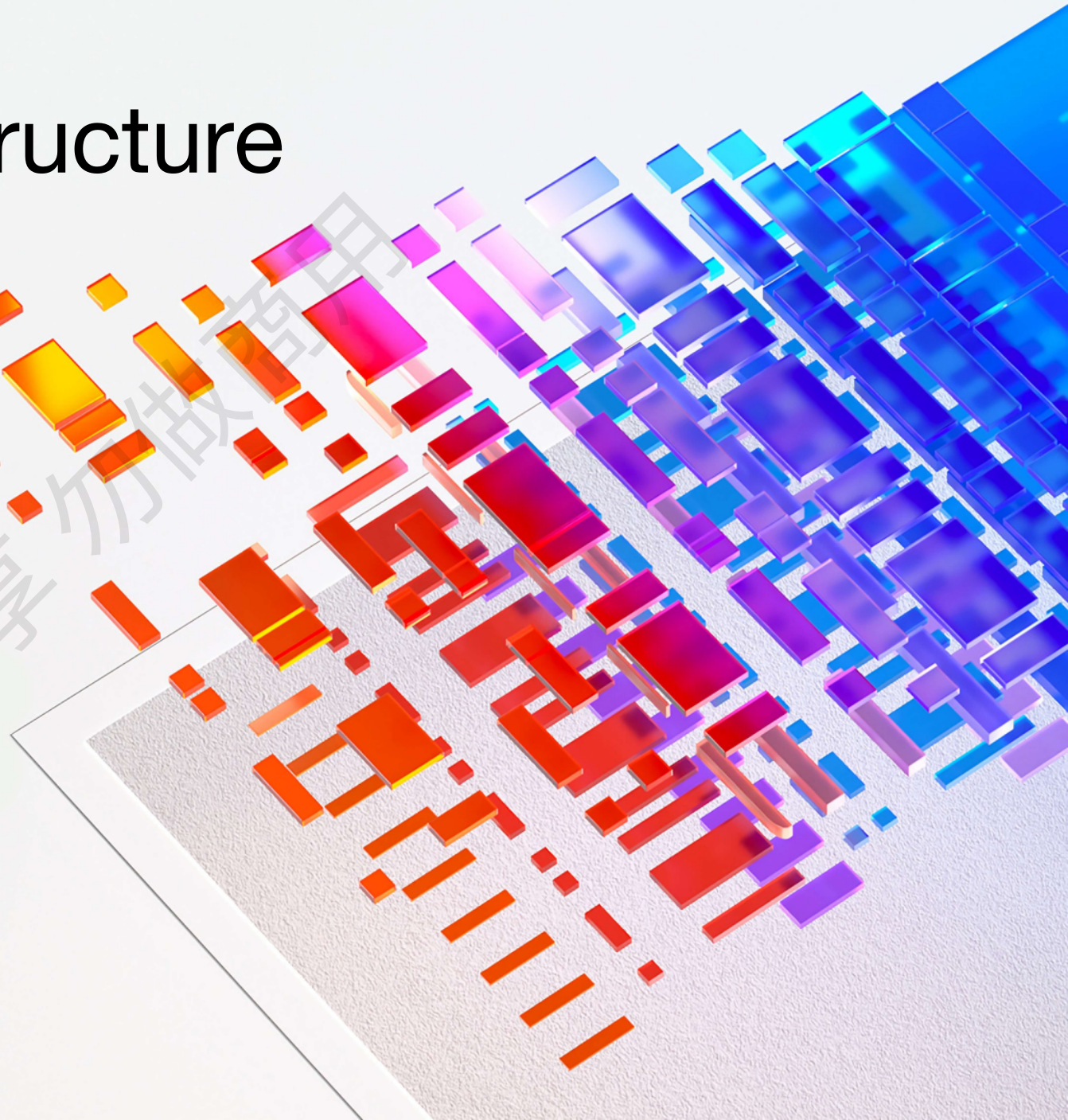
Azure global infrastructure

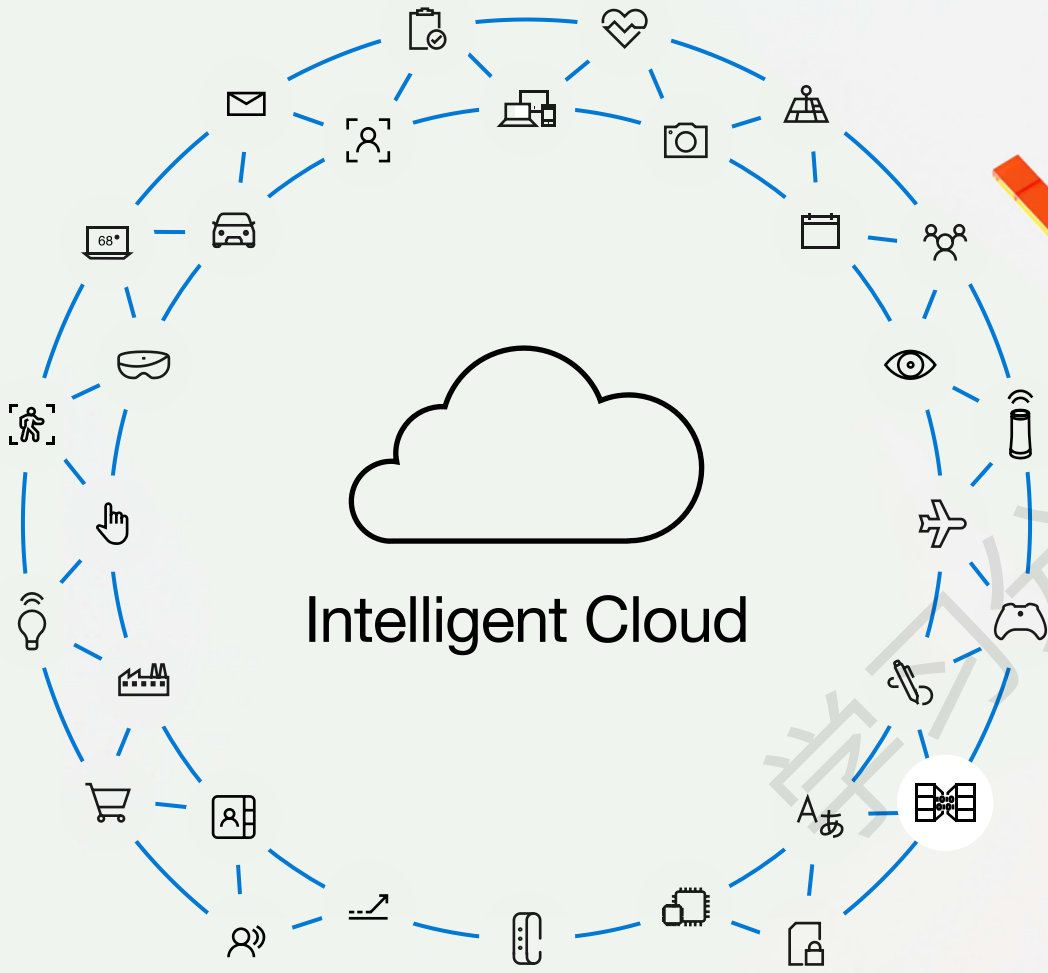


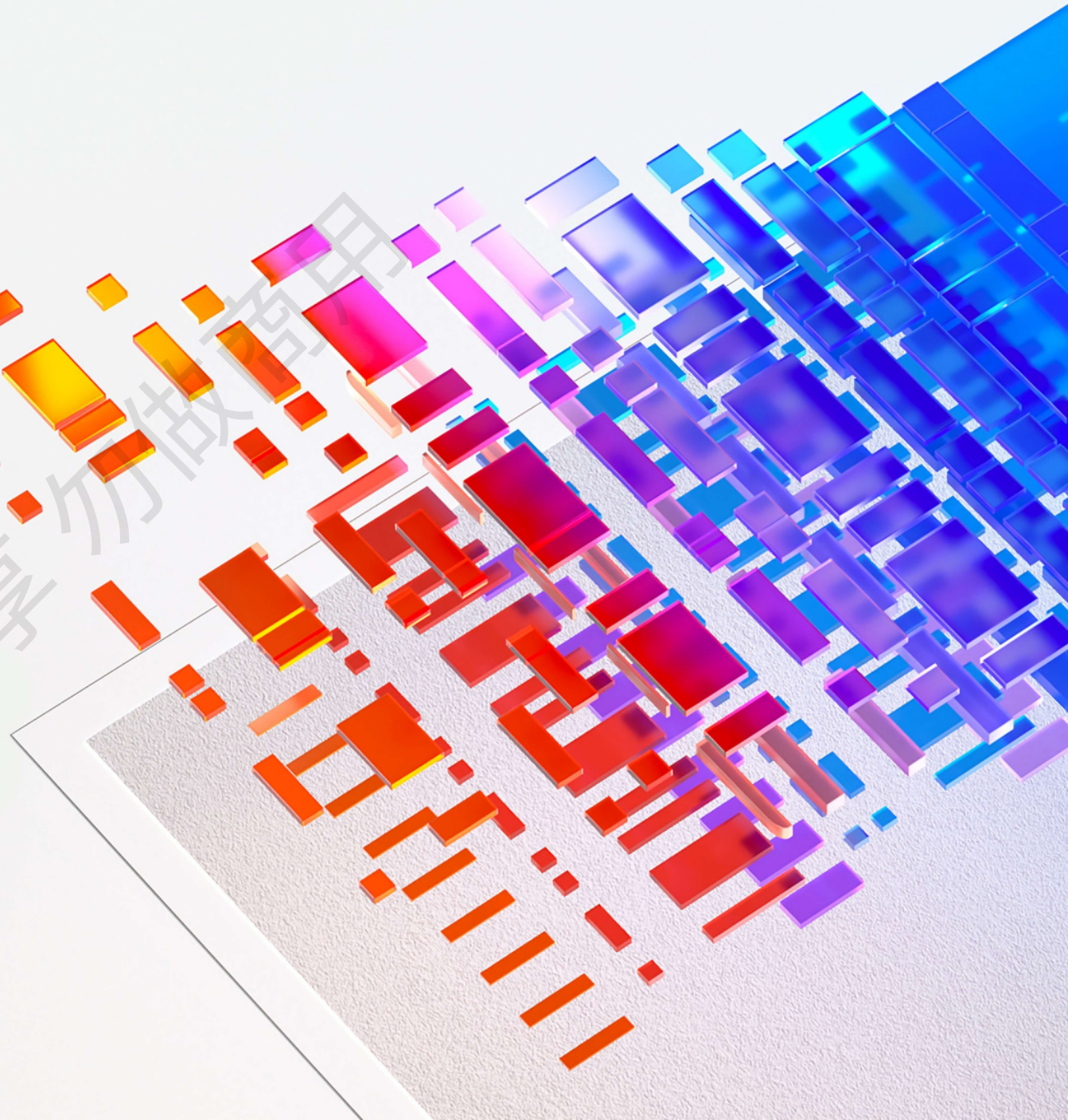


What can I do on Azure?

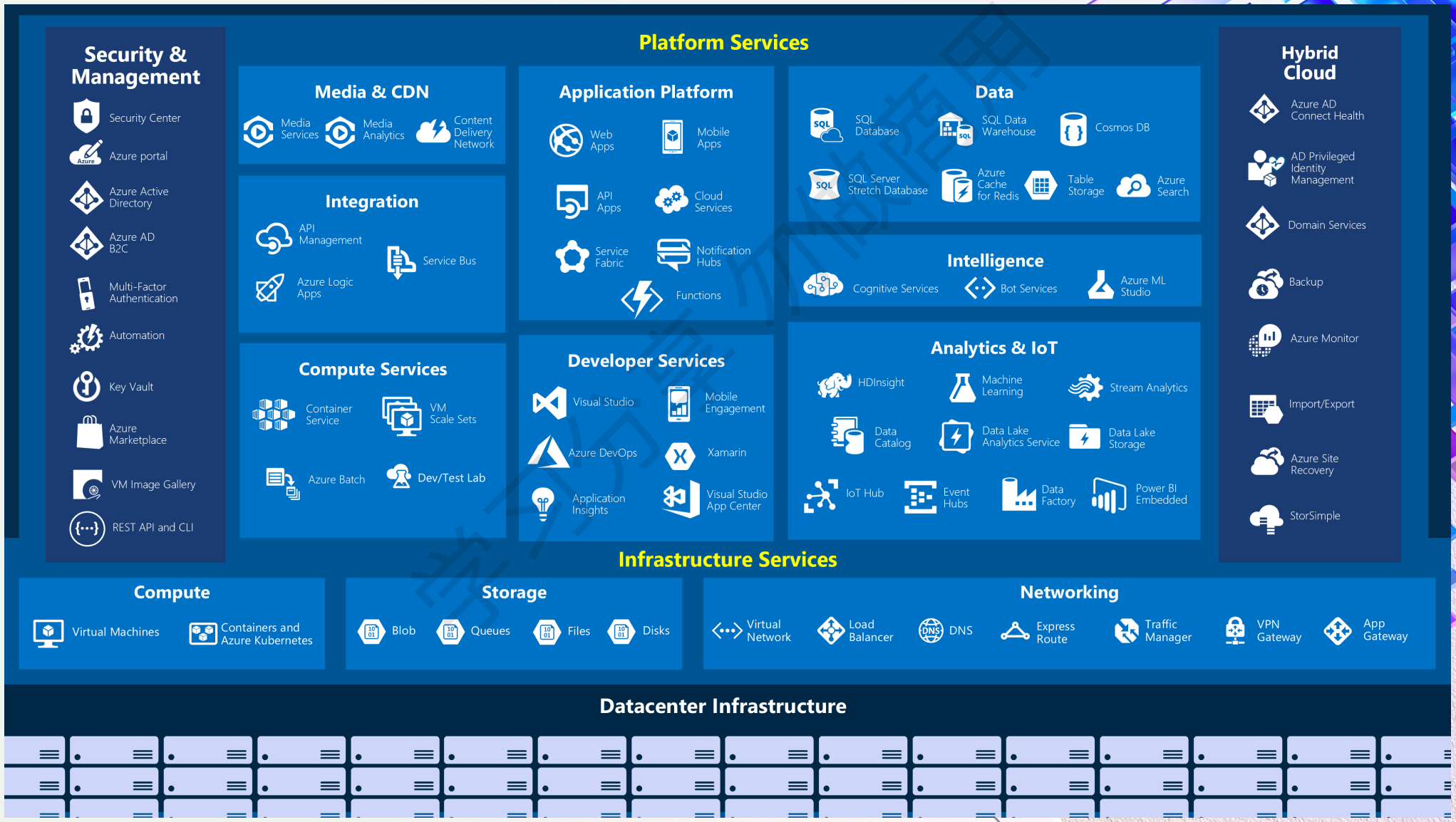
- Azure provides over 100 services that enable you to do everything from running your existing applications on virtual machines to exploring new software paradigms such as intelligent bots and mixed reality.
- Many teams start exploring the cloud by moving their existing applications to virtual machines 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

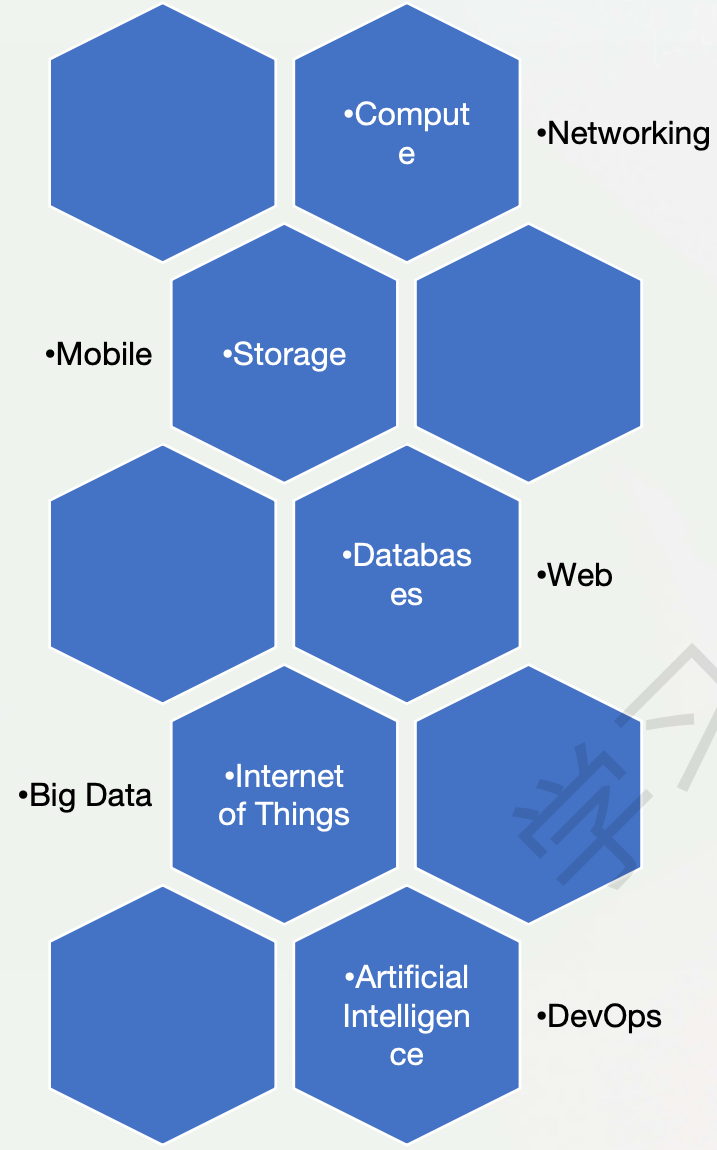


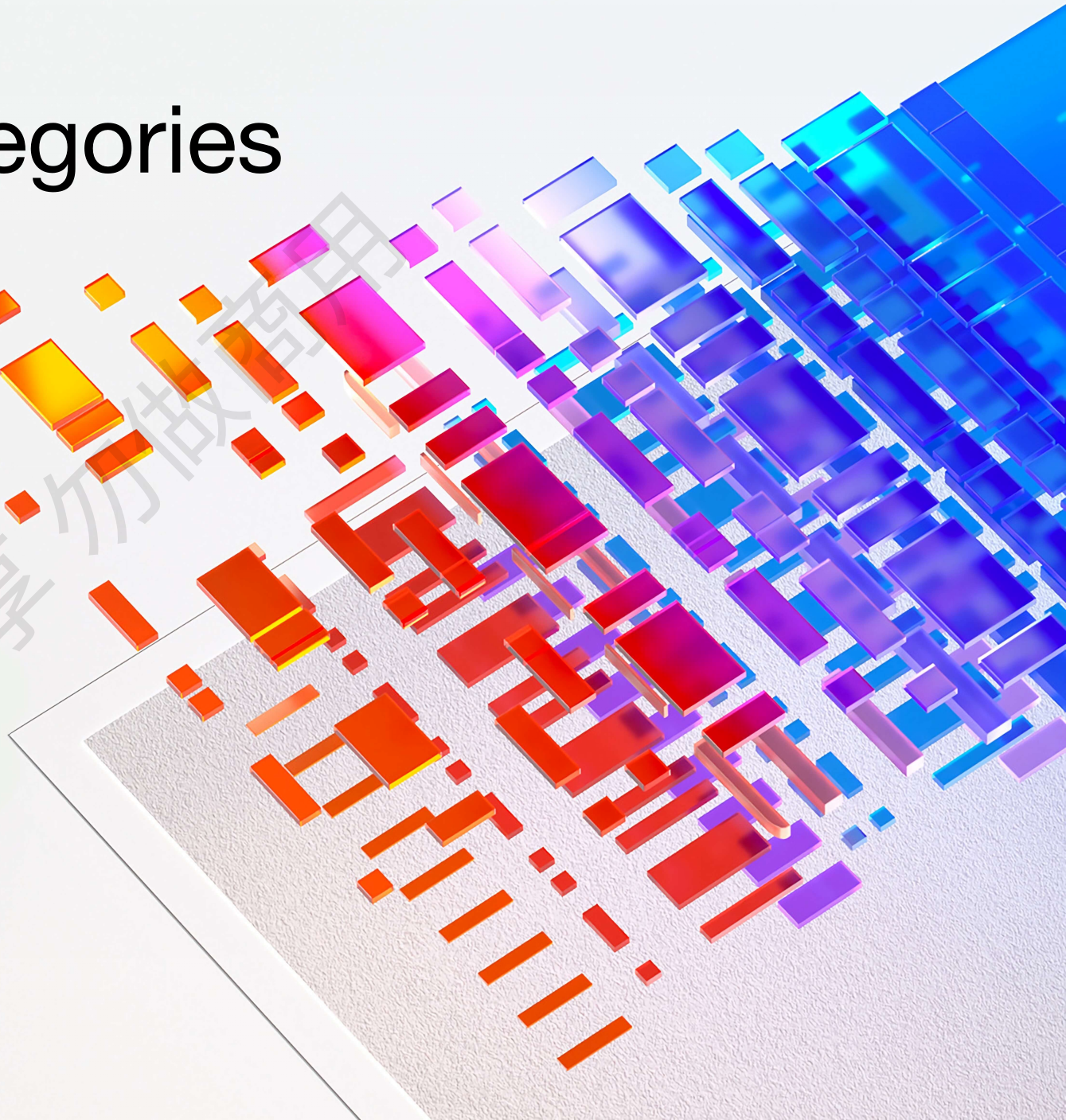


Azure services



Azure Services Categories





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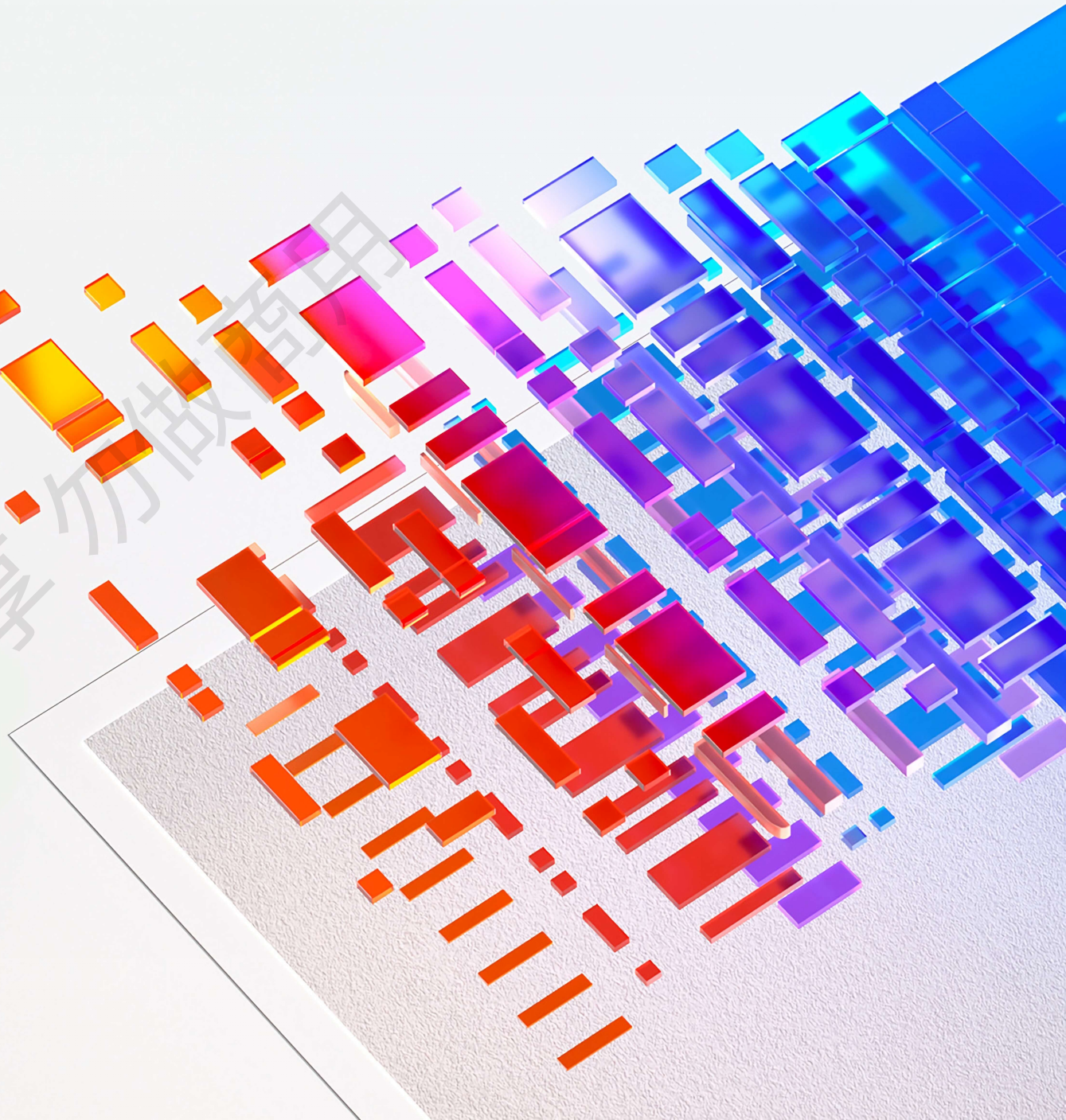
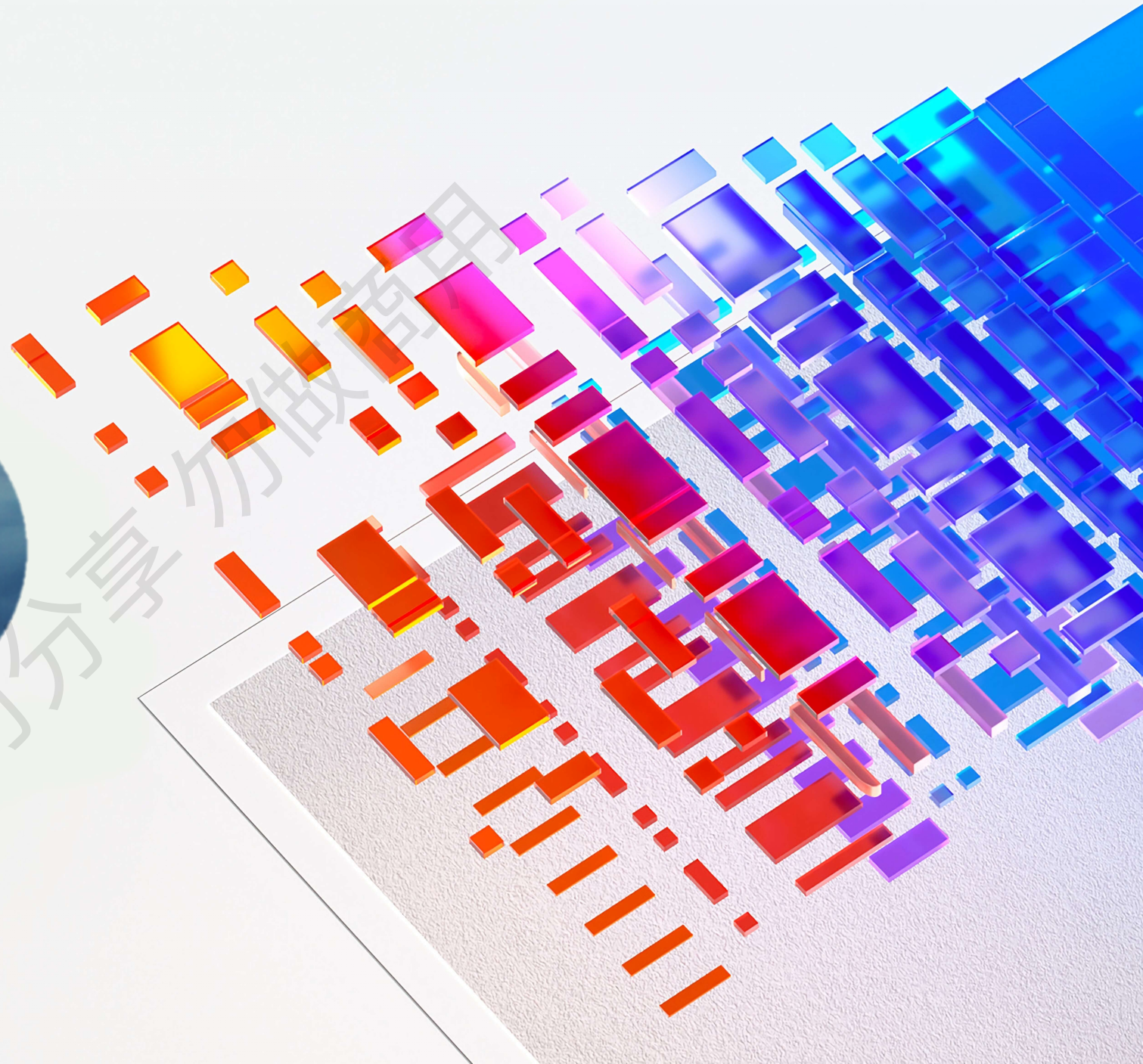


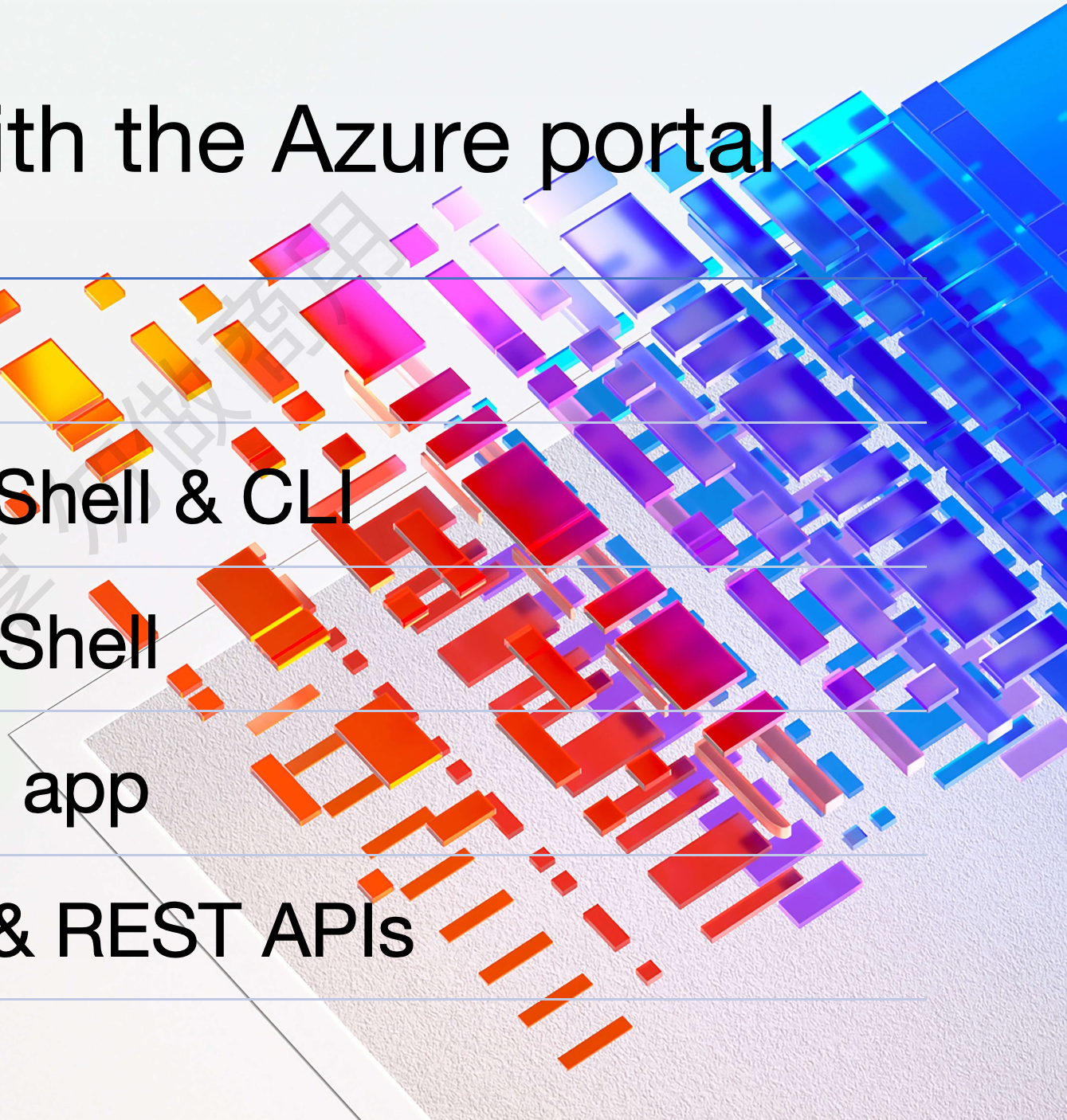
Microsoft Azure

Azure Portal & Azure Cloud Shell

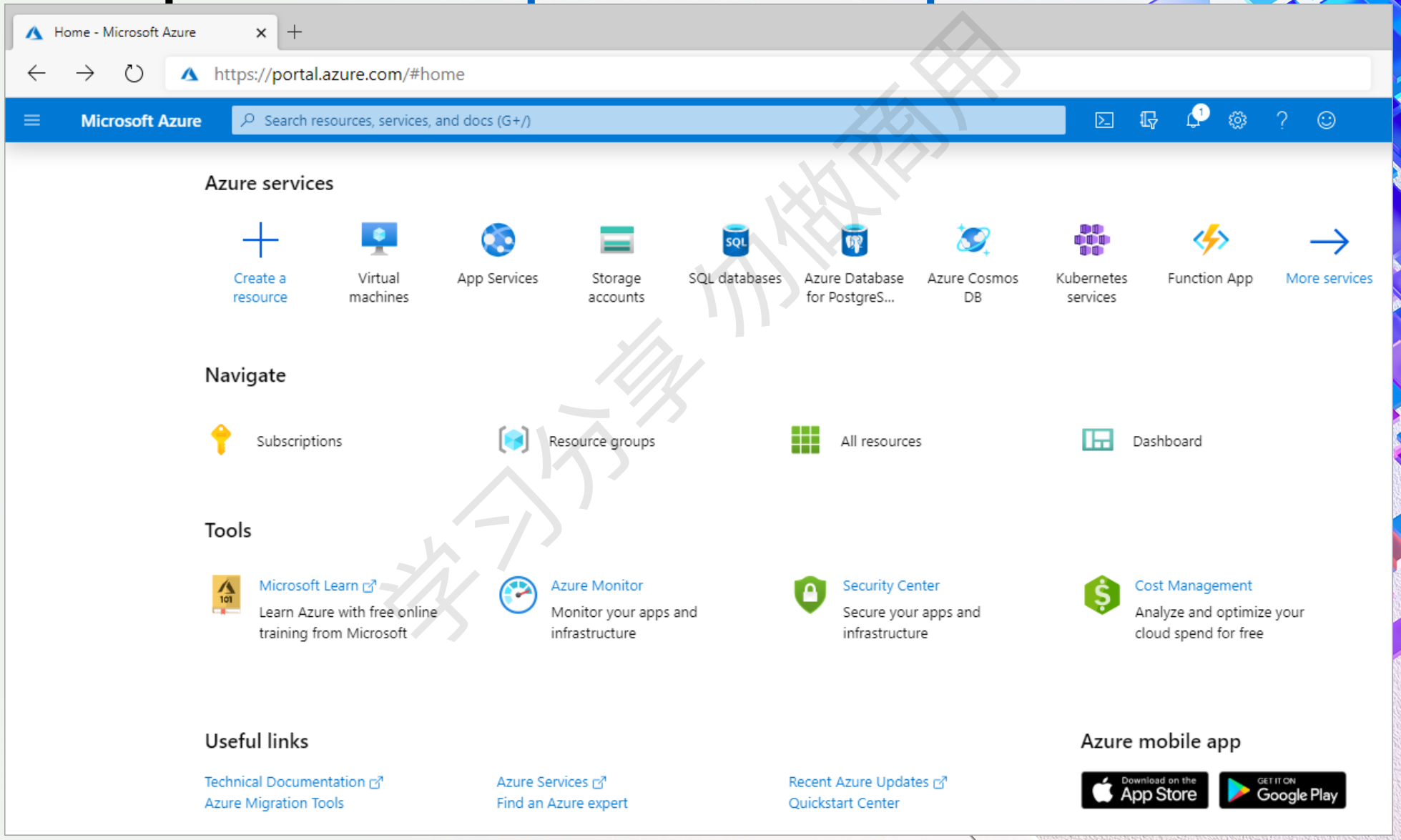


Manage services with the Azure portal

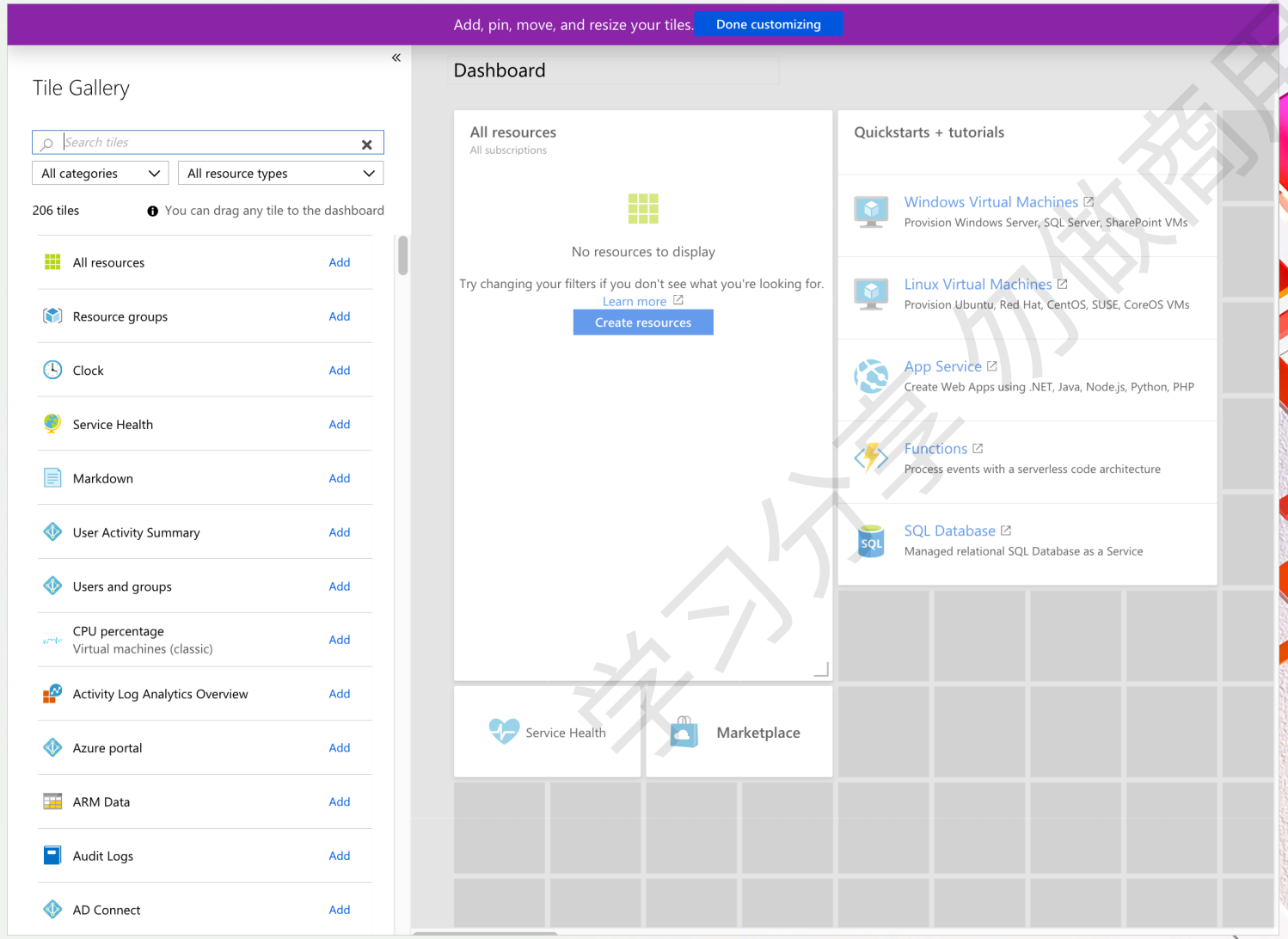
Management Tools
Azure portal
Azure PowerShell & CLI
Azure Cloud Shell
Azure mobile app
Azure SDKs & REST APIs



Azure portal: https://azure.portal.com



Azure Portal dashboards



Azure Cloud Shell & CLI

PowerShell

Azure Cloud Shell

Azure CLI

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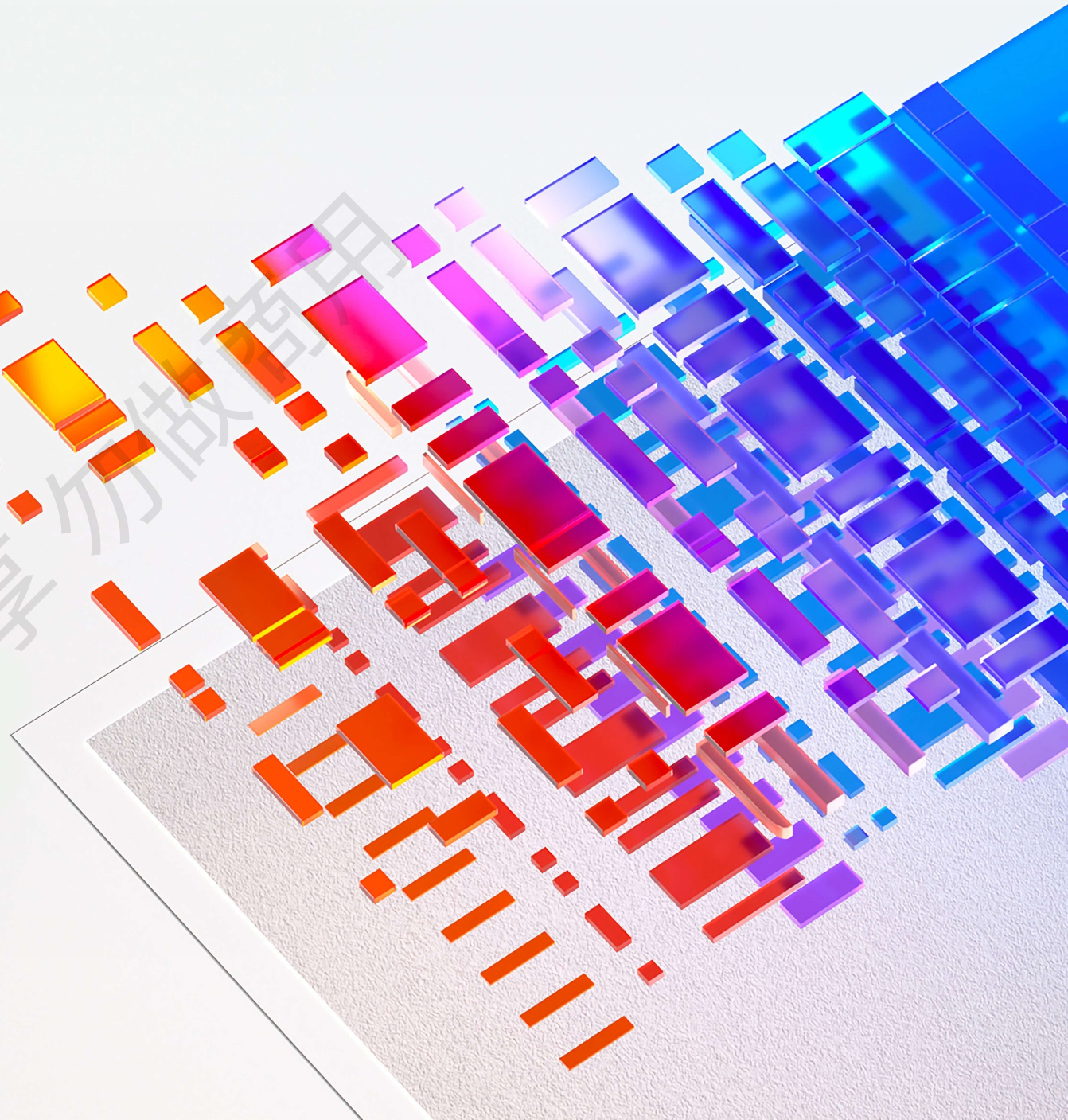
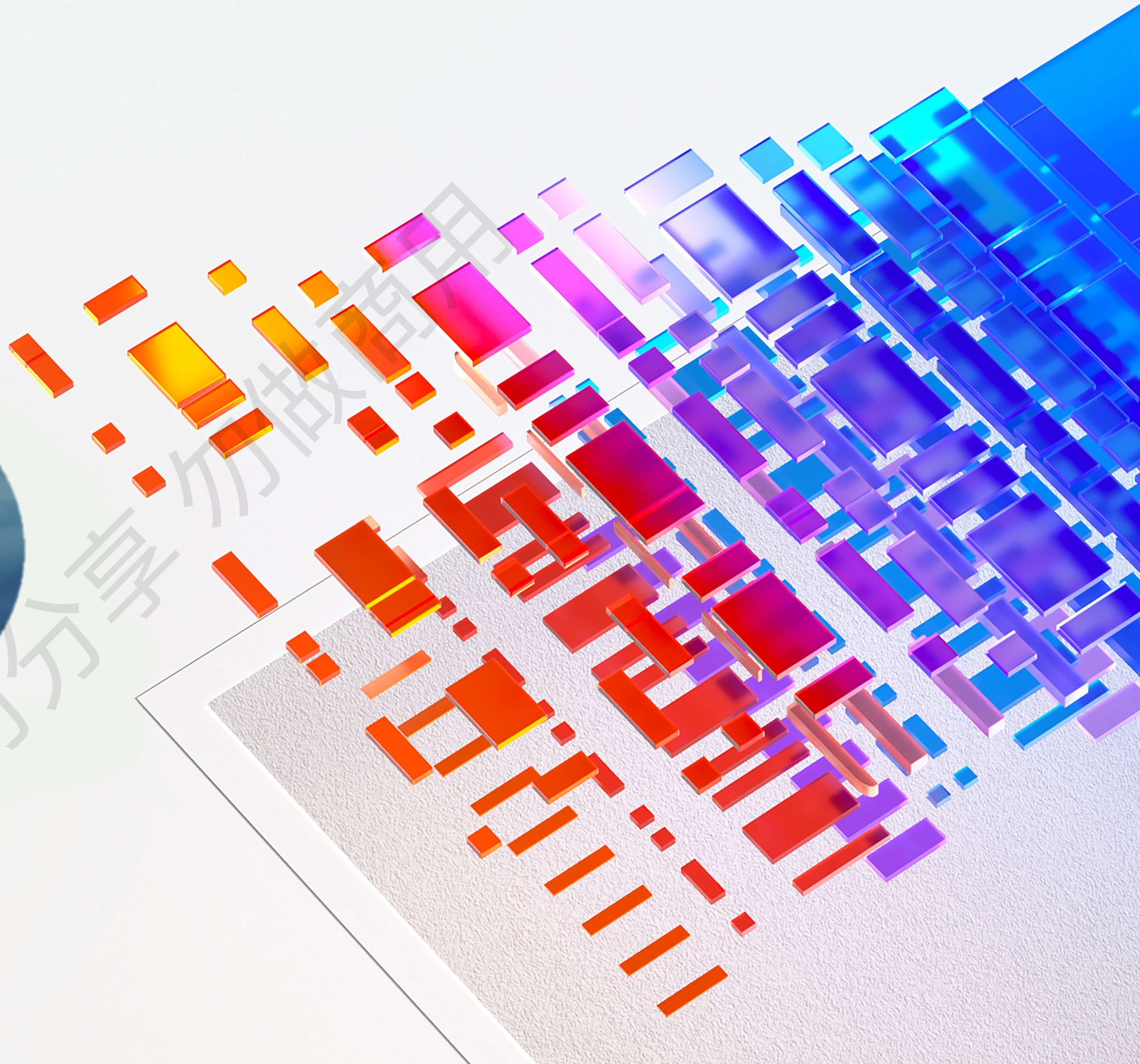


Microsoft Azure

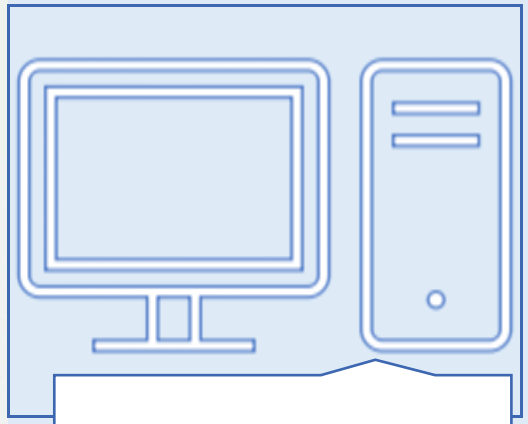
Azure Compute Services



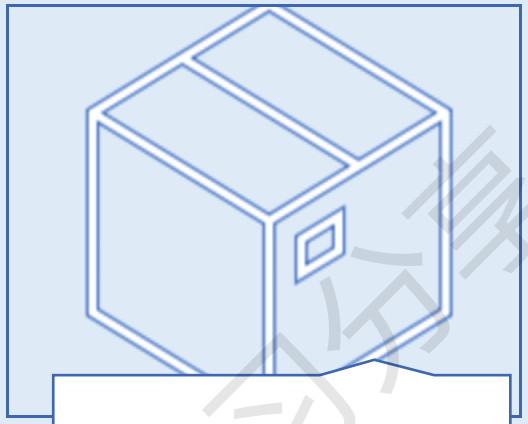
Module Objectives

- Identify Azure compute options
- Select compute options that will solve your specific business needs

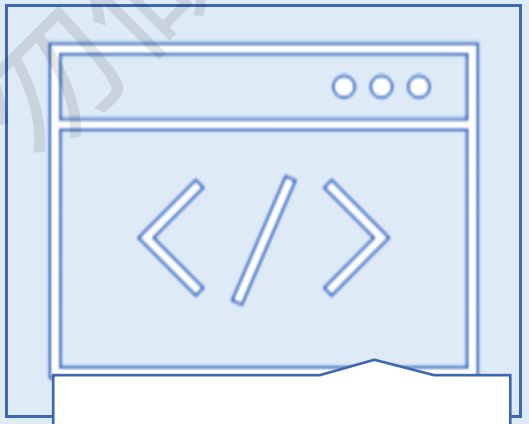
Azure compute options



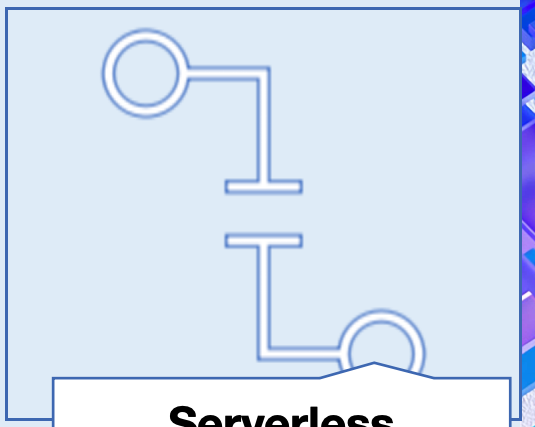
Virtual Machines



Containers



App Service



Serverless computing

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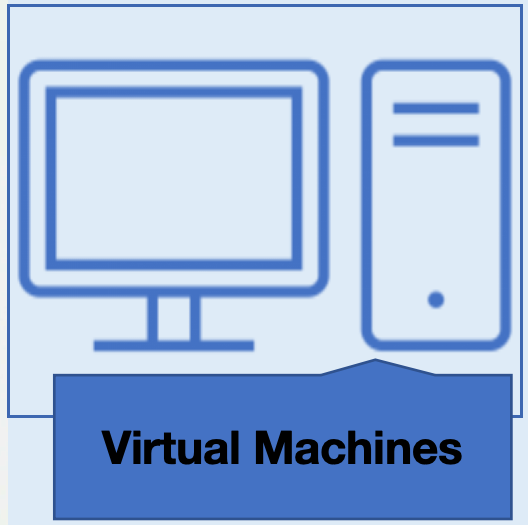
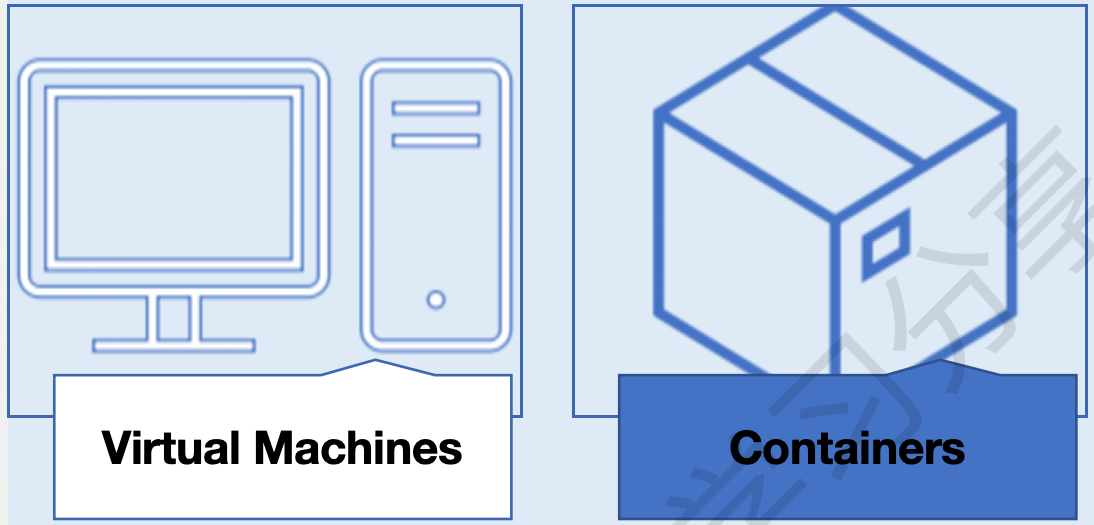
Azure compute options



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.

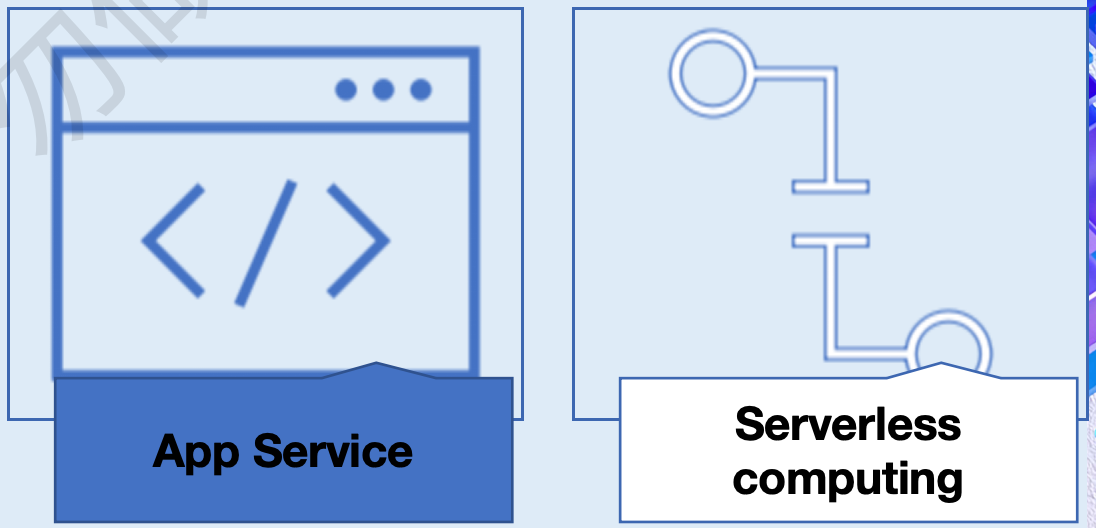
Azure compute options



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.

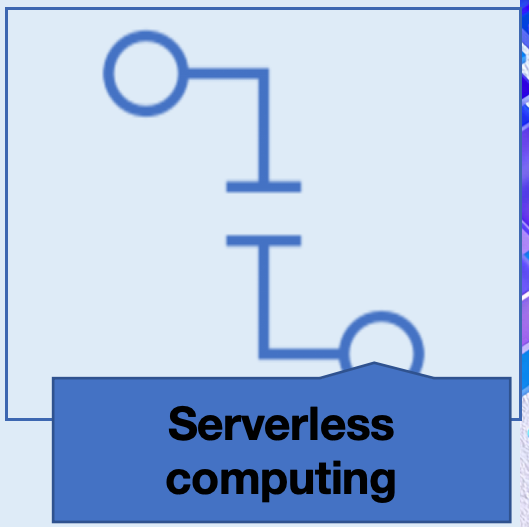
Azure compute options

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.

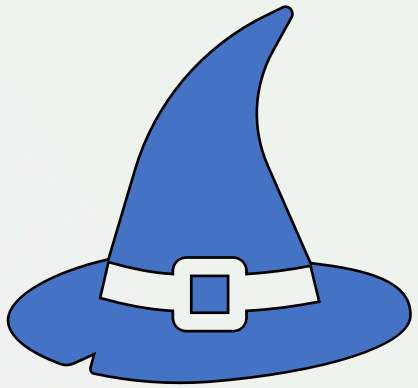


Azure compute options

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

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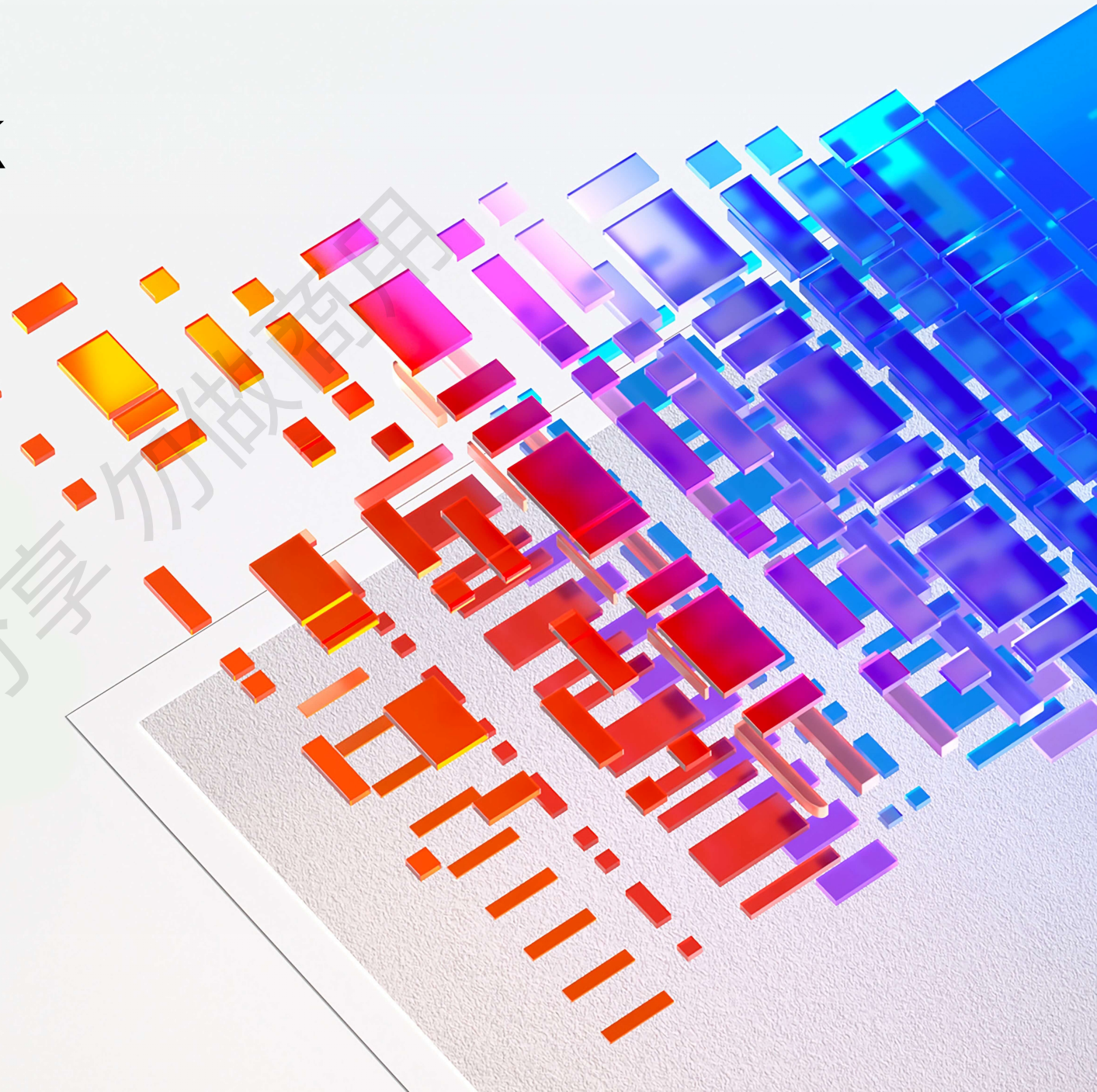
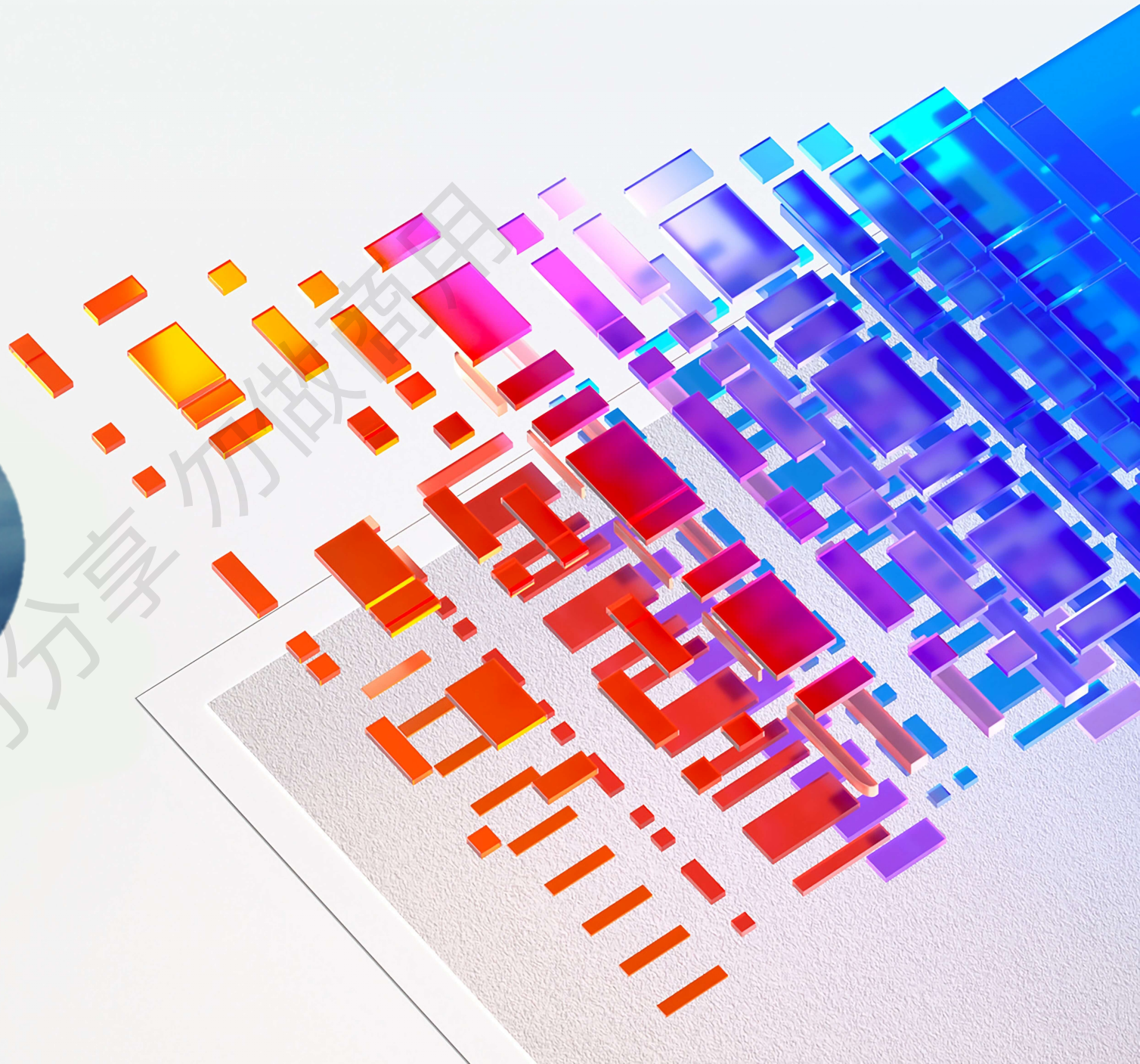
Then submit your answer.



Microsoft Azure

Azure Network Services

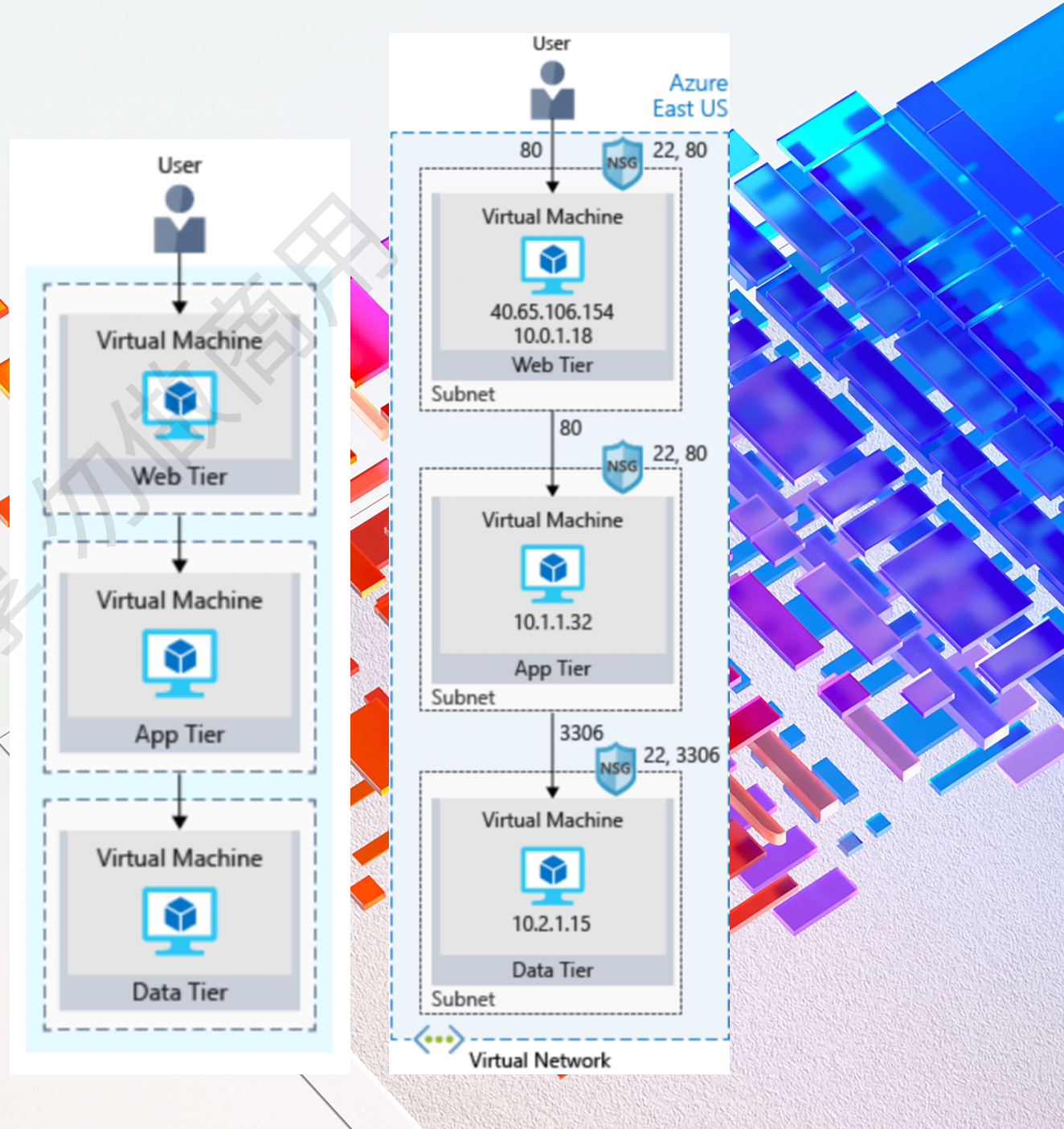


Module Objectives

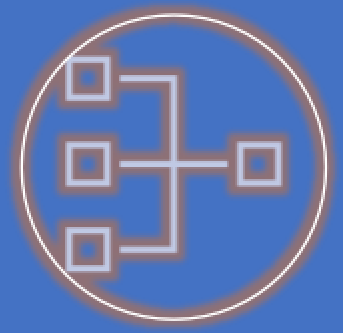
- Learn how virtual networking helps you isolate network and compute resources
- Learn how Azure Load Balancer helps improve resiliency, or the ability to recover when your service goes down
- Learn how Traffic Manager can route traffic to different endpoints, including the endpoint with the lowest latency 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.



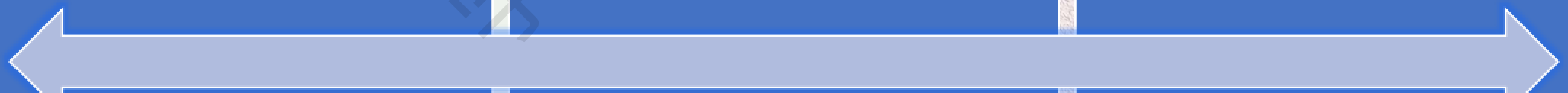
Azure networking options



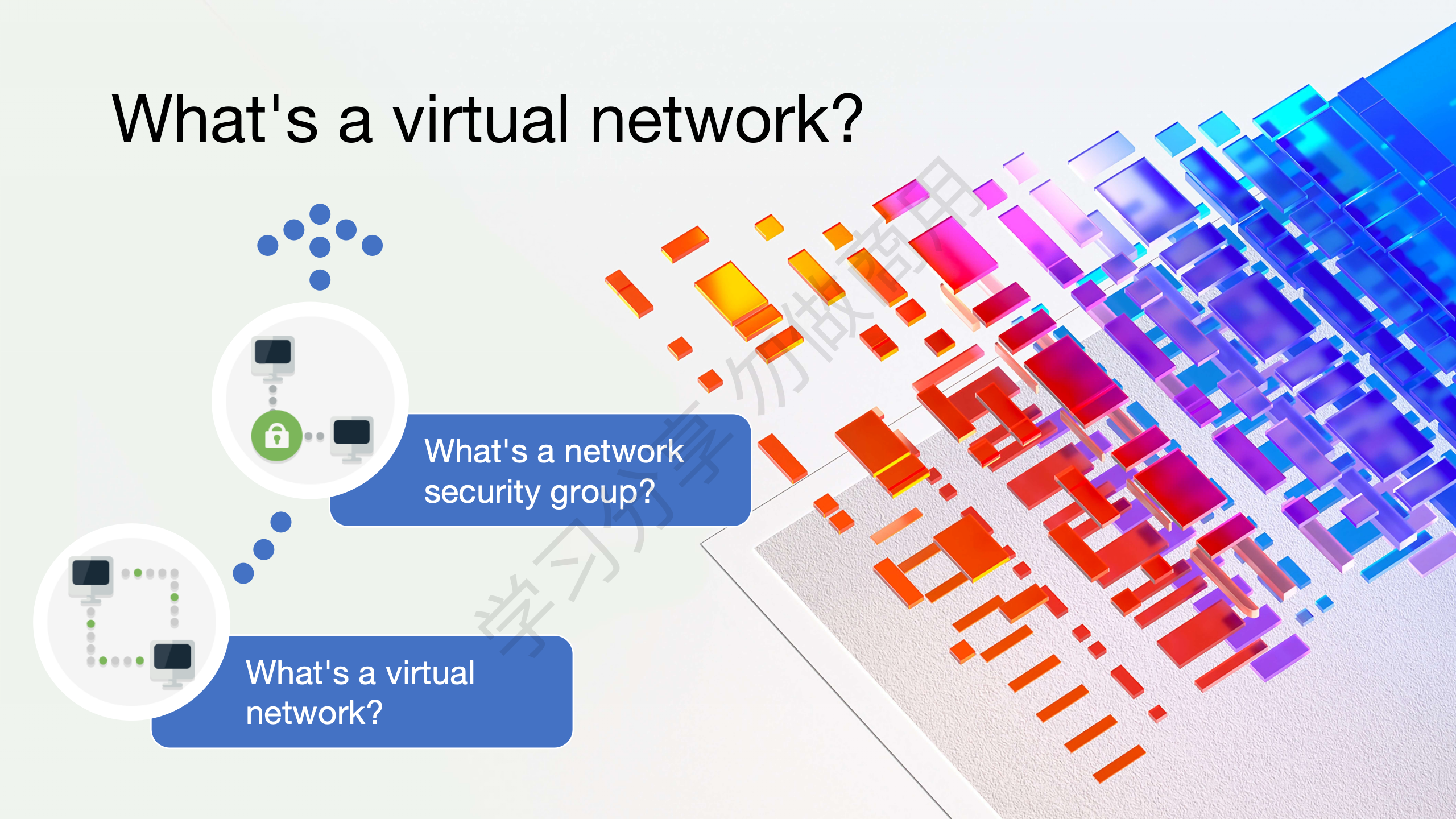
virtual network

Load Balancer

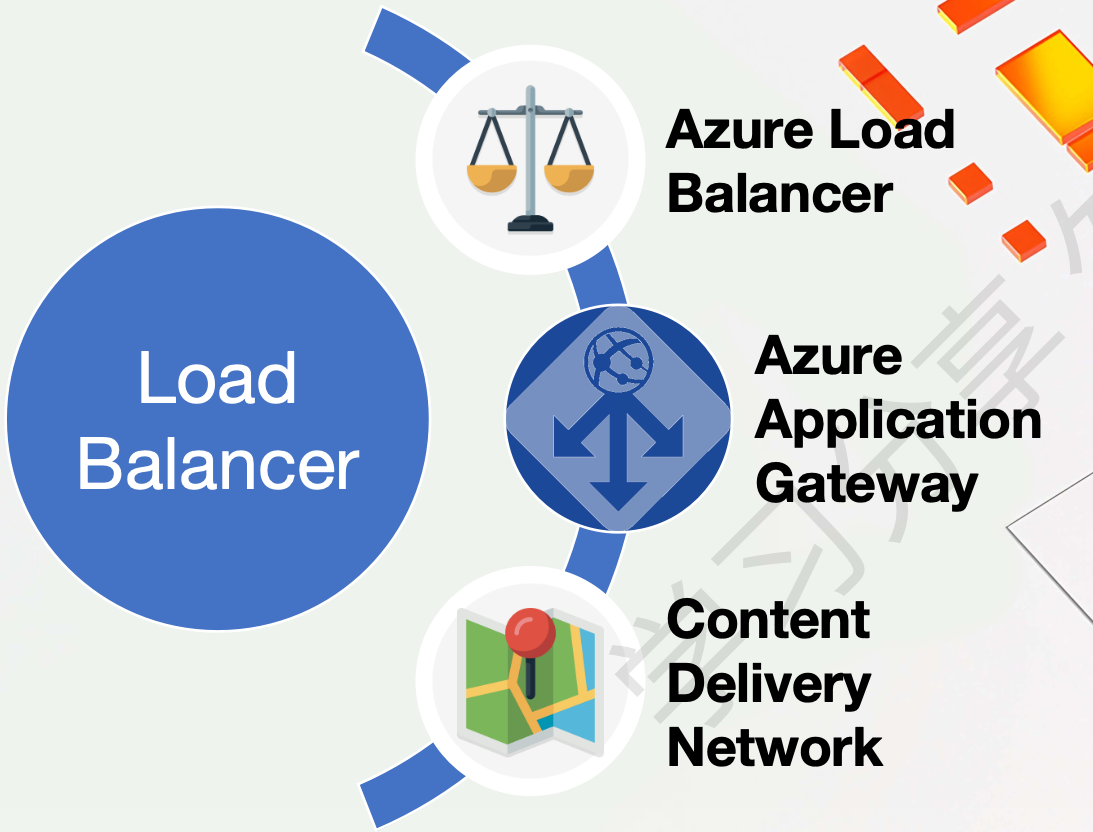
Traffic Manager

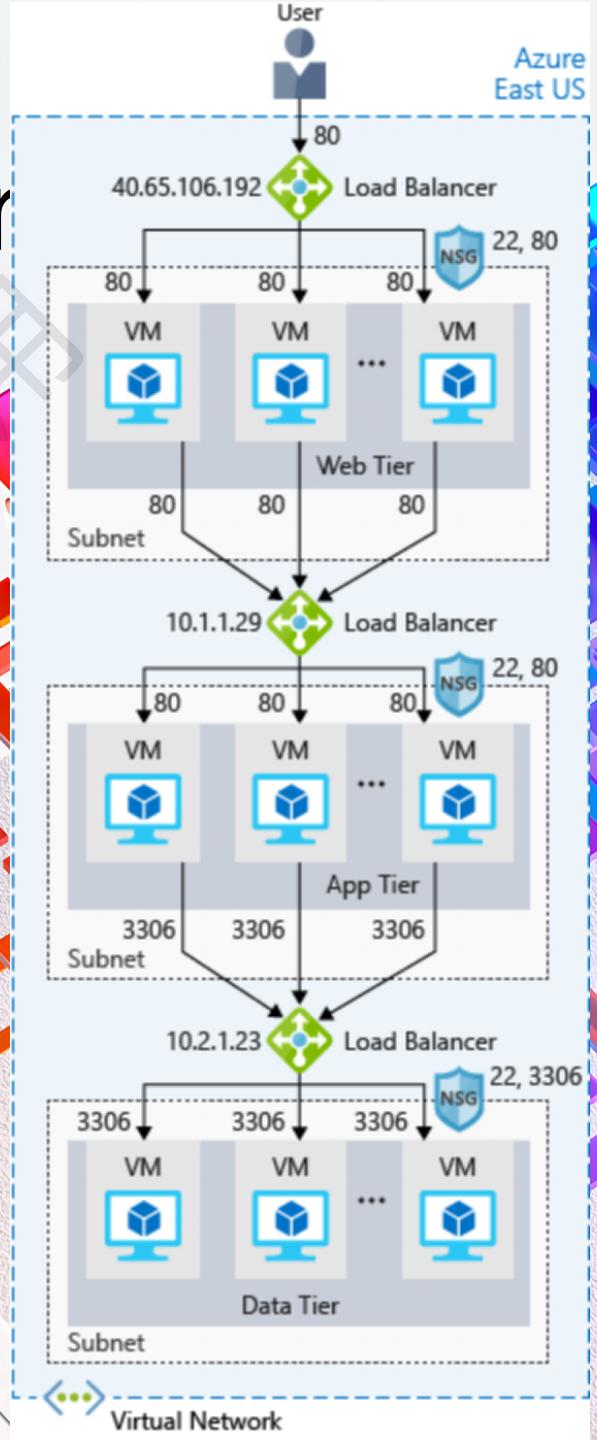


What's a virtual network?



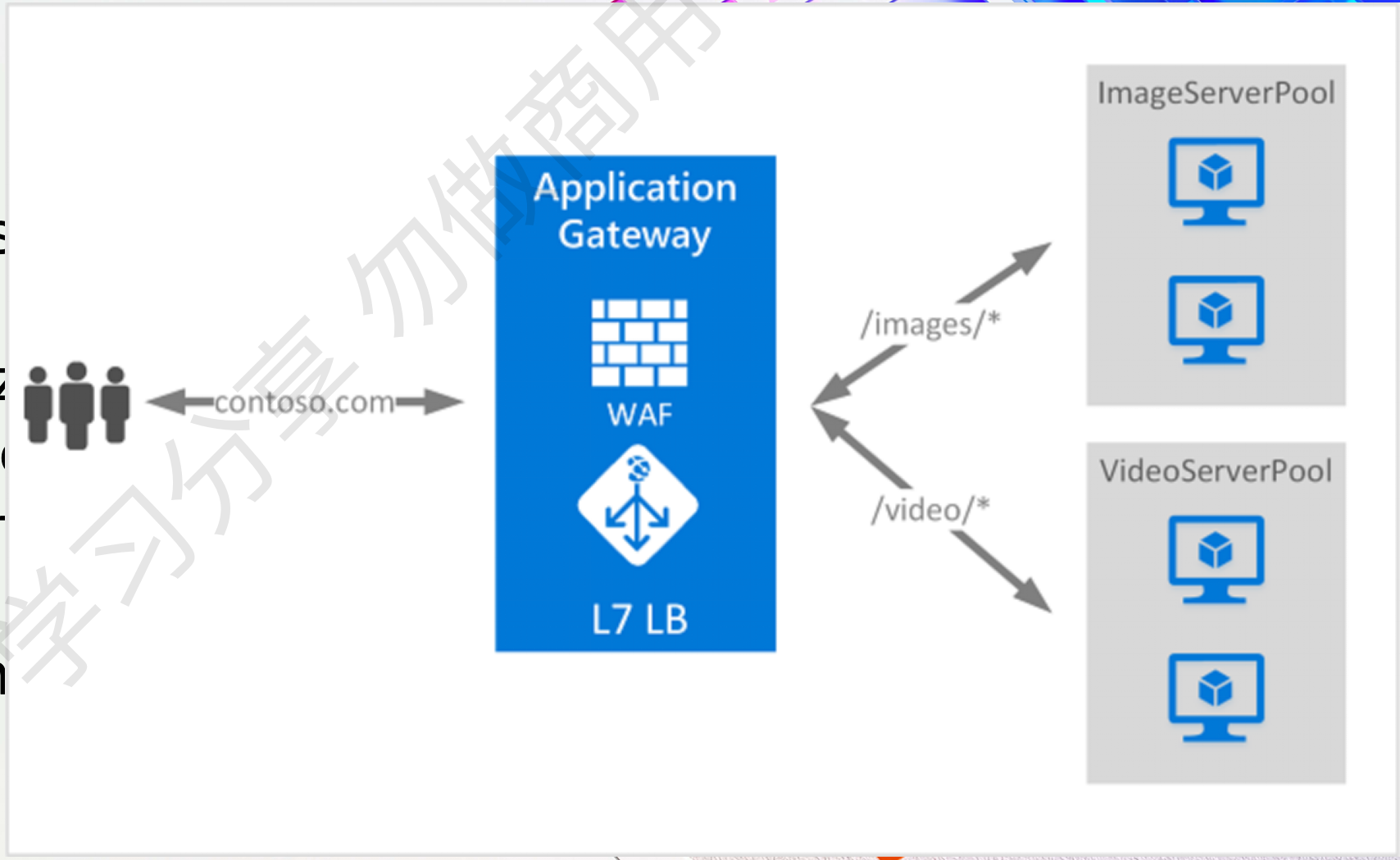
Scale with Azure Load Balar





A better option---Azure Application Gateway

Application Gateway is
balancer designed for
applications. It uses Az
Balancer at the transp
and applies sophistica
based routing rules to
several advanced scen



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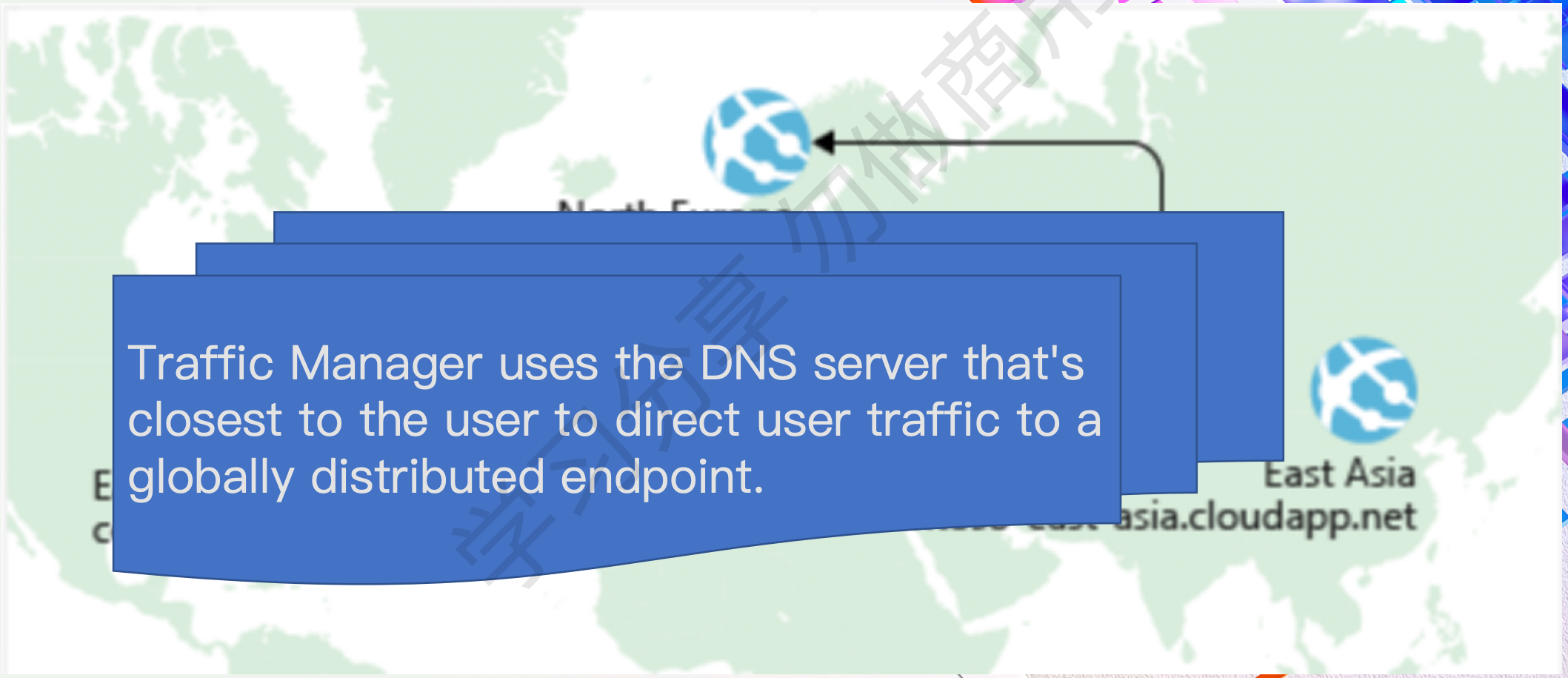
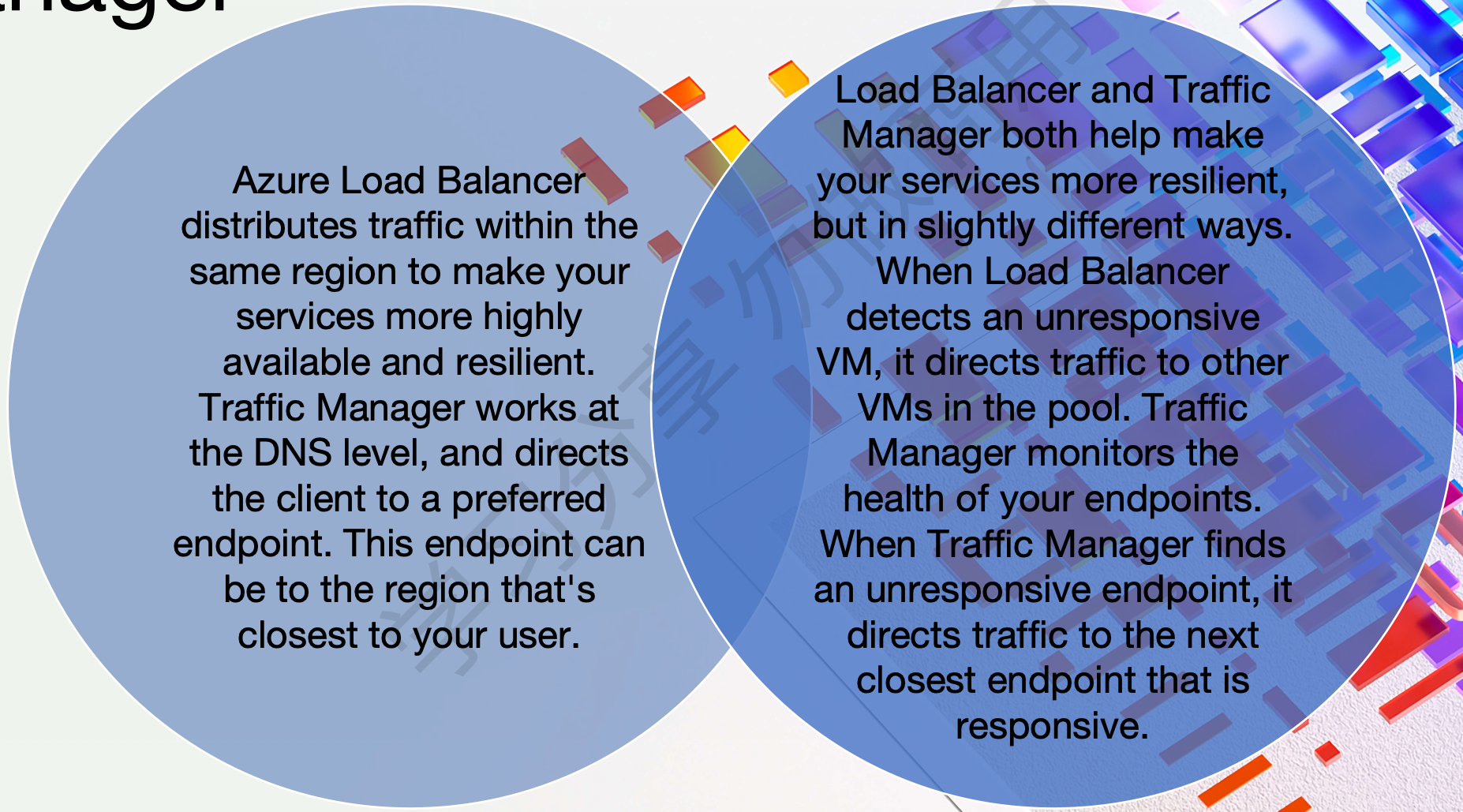
Reduce latency with Azure Traffic Manager



Compare Load Balancer to Traffic Manager



Knowledge Check

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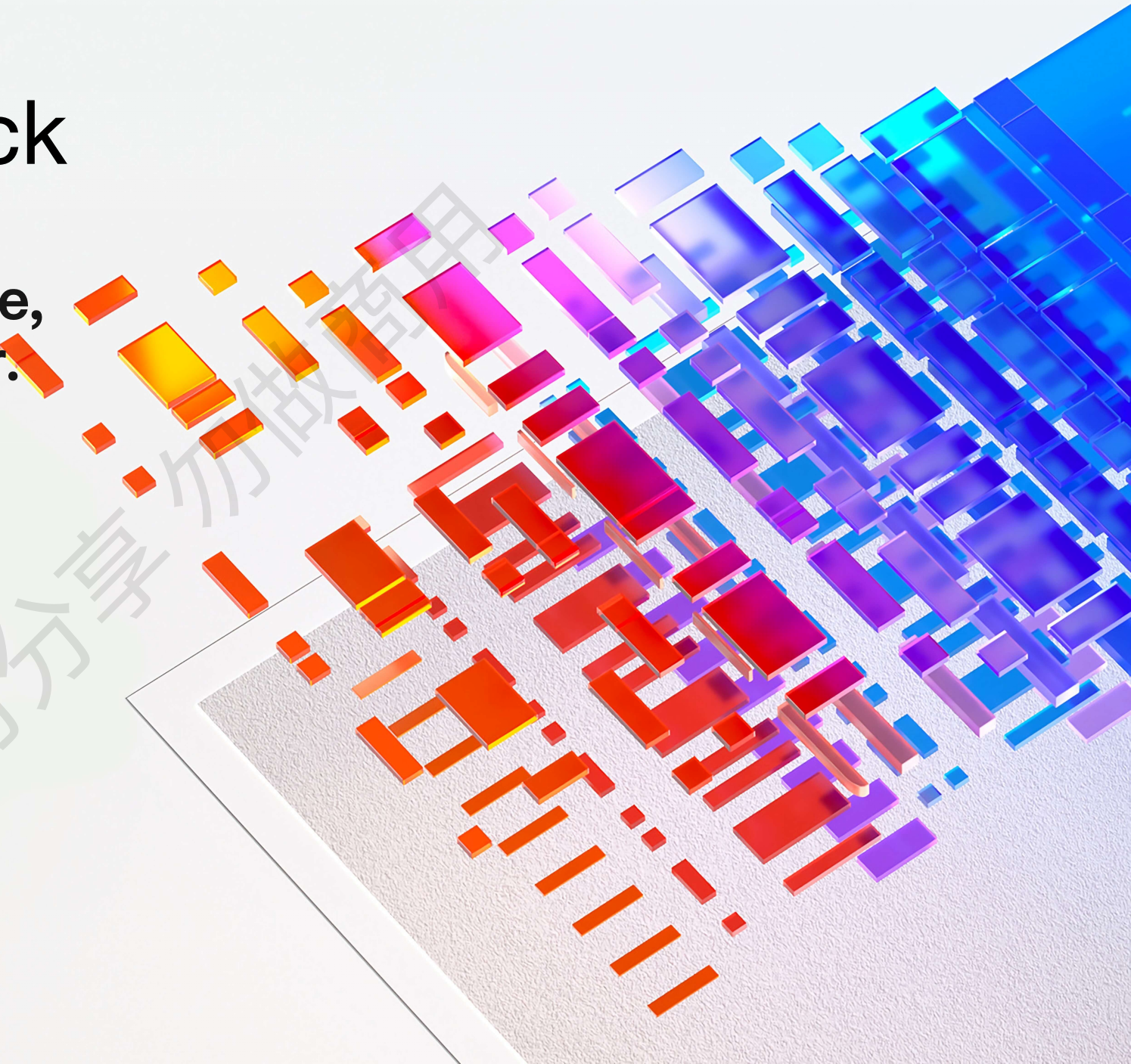
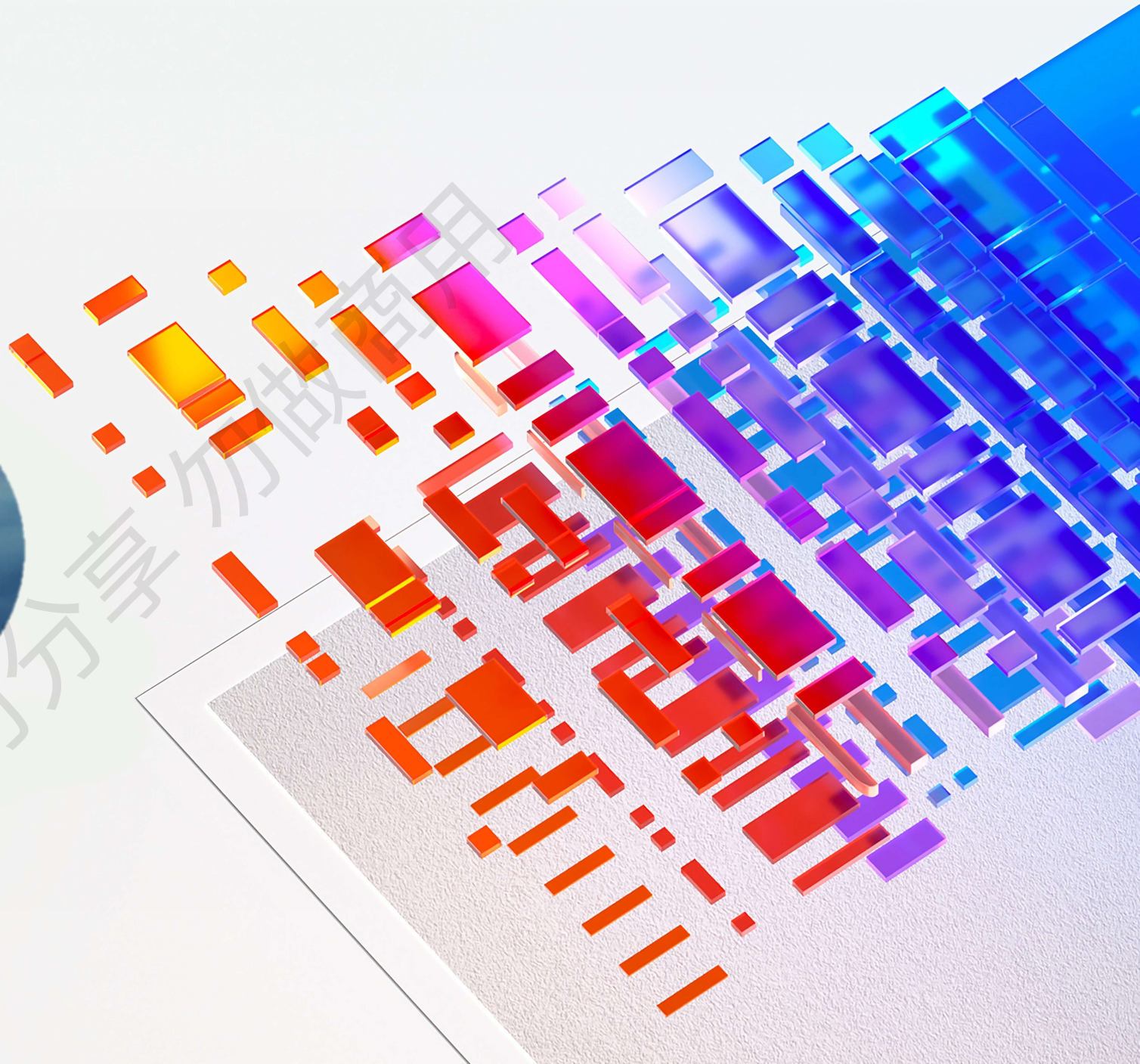


Microsoft Azure

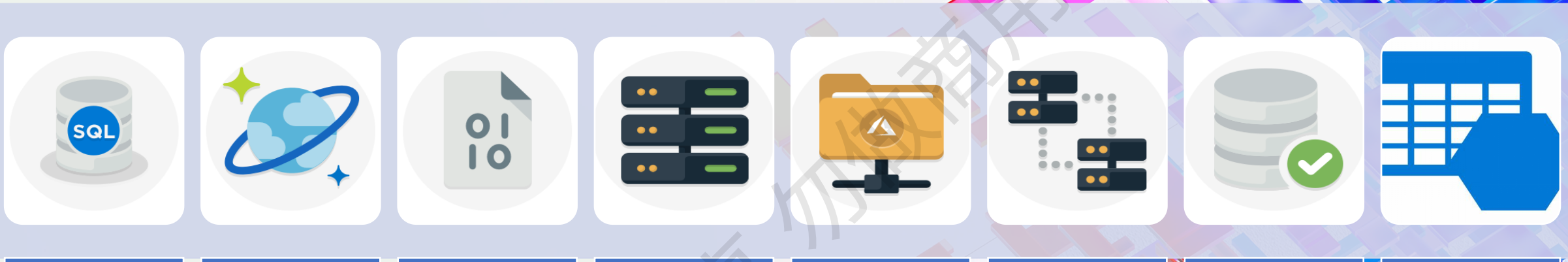
Azure Storage Services



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

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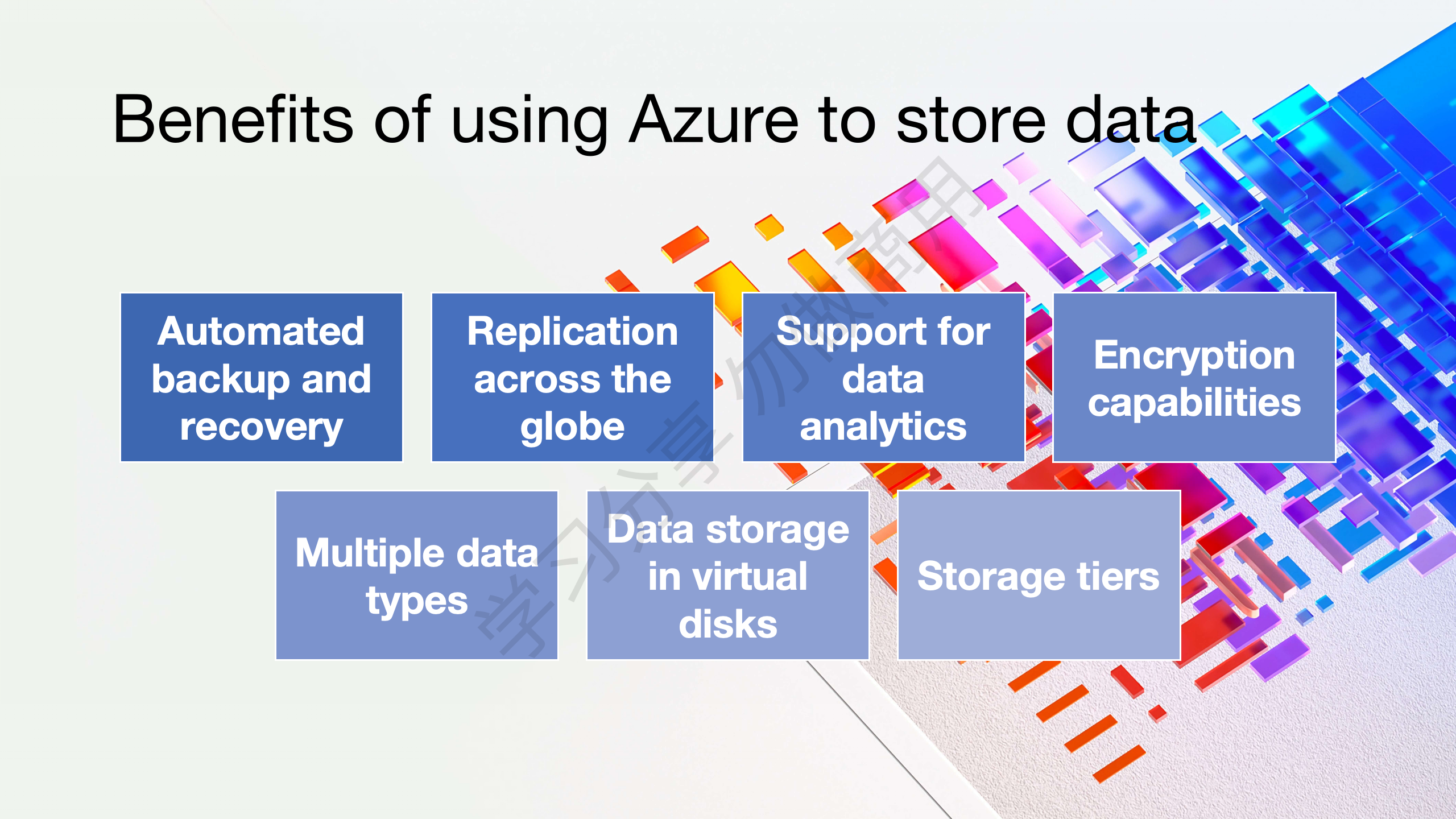
Comparison between Azure data storage and on-premises storage

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



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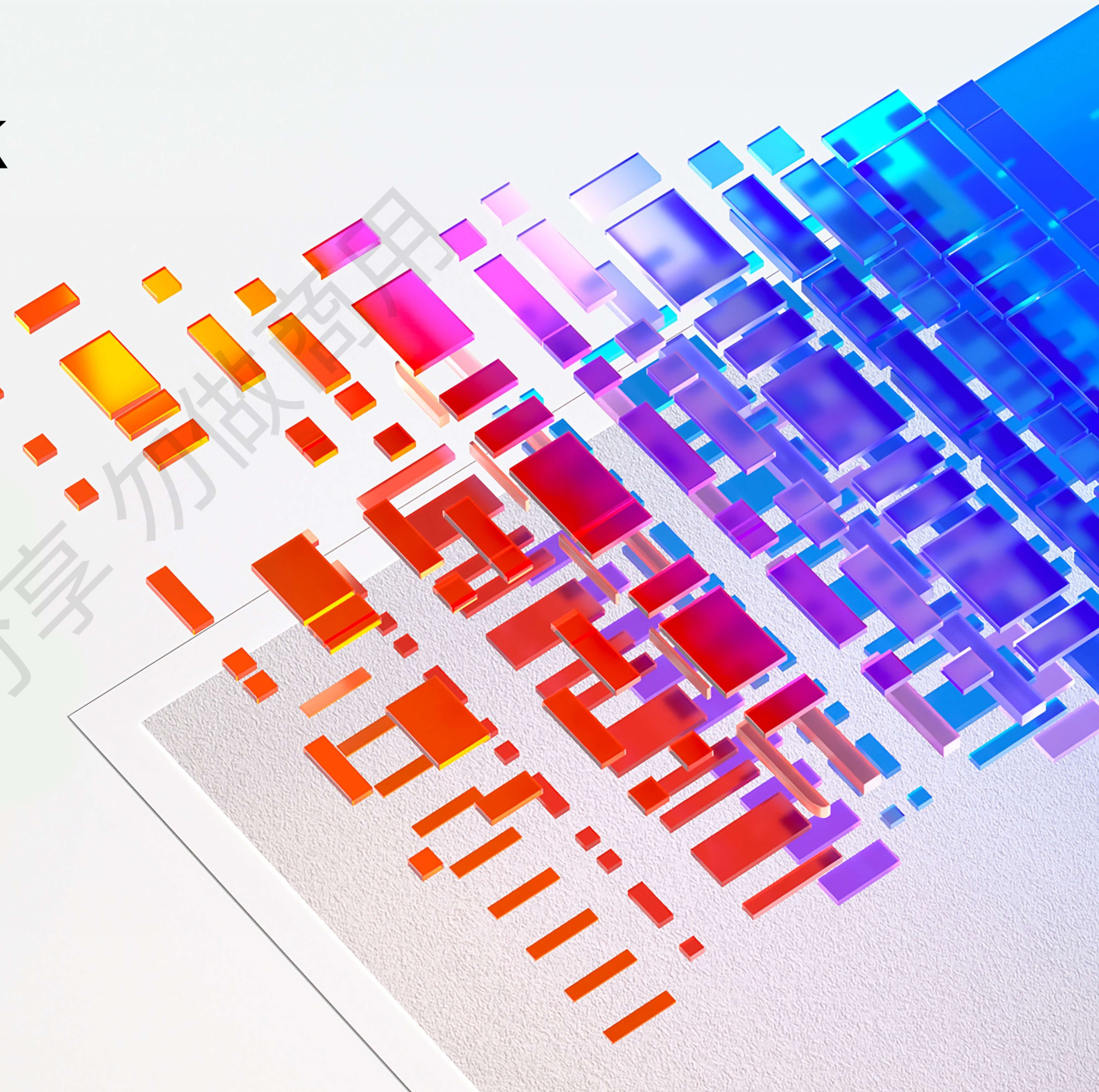
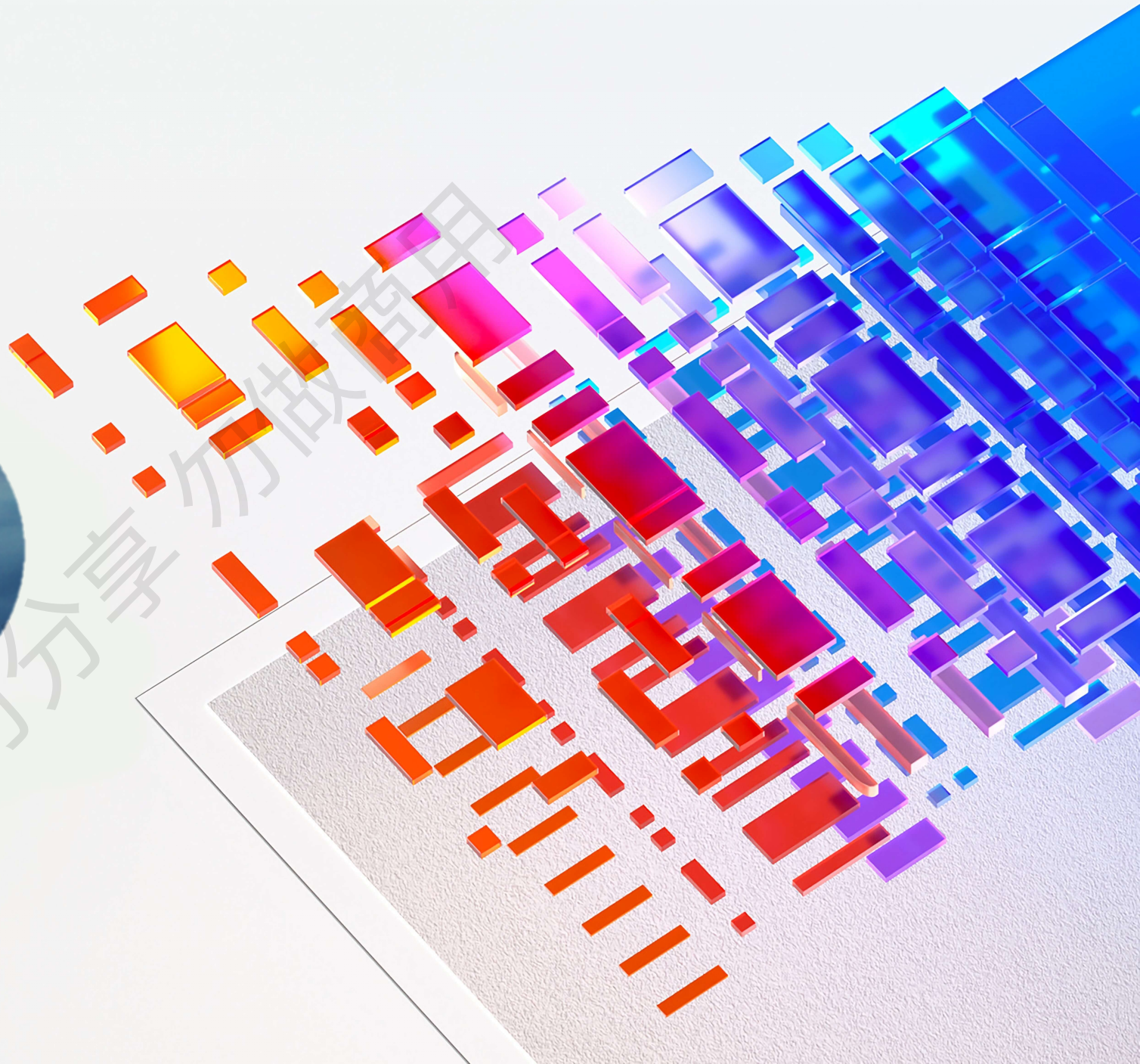


Microsoft Azure

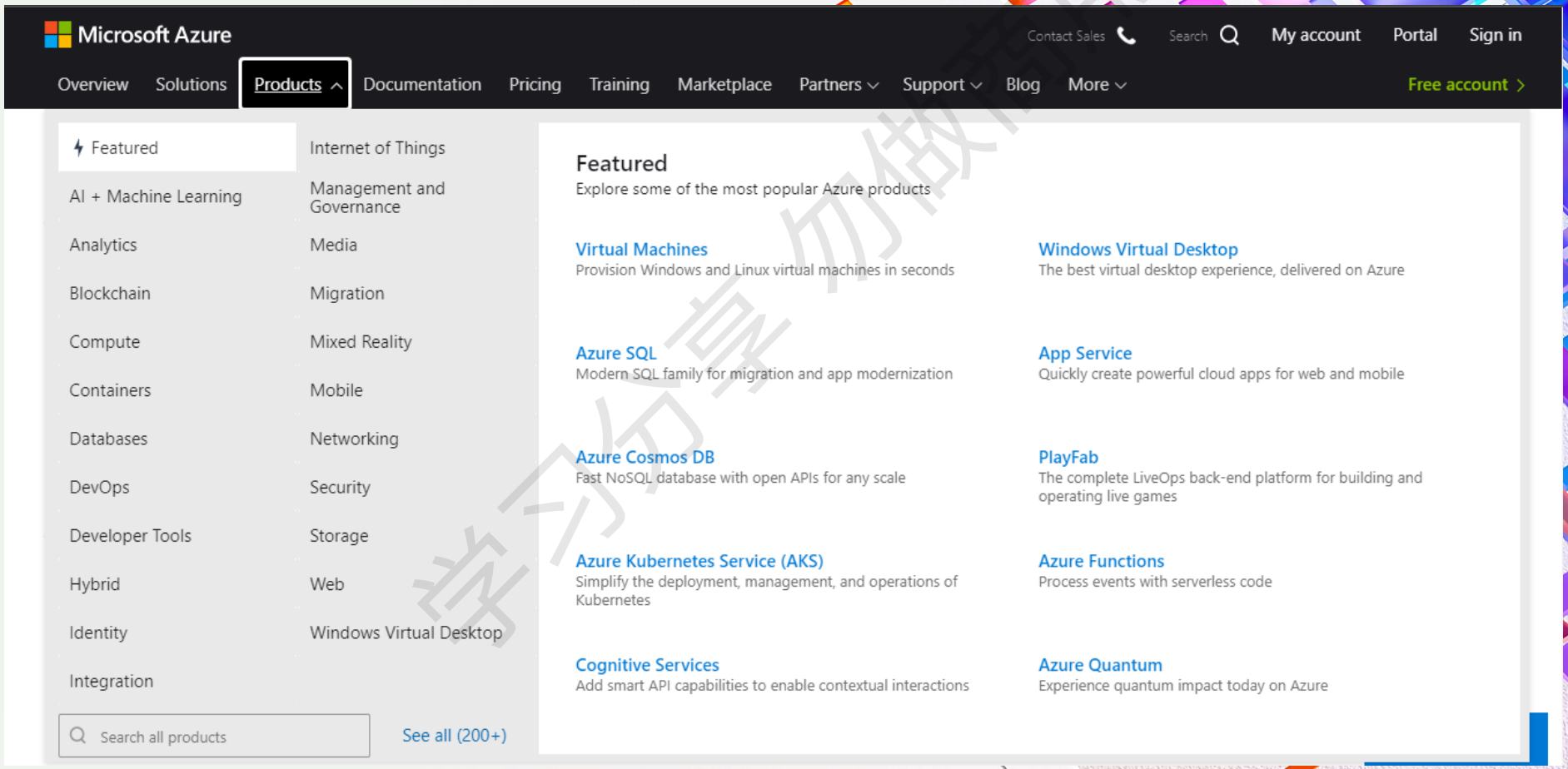
More on Azure Core Services



Module Objectives

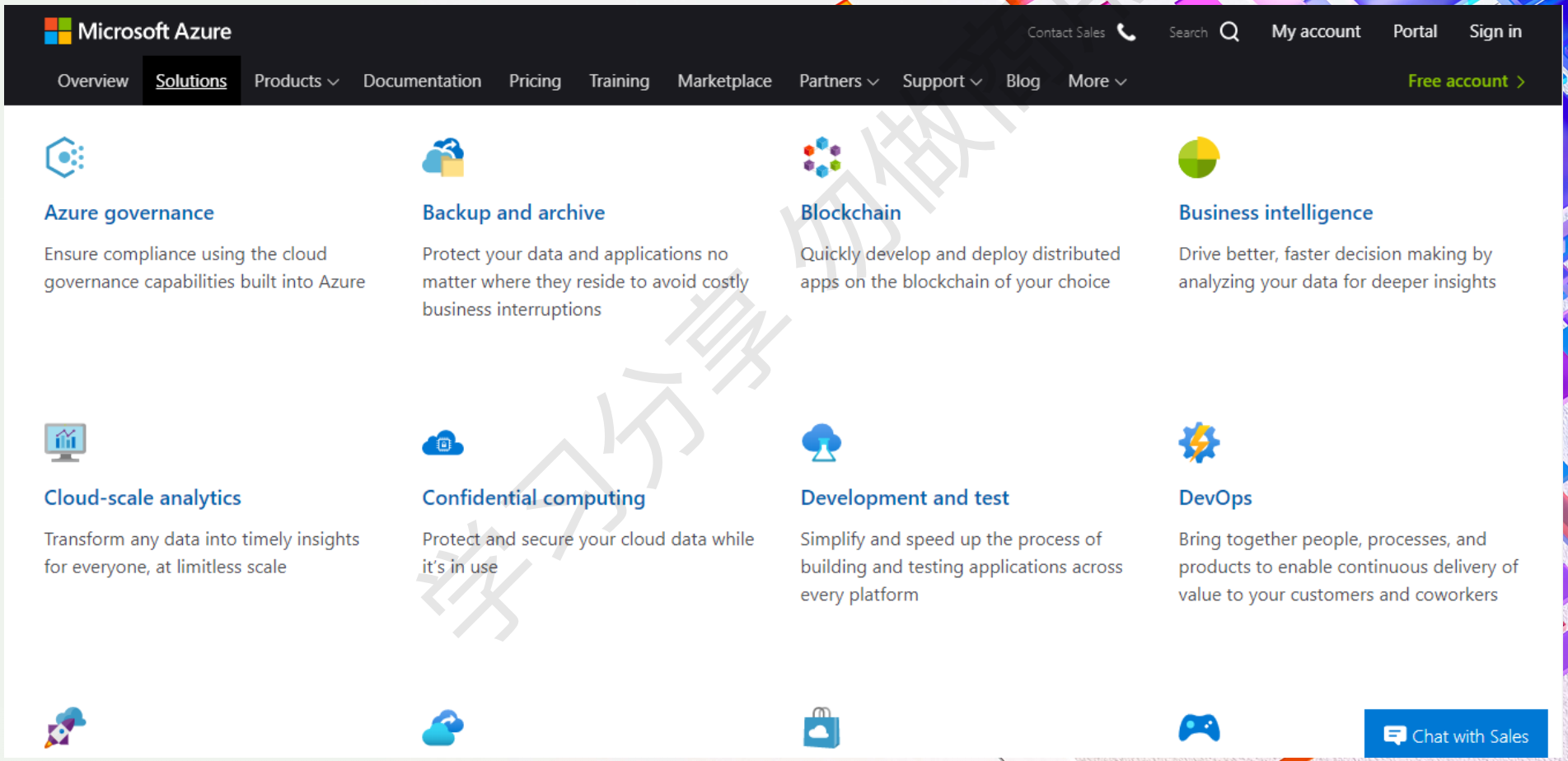
- Know much more products on Azure
- Know much more solutions on Azure
- Know about Azure Marketplace

More products on Azure



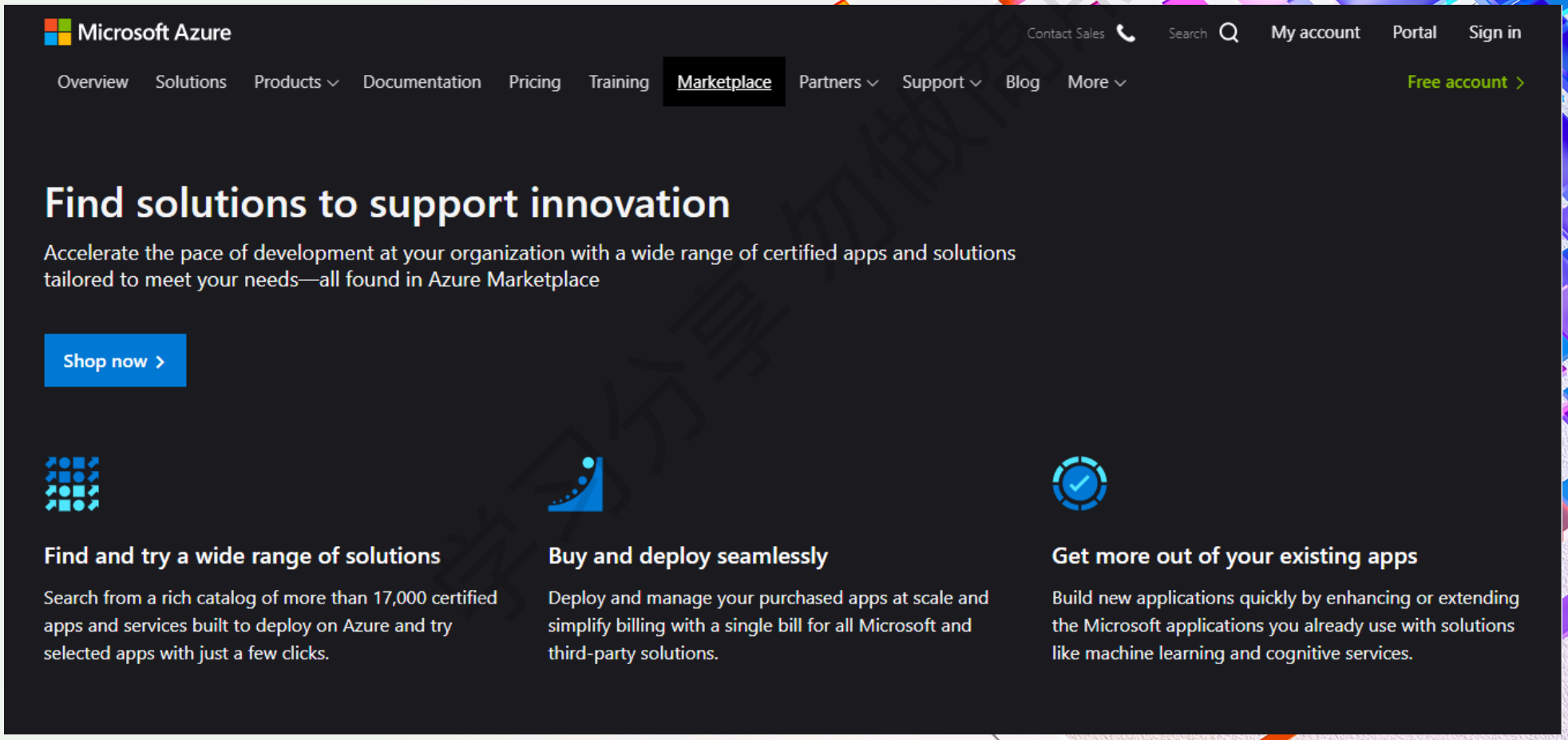
https://azure.microsoft.com/en-us/services/

More solutions on Azure



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

Azure Marketplace



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Knowledge Check

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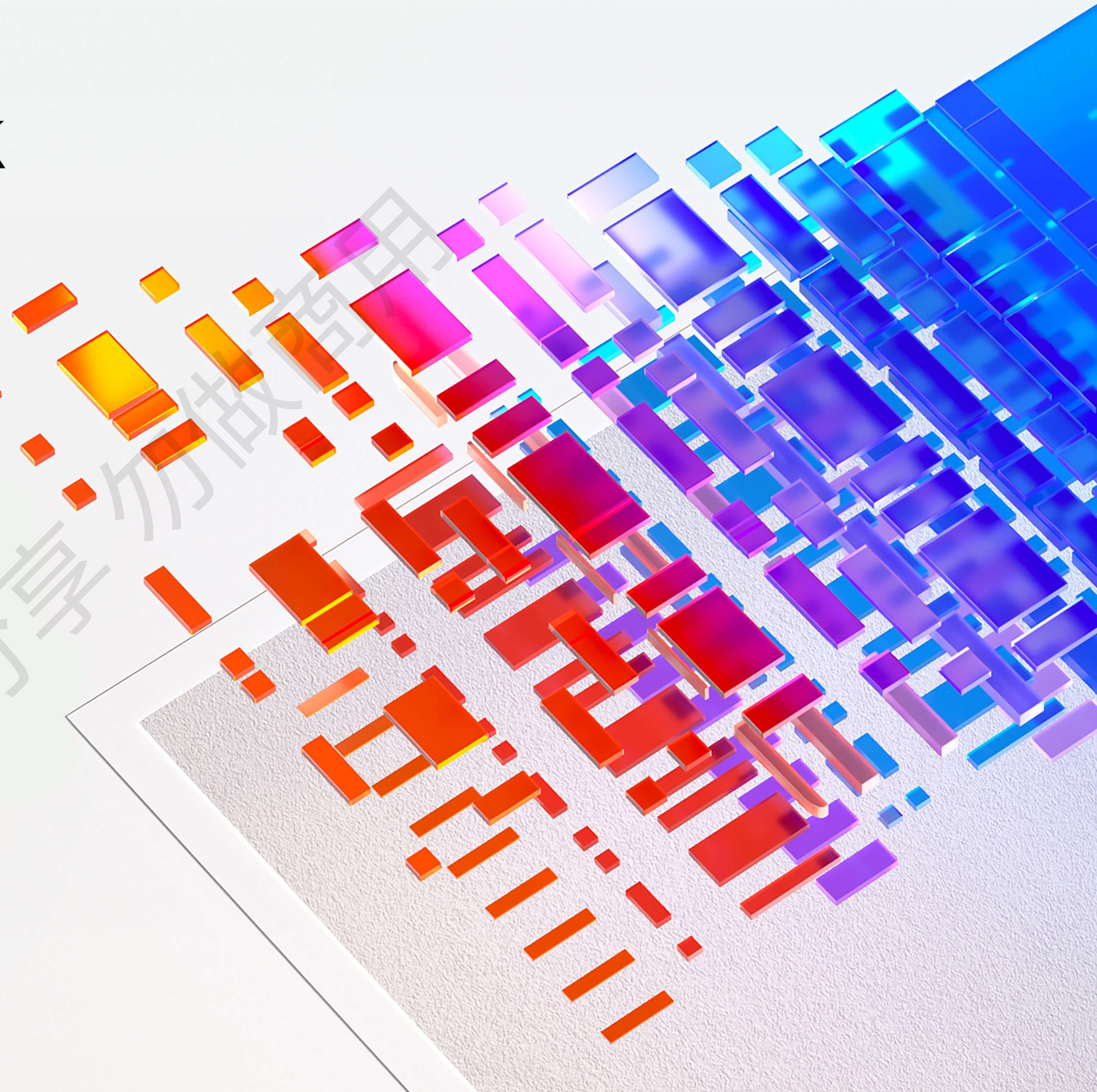

Hands-on One

Create a Virtual Machine on Azure(IaaS)

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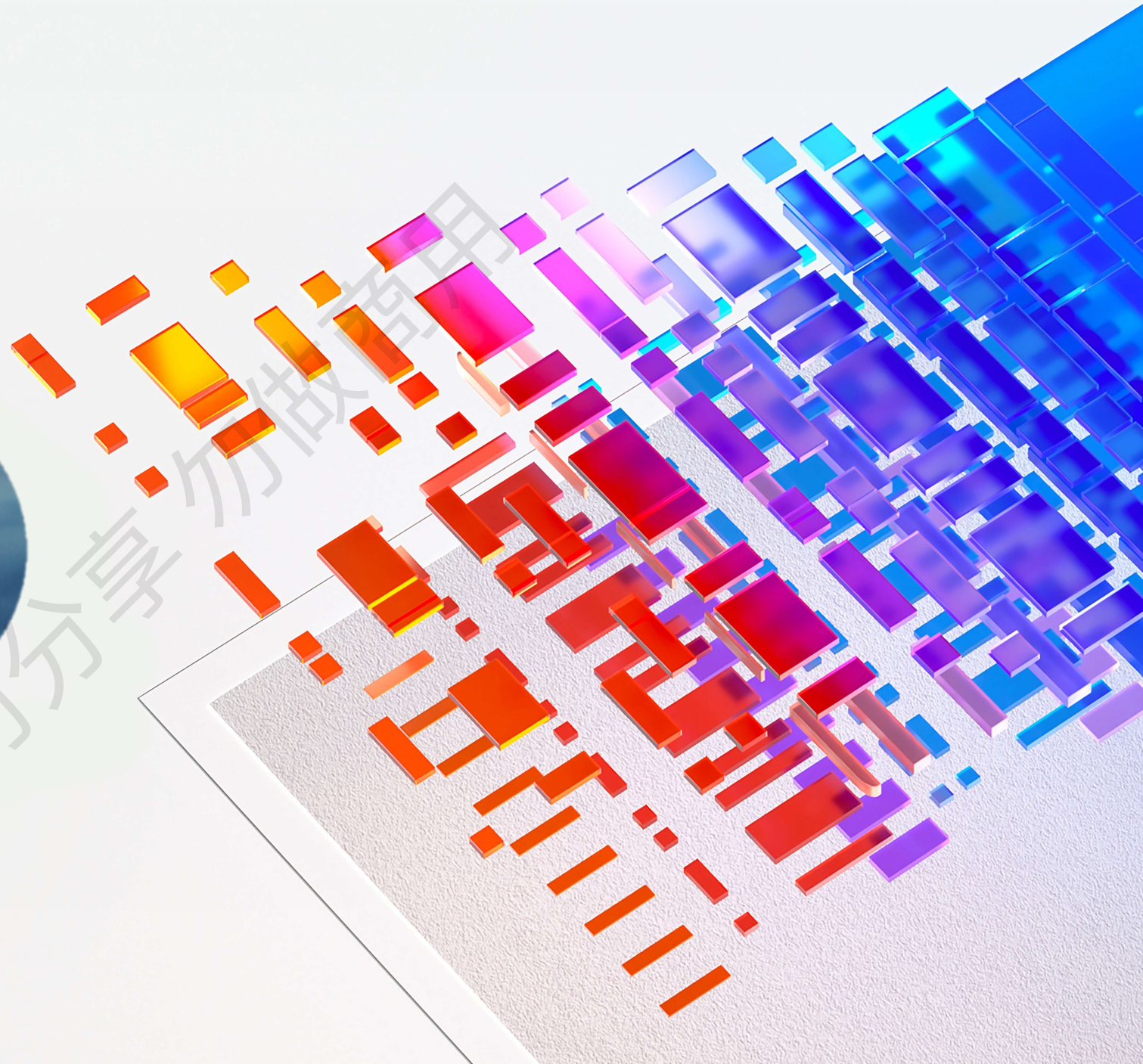
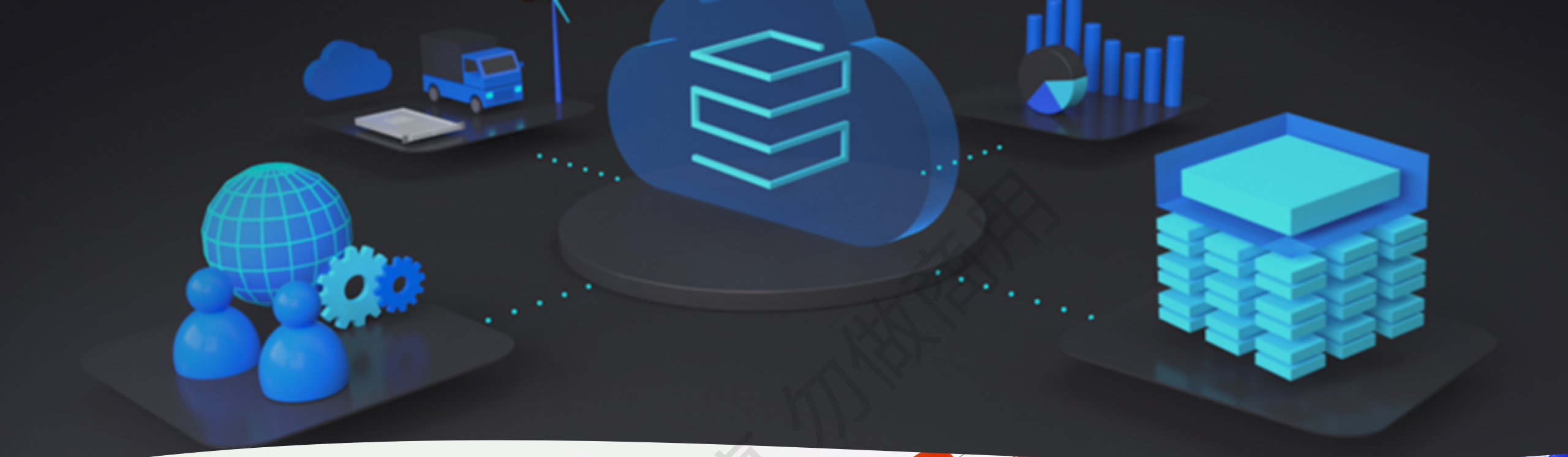
Microsoft Azure

Databricks & Synapse Analytics



Module Objectives

- Know about Azure Databricks
- Know about Azure Synapse Analytics
- Know more services about Analytics on Azure

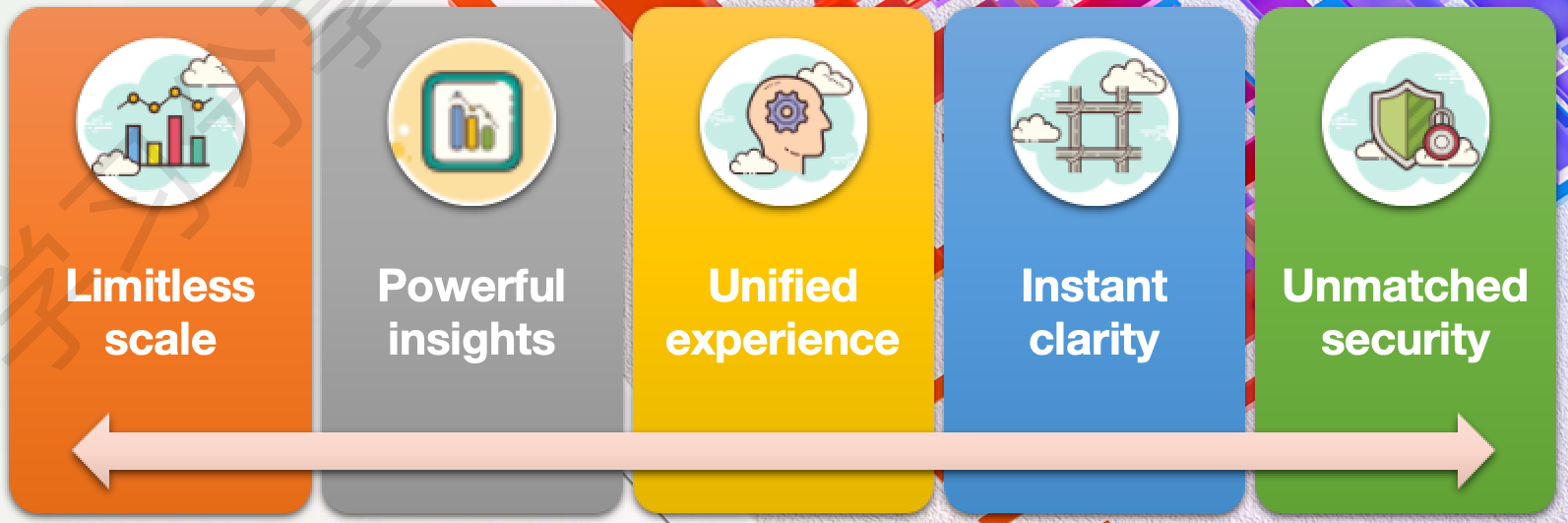


Azure Databricks

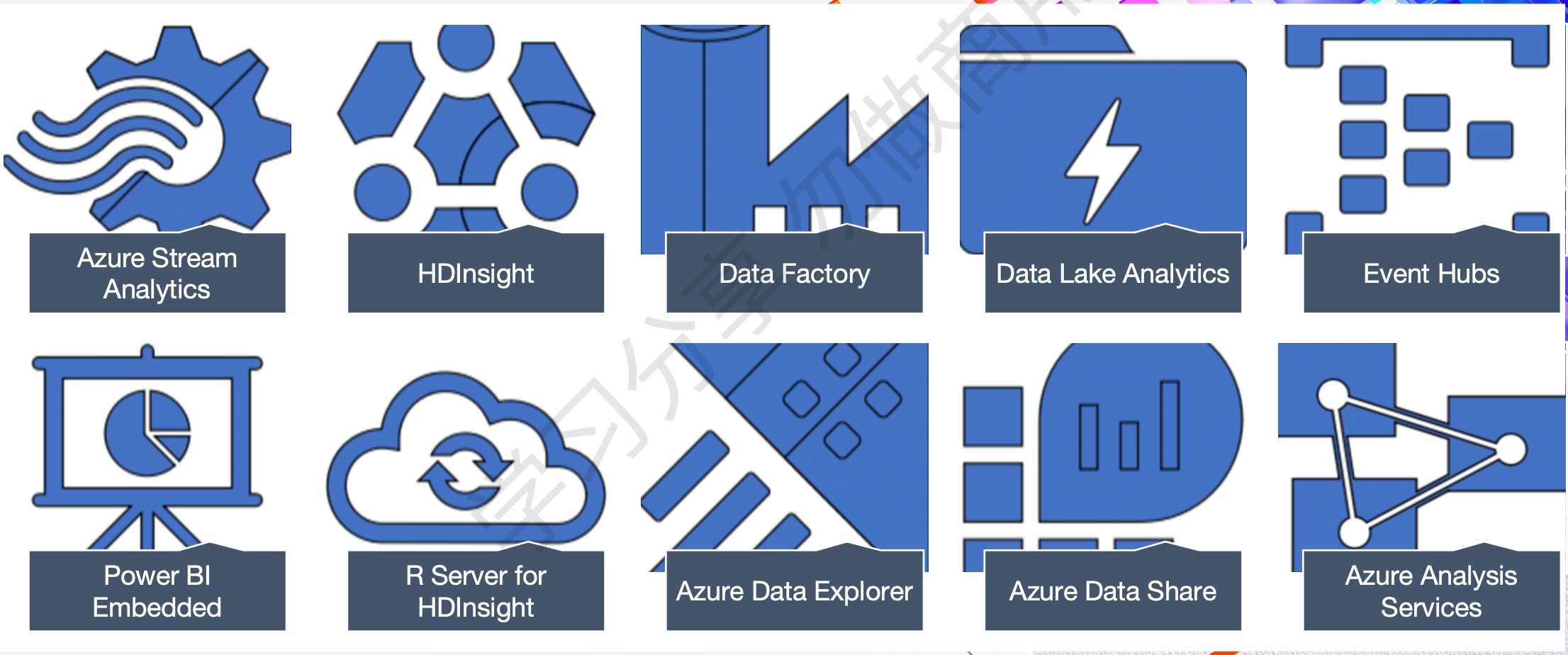
Azure Databricks is a fully-managed version of the open-source Apache Spark analytics and data processing engine. Azure Databricks is an enterprise-grade and secure cloud-based big data and machine learning platform.

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



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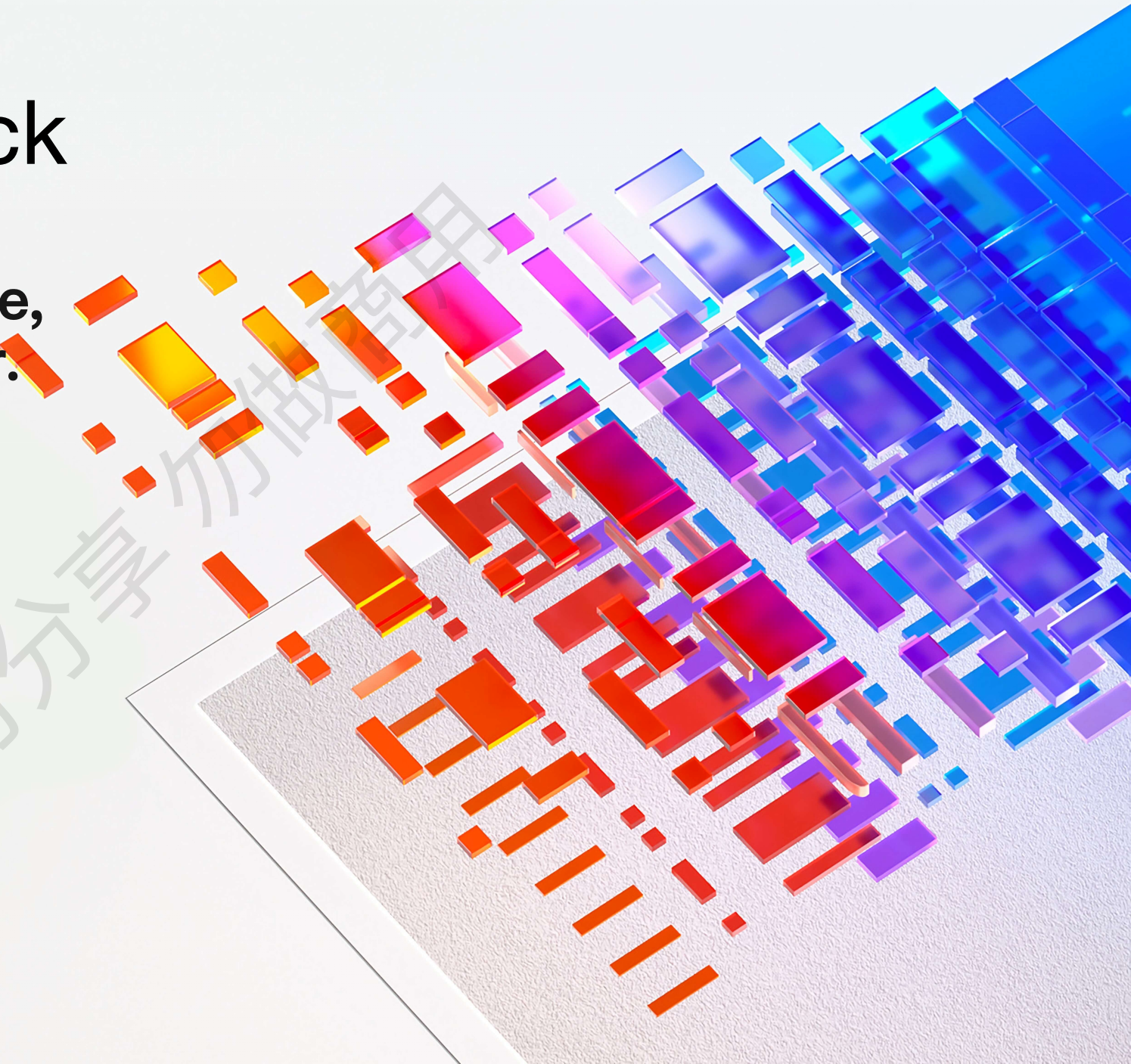
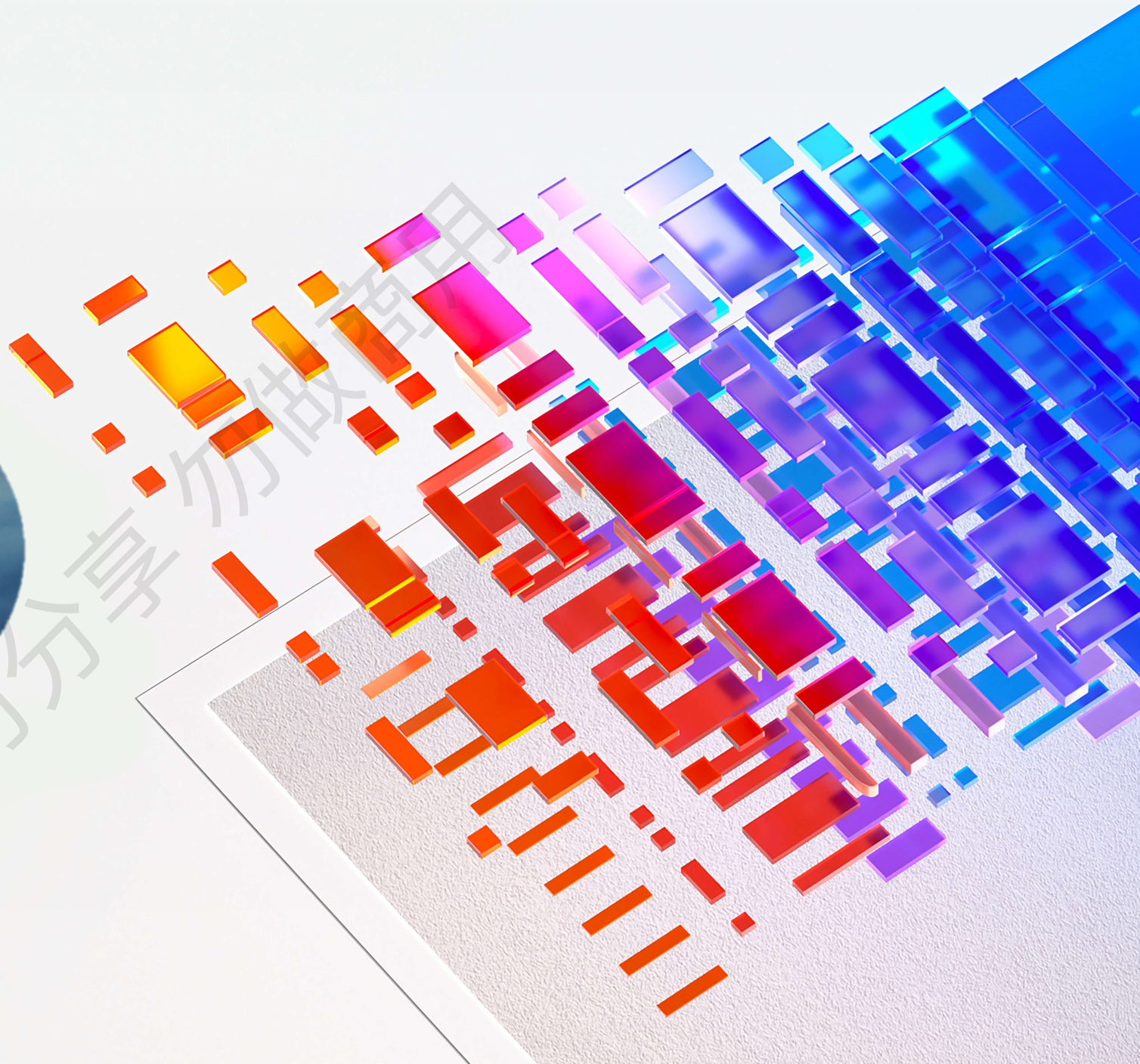


Microsoft Azure

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 safe

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

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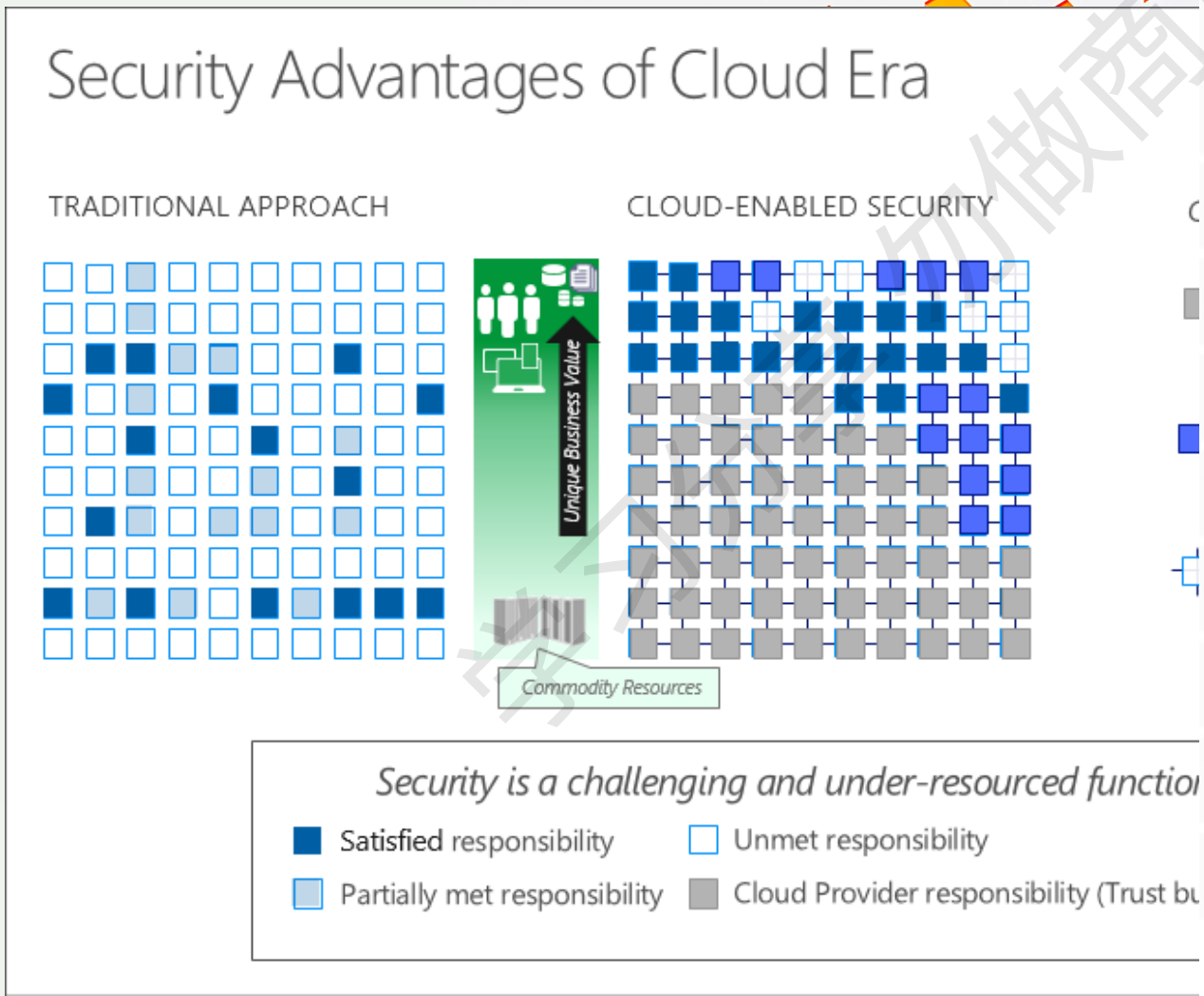
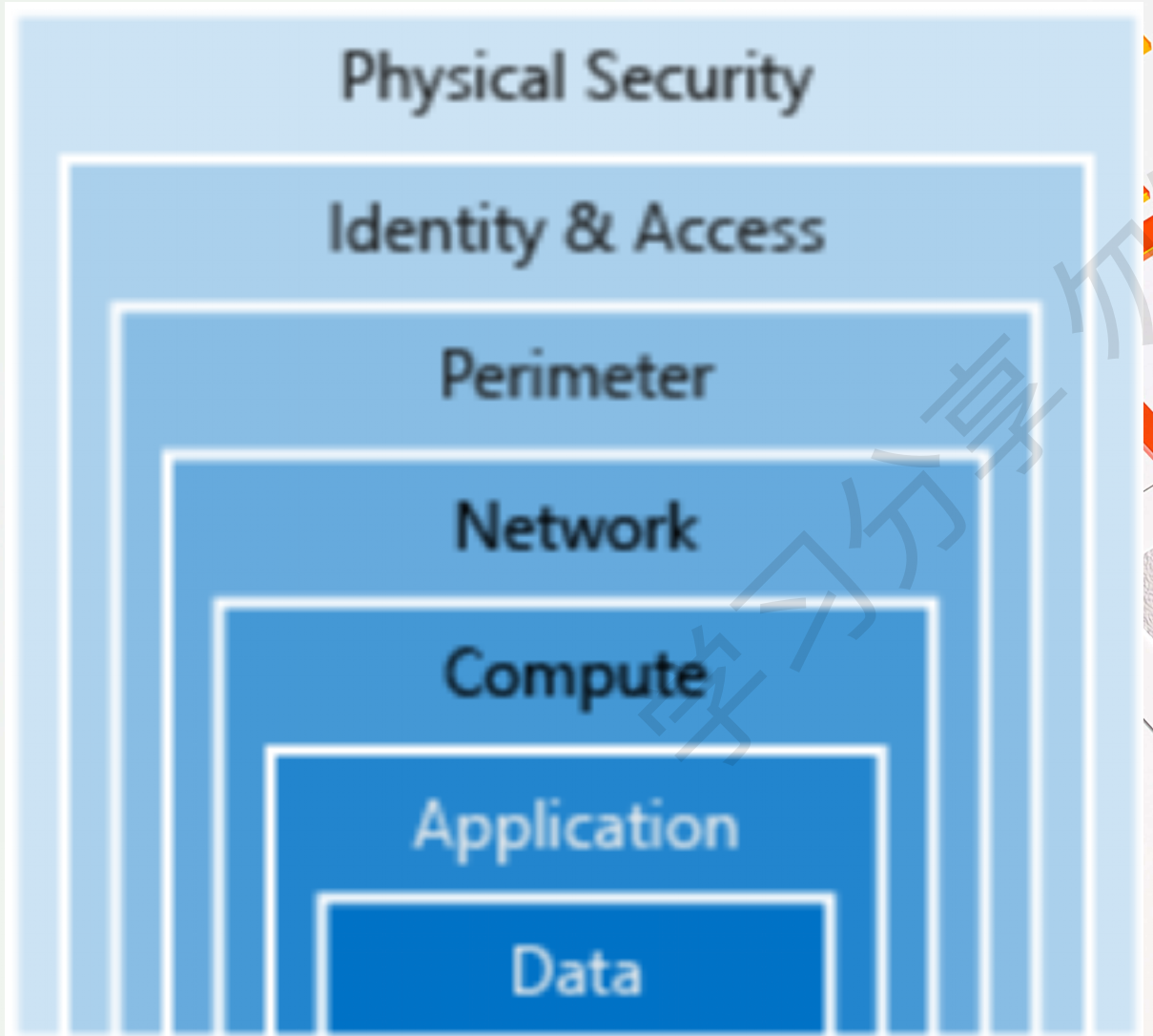
Cloud security is a shared responsibility

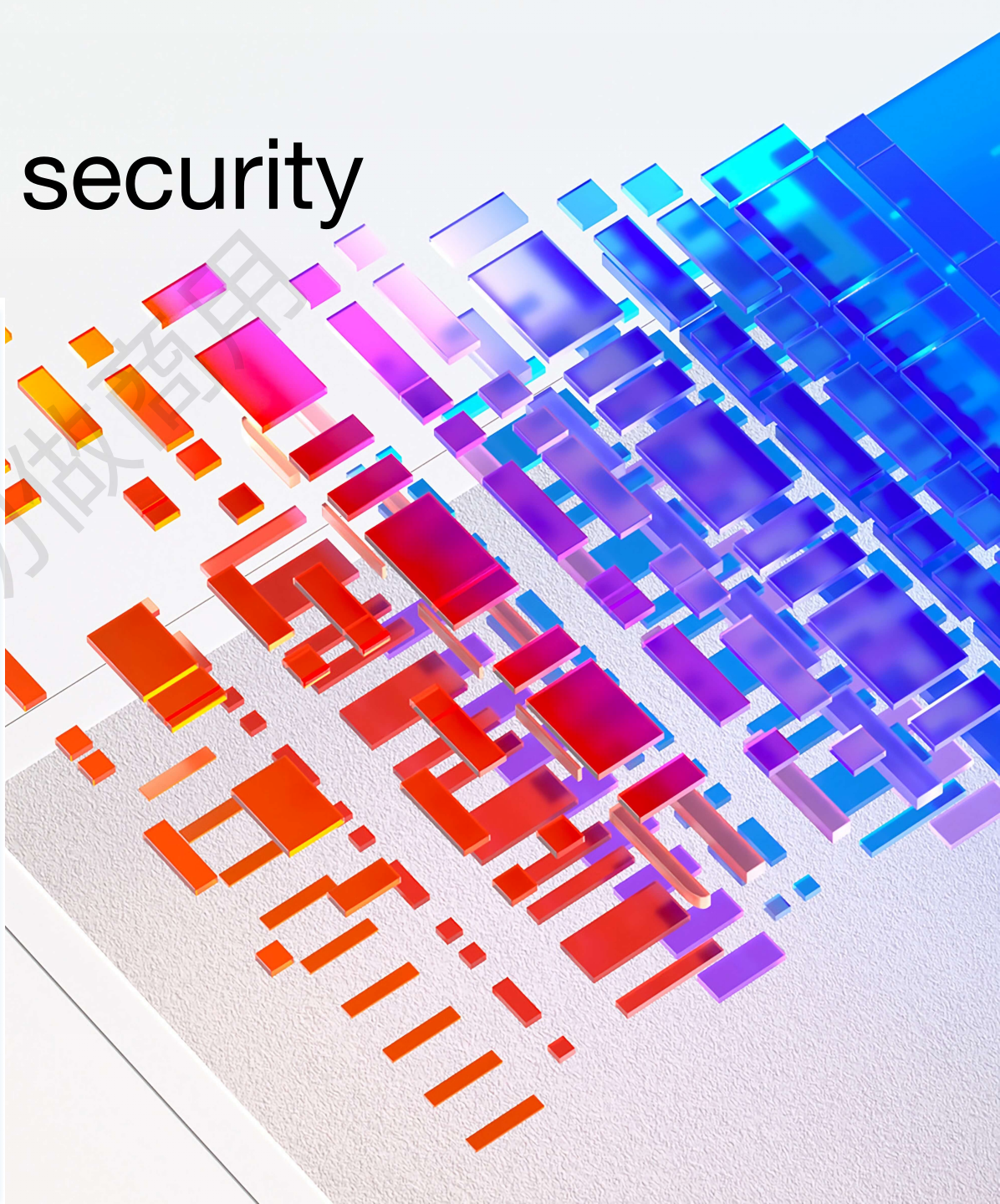


Responsibility	On-prem	IaaS	PaaS	SaaS
Data governance & rights management	Customer	Customer	Customer	Customer
Client endpoints	Customer	Customer	Customer	Customer
Account & access management	Customer	Customer	Customer	Customer
Identity & directory infrastructure	Customer	Customer	Shared	Shared
Application	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

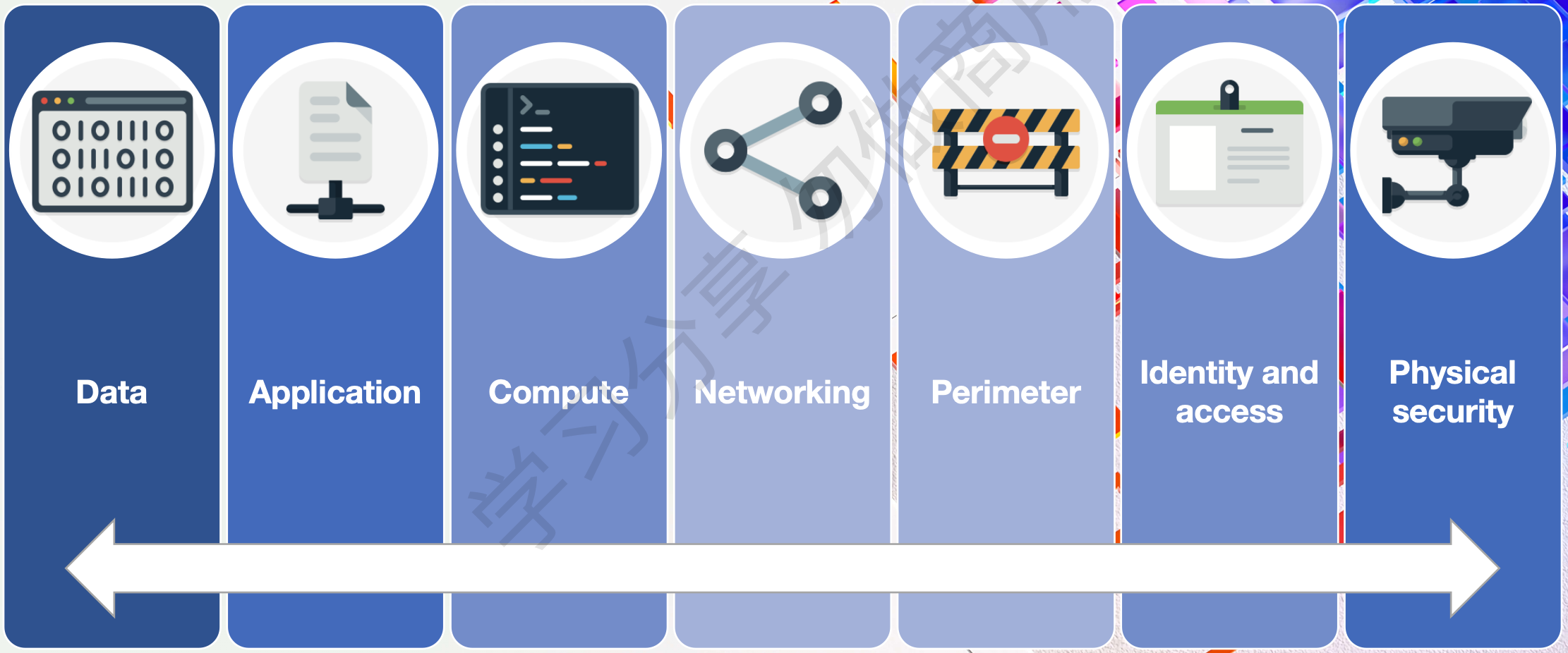
Microsoft Customer

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 surfac 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*

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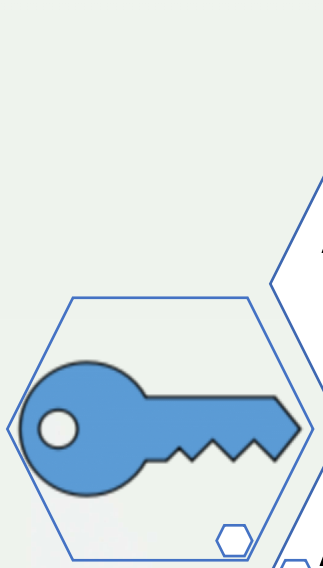
Azure Active Directory



Application management

Single-Sign-On (SSO)

Authentication

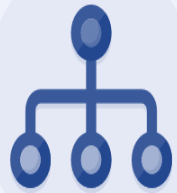
Multi-factor authentication

(B2B) identity services

Privileged Identity Management

(B2C) identity services

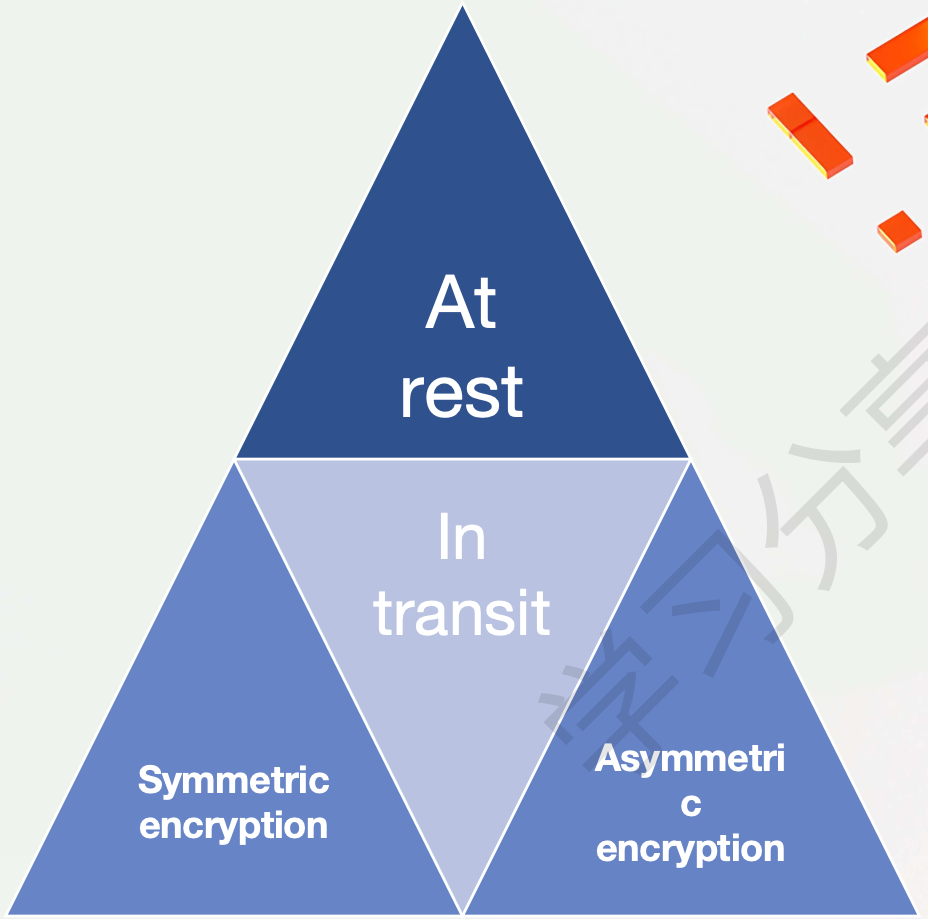
Device Management

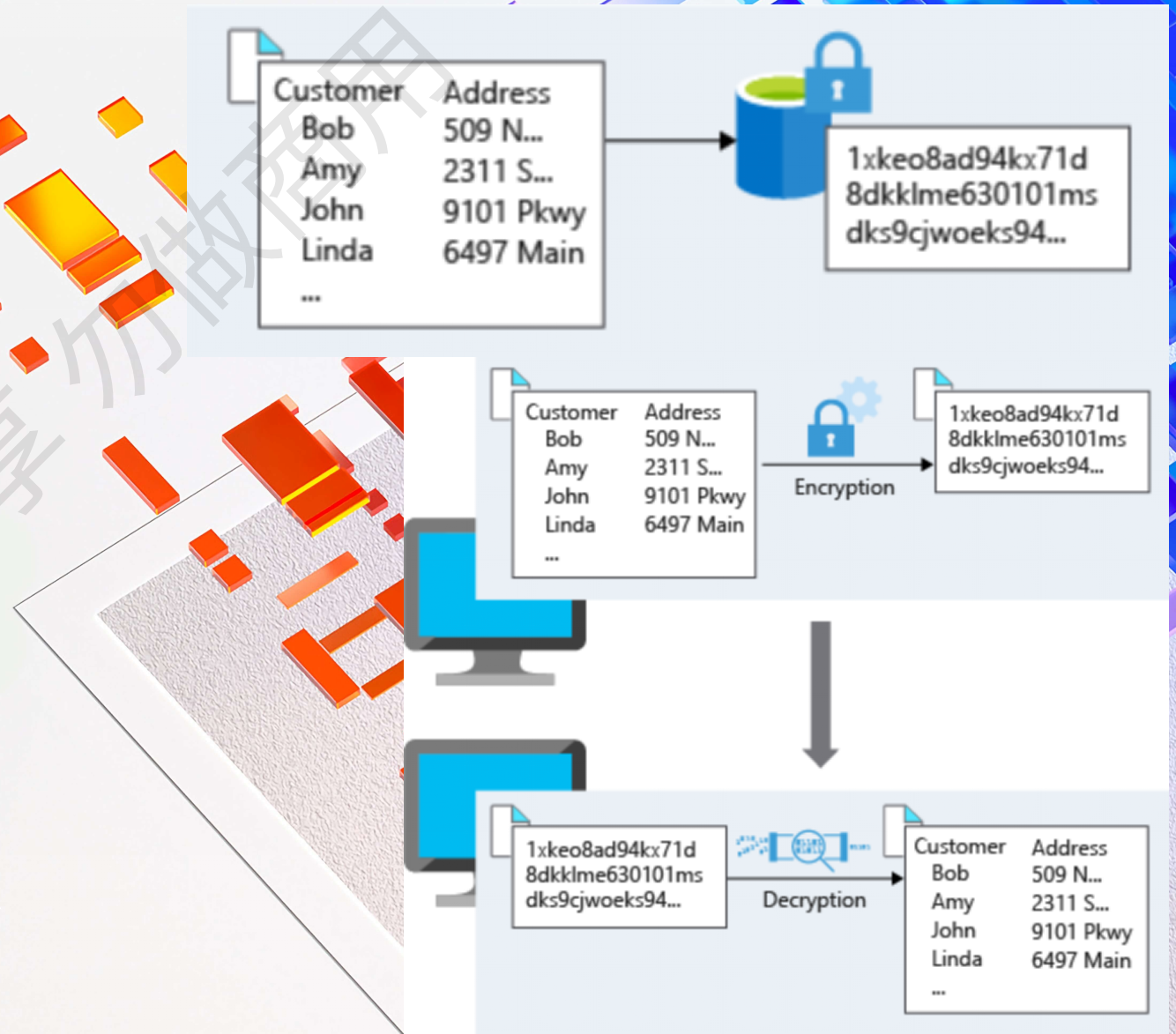


Role-based access control

Providing identities to services

Encryption on Azure





Encryption on Azure

Azure Storage Service Encryption

Encrypt virtual machine disks

Encrypt databases

Encrypt secrets（Key Vault)

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

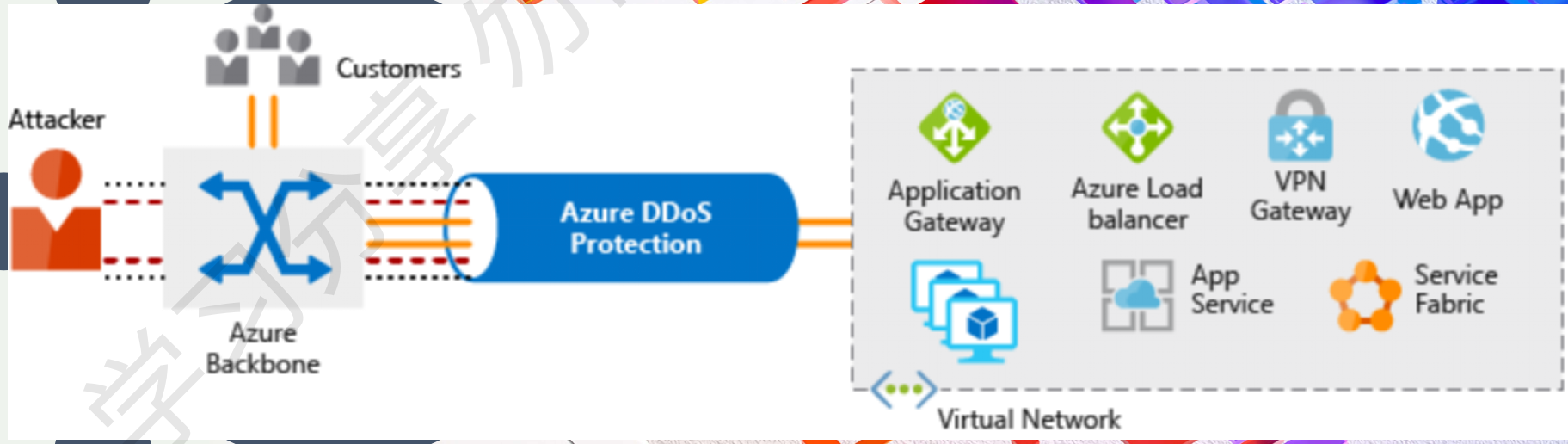
Network virtual appliances

Stopping DDoS attacks

Volumetric attacks

Protocol attacks

Resource (application) layer attacks



Protect your shared documents

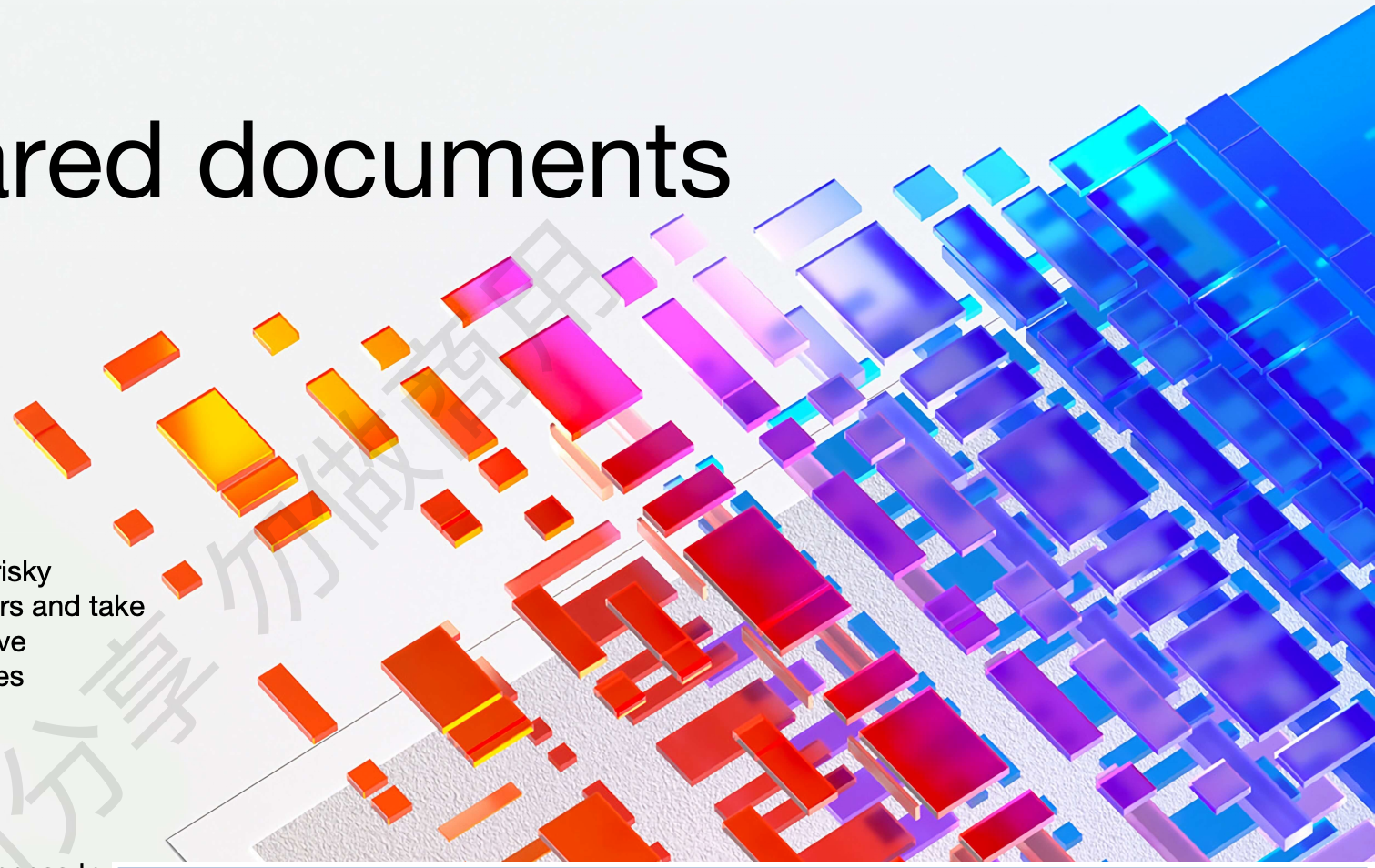
Microsoft Azure Information Protection

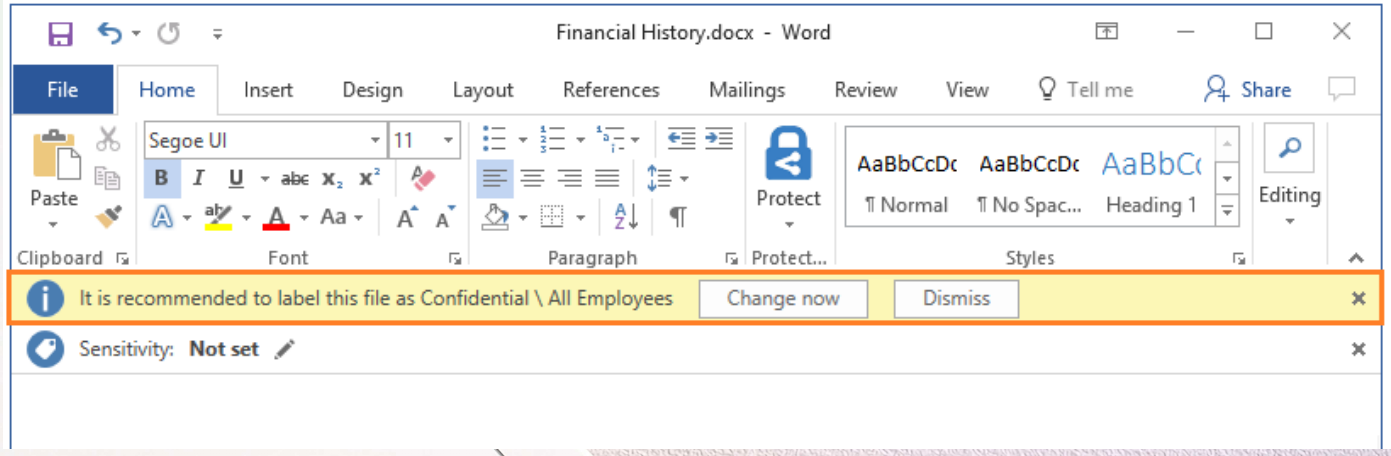
Analyze data flows to gain insight into your business

Detect risky behaviors and take corrective measures

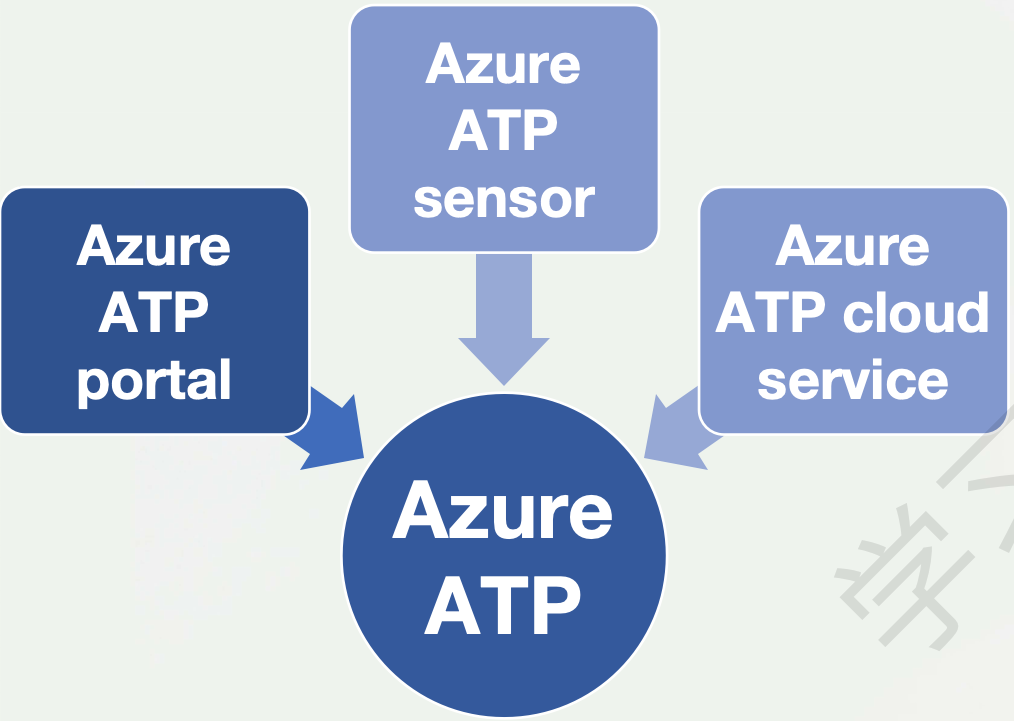
Track access to documents

Prevent data leakage or misuse of confidential information





Azure Advanced Th



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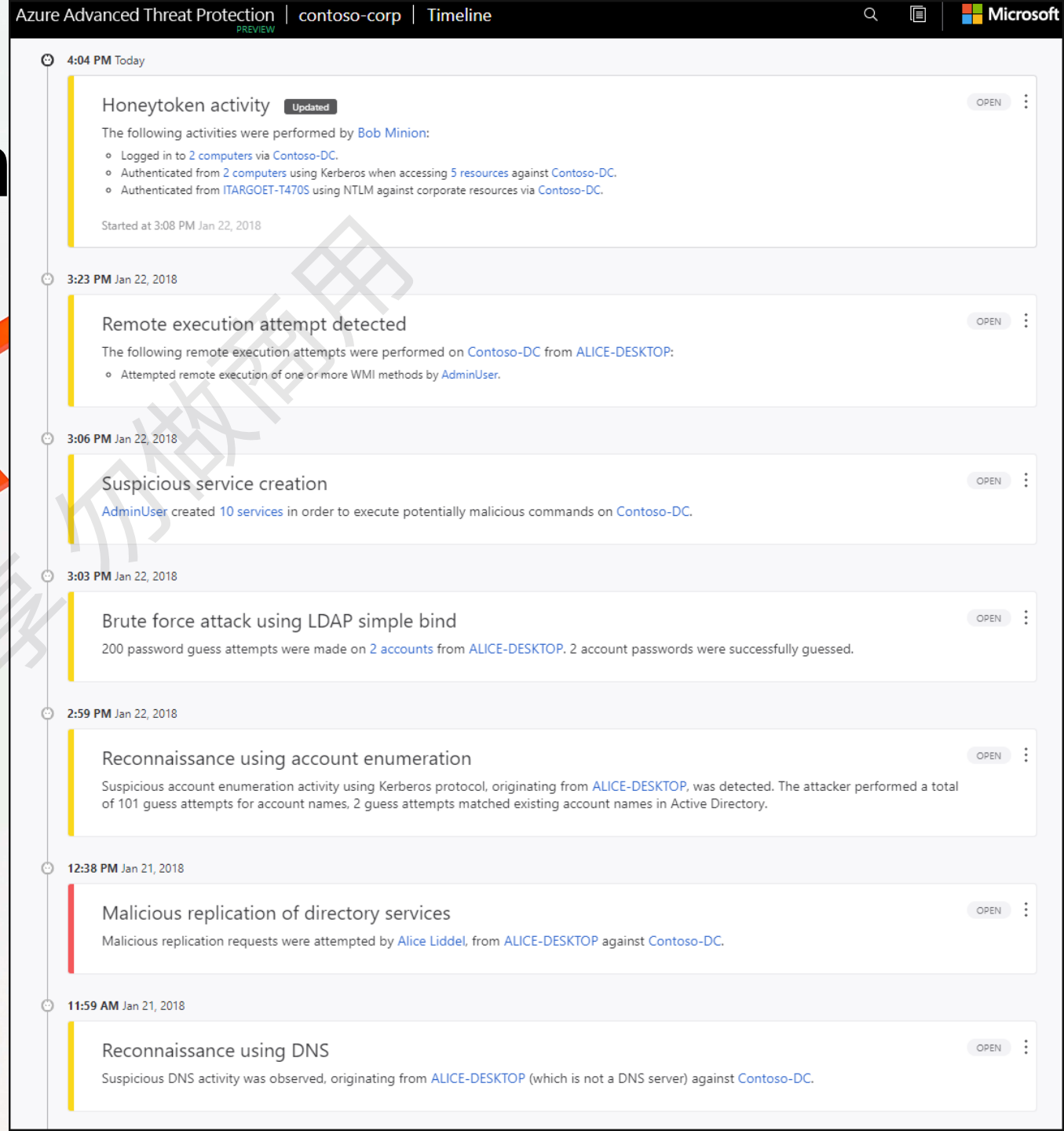
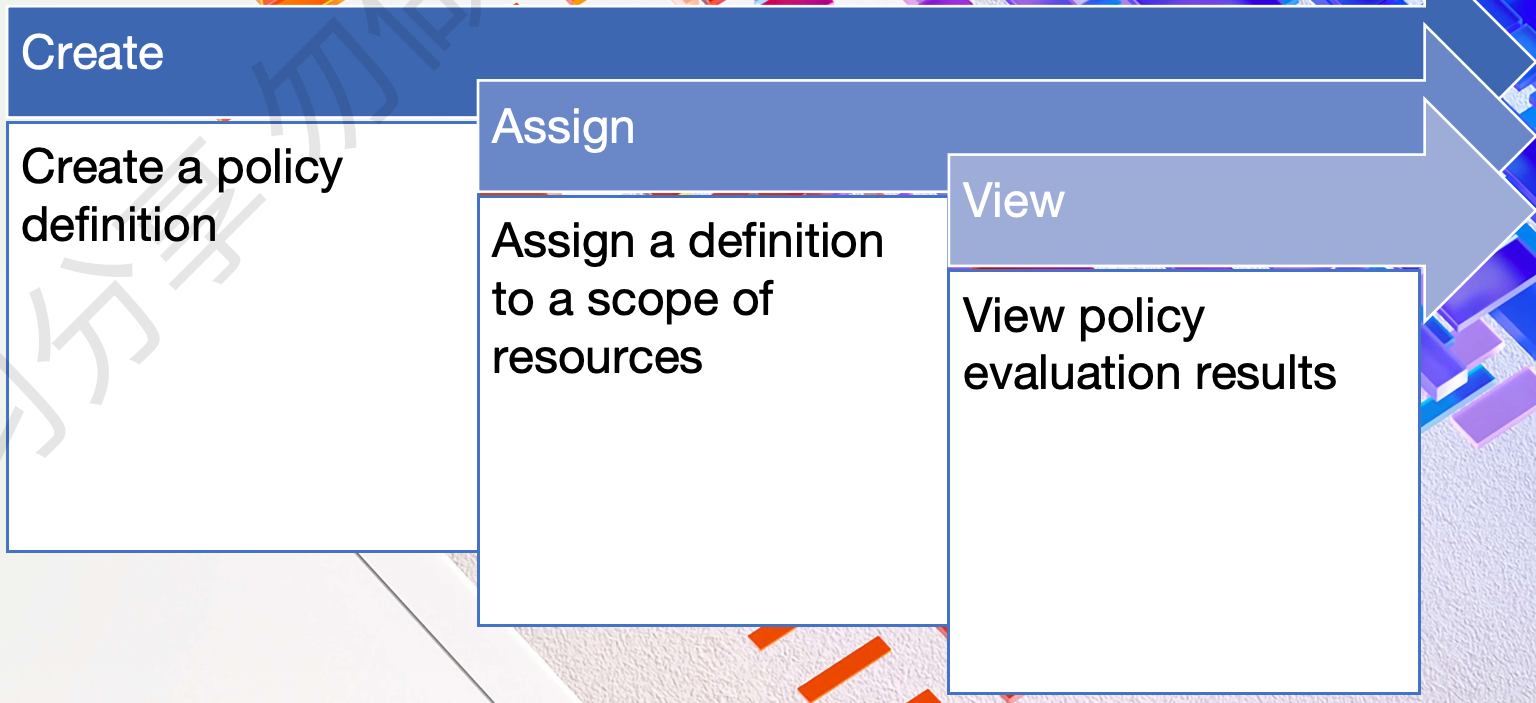


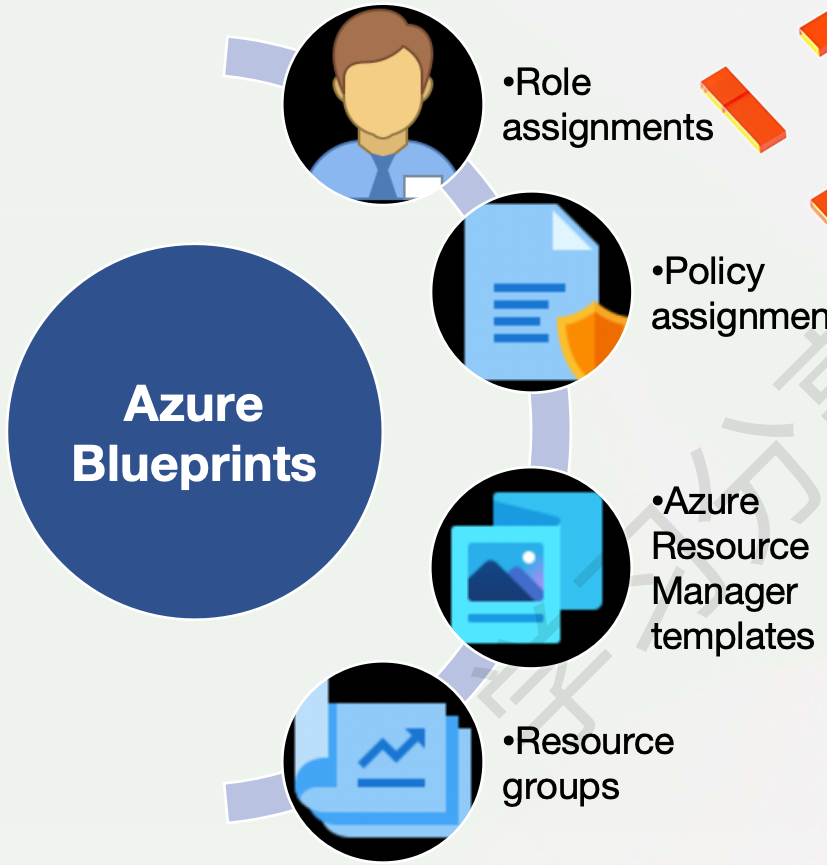
Define IT compliance with Azure Policy

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

Azure Policy



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

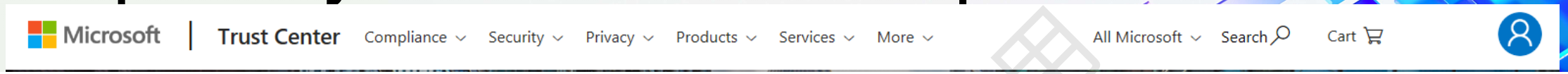
Microsoft Privacy Statement

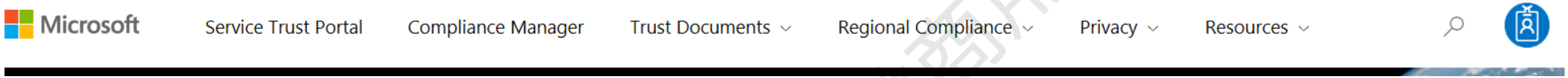
Microsoft Trust Center

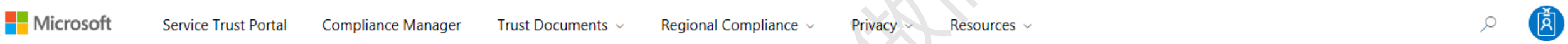
Service Trust Portal

Compliance Manager

Explore your service compliance







⚠ 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
Compliance Score: 0 / 626
Created 1/1/1 | Modified 1/1/1
Customer Managed Actions 0 of **65**

Default Group
Office 365 - NIST 800-53
Actions
Compliance Score: 0 / 4034
Created 1/1/1 | Modified 1/1/1
Customer Managed Actions 0 of **214**

Default Group
Azure - ISO 27018:2014
Actions
Assessment Status
Created 1/1/1 | Modified 1/1/1
Customer Managed Actions 0 of **0**

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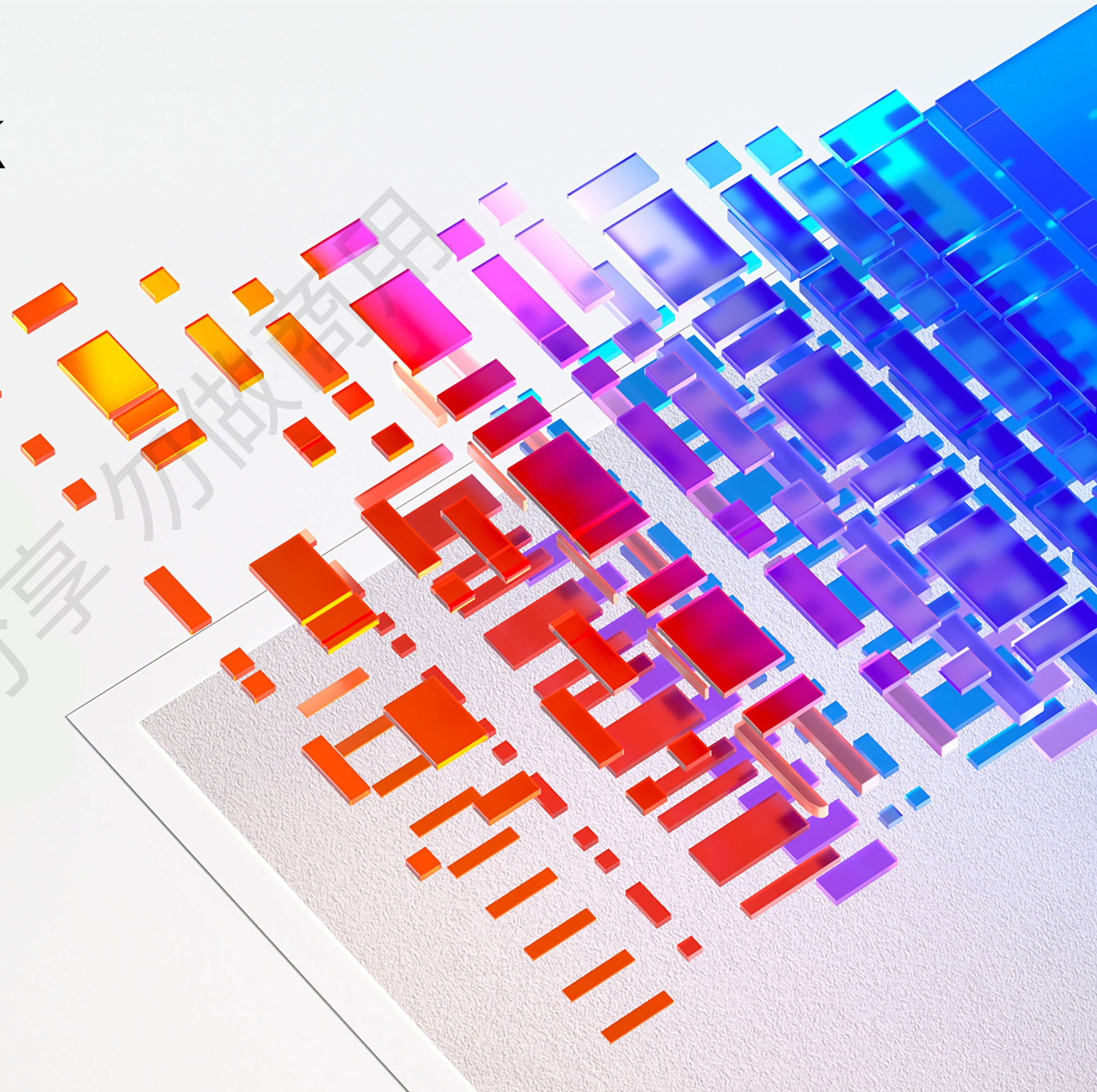
Azure Compliance Offerings

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	……	

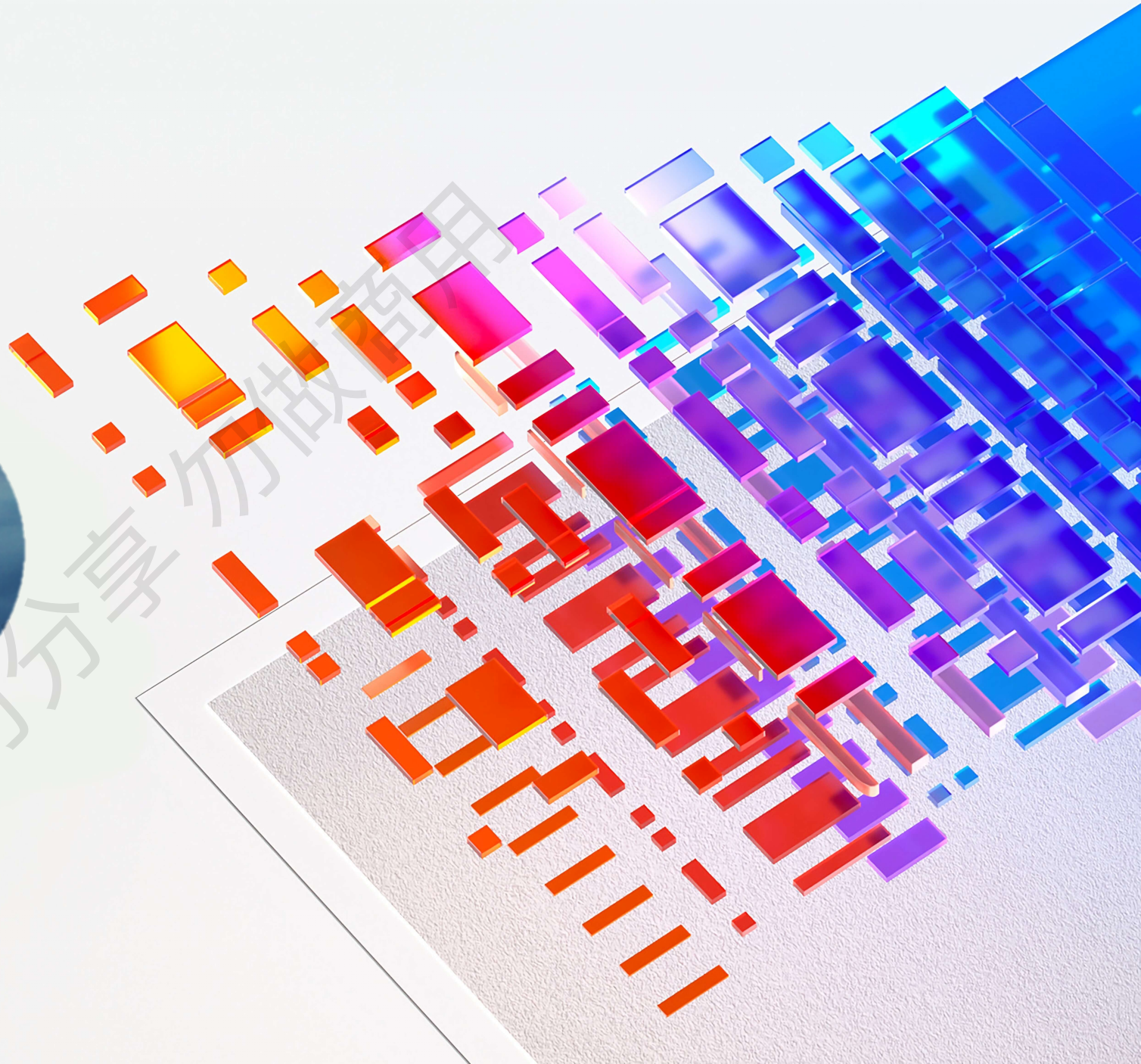
Knowledge Check

Please scan this QR Code,
Then submit your answer.



Microsoft Azure

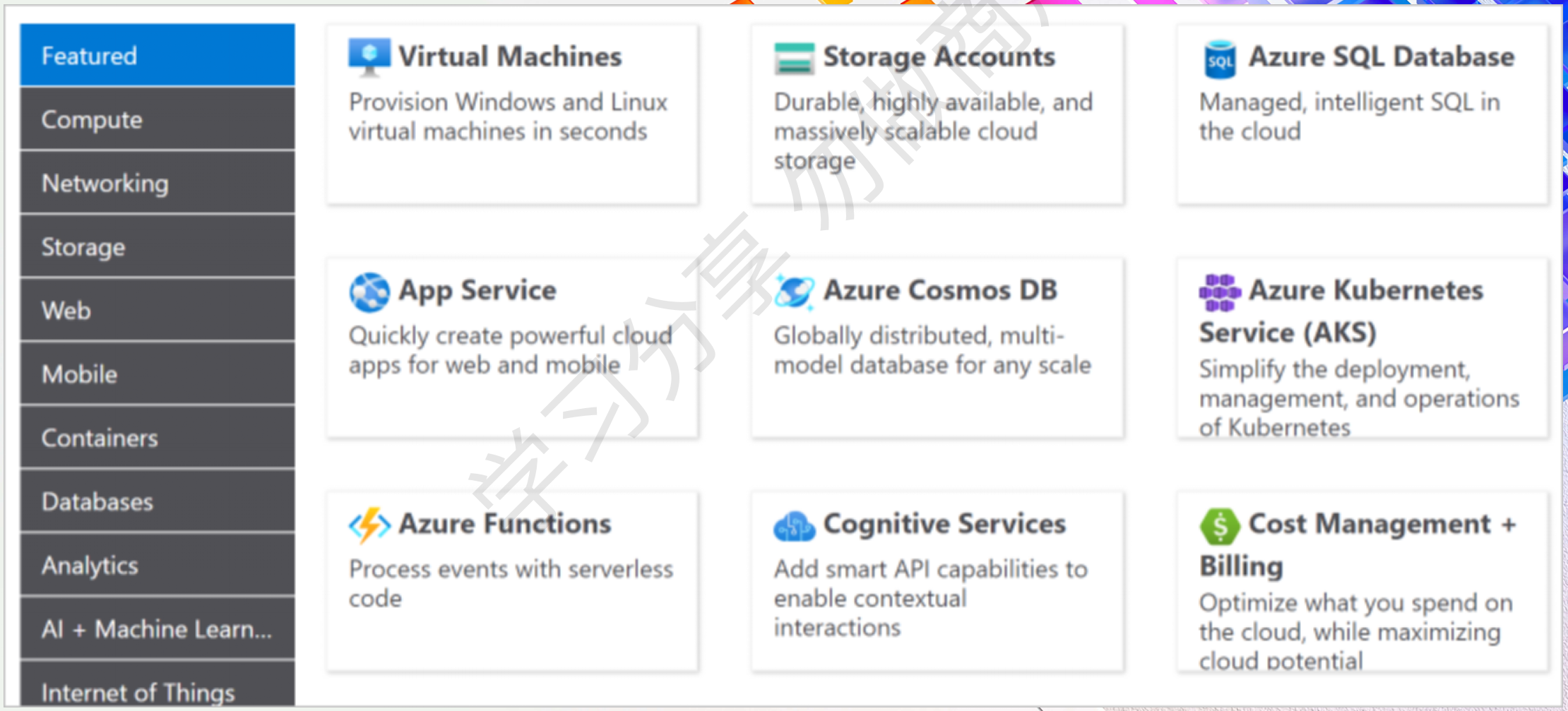
Optimize Spending & Technical support



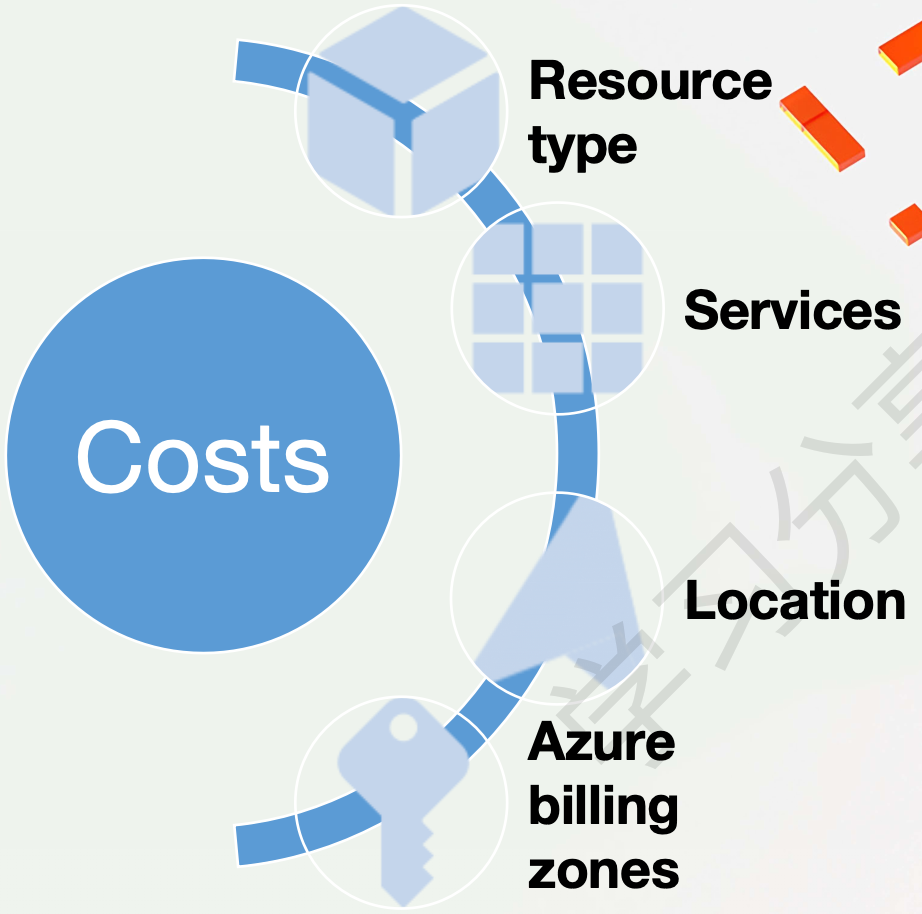
Module Objectives

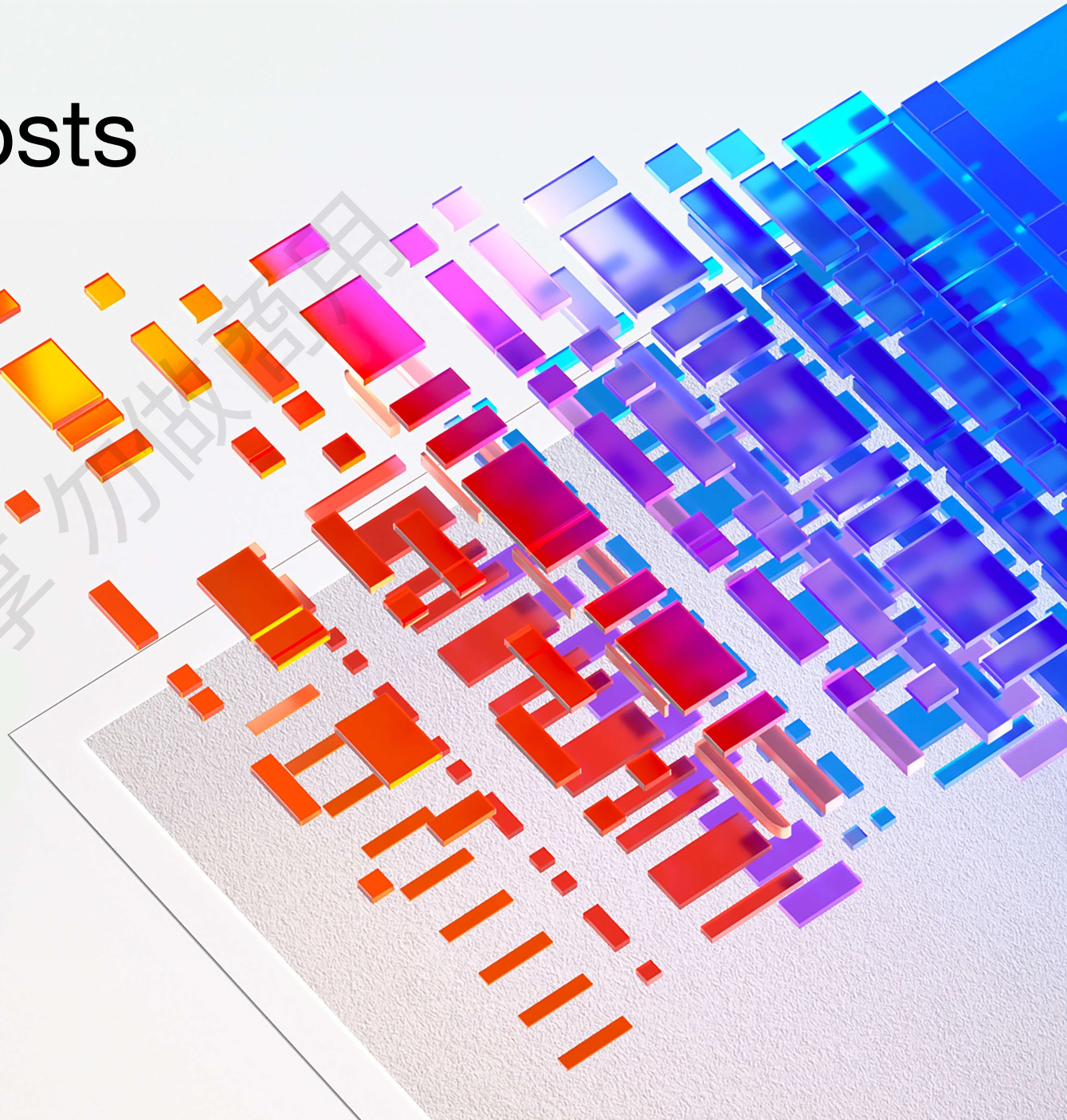
- Estimate costs with the Azure pricing calculator
- Predict and optimize costs with Azure Cost Management and Azure Advisor
- Apply best practices for saving on infrastructure costs
- Apply best practices for saving on licensing costs
- Learn about different support options

Products and services in Azure



Factors affecting costs

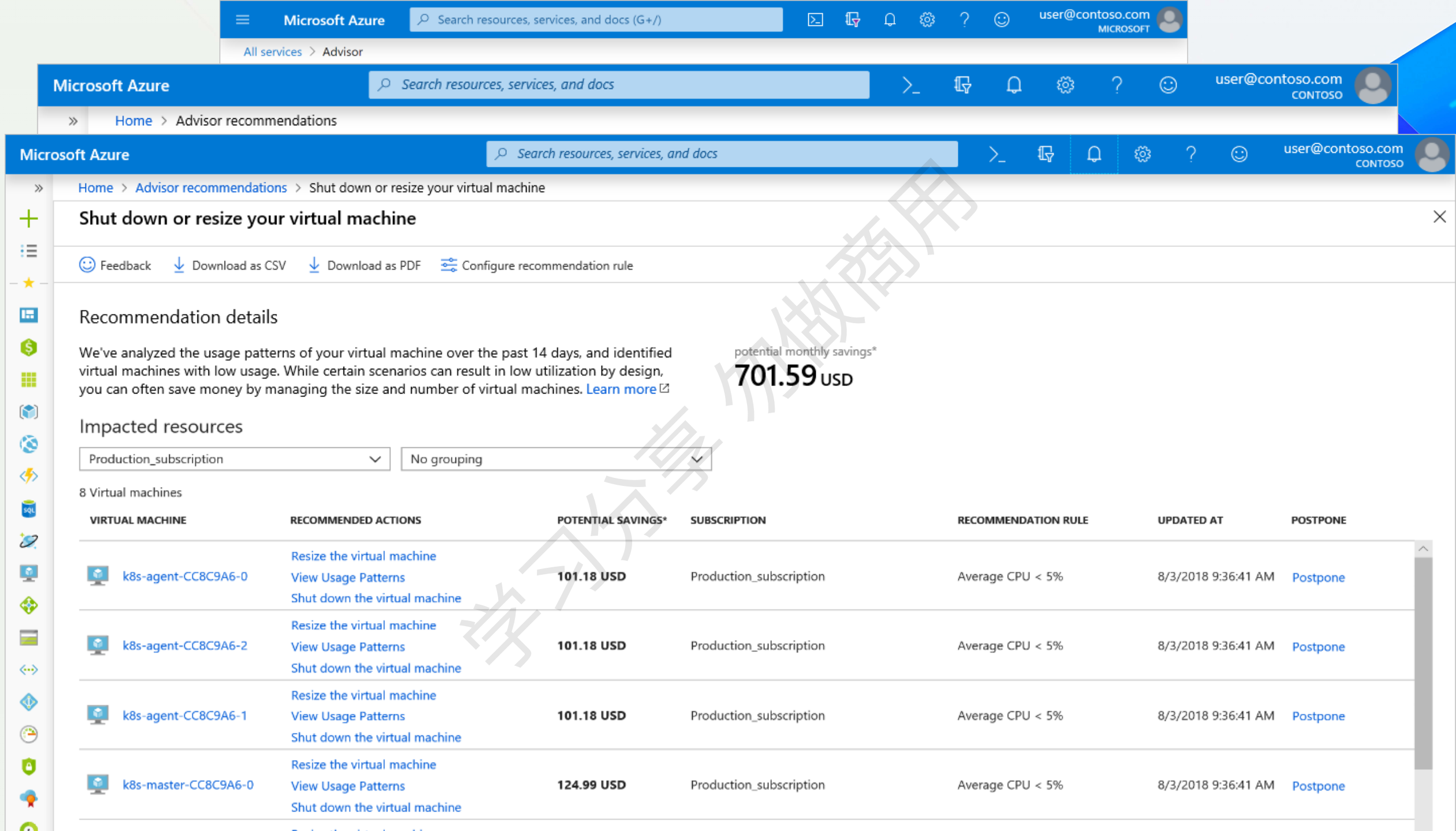




Estimate costs with Azure pricing calculator

Azure pricing calculator

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


Microsoft Azure
Search resources, services, and docs (G+/)
user@contoso.com
MICROSOFT
All services > Advisor
Microsoft Azure
Search resources, services, and docs
user@contoso.com
CONTOSO
Home > Advisor recommendations
Microsoft Azure
Search resources, services, and docs
user@contoso.com
CONTOSO
Home > Advisor recommendations > Shut down or resize your virtual machine
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
Resize the virtual machine
View Usage Patterns
Shut down the virtual machine
101.18 USD
Production_subscription
Average CPU < 5%
8/3/2018 9:36:41 AM
Postpone
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Resize the virtual machine
View Usage Patterns
Shut down the virtual machine
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Production_subscription
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k8s-agent-CC8C9A6-1
Resize the virtual machine
View Usage Patterns
Shut down the virtual machine
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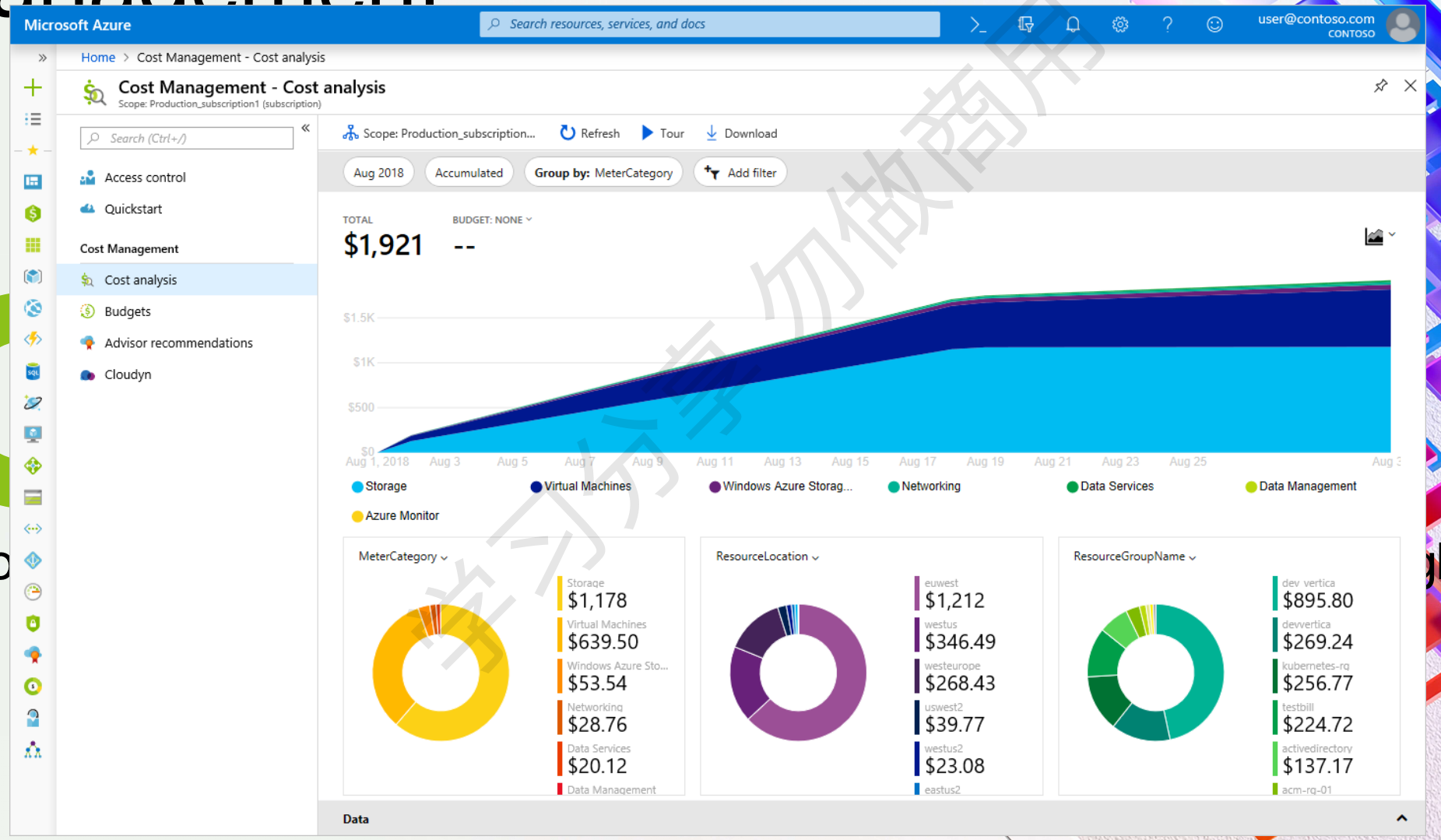
Production_subscription
Average CPU < 5%
8/3/2018 9:36:41 AM
Postpone
k8s-master-CC8C9A6-0
Resize the virtual machine
View Usage Patterns
Shut down the virtual machine
124.99 USD
Production_subscription
Average CPU < 5%
8/3/2018 9:36:41 AM
Postpone

Predict and optimize with Cost Management

Ano ghts into



Estimate the Total Cost of Ownership with the Azure TCO calculator

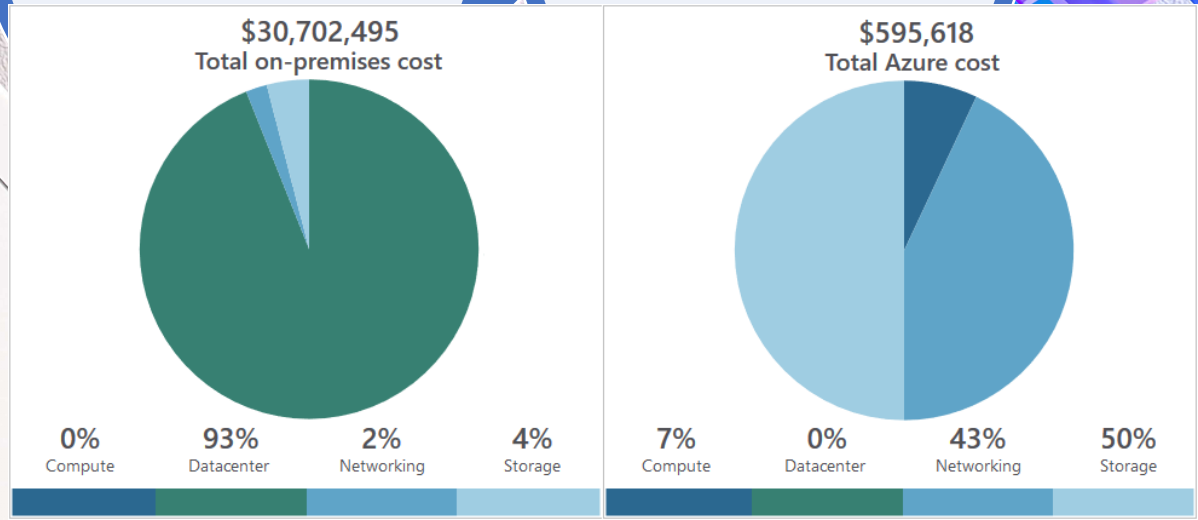
Total Cost of Ownership calculator

Open the TCO calculator

Define your workloads

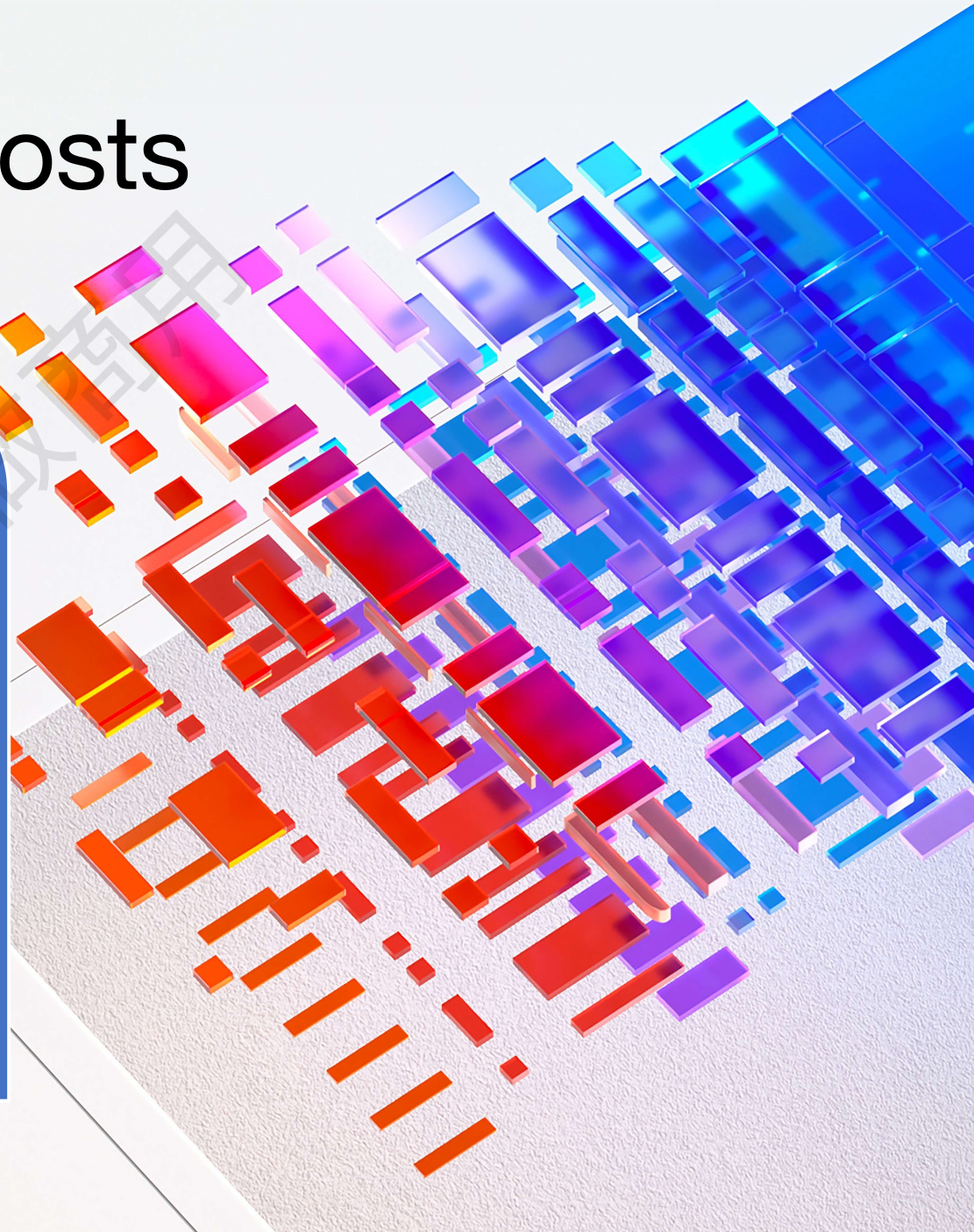
Adjust assumptions

View the report



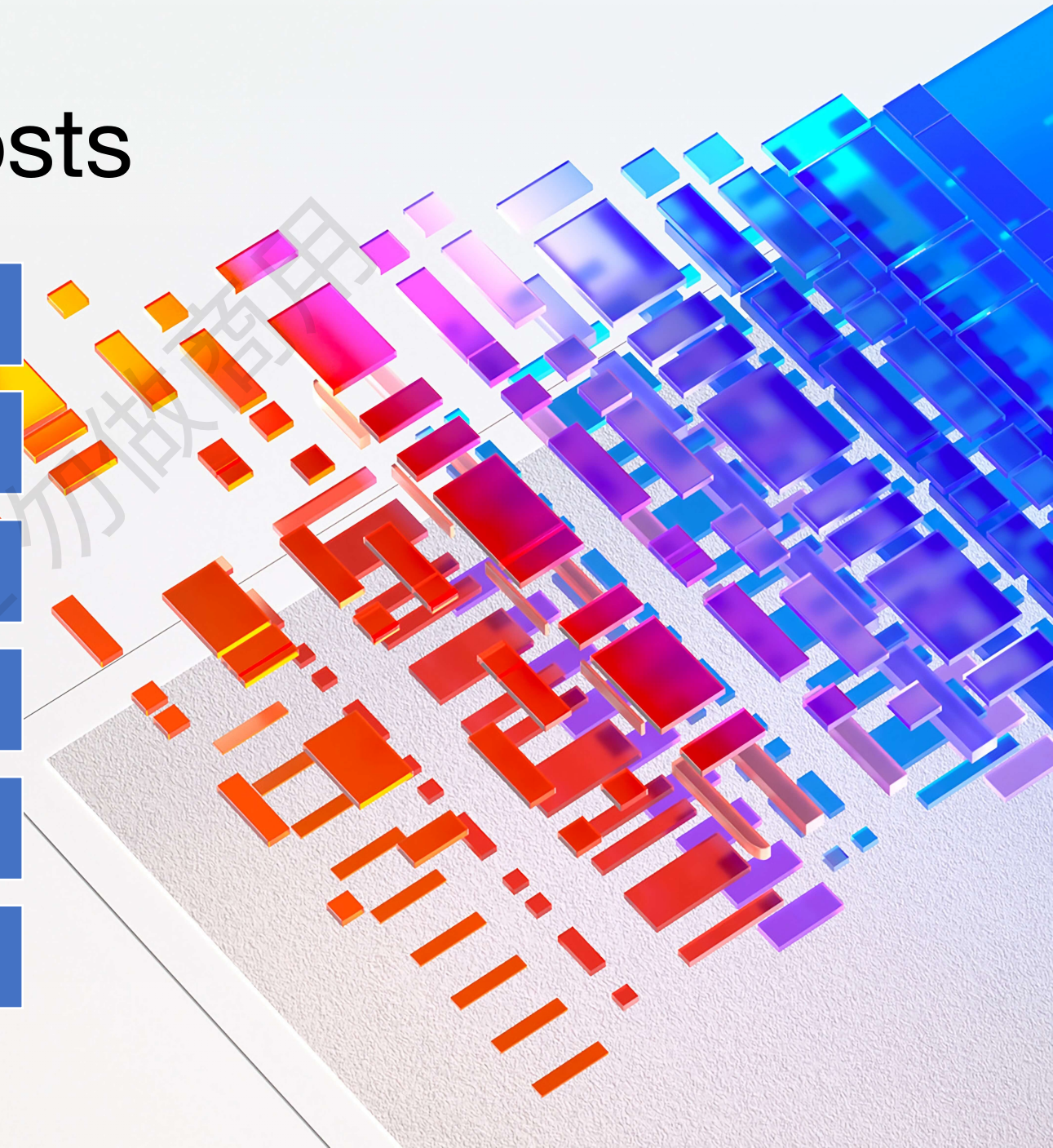
Save on infrastructure costs

- 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

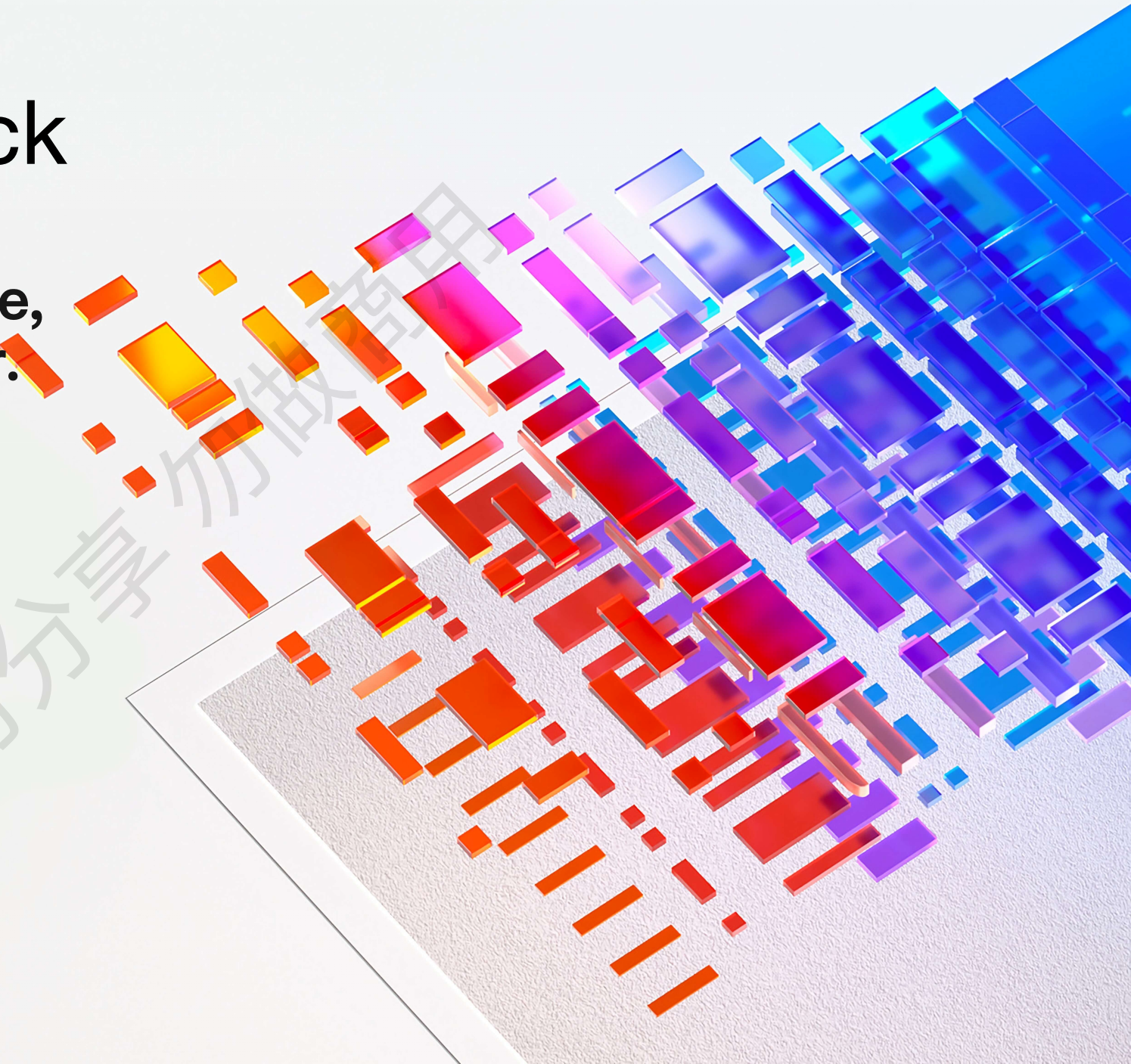
- Developer
- Standard
- Professional Direct

Azure community support

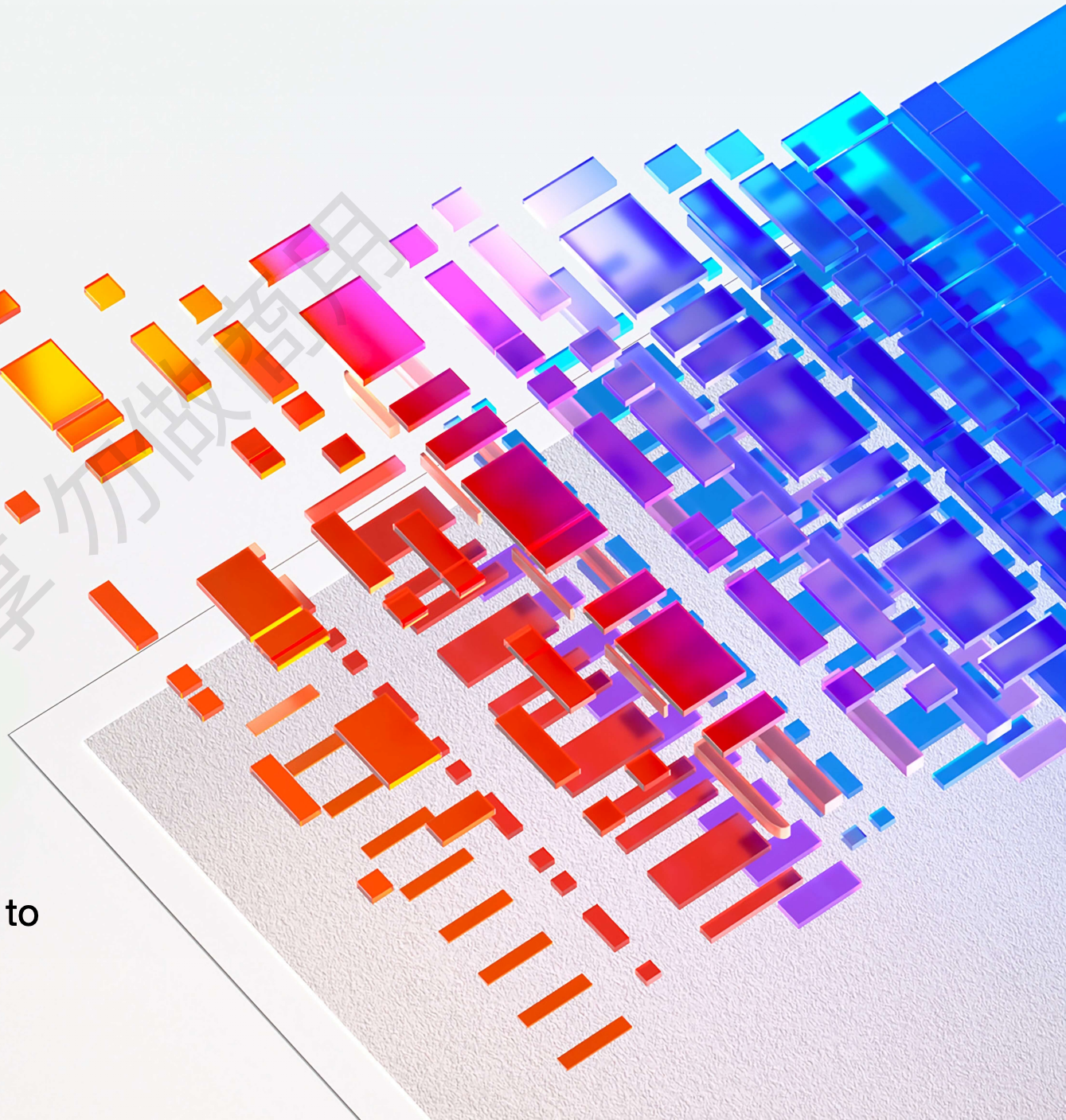
- Azure Knowledge Center
- Microsoft Tech Community
- Stack Overflow

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)

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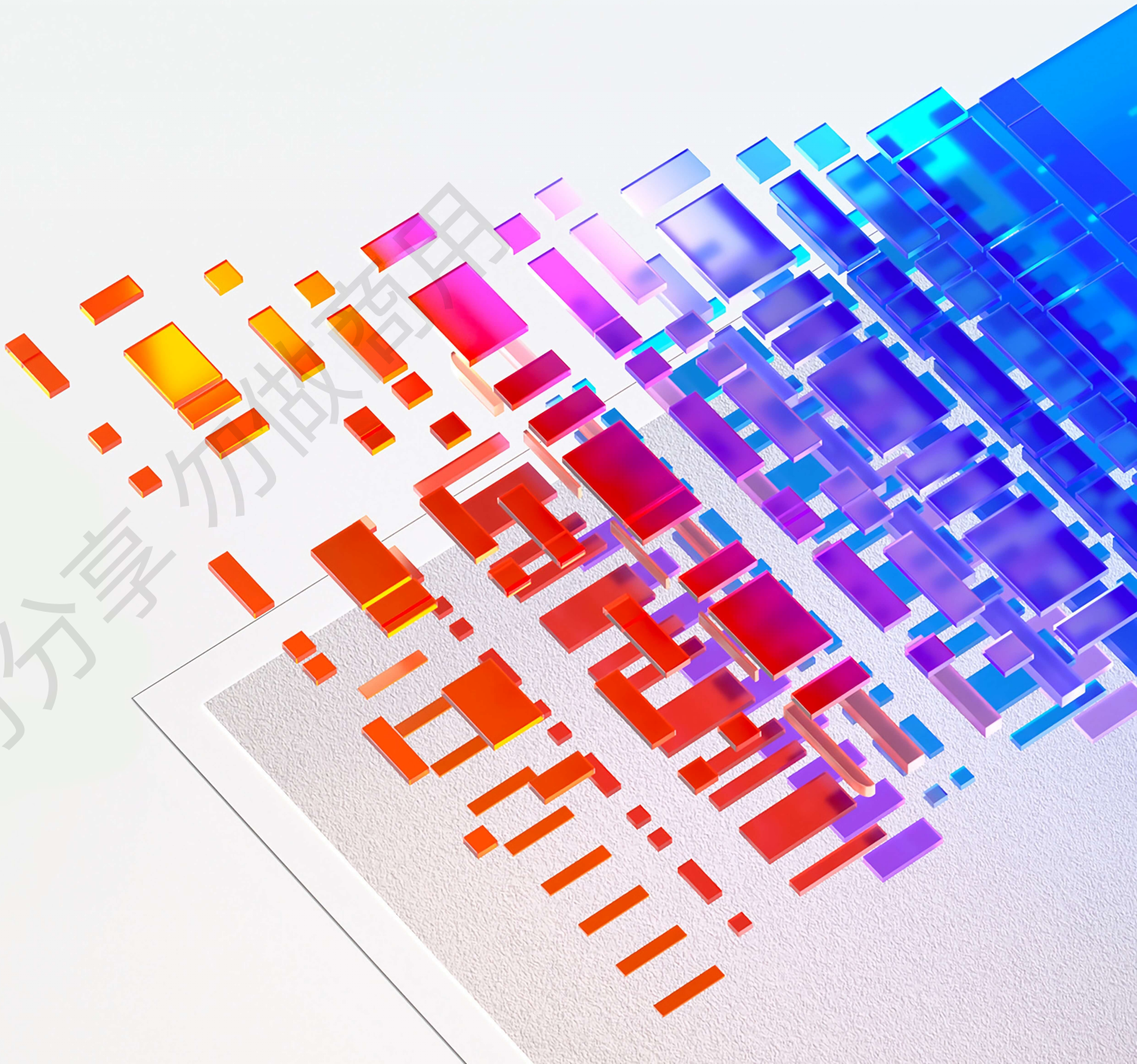
Q&A



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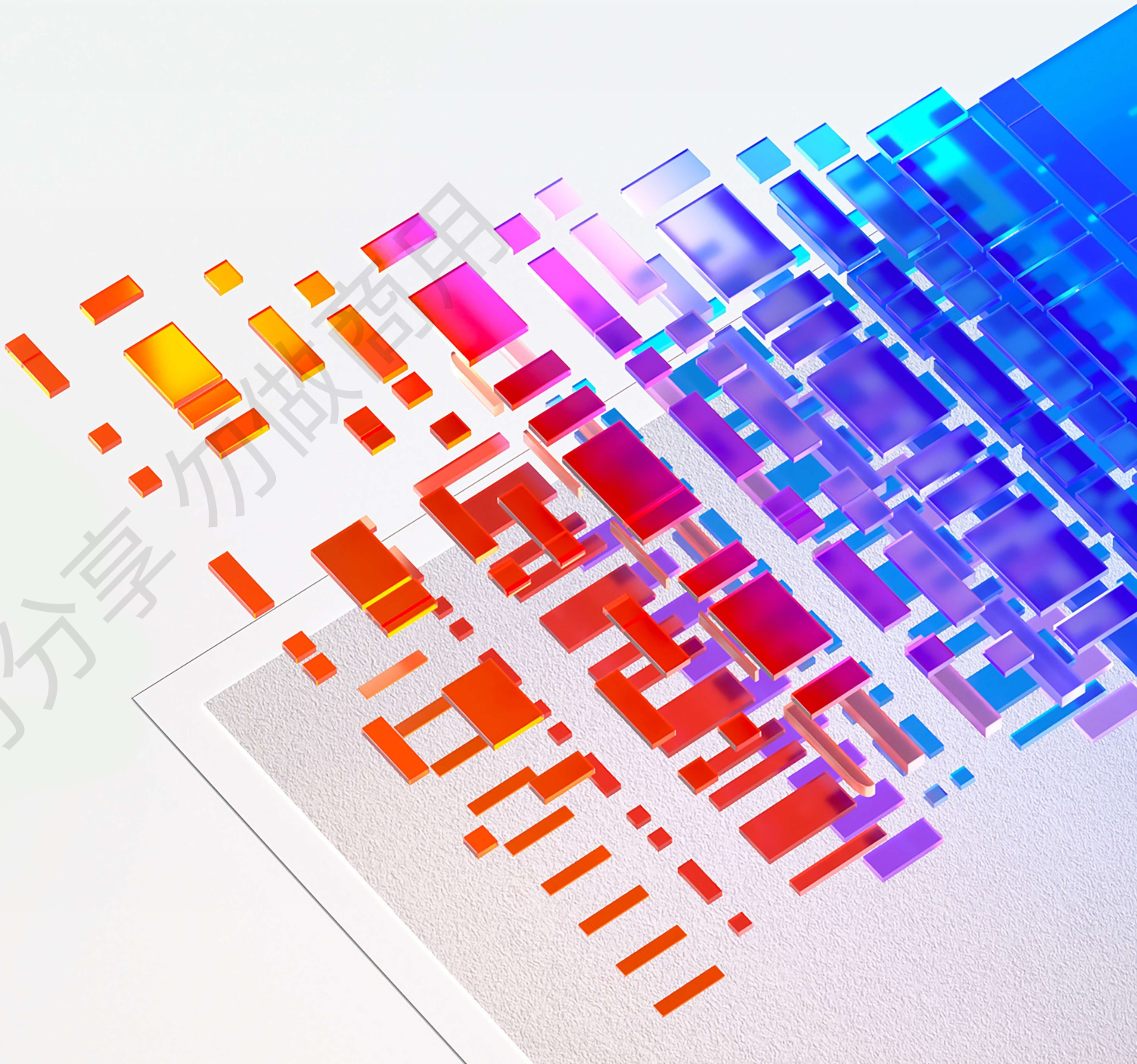
Thank you!