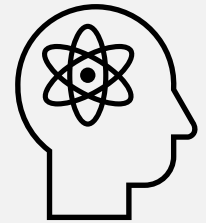


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MOD 4: Azure Security and Network Security

Module outline



Module 04 – Outline

You will learn the following concepts:

- **Azure Security features**
 - Security Center and resource hygiene
 - Key Vault, Sentinel, and Dedicated Hosts
- **Azure network security**
 - Defense in depth
 - Network Security Groups and Firewalls
 - DDoS protection

Security tools and features



Security tools and features - Objective Domain

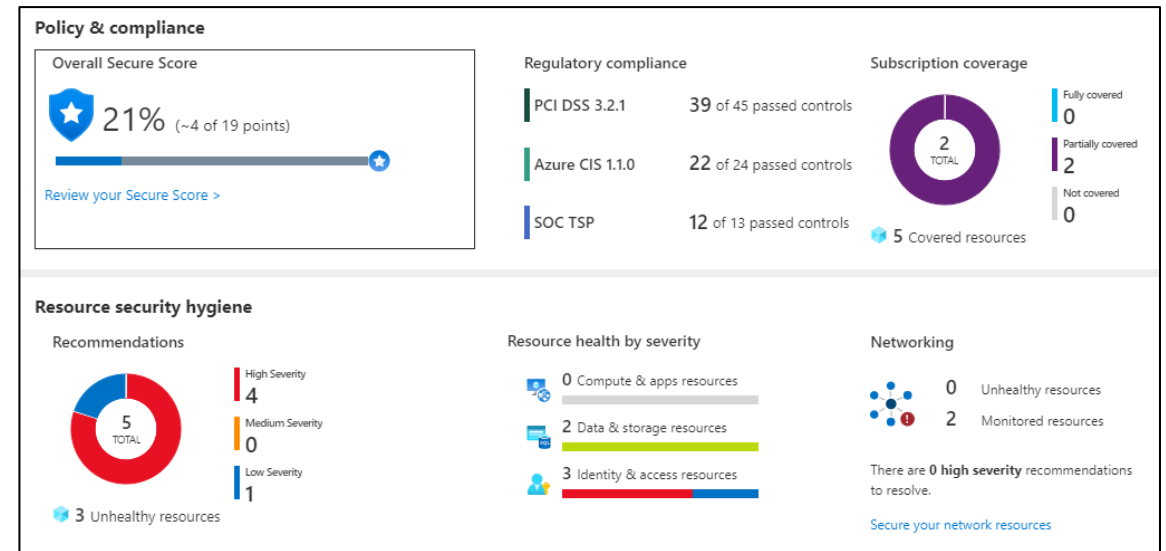
Describe the features and the functionality of:

- Azure Security Center, including policy compliance, security alerts, secure score, and resource hygiene
- Azure Sentinel
- Key Vault
- Azure Dedicated Hosts

Azure Security Center

Azure Security Center is a monitoring service that provides threat protection across both Azure and on-premises datacenters.

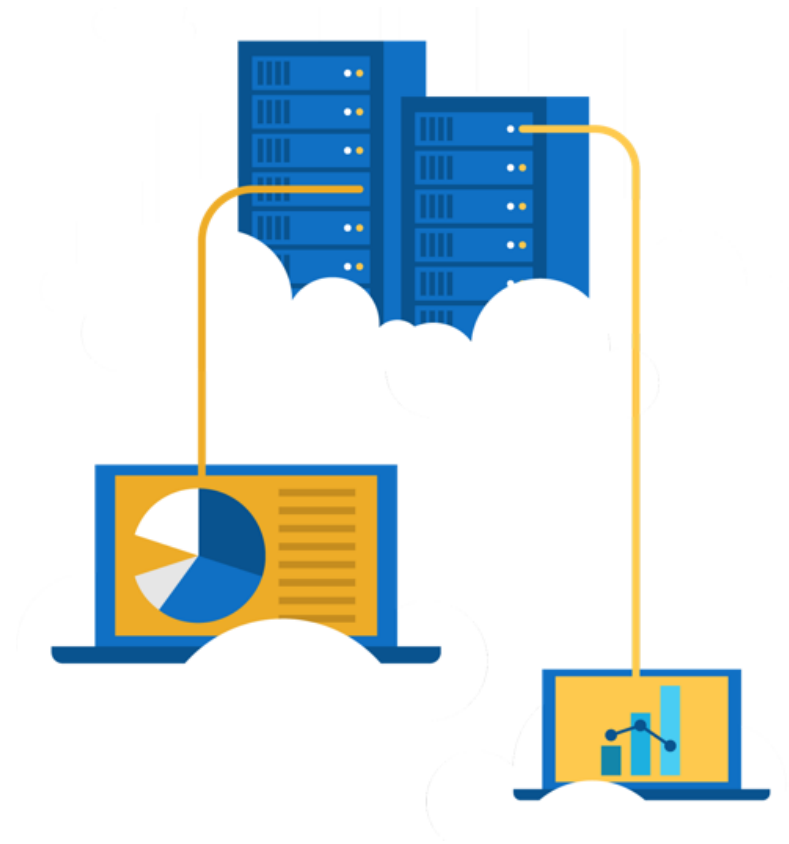
- Provides security recommendations
- Detect and block malware
- Analyze and identify potential attacks
- Just-in-time access control for ports



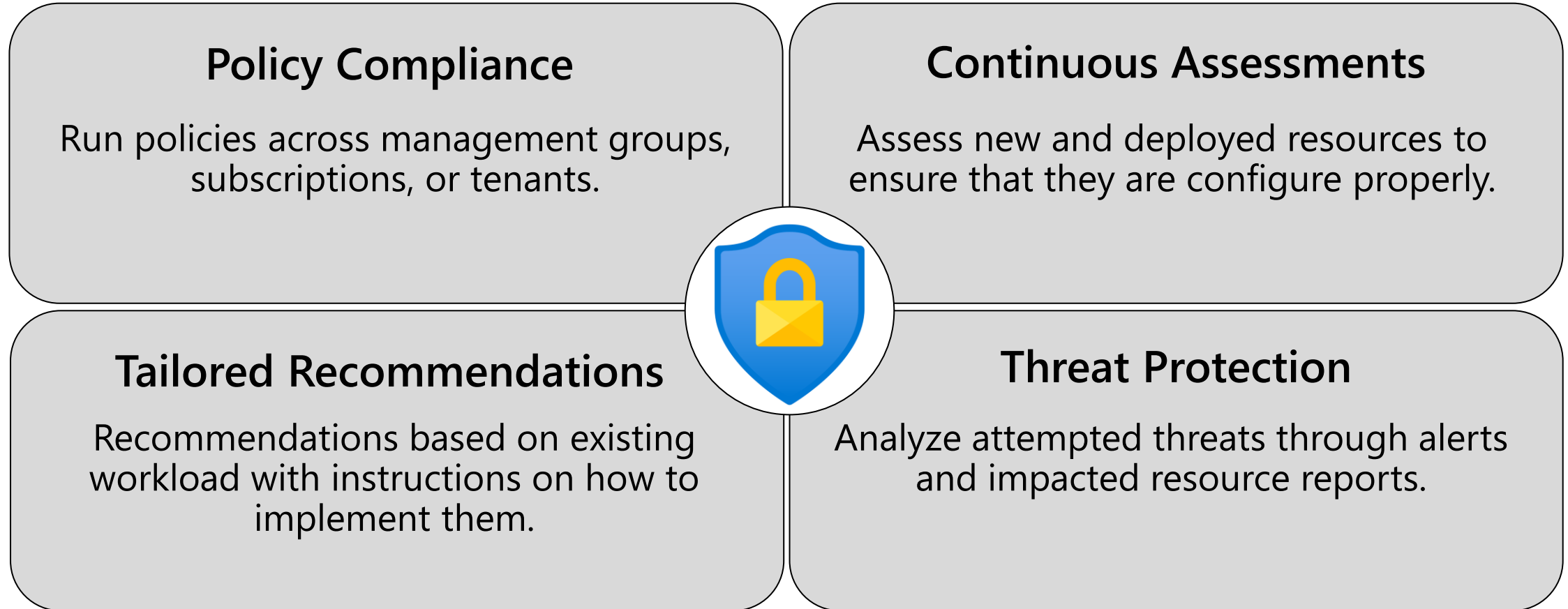
Walkthrough-Azure Security Center

Open Azure Security Center and view some of the common features and configuration options.

1. Launch Azure Security Center.
2. View Policy compliance options.
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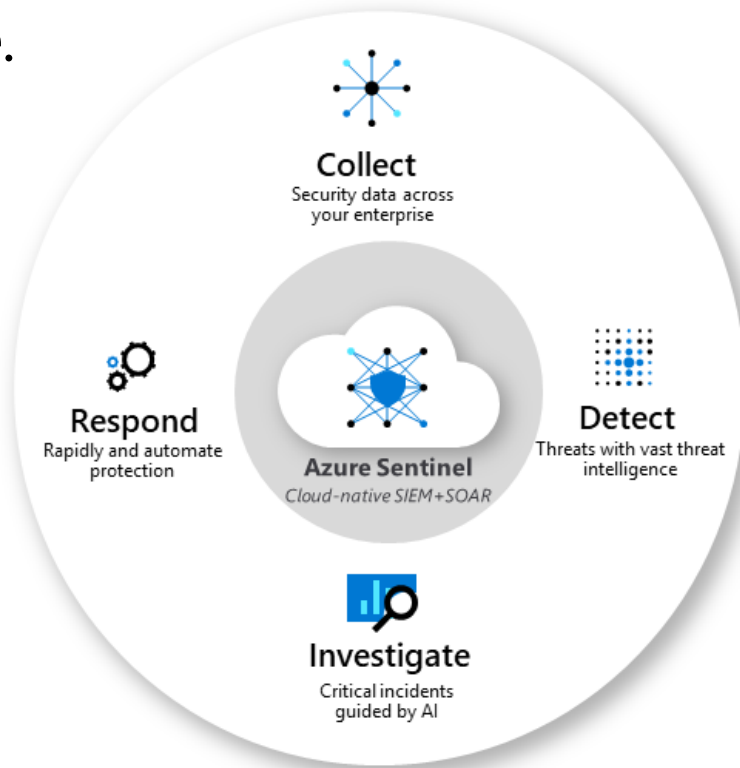


Azure Security Center - capabilities



Azure Sentinel

Azure Sentinel is a security information management (SIEM) and security automated response (SOAR) solution that provides security analytics and threat intelligence across an enterprise.



Connector and Integrations:

- Office 365
- Azure Active Director
- Azure Advanced Threat Protection
- Microsoft Cloud App Security

Azure Key Vault

Azure Key Vault stores application secrets in a centralized cloud location in order to securely control access permissions and access logging.

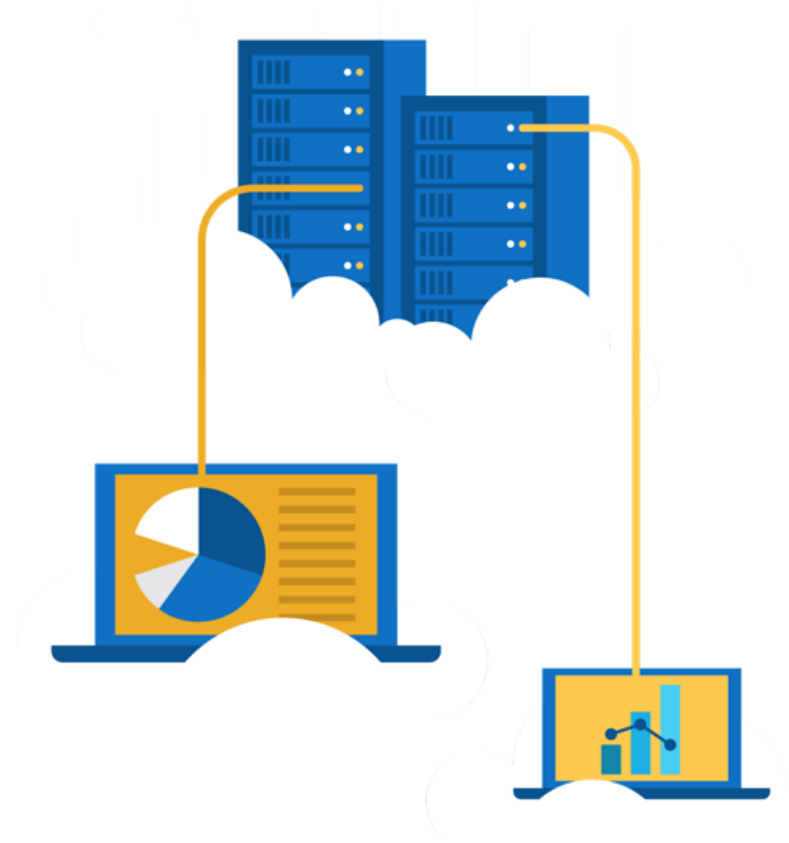
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- Key management.
- Certificate management.
- Storing secrets backed by hardware security modules (HSMs).



Walkthrough-Implement Azure Key Vault

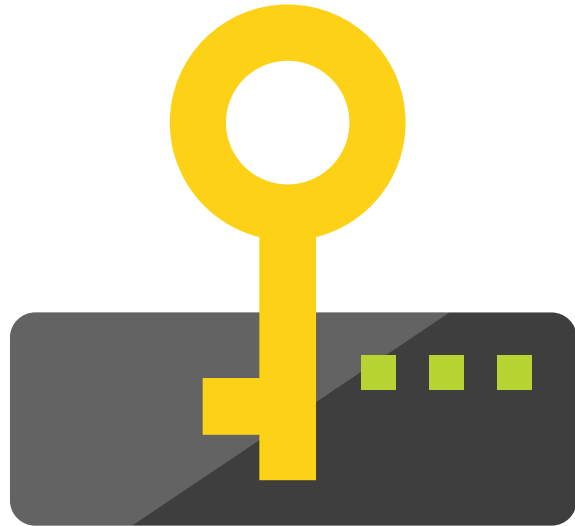
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Azure Dedicated Host

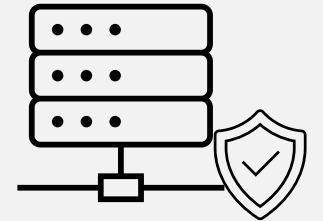
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Benefits

- Hardware isolation at the server level
- Control over maintenance event timing
- Aligned with Azure Hybrid Use Benefits

Secure network connectivity



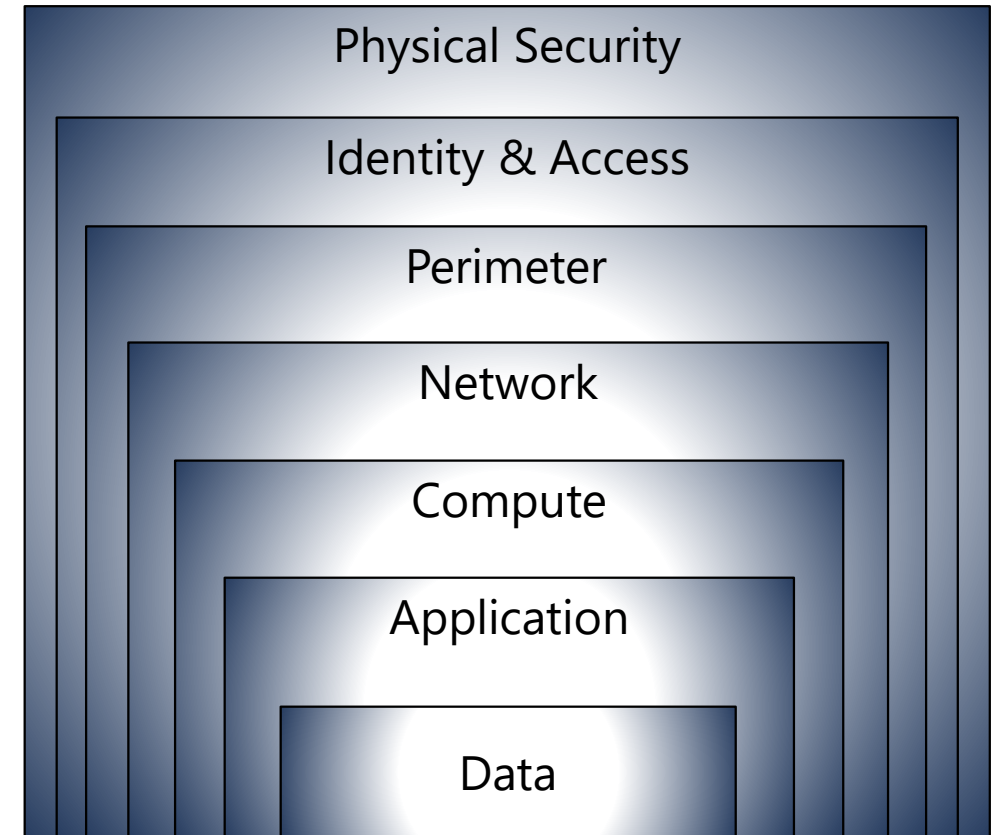
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Describe the concept and functionality of:

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Defense in depth

- A layered approach to securing computer systems.
- Provides multiple levels of protection.
- Attacks against one layer are isolated from subsequent layers.



Shared Security

- Migrating from customer-controlled to cloud-based datacenters shifts the responsibility for security.
- Security becomes a shared concern between cloud providers and customers.

Responsibility	On-Premises	IaaS	PaaS	SaaS
Data governance and Rights Management	Customer	Customer	Customer	Customer
Client endpoints	Customer	Customer	Customer	Customer
Account and access management	Customer	Customer	Customer	Customer
Identity and directory infrastructure	Customer	Customer	Microsoft/ Customer	Microsoft/ Customer
Application	Customer	Customer	Microsoft/ Customer	Microsoft
Network controls	Customer	Customer	Microsoft/ Customer	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

Network Security Groups (NSGs)

Network Security Groups (NSGs) filter network traffic to and from Azure resources on Azure Virtual Networks.

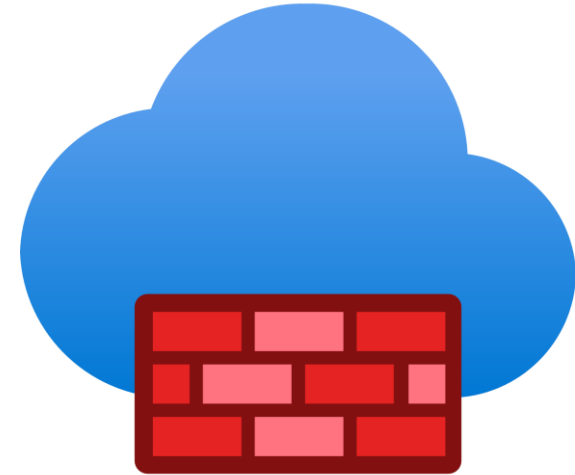
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Azure Firewall

A stateful, managed Firewall as a Service (FaaS) that grants/denies server access based on originating IP address, in order to protect network resources.

- Applies inbound and outbound traffic filtering rules
- Built-in high availability
- Unrestricted cloud scalability
- Uses Azure Monitor logging



Azure Application Gateway also provides a firewall, Web Application Firewall (WAF). WAF provides centralized, inbound protection for your web applications.

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DDoS attacks overwhelm and exhaust network resources, making apps slow or unresponsive.

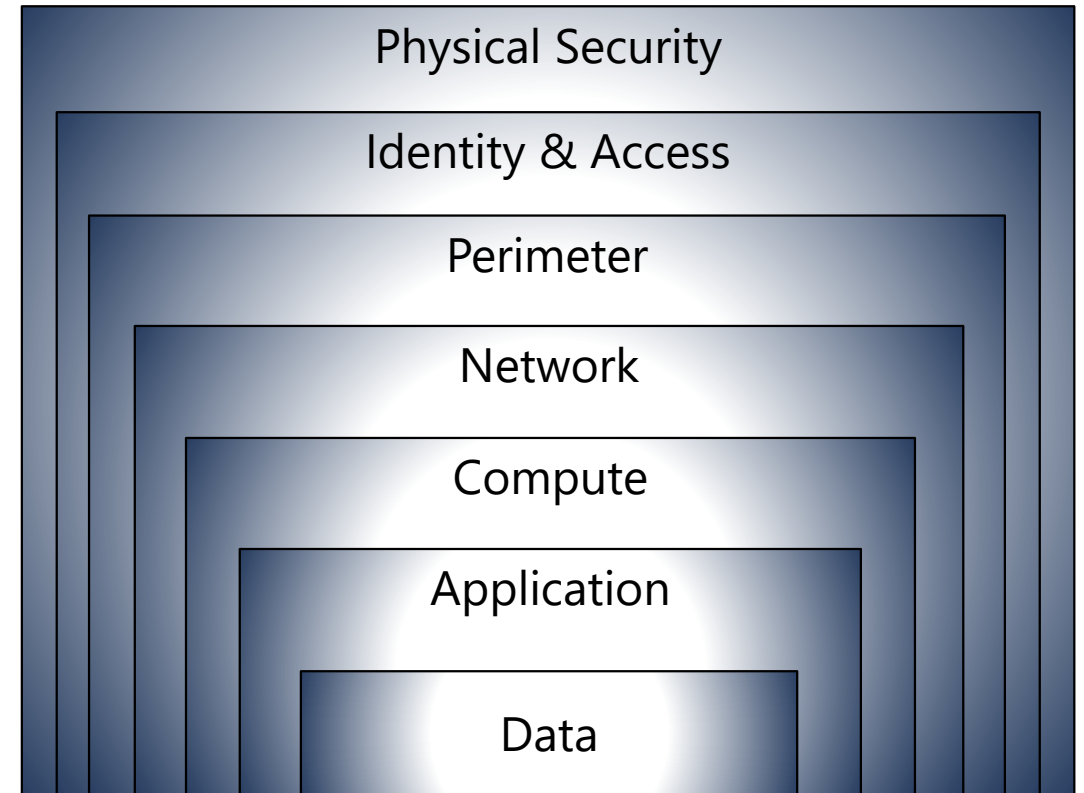
- Sanitizes unwanted network traffic before it impacts service availability.
- Basic service tier is automatically enabled in Azure.
- Standard service tier adds mitigation capabilities that are tuned to protect Azure Virtual Network resources.



Defense in Depth Reviewed

Combining network security solutions

- **NSGs** with **Azure Firewall** to achieve defense in depth.
- **Perimeter layer** protects your network boundaries with Azure DDoS Protection and Azure Firewall.
- **Networking layer** only permits traffic to pass between networked resources with Network Security Group (NSG) inbound and outbound rules.



Walkthrough - Secure network traffic

Create and configure inbound & outbound security port rules.

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Module 4 Review



Microsoft Learn Modules
(docs.microsoft.com/Learn)

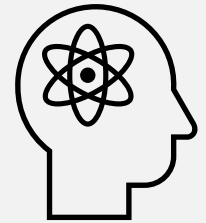
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MOD 4: Azure Security and Network Security

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Security tools and features - Objective Domain

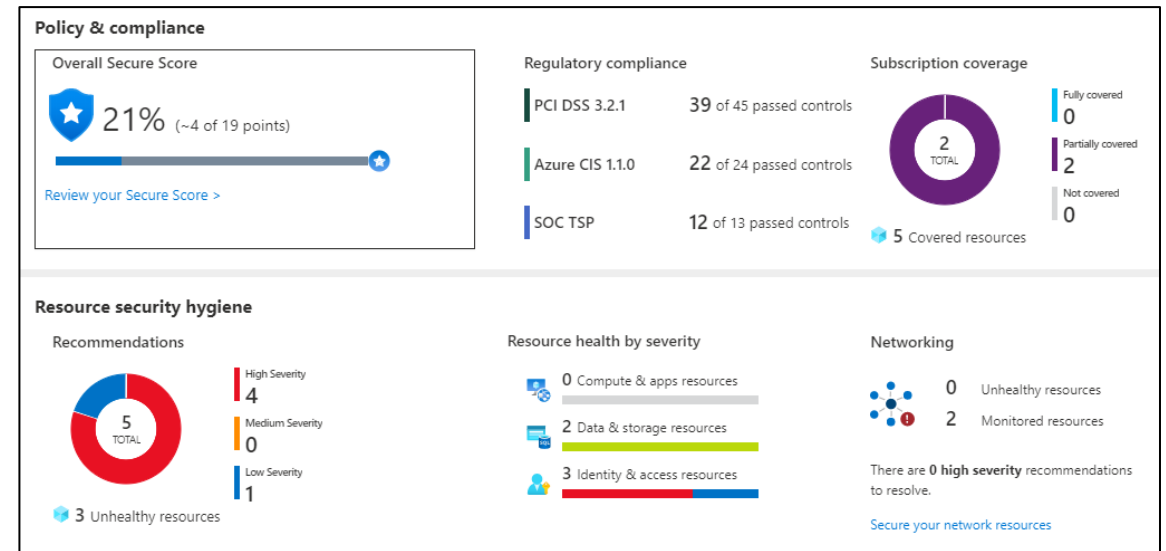
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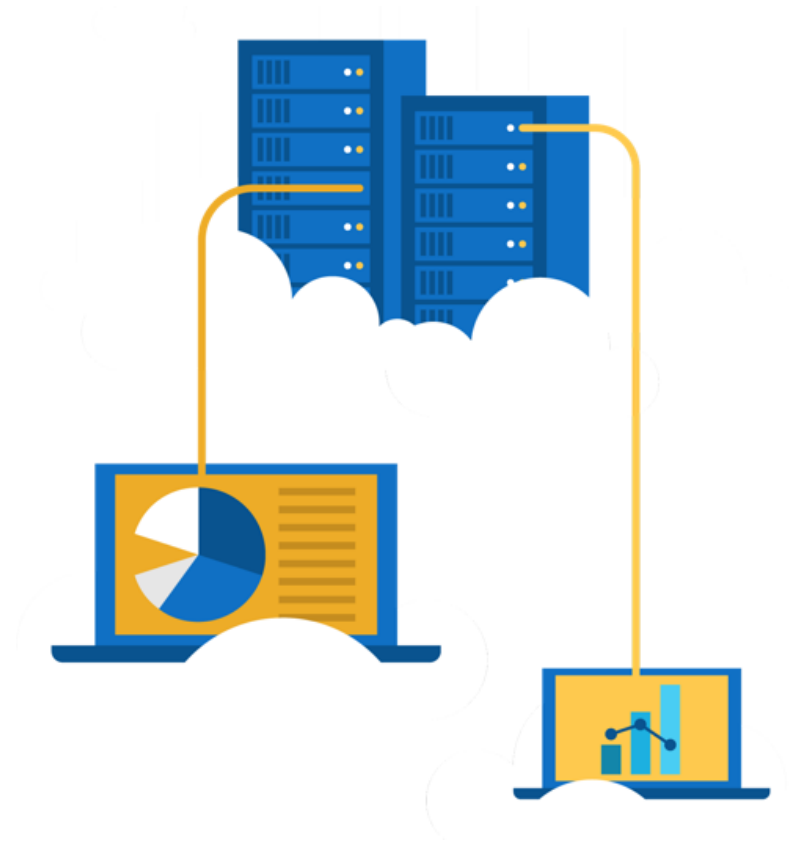
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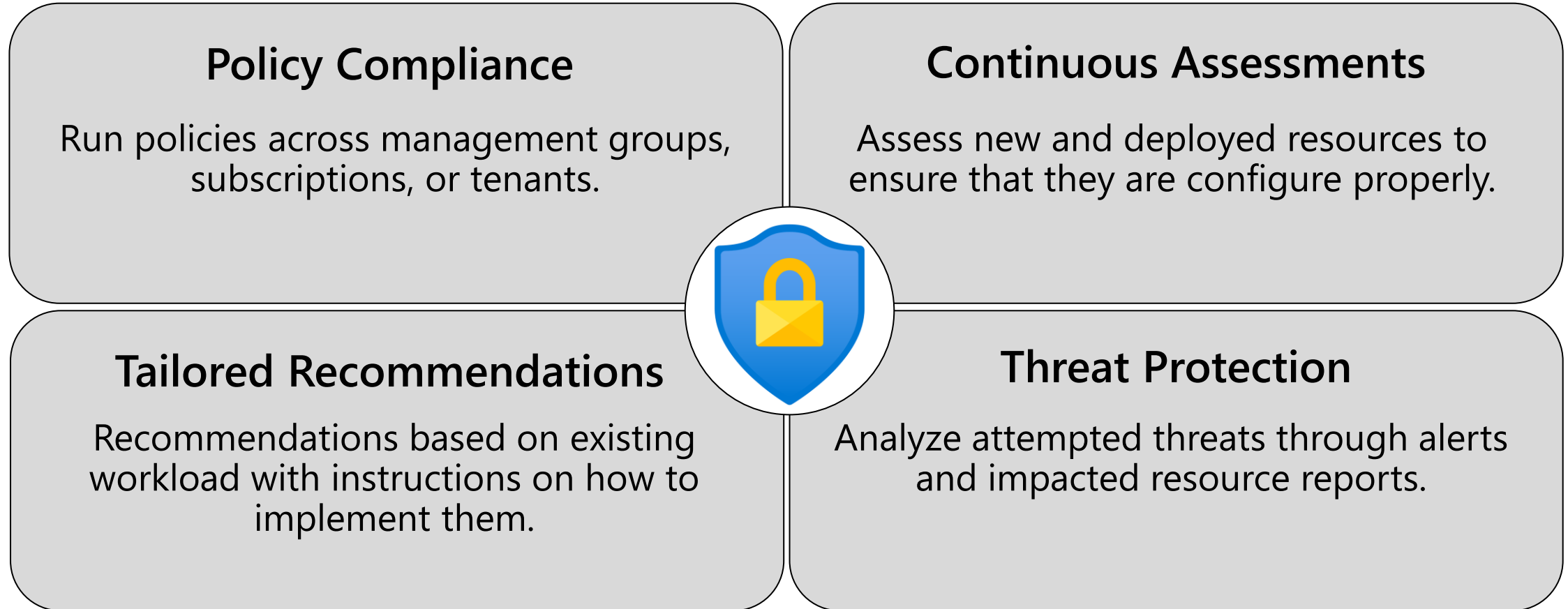
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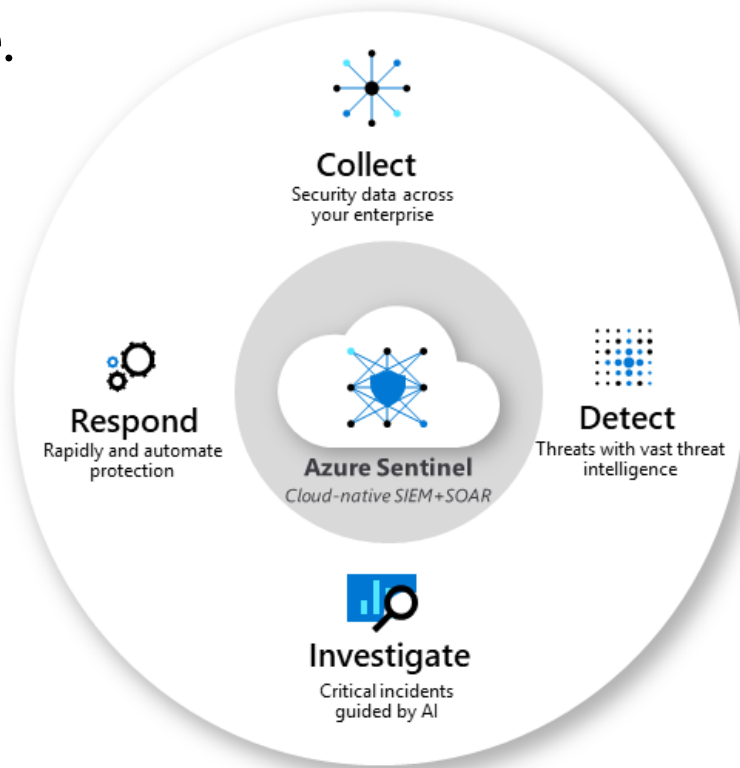


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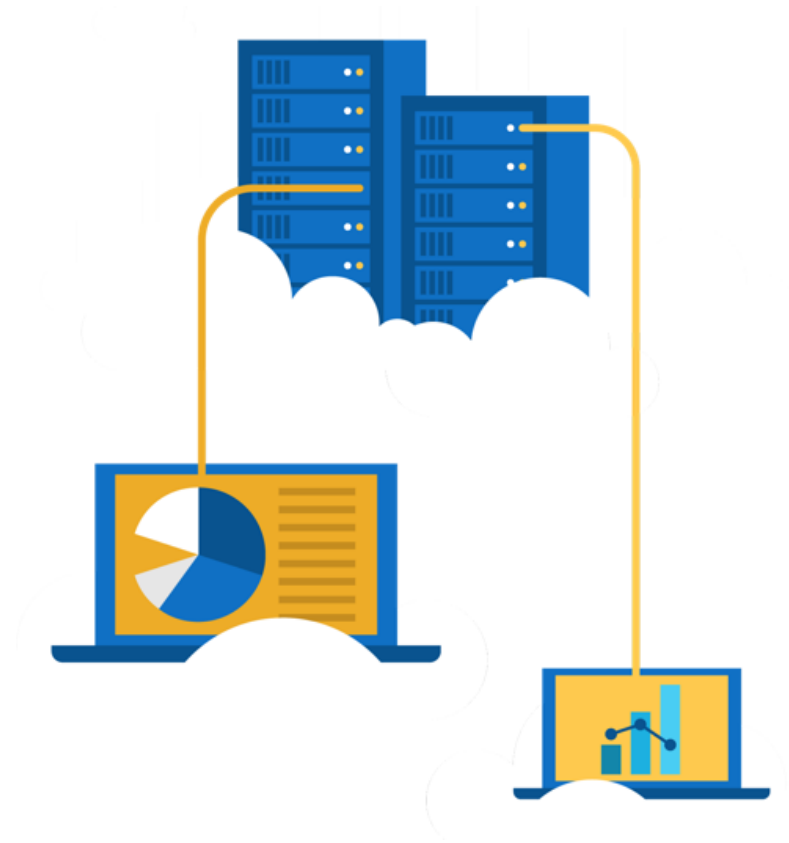
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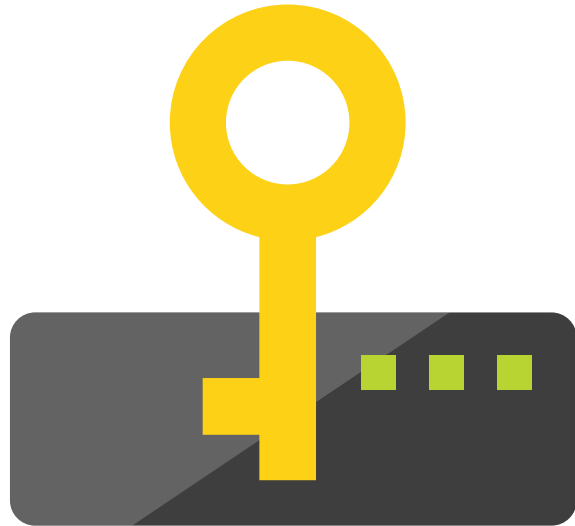
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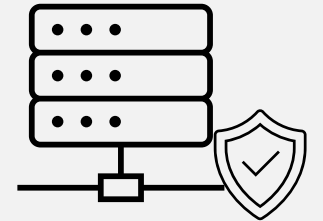
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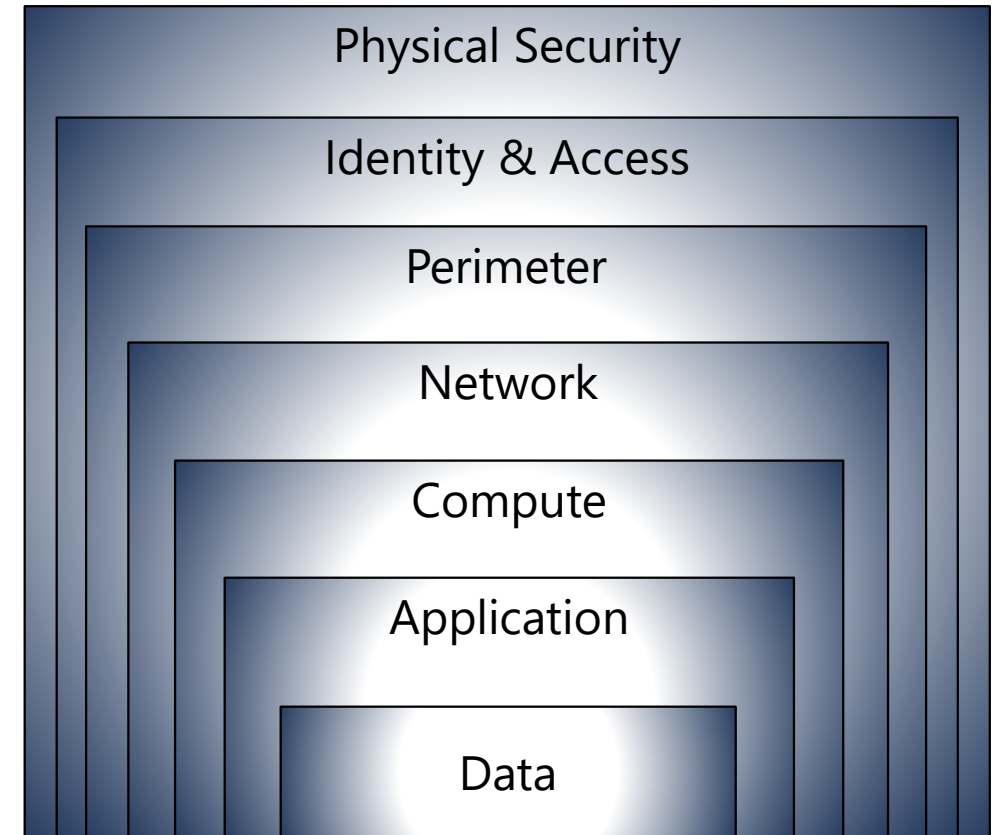
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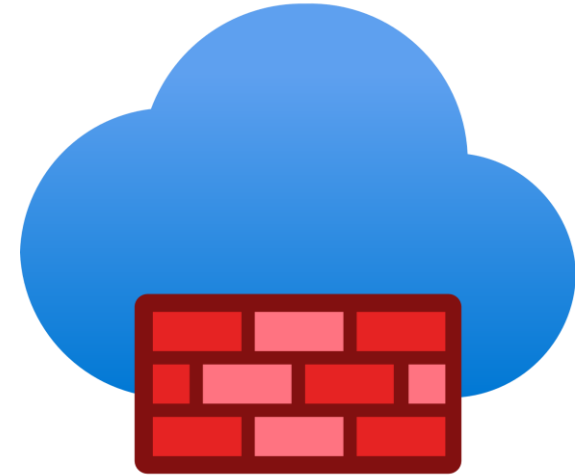
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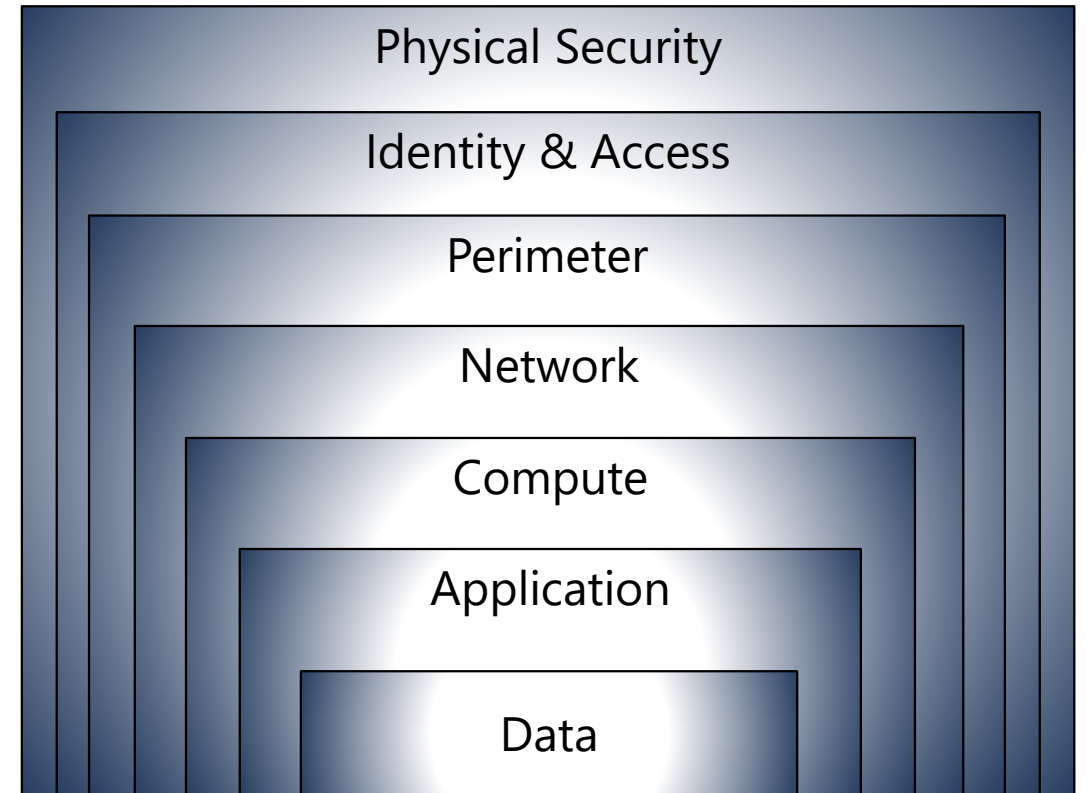
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Defense in Depth Reviewed

Combining network security solutions

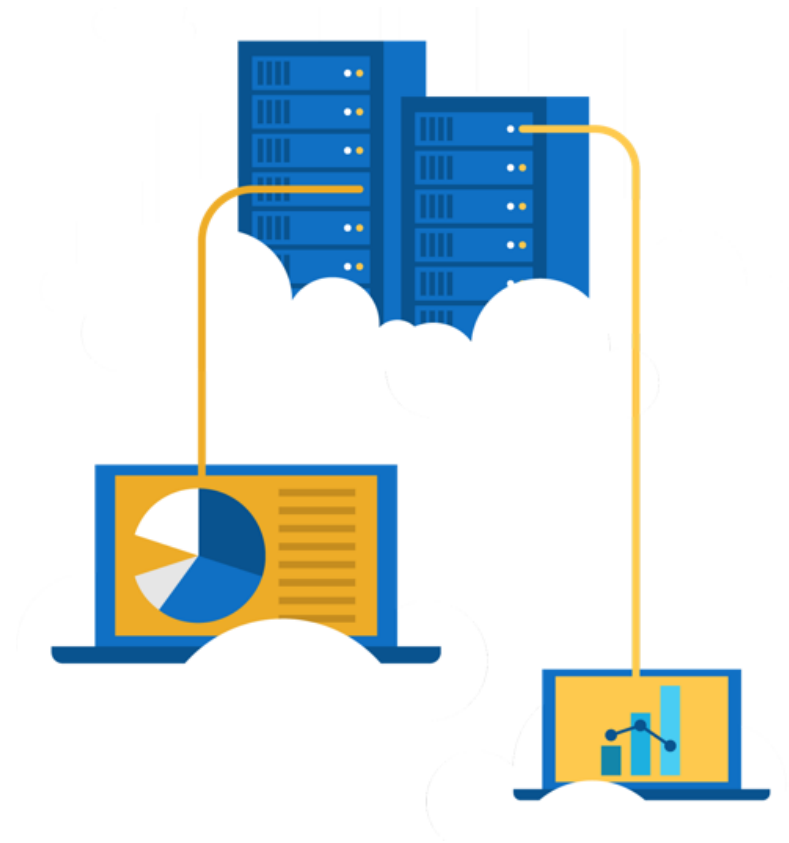
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Module 4 Review



Microsoft Learn Modules
(docs.microsoft.com/Learn)

- Azure Security Center and resource hygiene
- Key Vault, Sentinel, and Dedicated Hosts
- Defense in depth
- DDoS protection

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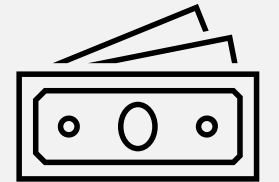
MOD 6: Azure pricing and lifecycles

Module 06 – Outline

You will learn the following concepts:

- **Methods for managing costs**
 - Factors affecting costs
 - Options to reduce and control costs
 - Azure Cost Management
- **Service Level Agreements and Lifecycles**
 - Azure Service Level Agreement (SLA)
 - Factors impacting SLAs
 - Azure product and feature lifecycle

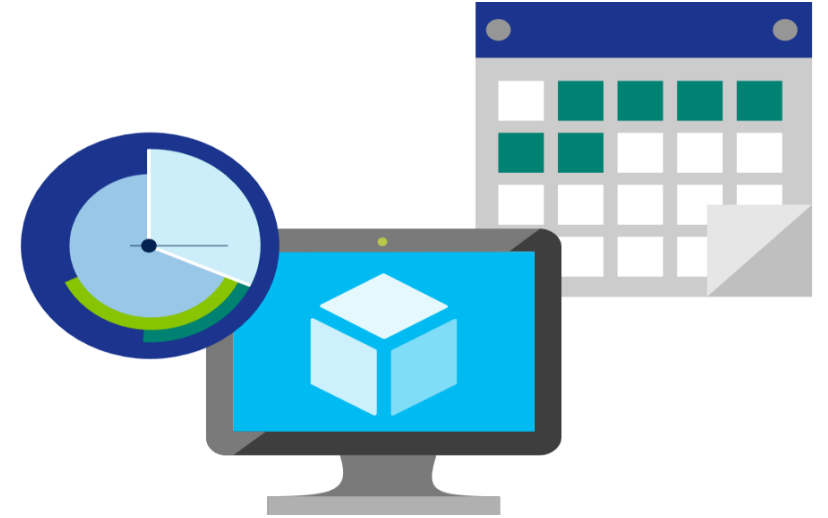
Planning and Cost Management



Planning and Cost Management - Objective Domain

- Identify factors that can affect costs (resource types, services, locations, ingress and egress traffic)
- Identify factors that can reduce costs (reserved instances, reserved capacity, hybrid use benefit, and spot pricing)
- Describe the functionality and usage of the Pricing calculator and the Total Cost of Ownership (TCO) calculator
- Describe the functionality and usage of Azure Cost Management

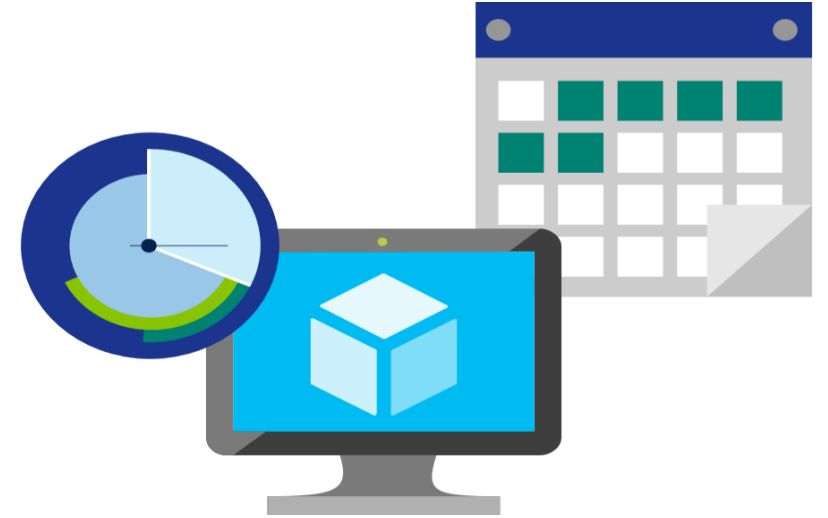
Factors affecting costs (part 1)



There are [six](#) primary factors affecting costs:

1) Resource Type	2) Services	3) Location
Costs are resource-specific, so the usage that a meter tracks and the number of meters associated with a resource, depend on the resource type.	Azure usage rates and billing periods can differ between Enterprise, Web Direct, and CSP customers.	The Azure infrastructure is globally distributed, and usage costs might vary between locations that offer Azure products, services, and resources.

Factors affecting costs (part 2)



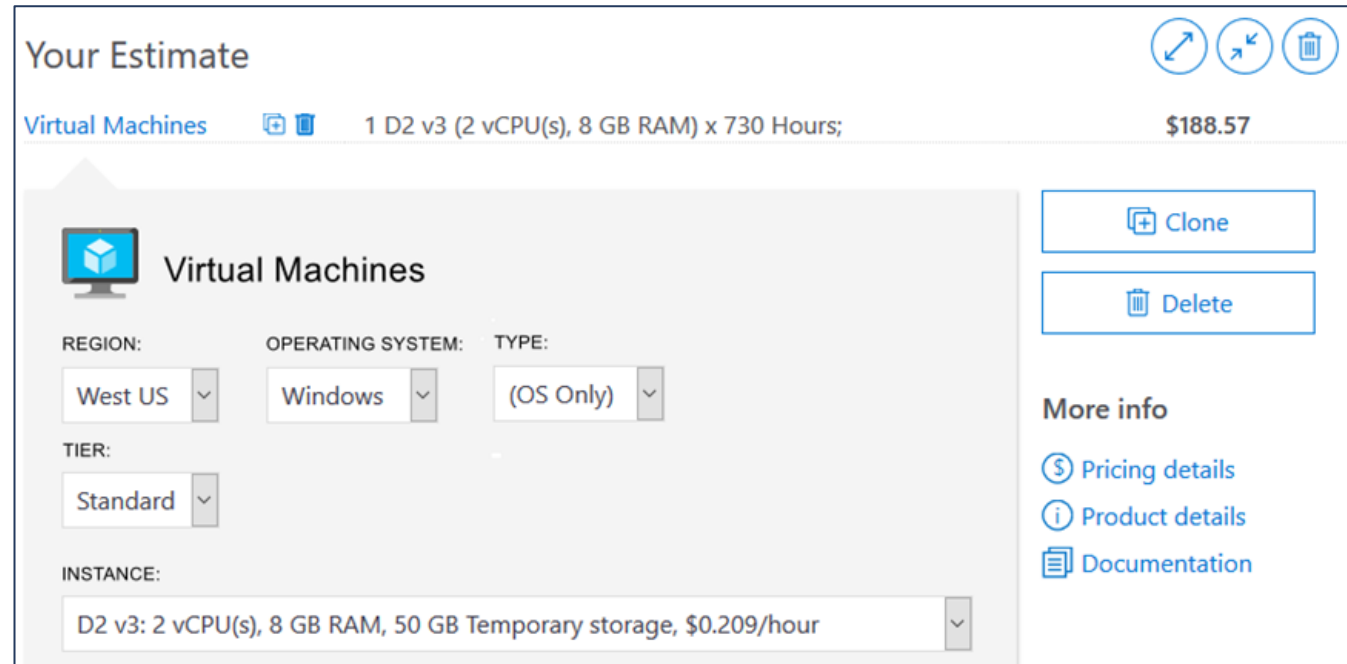
There are [six](#) primary factors affecting costs:

4) Bandwidth	5) Reserved Instances	6) Azure Hybrid Use Benefit
Some inbound data transfers are free, such as data going into Azure datacenters. For outbound data transfers, such as data going out of Azure datacenters, pricing is based on Zones.	With Azure Reservations, you commit to buying one-year or three-year plans for multiple products. Reservations can significantly reduce your resource costs up to 72% on pay-as-you-go prices.	For customers with Software Assurance, Azure Hybrid Benefit allows you to use your on-premises licenses on Azure at a reduced cost.

Pricing Calculator

The **Pricing Calculator** is a tool that helps you estimate the cost of Azure products. The options that you can configure in the Pricing Calculator vary between products, but basic configuration options include:

- Region
- Tier
- Billing options
- Support options
- Programs and offers
- Azure dev/test pricing

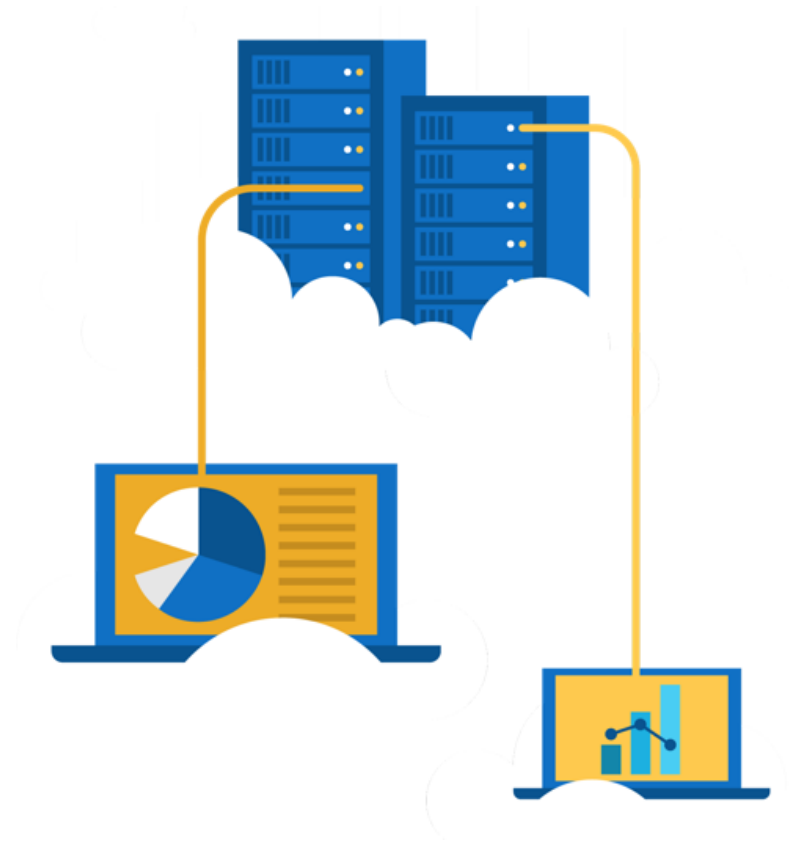


The screenshot displays the 'Your Estimate' section of the Azure Pricing Calculator. At the top, it shows the product 'Virtual Machines' with a trash icon, followed by the configuration '1 D2 v3 (2 vCPU(s), 8 GB RAM) x 730 Hours;' and the total cost '\$188.57'. Below this, there are three icons: a share icon, a refresh icon, and a trash icon. The main configuration area is titled 'Virtual Machines' and includes several dropdown menus: 'REGION:' set to 'West US', 'OPERATING SYSTEM:' set to 'Windows', 'TYPE:' set to '(OS Only)', and 'TIER:' set to 'Standard'. At the bottom, the 'INSTANCE:' dropdown shows 'D2 v3: 2 vCPU(s), 8 GB RAM, 50 GB Temporary storage, \$0.209/hour'. On the right side, there are two buttons: 'Clone' and 'Delete'. Below these buttons, there is a 'More info' section with three links: 'Pricing details', 'Product details', and 'Documentation'.

Walkthrough - Use the Azure Pricing Calculator

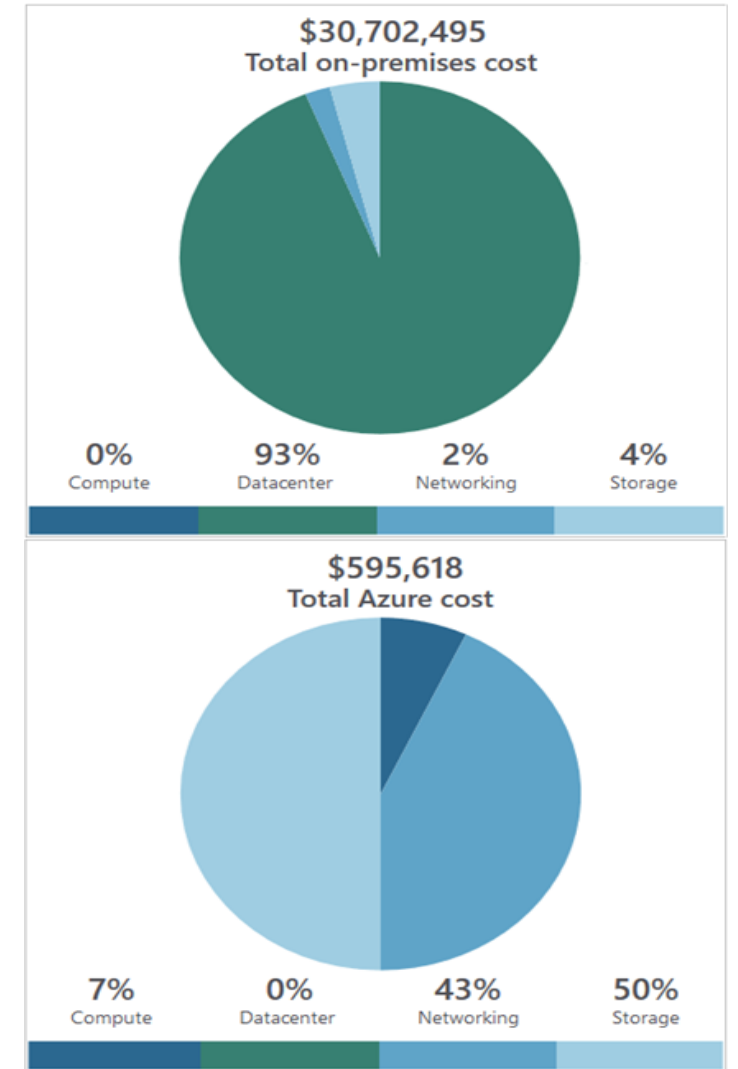
Use the Azure Pricing Calculator to generate a cost estimate for an Azure virtual machine and related network resources.

1. Configure the pricing calculator.
2. Review the pricing estimate.



Total Cost of Ownership Calculator

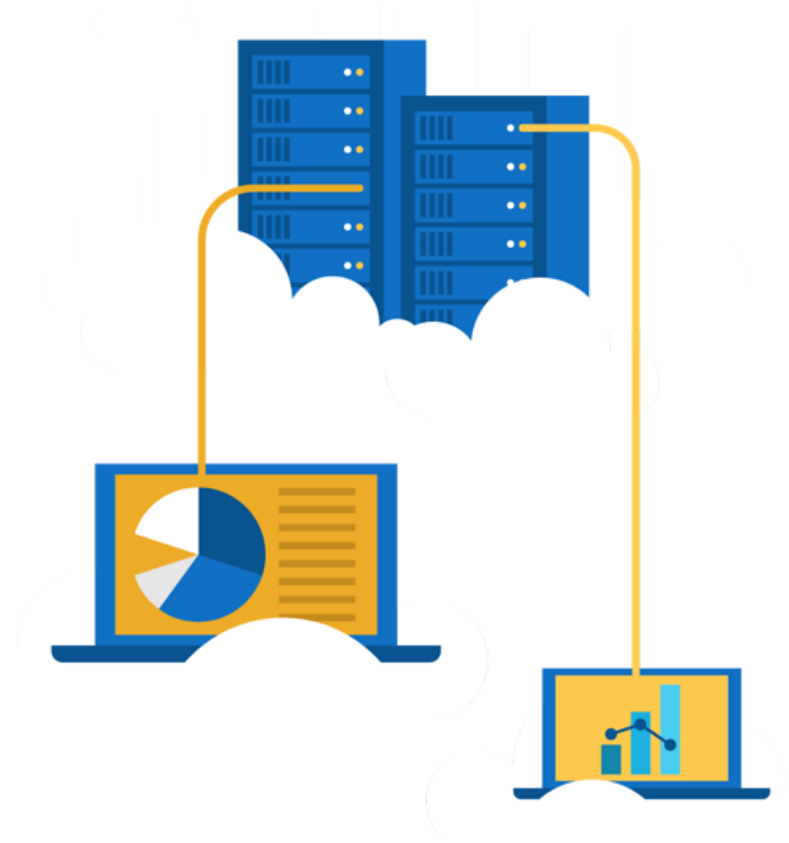
- A tool to estimate cost savings you can realize by migrating to Azure.
- A report compares the costs of on-premises infrastructures with the costs of using Azure products and services in the cloud.



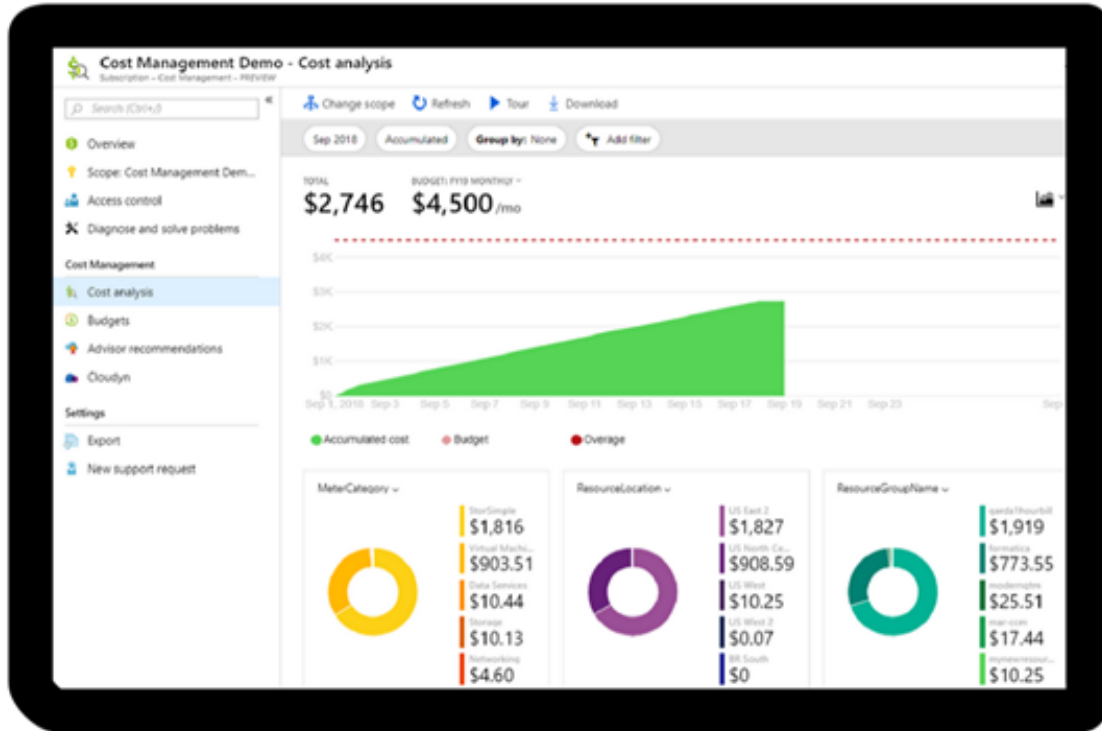
Walkthrough - Use the Azure TCO Calculator

Use the Total Cost of Ownership (TCO) Calculator to generate cost comparison report for an on-premises environment.

1. Configure the TCO calculator.
2. Review the results and save a copy.

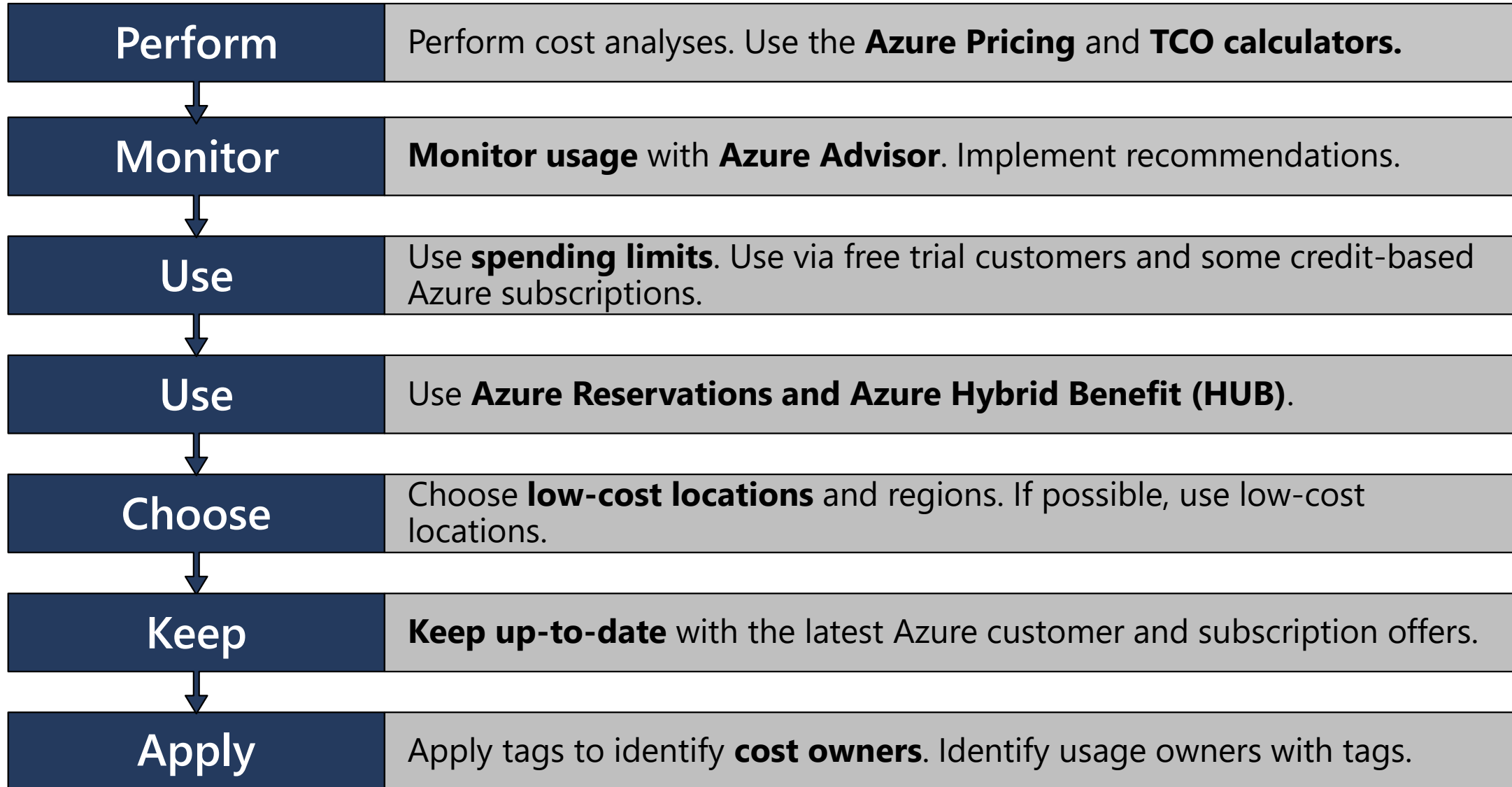


Azure Cost Management



- Reporting – billing reports
- Data enrichment
- Budgets – set spend budget
- Alerting – when cost exceed limits
- Recommendation – cost recommendations

Minimizing costs



Azure SLAs and service lifecycles



Azure SLAs and service lifecycles - Objective Domain

- Describe the purpose of an Azure Service Level Agreement (SLA)
- Identify actions that can impact an SLA (i.e. Availability Zones)
- Describe the service lifecycle in Azure (Public Preview and General Availability)

Service Level Agreements (SLAs)

Service Level Agreements (SLAs) describes Microsoft's commitments for uptime and connectivity.

- SLAs are based on individual products and services.
- Detailed agreements on the service provided, and any exceptions to the SLA.
- Free and preview features/services do not offer SLAs.



SLAs for Azure products and services

- Performance targets are expressed as uptime and connectivity guarantees.
- Performance-targets range from 99% to 99.999%.
- If a service fails to meet the guarantees, a percentage of the monthly service fees can be credited.

SLA	Downtime per month
99%	7h 18m 17s
99.5%	3h 39m 8s
99.9%	43m 49s
99.95%	21m 54s
99.99%	4m 22s
99.999%	26s

Actions that affect SLAs

Lower your SLA

- Adding more services
- Choosing free or non-SLA services

Raise your SLA

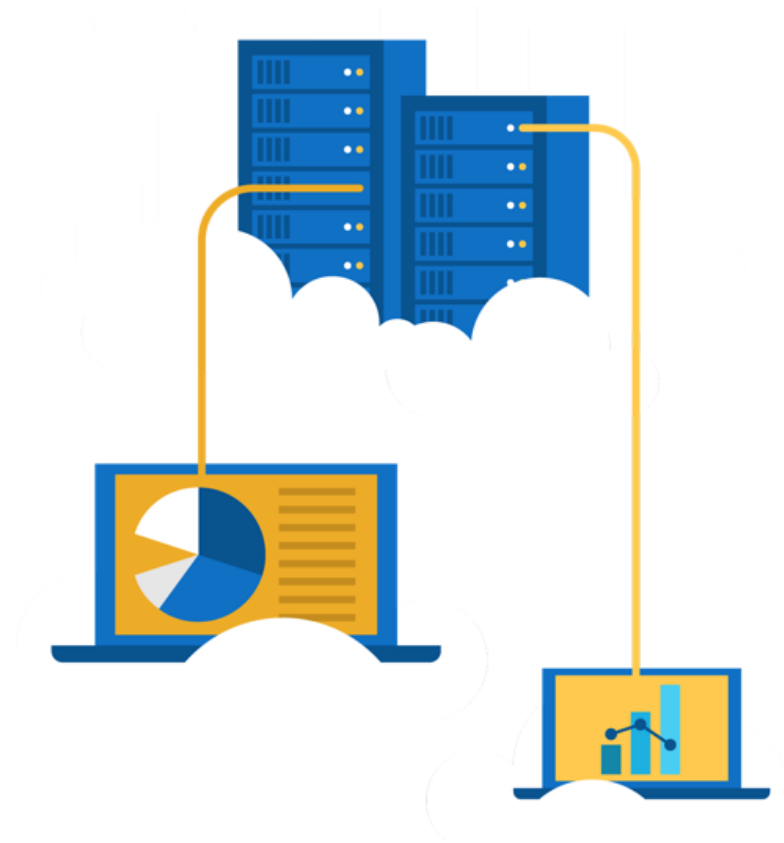
- Availability Zones
- Redundant systems

Many factors can raise or lower your SLA. Design decisions based on business goals will drive your SLA goals.

Walkthrough - Calculate a Composite SLA

Determine services SLA uptime percentages and then calculate the application composite SLA uptime percentage.

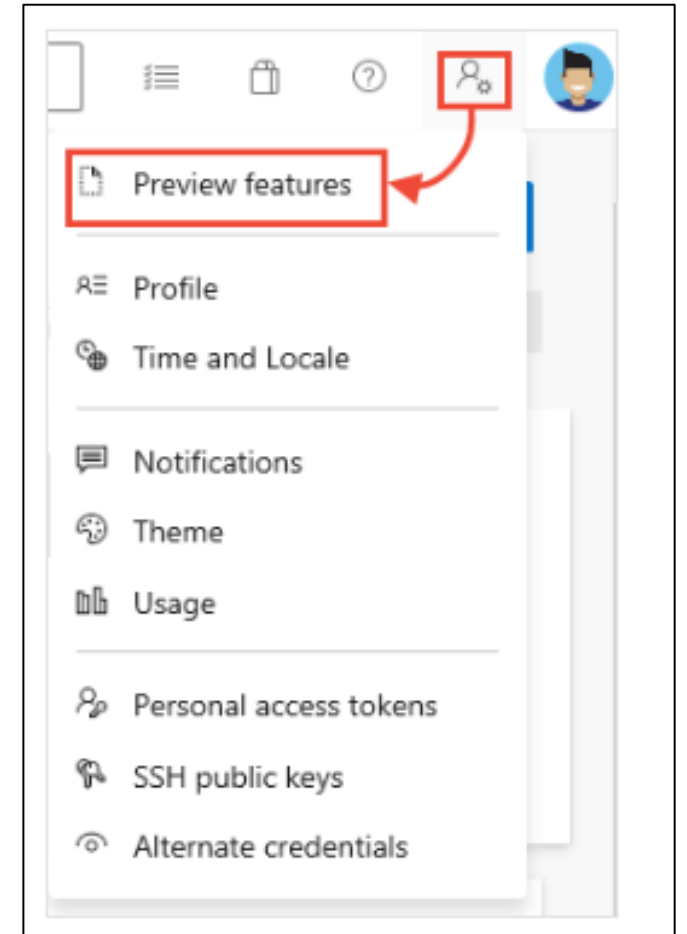
1. Determine the SLA uptime percentage values for an application.
2. Calculate the Application Composite SLA percentage uptime.



Azure Preview Program

With Azure previews, users can test beta and other pre-release features, products, services, software, and regions to provide feedback.

- **Public Preview:** all Azure customers can evaluate the new features
- **Generally available (GA):** after public preview is completed, all customers can use the feature, and region availability will vary.




Monitoring service and feature updates

- Azure updates provides information about the Azure products, services, and features, in addition to product roadmaps and availability.
- View details about all Azure updates and their status.
- Browse and search for updates.
- Subscribe to Azure update notifications by RSS.

Azure updates


Get the latest updates on Azure products and features to meet your cloud investment needs. Sign up for notifications to stay informed.


 RSS feed


Search all updates

Keyword Search

Status:


☐  NOW AVAILABLE

☐  IN PREVIEW

☐  IN DEVELOPMENT

Updates

[Release of new Azure CDN \(Microsoft Standard\) capability](#)

 IN PREVIEW

The Azure CDN service, a distributed network of servers that can efficiently deliver web content supports multiple origins.

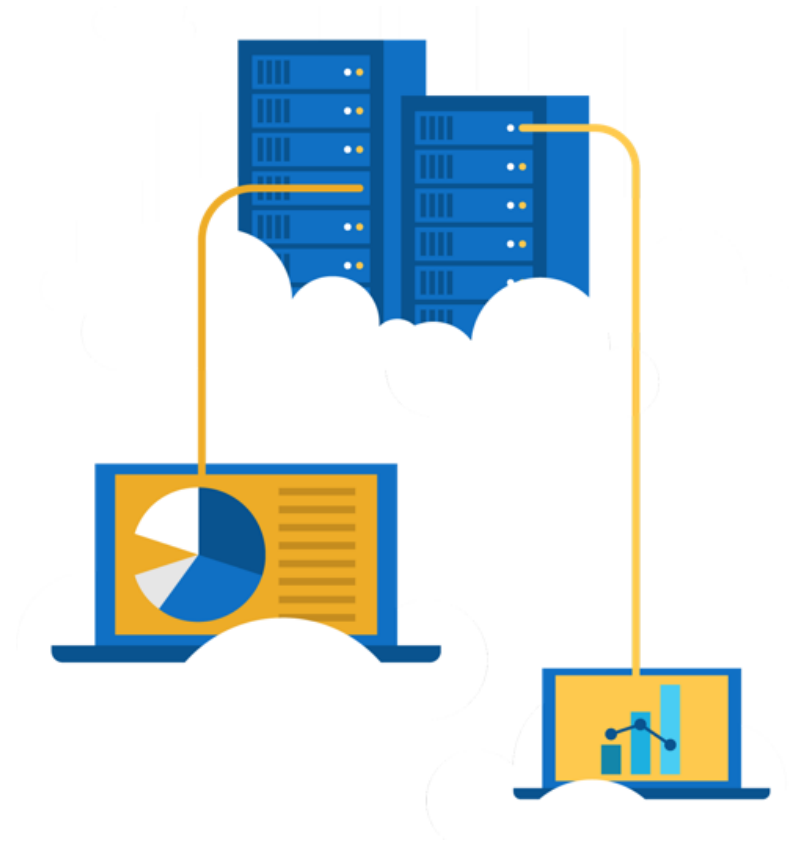
Content Delivery Network

Services

Walkthrough - Access Azure Preview features

Access and identify Azure preview services and features and view the latest Azure updates information.

1. Access preview services and features.
2. Review the Azure updates page.



Module 06 Review



Microsoft Learn Modules
(docs.microsoft.com/Learn)

- Factors affecting costs
- Recognize Azure Cost Management
- Azure Service Level Agreement (SLA)
- Factors impacting SLAs
- Azure product and feature lifecycle