AZ-900 Microsoft Azure Fundamentals

Scott Duffy, Instructor
Microsoft Azure Fundamentals

“foundational level knowledge of cloud services and how those services are provided with Microsoft Azure”
Microsoft Azure Fundamentals

- Candidates with non-technical backgrounds
- Candidates with a technical background who have a need to validate their foundational level knowledge around cloud services
Microsoft Azure Fundamentals

- Understand cloud concepts
- Understand core Azure services
- Understand security, privacy, compliance and trust
- Understand Azure pricing and support
You’ll be prepared to take an pass the AZ-900 exam
But you don’t have to, if you just want to learn cloud concepts
What is the Cloud?
There is no cloud
it's just someone else's computer
The ability to rent computing resources - on demand
What Computing Resources?

Virtual Machines
Unlimited Storage
Databases
Queues
Content Delivery Network
Batch Processing Jobs
What Computing Resources?

Big Data - Hadoop
Media Services
Machine Learning
Chat Bots
Cognitive Services
1000+

Azure Service options
Exam AZ-900

Microsoft Azure Fundamentals

$99.00 USD*

Not in United States?

Are you a student?

SCHEDULE EXAM

Fulfills requirements for Microsoft Certified Azure Fundamentals

With Microsoft Certification, technology professionals are more likely to get hired, demonstrate clear business impact, and advance their careers.

ABOUT THE CERTIFICATION

This exam may be available in your country for online proctored delivery. Learn more.

Convince your boss
Understand Cloud Concepts (15-20%)
Understand Cloud Concepts (15-20%)

Describe the benefits and considerations of using cloud services
- Understand terms such as High Availability, Scalability, Elasticity, Agility, Fault Tolerance, and Disaster Recovery
- Understand the principles of economies of scale
- Understand the differences between Capital Expenditure (CapEx) and Operational Expenditure (OpEx)
- Understand the consumption-based model

Describe the differences between Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS) and Software-as-a-Service (SaaS)
- Describe Infrastructure-as-a-Service (IaaS)
- Describe Platform-as-a-Service (PaaS)
- Describe Software-as-a-Service (SaaS)
- Compare and contrast the three different service types

Describe the differences between Public, Private and Hybrid cloud models
- Describe Public cloud
- Describe Private cloud
- Describe Hybrid cloud
- Compare and contrast the three different cloud models

Understand Core Azure Services (30-35%)

Understand the core Azure architectural components
High Availability
Expressed as a percentage, it’s the ability of a system to respond to users
99.99%

Four nines, 4 minutes per month
Scalability
The ability of a system to handle growth of users or work
Elasticity
The ability of a system to automatically grow and shrink based on application demand
Agility
The ability to change rapidly based on changes to market or environment
Fault Tolerance
The ability of a system to handle faults like power, networking, or hardware failures
Disaster Recovery
The ability of a system to recover from failure within a period of time, and how much data is lost.
Economies of Scale
It’s cheaper for Microsoft to run a server than you can ever achieve yourself
Capital Expenditure (CapEx) and Operational Expenditure (OpEx)
CapEx is money invested in assets (like computers) that return investment over time.
OpEx is money spent every day on operating expenses
Consumption-Based Model
Pay per minute
Pay per hour
Pay per execution
Infrastructure-as-a- Service (IaaS)
Virtual machines, networking, load balancers, firewalls
Platform-as-a-Service (PaaS)
Upload code packages and have them run, without access to the hardware
Software-as-a-Service (SaaS)
Access to configuration only
Compare and Contrast
Public cloud
Computing services offered over the public Internet; anyone can sign up.
Private cloud
Computing services offered to only select users; internal or corporate cloud
Hybrid cloud
Combination of public and private clouds; scale private infrastructure to the cloud
Compare and Contrast
Public vs private vs hybrid
Understand Core Azure Services (30-35%)
Understand Core Azure Services (30-35%)

Understand the core Azure architectural components

- Describe Regions
- Describe Availability Zones
- Describe Resource Groups
- Describe Azure Resource Manager
- Describe the benefits and usage of core Azure architectural components

Describe some of the core products available in Azure

- Describe products available for Compute such as Virtual Machines, Virtual Machine Scale Sets, App Service and Functions
- Describe products available for Networking such as Virtual Network, Load Balancer, VPN Gateway, Application Gateway and Content Delivery Network
- Describe products available for Storage such as Blob Storage, Disk Storage, File Storage, and Archive Storage
- Describe products available for Databases such as CosmosDB, Azure SQL Database, Azure Database Migration service, and Azure SQL Data Warehouse
- Describe the Azure Marketplace and its usage scenarios

Describe some of the solutions available on Azure

- Describe Internet of Things (IoT) and products that are available for IoT on Azure such as IoT Fundamentals, IoT Hub and IoT Central
- Describe Big Data and Analytics and products that are available for Big Data and Analytics such as SQL Data Warehouse, HDInsight and Data Lake Analytics
- Describe Artificial Intelligence (AI) and products that are available for AI such as Azure Machine Learning Service and Studio
- Describe Serverless computing and Azure products that are available for serverless computing such as Azure Functions, Logic Apps and App grid
- Describe the benefits and outcomes of using Azure solutions

Understand Azure management tools

- Understand Azure tools such as Azure CLI, PowerShell, and the Azure Portal
- Understand Azure Advisor

Understand Security, Privacy, Compliance, and Trust (30-35%)

Understand securing network connectivity in Azure
Regions
Regions - not all accessible by everyone
54 regions worldwide  140 available in 140 countries

* Two Azure Government Secret region locations undisclosed
Availability Zones
Resource Groups
Azure Resource Manager (ARM)
Core Azure architectural components
Compute

Virtual Machines

Virtual Machine Scale Sets

App Service

Functions
Networking

Virtual Network
Load Balancer
VPN Gateway
Application Gateway
Content Delivery Network
Storage

Azure Storage - Blob, File, Table, Queue

Managed Disk

Backup and Recovery Storage
Databases

Cosmos DB

Azure SQL Database

Azure Database Migration service

Azure SQL Data Warehouse
Azure Marketplace
Internet of Things (IoT)

IoT Fundamentals

IoT Hub

IoT Central
Big Data and Analytics

SQL Data Warehouse

HDInsight

Data Lake Analytics
Artificial Intelligence (AI)

Azure Machine Learning Service

Studio
Serverless

Azure Functions

Logic Apps

App grid
Azure Tools

Azure CLI
PowerShell
Azure Portal
Azure Advisor
You can customize Advisor to process recommendations for resources that matter to you the most.
You can optimize underutilized virtual machines to reduce your monthly Azure spend.
You can improve the performance of your SQL Azure databases.
You can enable virtual machine backup to protect your data from corruption or accidental deletion.
Understand Security, Privacy, Compliance, and Trust (25-30%)
Understand Security, Privacy, Compliance, and Trust (30-35%)

Understand securing network connectivity in Azure
- Describe Azure Firewall
- Describe Azure DDoS Protection
- Describe Network Security Group (NSG)
- Choose an appropriate Azure security solution

Describe core Azure Identity services
- Understand the difference between authentication and authorization
- Describe Azure Active Directory
- Describe Azure Multi-Factor Authentication

Describe security tools and features of Azure
- Describe Azure Security
- Understand Azure Security center usage scenarios
- Describe Key Vault
- Describe Azure Information Protection (AIP)
- Describe Azure Advanced Threat Protection (ATP)

Describe Azure governance methodologies
- Describe Azure Policies
- Describe Initiatives
- Describe Role-Based Access Control (RBAC)
- Describe Locks
- Describe Azure Advisor security assistance

Understand monitoring and reporting options in Azure
- Describe Azure Monitor
- Describe Azure Service Health
- Understand the use cases and benefits of Azure Monitor and Azure Service Health

Understand privacy, compliance and data protection standards in Azure
- Understand industry compliance terms such as GDPR, ISO and NIST
- Understand the Microsoft Privacy Statement
- Describe the Trust center
- Describe the Service Trust Portal
- Describe Compliance Manager
- Determine if Azure is compliant for a business need
- Understand Azure Government services
- Understand Azure Germany services
Azure Firewall
Azure DDoS Protection
<table>
<thead>
<tr>
<th>Feature</th>
<th>Basic</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always on monitoring</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Automatic mitigation for L3/L4 attacks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L7 Protection with Application Gateway Web application firewall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Globally deployed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protection policies tuned to your VNet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Logging, alerting, and telemetry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resource cost scale protection</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Network Security Group (NSG)
Choose an appropriate Azure security solution
All virtual network subnets should use NSG
It’s a strong lock on windows and doors that you don’t use.
DDoS - as needed or after attacked
Application Gateway with WAF
Security through layers
The difference between Authentication and Authorization
Authentication is a user proving who they are - user id and password
Authorization is ensuring that a user is permitted to perform an action.
Move away from all authenticated users having admin access
Azure Active Directory
Identity as a service (IDaaS)
Microsoft’s preferred solution for identity management
Complete solution for managing users, groups, roles
Single-sign on
Synchronize with your corporate AD
Azure Multi-Factor Authentication
First factor is your user id - might be easy to guess
Second factor is your password - hopefully hard to guess
(Also hopefully unique)
Third factor is that you have your phone on you.
SMS, authenticator app, phone call
Azure Security
Physical vs digital security
Shared security model
Azure AD
MFA
Role-Based Access Control (RBAC)
Layered approach
Security Layers

- Data - i.e. virtual network endpoint
- Application - i.e. API Management
- Compute - i.e. Limit Remote Desktop access, Windows Update
- Network - i.e. NSG, use of subnets, deny by default
- Perimeter - i.e. DDoS, firewalls
- Identity & access - i.e. Azure AD
- Physical - i.e. Door locks and key cards
Azure Security Center usage scenarios
Unified security management and advanced threat protection
Free tier and Standard tier
Key Vault
Central, secure repository for your secrets, certificates and keys
<table>
<thead>
<tr>
<th>NAME</th>
<th>TYPE</th>
<th>STATUS</th>
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</thead>
<tbody>
<tr>
<td>A37CA50C-C519-4605-8A73-5F67</td>
<td>Wrapped BEK</td>
<td></td>
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<tr>
<td>weather-service-api</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NAME</td>
<td>THUMBPRINT</td>
<td>STATUS</td>
</tr>
<tr>
<td>------------</td>
<td>-------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>azsjsfc-cert</td>
<td>61D304B7D8692F0CDF120C2C940...</td>
<td>Enabled</td>
</tr>
<tr>
<td>newsfckey</td>
<td>395F068B7972B75D5F09C7C82D6...</td>
<td>Enabled</td>
</tr>
</tbody>
</table>

There are no certificates available.
Administrator with Azure subscription creates and manages vault and keys

Azure Key Vault

URIs for keys

Azure developer

Usage logging for keys

Security administrator
Azure Information Protection (AIP)
Apply labels to emails and documents
i.e. Confidential, Super Confidential, Top Secret
Used to protect documents from being viewed, printed and/or shared
Azure Advanced Threat Protection (ATP)
Monitor and profile user behavior and activities
Protect user identities and reduce the attack surface
Identify suspicious activities and advanced attacks
Investigate alerts and user activities
Azure Policy
Governance
Create rules across all of your Azure resources
Evaluate compliance to those rules
Examples of Built-In Policies

● Require SQL Server 12.0
● Allowed Storage Account SKUs
● Allowed Locations
● Allowed Virtual Machine SKUs
● Apply tag and its default value
● Not allowed resource types
Can create custom policies using JSON definition
Policy Initiatives
A set of policies, grouped together
“Every resource and resource group must have these five tags.”
10 policies that need to be enforced
Grouped together as a policy initiative
Role-Based Access Control (RBAC)
Microsoft recommended solution for access control
Create roles that represent the common tasks of the job
Accountant
Developer
Business Lead
Assign granular permissions to that role
Assign users to that role
Do not assign granular permissions to an individual
Locks
Read Only
Can Not Delete
Add lock

Lock name: dontdeleteme
Lock type: Delete

Notes:
This is needed for production processes

[OK] [Cancel]
Using RBAC, you can restrict who has access to locks
Azure Advisor security assistance
**Your recommendations have been loaded**

**Subscriptions:** Pay-As-You-Go (Azure Courses) – Don’t see a subscription? Open Directory + Subscription settings

<table>
<thead>
<tr>
<th>IMPACT</th>
<th>DESCRIPTION</th>
<th>IMPACTED RESOURCES</th>
<th>UPDATED</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Enable Network Security Groups on subnets</td>
<td>1 Subnet</td>
<td>5/30/2023 1:34:20</td>
</tr>
<tr>
<td>High</td>
<td>Require secure transfer to storage account</td>
<td>4 Storage accounts</td>
<td>5/30/2023 1:34:20</td>
</tr>
<tr>
<td>Medium</td>
<td>Restrict access to App Services (Preview)</td>
<td>3 App services</td>
<td>5/30/2023 1:34:20</td>
</tr>
<tr>
<td>Low</td>
<td>Enable diagnostic logs in Key Vault</td>
<td>2 Key vaults</td>
<td>5/30/2023 1:34:20</td>
</tr>
</tbody>
</table>

Your security experience may be limited. Click here to learn more.
Secure transfer to storage accounts should be enabled

Description

Secure transfer is an option that forces your storage account to accept requests only from secure connections (HTTPS). Use of HTTPS ensures authentication between the server and the service and prevents data in transit from network layer attacks such as man-in-the-middle, eavesdropping, and session-hijacking.

General Information

- Recommendation score: 0/20
- Recommendation impact: +20
- User impact: Low
- Implementation cost: Low

Threats

- Data exfiltration
- Data spillage
- Threat resistance

Remediation steps

To enable secure transfer required:
1. In your storage account, go to the 'Configuration' page.
Secure transfer to storage accounts should be enabled

Remediation steps
To enable secure transfer required:
1. In your storage account, go to the 'Configuration' page.
2. Enable 'Secure transfer required'.

Unhealthy resources 4  Healthy resources 0

Unhealthy resources (4)  Healthy resources (0)  Unscanned resources (0)

Search storage accounts

<table>
<thead>
<tr>
<th>NAME</th>
<th>SUBSCRIPTION</th>
</tr>
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<tbody>
<tr>
<td>softwarearchitectca</td>
<td>Pay-As-You-Go (Azure Courses)</td>
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<tr>
<td>aazsjdevlab4658</td>
<td>Pay-As-You-Go (Azure Courses)</td>
</tr>
<tr>
<td>cs27ad168afd6a9x4286xa21</td>
<td>Pay-As-You-Go (Azure Courses)</td>
</tr>
<tr>
<td>d6on4cg442sjgstorage</td>
<td>Pay-As-You-Go (Azure Courses)</td>
</tr>
</tbody>
</table>
Azure Monitor
Azure Service Health
No service issues found

See 1 resolved service issues in the last 24 hours, or see all past issues in the health history.
### Summary

**Summary of impact:** Between 07:50 and 08:36 UTC on 22 May 2019, a subset of customers may have experienced connectivity issues when accessing Azure services in North Europe.

**Root Cause:** During this incident, approximately 12% of the network flows in or out of a single row of servers in a data center in North Europe would have failed.

Each row of servers in an Azure data center (DC) is connected to the DC network spine by eight routers. During this incident, one of the eight routers in a single row of a DC in North Europe began dropping all packets that it was expected to forward. Flows are spread over the eight routers, so flows sent to this one router would have been dropped.
Azure Monitor vs Azure Service Health
Azure Monitor collects all the data for you to analyze and create alerts on.
Specific to your application, your actions
Azure Service Health are general alerts across all of Azure
Compliance terms such as GDPR, ISO and NIST
Many different standards for technology across the world
Microsoft claims to be in compliance with many of them
And has tools to help you be in compliance with others
General Data Protection Regulation (GDPR)

GDPR is a new set of rules designed to give EU citizens more control over their personal data.

Affects companies outside of the EU that handle EU citizen’s data.

Data has to be collected legally under strict conditions.

Data has to be protected against misuse.

Reporting obligations if data is mishandled.
ISO - International Organization for Standardization

<table>
<thead>
<tr>
<th>Certification</th>
<th>Azure</th>
<th>Azure Government</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSA STAR Certification</td>
<td>✓</td>
<td>✓ (new)</td>
</tr>
<tr>
<td>ISO 27001:2013</td>
<td>✓</td>
<td>✓ (new)</td>
</tr>
<tr>
<td>ISO 27017:2015</td>
<td>✓</td>
<td>✓ (new)</td>
</tr>
<tr>
<td>ISO 27018:2014</td>
<td>✓</td>
<td>✓ (new)</td>
</tr>
<tr>
<td>ISO 20000-1:2011</td>
<td>✓ (new)</td>
<td>✓ (new)</td>
</tr>
<tr>
<td>ISO 22301:2012</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>ISO 9001:2015</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>
ISO 9001:2015 is for Quality Management Systems (QMS)
ISO/IEC 20000-1:2011 is for Service Management Systems (SMS)
NIST Cybersecurity Framework (CSF)

National Institute of Standards and Technology (NIST)

Audited for compliance to security and privacy processes
NIST Cybersecurity Framework (CSF)

Microsoft Cloud Services meet the National Institute of Standards and Technology (NIST) Cybersecurity Framework (CSF).

Microsoft and the NIST CSF

NIST Cybersecurity Framework (CSF) is a voluntary Framework that consists of standards, guidelines, and best practices to manage cybersecurity-related risks. Microsoft Cloud services have undergone independent, third-party FedRAMP Moderate and High Baseline audits and are certified according to the FedRAMP standards. Additionally, through a validated assessment performed by HITRUST, security and privacy standards development and accreditation organization, Office 365 is certified to the objectives specified in the NIST CSF.

Learn how to accelerate your NIST Cybersecurity Framework deployment with Compliance Manager and our Azure Security and Compliance Blueprint:

Download the Azure Security and Compliance Blueprint - NIST CSF Risk Assessment Checklist > Learn more about the NIST CSF assessment for Office 365 in Compliance Manager >
Microsoft Privacy Statement
Your privacy is important to us. This privacy statement explains the personal data Microsoft processes, how Microsoft processes it and for what purposes.

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Trust center
Microsoft Azure

Now you can take advantage of the latest security, privacy, and compliance features of Microsoft Azure. In this site, you'll learn about the trusted cloud, how your data is stored and accessed, and our comprehensive approach to securing your IT environment.

About Microsoft Azure

Microsoft Azure is a cloud computing platform that features a growing collection of integrated cloud services—analytics, computing, database, mobile, networking, storage, and web. Azure includes integrated tools, pre-built templates, and managed services that make it easier to build and manage enterprise, mobile, web, and Internet of Things (IoT) apps faster, using skills you have and technologies you already know.

We understand that some organizations are still wary about cloud computing; keeping data confidential is essential for any organization. That's why Microsoft has made an industry-leading commitment to the protection and privacy of your data. We were the first cloud provider recognized by the European Union's data protection authorities for our commitment to rigorous EU privacy laws. Microsoft was also the first major cloud provider to adopt the new international cloud privacy standard, ISO 27018.

Azure safeguards customer data in the cloud and provides support for companies that are bound by extensive regulations regarding the use, transmission, and storage of customer data.

Azure Security Documentation ➤
Get the information you need
Service Trust Portal
Compliance Manager

Compliance Manager makes it easy to perform risk assessments of Microsoft's cloud services. Use Compliance Manager to manage your organization's compliance activities from implementation to reporting.

Pen Tests & Security Assessments

View reports from independent third-party penetration tests and security assessments of Microsoft's cloud services.

Azure Blueprints

Define a repeatable set of Azure resources that implement and adhere to your organization's standards, patterns, and requirements and rapidly build new environments with a set of built-in components to speed up development and delivery.

White Papers, FAQs, & Compliance Guides

Review the wealth of available security implementation and design information with the goal of making it easier for you to meet regulatory compliance objectives by understanding how Microsoft Cloud services keep your data secure.
Compliance Manager
workflow-based risk assessment tool ... to help you manage regulatory compliance
Compliance Manager

Assessments

Default Group
Office 365 - GDPR

Compliance Score
243 of 568

Actions
Created 3/26/2018
Modified 4/6/2018

Customer Managed Actions
0 of 61

Microsoft Managed Actions
48 of 48

Default Group
Office 365 - NIST 800-53

Compliance Score
417 of 562

Actions
Created 3/26/2018
Modified 4/6/2018

Customer Managed Actions
0 of 215

Microsoft Managed Actions
760 of 760
Azure Government services
Separate account
For US government agencies - federal, state and local
Department of Defence (DoD) has its own too
Isolated data centers separate from the Azure public cloud
Meets standards specific to government
FedRAMP, NIST 800.171 (DIB), ITAR, IRS 1075, DoD L4, and CJIS
Different URLs for connecting to storage, functions, etc.
Azure Germany services
Separate account
Data remains in Germany
Strictest EU data protection
German Data trustee
START HERE
Understand Azure Pricing and Support (25-30%)
Understand Azure Pricing and Support (25-30%)

Understand Azure subscriptions
- Describe an Azure Subscription
- Understand the uses and options with Azure subscriptions

Understand planning and management of costs
- Understand options for purchasing Azure products and services
- Understand options around Azure Free account
- Understand the factors affecting costs such as resource types, services, locations, ingress and egress traffic
- Understand Zones for billing purposes
- Understand the Pricing calculator
- Understand the Total Cost of Ownership (TCO) calculator
- Understand best practices for minimizing Azure costs such as performing cost analysis, creating spending limits and quotas, and using tags to identify cost owners; use Azure reservations; use Azure Advisor recommendations
- Describe Azure Cost Management

Understand the support options available with Azure
- Understand support plans that are available such as Dev, Standard, Professional Direct and Premier
- Understand how to open a support ticket
- Understand available support channels outside of support plan channels
- Describe the Knowledge Center

Describe Azure Service Level Agreements (SLAs)
- Describe a Service Level Agreement (SLA)
- Determine SLA for a particular Azure product or service

Understand service lifecycle in Azure
- Understand Public and Private Preview features
- Understand how to access Preview features
- Understand the term General Availability (GA)
- Monitor feature updates
Azure Subscription
Subscription is a billing unit
Users have access to one or more subscriptions, with different roles.
All resources consumed by a subscription will be billed to the owner
Can be used to organize resources into completely distinct accounts
Management groups
Purchasing Azure products and services
Purchase from Microsoft

- Pay as you go
- Enterprise Agreement
Negotiated Minimum Spend Annual Custom Prices
Purchase from a Microsoft Partner

- Microsoft Cloud Solution Provider (CSP)
Azure Free account
http://azure.microsoft.com/free
US $200 credit for the first 30 days
12 months of free services
Some services are always free
Factors affecting costs
Different services are billed based on different factors
Free services
Free services

Resource groups
Virtual network (up to 50)
Load balancer (basic)
Azure Active Directory (basic)
Network security groups
Free-tier web apps (up to 10)
kilowatt hours (kWh)
Pay per usage
(consumption model)
Opportunity for cost savings

Azure Functions:

- 1 million executions free per month
- $0.20 per million executions
- Cheapest virtual machine is $20 per month
Pay per usage services

Functions
Logic Apps
Storage (pay per GB)
Outbound bandwidth
Cognitive Services API
Pay for time (per second)
Per second billing means billing stops when the VM is stopped.
Stability in pricing

Pay a fixed price per month for computing power or storage capacity

Whether you use it or not

Discounts for 1-year or 3-year commitment in VM (Reserved Instances)

Multi-tenant or isolated environment
Pay for bandwidth
First 5 GB is free
Inbound data is free
Bandwidth costs

Outbound data, $0.05 to $0.087 / GB for Zone 1 (NA and EU w/o Germany)
Outbound data, $0.057 to $0.10 / GB for DE Zone 1 (Germany)
Outbound data, $0.08 to $0.12 / GB for Zone 2 (Asia, Africa and Oceania)
Outbound data, $0.16 to $0.181 / GB for Zone 3 (Brazil)

(Availability zone pricing is different)
1 PB of data transfer = $52,000
Zones for billing purposes
Zone is a geographical grouping of Azure Regions for billing purpose
Zone 1

United States, Europe, Canada, UK, France
Zone 2

Asia Pacific, Japan, Australia, India, Korea
Zone 3

Brazil South
DE Zone 1

Germany Central, Germany Northeast
Pricing calculator
Estimates are hard to make 100% accurate
Configurable Options

Region

Tier

Subscription Type

Support Options

Dev/Test Pricing
Export and share the estimate
Total Cost of Ownership (TCO) calculator
The cost of a server is more than just the cost of the hardware.
Other costs

- Electricity
- Cooling
- Internet connectivity
- Rack space
- Setup labor
- Maintenance labor
- Backup
https://azure.microsoft.com/en-ca/pricing/tco/calculator/
Best practices for minimizing Azure costs
Azure Advisor cost tab
Auto shutdown on dev/qa resources
Utilize cool/archive storage where possible
Reserved instances
Configure alerts when billing exceeds an expected level.
Use Policy to restrict access to certain expensive resources
Auto scaling resources
Downsize when resources over-provisioned
Ensure every resource has an owner (tags)
Azure Cost Management
Another free tool inside Azure to analyze spending
Analyze spending over time
Tracking against budgets
Schedule reports
Support plans
Levels of Azure Support

Basic - free and included in all plans
Developer - non-production environments
Standard - production environments
Professional Direct - business critical
Premier - multiple products, including Azure
Basic Support

Self-help support

Documentation

Azure Advisor recommendations

Service Health dashboard and Health API
Developer Support

Business hours access to support engineers via email

Unlimited contacts / cases

Sev C - Non-business critical

One day response time (< 8 hours)

General architectural guidance

$29 / month
Standard Support

24 x 7 access to support engineers by phone and email

Unlimited contacts / cases

Sev C support (< 8 hours), Sev B (< 4 hours), and Sev A (< 1 hour)

General architectural guidance

$100 / month
Professional Direct Support

24 x 7 access to support engineers by phone and email

Unlimited contacts / cases

Sev C support (< 8 hours), Sev B (< 4 hours), and Sev A (< 1 hour)

Architectural guidance on best practices

Onboarding and consultations

Delivery Manager

$1,000 / month
Premier Support

24 x 7 access to support engineers by phone and email

Unlimited contacts / cases

Sev C support (< 8 hours), Sev B (< 4 hours), and Sev A (< 1 hour, < 15 minutes)

Specific architectural support such as design reviews, performance tuning, etc

Technical account manager, including service reviews, reporting

On demand training

“Contact us”
Help

Visit the help and support center to create or track a support ticket and monitor health.

What's new
Azure roadmap
Launch guided tour
Keyboard shortcuts
Show diagnostics
### Link support benefits

<table>
<thead>
<tr>
<th>Azure</th>
<th>Marketplace</th>
</tr>
</thead>
</table>

**Subscription**

Pay-As-You-Go (Azure Courses) (7ad168af-d6a9-4286-a218-afc72...

Can't find your subscription? Show more ⚡

#### BASIC

- **Scope**: Billing and subscription support; online self-help
- **Customer Service and Communities**: 24x7 access to customer service, documentation, whitepapers, and support forums
- **Best Practices**: Access to full set of Azure Advisor recommendations
- **Health Status and Notifications**: Access to personalized Service Health Dashboard & Health API

#### DEVELOPER

- **Scope**: Trial and non-production environments
- **Customer Service and Communities**: 24x7 access to customer service, documentation, whitepapers, and support forums
- **Best Practices**: Access to full set of Azure Advisor recommendations
- **Health Status and Notifications**: Access to personalized Service Health Dashboard & Health API

#### STANDARD

- **Scope**: Production workload environments
- **Customer Service and Communities**: 24x7 access to customer service, documentation, whitepapers, and support forums
- **Best Practices**: Access to full set of Azure Advisor recommendations
- **Health Status and Notifications**: Access to personalized Service Health Dashboard & Health API

#### PROFESSIONAL DIRECT

- **Scope**: Business-critical dependence
- **Customer Service and Communities**: 24x7 access to customer service, documentation, whitepapers, and support forums
- **Best Practices**: Access to full set of Azure Advisor recommendations
- **Health Status and Notifications**: Access to personalized Service Health Dashboard & Health API
Open a support ticket
Help

Visit the help and support center to create or track a support ticket and monitor health.

What's new
Azure roadmap
Launch guided tour
Keyboard shortcuts
Show diagnostics
Create a new support request to get assistance with billing, subscription, technical or quota management issues. Complete the Basics tab by selecting the options that best describe your problem. Providing detailed, accurate information can help to solve your issues faster. Looking for the old experience? Click here

* Issue type

Select an issue type

Billing
Service and subscription limits (quotas)
Subscription management
Technical
Available support channels
https://azure.microsoft.com/en-ca/resources/knowledge-center/
Am I billed separately for local disk storage?

No. All new virtual machines have an operating system disk and a local disk (or “resource disk”). We don’t charge for local disk storage. The operating system disk is charged at the regular rate for disks. See all virtual machines configurations.

Related questions and answers

+ How can I troubleshoot issues with a new VM deployment?
+ How do I diagnose and recover my Virtual Machines from boot failures?
+ How do I migrate IaaS resources from classic to Azure Resource Manager?
+ How do I plan for migration of IaaS resources from classic to Azure Resource Manager?
Service Level Agreement (SLA)
The Service Level Agreement (SLA) describes Microsoft’s commitments for uptime and connectivity. The SLA for individual Azure services are listed below.
SLA for Virtual Machines

Last updated: March 2018

- For all Virtual Machines that have two or more instances deployed across two or more Availability Zones in the same Azure region, we guarantee you will have Virtual Machine Connectivity to at least one instance at least 99.99% of the time.
- For all Virtual Machines that have two or more instances deployed in the same Availability Set, we guarantee you will have Virtual Machine Connectivity to at least one instance at least 99.95% of the time.
- For any Single Instance Virtual Machine using premium storage for all Operating System Disks and Data Disks, we guarantee you will have Virtual Machine Connectivity of at least 99.9%.

Introduction

General Terms

SLA details

Additional Definitions

“Availability Set” refers to two or more Virtual Machines deployed across different Fault Domains to avoid a single point of failure.

“Availability Zone” is a fault-isolated area within an Azure region, providing redundant power, cooling, and networking.
Preview features
Preview features are for “testing” and not production use
Could change significantly before it goes live
May not go live
Public and Private Preview
Public preview available to everyone
Private Preview requires registration
Announcing private preview of Azure VM Image Builder

Posted on 26 September, 2018

Daniel Sol, Program Manager, Azure Compute

Today I am excited to announce the private preview of Azure VM Image Builder, a service which allows users to have an image building pipeline in Azure. Creating standardized virtual machine (VM) images allow organizations to migrate to the cloud and ensure consistency in the deployments. Users commonly want VMs to include predefined security and configuration settings as well as application software they own. However, setting up your own image build pipeline would require infrastructure and setup. With Azure VM Image Builder, you can take an ISO or Azure Marketplace image and start creating your own golden images in a few steps.

How it works

Azure VM Image Builder lets you start with either a Linux-based Azure Marketplace VM or Red Hat Enterprise Linux (RHEL) ISO and begin to add your own customizations. Your customizations can be added in the form of a shell script, and because the VM Image Builder is built on HashiCorp Packer, you can also import your existing Packer shell provisioner scripts. As the last step, you specify where you would like your images hosted, either in the Azure Shared Image Gallery or as an Azure Managed Image. See below for a quick video on how to create a custom image using the VM Image Builder.
Azure VM Image Builder – Private Preview Signup

Thank you for your interest in the Azure VM Image Builder. Please sign up for the private preview and we will get back to you.

* Required

1. Name *

Enter your answer
General Availability (GA)
Web Application Firewall (WAF) for Azure Front Door service is now generally available.

Web Application Firewall (WAF) for Azure Front Door service is now generally available. Customers can use WAF to define security policies that allow, block, forward or rate limit access to their web applications delivered through Azure Front Door.

- A WAF security policy may consist of an ordered list of custom rules and Azure managed pre-configured rulesets.
- Custom rules are based on a combination of client IP addresses, geolocation, http parameters, request methods and size constraints.
- The pre-configured default rule set can be enabled to protect your applications from OWASP top 10 threats.
- New or updated WAF configurations are deployed globally within minutes, letting you respond quickly to changing attack patterns.
- WAF for Azure Front Door is integrated with Azure Monitor and the logs can be accessed through an Azure storage account, Azure Event Hub or Azure Log Analytics.

Along with the general availability of the service, we are also adding in preview a new Azure managed pre-configured ruleset, Bot Protection Ruleset, that can be enabled to block requests coming from malicious IPs based on Microsoft’s threats intelligence data feeds.

For more details, see WAF overview. To get started, follow WAF configuration guide.
Monitor feature updates
June 2019

1 Jun  Azure Monitor for Containers - Updates on Windows AKS Support, UI enhancement, and Node Storage Capacity
New features updates for Azure Monitor for Containers for Node Storage, Windows AKS support, and UI enhancements

May 2019

31 May  Web Application Firewall (WAF) for Azure Front Door service is now generally available
Web Application Firewall (WAF) for Azure Front Door service is now generally available. Customers can use WAF to define security policies that allow, block, forward or rate limit access to their web applications delivered through Azure Front Door.
AZ-900 Microsoft Azure Fundamentals

Scott Duffy, Instructor
Thank you and best of luck!