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Azure Cost Management in 90 Minutes

Decoding Azure Costs for Structure and Optimization



Reza Salehi



- Cloud Consultant and Trainer: **helping my clients to save on Azure costs!**
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- @zaalion



Microsoft Azure Fundamentals (AZ-900) Certification Course, 2nd Edition



4h 55m remaining

With your instructor

[Reza Salehi](#)

[+ Add to playlist](#)

Associated roles

Cloud native engineer

Cloud solutions architect

Cybersecurity engineer

Database administrator

[+1 more](#)

Skills covered

AZ-900: Microsoft Azure Fundamentals

AZ-303: Microsoft Azure Architect...

AZ-500: Microsoft Azure Security...

AI-900: Microsoft Azure AI Fundamentals



Includes quizzes

Test your knowledge during the course and with a final quiz.

 October 2024

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Learning Outcomes

- Gain knowledge of Azure cloud concepts and services
- Explore Azure services in greater depth
- Get ready for Exam AZ-900: Microsoft Azure Fundamentals
- Comfortably work with the Azure portal

The Microsoft Azure Fundamentals (AZ-900) exam is one of the most popular certifications for those who are just beginning to work with cloud-based solutions and services or who are new to Azure. The exam certifies knowledge of cloud concepts, Azure services, workloads, security and privacy, and pricing and support.

In this self-paced course, Reza Salehi will help you get familiar with Microsoft Azure's cloud services and begin your Azure certification journey. This course is aligned to the AZ-900 exam objective domains and has recently been updated to reflect the most current version of the exam (2024). It covers all the services and concepts in the Azure ecosystem you need to know in order to prepare for the test.

What you'll learn and how to apply it

By the end of this certification course, you will understand the following:

- General cloud concepts
- Core Azure services
- Core solutions and management tools on Azure
- General security and network security features
- Identity, governance, privacy, and compliance features
- Azure cost management and service-level agreements

Azure Cookbook

<https://learning.oreilly.com/library/view/azure-cookbook/9781098135782/>

<https://www.amazon.ca/Azure-Cookbook-Recipes-Maintain-Solutions/dp/1098135792/>

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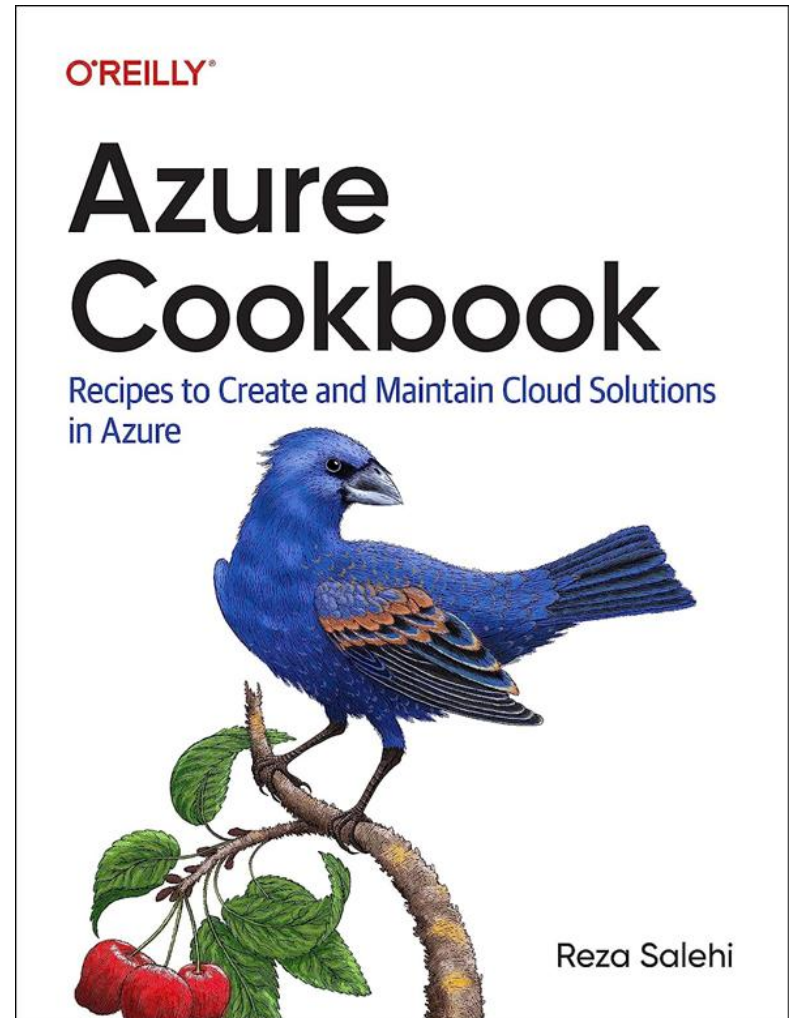
Azure Cookbook

Recipes to Create and Maintain Cloud Solutions
in Azure



Reza Salehi

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- <https://www.amazon.ca/Azure-Cookbook-Recipes-Maintain-Solutions/dp/1098135792/>
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Course GitHub Repository

<https://github.com/zaalion/Azure-Cost-Management>

Pulse Check: Have you used the Azure Pricing Calculator?



Course schedule and learning objectives

- Introduction
- Azure Pricing Models (fixed vs. pay-as-you-go vs. serverless)
- Azure Cost of Ownership Calculator
- Azure Pricing Calculator
- Factors that affect cost
- Q&A



Course schedule and learning objectives

- Right-sizing using metrics
- Azure Reservations
- Azure Saving Plans for Compute
- Azure Spot VMs
- Azure Hybrid Benefit for VMs
- Q&A



Course schedule and learning objectives

- Azure Cost Management portal
- Monitoring subscription cost
- Setting monthly budgets
- Q&A



Quiz: I have an unused Azure VM which is running 24/7. Do I get charged for this VM?

- Yes
- No



Quiz : I have an online Function App. No request has been made to this FA yet. Do I still need to pay?

- No
- Yes



Azure Pricing

- Azure Pricing Models (fixed vs. pay-as-you-go vs. serverless)
- Azure Cost of Ownership Calculator
- Azure Pricing Calculator
- Factors that affect cost



Azure Pricing Models

- **Fixed-cost:** you provision Azure resources, and you will be charged for those resources, whether you use them or not.
- **Pay-as-you-go (consumption-based / serverless):** You are only charged for what you use.



Fixed-price



App Services



Virtual Machines



Azure SQL Database



Consumption-based



Cognitive Services



Azure Function Apps
(Serverless tier)



Cosmos DB
(Serverless offering)

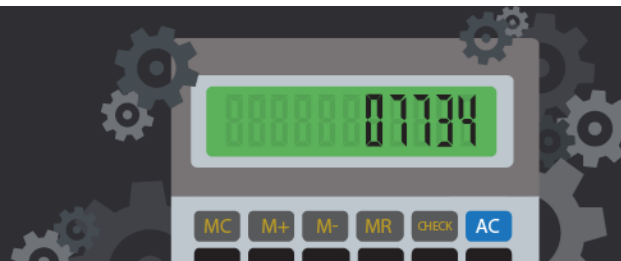


Azure SQL Database
(Serverless offering)

Azure Calculators

Pricing calculator

Calculate your estimated hourly or monthly costs for using Azure.



Total Cost of Ownership (TCO) Calculator

Estimate the cost savings you can realise by migrating your workloads to Azure



Azure Pricing Calculator

- Calculate your estimated hourly or monthly costs for using Azure
- Add multiple resources to the same session
- Export the results to Excel
- Save the results in your account
- Share a link to the calculation session



Total Cost of Ownership Calculator

- Estimate the cost savings by migrating your workloads to Azure
- Enter your on-premises workload details
- Get the cost for the same workload in Azure

SAMPLE

Over 5 year(s) with Microsoft Azure, your estimated cost savings could be as

much as **US\$98,315**



Factors Affecting Cost in Azure

- Resource type
- Resource location/region
- Resource pricing tier/size
- Storage
- Traffic
- Processed Data



Resource Type: Cosmos DB vs. Azure SQL

Azure Cosmos DB

DATABASE OPERATIONS:
Standard provisioned throughput (manual)

WRITE REGIONS:
Single Region Write (Single-Master)

☒ ENABLE ALWAYS-FREE QUANTITY

Savings Options

Save up to 65% on pay-as-you-go prices with 1 year or 3 year Reserved Capacity options.

☒ Pay as you go
☐ 1 year reserved capacity
☐ 3 year reserved capacity

\$23.36
Average per month
(\$0.00 charged upfront)

Request units per second (RU/s)

400
RU/s

×

730
Hours

Write Region:
East US

400
RU/s

×

730
Hours

×

\$0.008
Per 100 RU/s
per hour

☒ Availability
Zone

= \$23.36

Azure SQL Database

REGION:
East US

TYPE:
Single Database

BACKUP STORAGE TIER:
RA-GRS

PURCHASE MODEL:
vCore

SERVICE TIER:
General Purpose

COMPUTE TIER:
Provisioned

HARDWARE TYPE:
Standard-series (Gen 5)

INSTANCE:
4 vCore

Compute

REDUNDANCY:
Locally Redundant

1
Databases

×

730
Hours

Savings Options

Save up to 73% on pay as you go prices with 1 year or 3 year reserved options.

Compute

☒ Pay as you go
☐ 1 year reserved
☐ 3 year reserved

\$444.47
Average per month
(\$0.00 charged upfront)

SQL License

☒ Pay as you go
☐ Azure Hybrid Benefit

\$291.90
Average per month
(\$0.00 charged upfront)

= \$736.37
Average per month
(\$0.00 charged upfront)

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

21



Resource Location/Region: Cosmos DB

Azure Cosmos DB

DATABASE OPERATIONS:
Standard provisioned throughput (manual)

WRITE REGIONS:
Single Region Write (Single-Master)

☒ ENABLE ALWAYS-FREE QUANTITY ⓘ

Savings Options

Save up to 65% on pay-as-you-go prices with 1 year or 3 year Reserved Capacity options.

☒ Pay as you go

☐ 1 year reserved capacity

☐ 3 year reserved capacity

\$23.36

Average per month
(\$0.00 charged upfront)

Request units per second (RU/s) ⓘ

RU/s × Hours

Write Region:

RU/s × Hours × Per 100 RU/s per hour ☒ Availability Zone

= \$23.36

Azure Cosmos DB

DATABASE OPERATIONS:
Standard provisioned throughput (manual)

WRITE REGIONS:
Single Region Write (Single-Master)

☒ ENABLE ALWAYS-FREE QUANTITY ⓘ

Savings Options

Save up to 65% on pay-as-you-go prices with 1 year or 3 year Reserved Capacity options.

☒ Pay as you go

☐ 1 year reserved capacity

☐ 3 year reserved capacity

\$29.20

Average per month
(\$0.00 charged upfront)

Request units per second (RU/s) ⓘ

RU/s × Hours

Write Region:

RU/s × Hours × Per 100 RU/s per hour ☒ Availability Zone

= \$29.20



Resource Pricing Tier/Size: Cosmos DB

Azure Cosmos DB

DATABASE OPERATIONS:
Standard provisioned throughput (manual)

WRITE REGIONS:
Single Region Write (Single-Master)

ENABLE ALWAYS-FREE QUANTITY

Savings Options

Save up to 65% on pay-as-you-go prices with 1 year or 3 year Reserved Capacity options.

☒ Pay as you go
☐ 1 year reserved capacity
☐ 3 year reserved capacity

\$23.36
Average per month
(\$0.00 charged upfront)

Request units per second (RU/s)

400

RU/s

x

730

Hours

Write Region:
East US

400

RU/s

x

730

Hours

x

\$0.008

Per 100 RU/s

per hour

Availability Zone

= \$23.36

Azure Cosmos DB

DATABASE OPERATIONS:
Standard provisioned throughput (manual)

WRITE REGIONS:
Multiple Region Write (Multi-Master)

ENABLE ALWAYS-FREE QUANTITY

Savings Options

Save up to 65% on pay-as-you-go prices with 1 year or 3 year Reserved Capacity options.

☒ Pay as you go
☐ 1 year reserved capacity
☐ 3 year reserved capacity

\$46.72
Average per month
(\$0.00 charged upfront)

Request units per second (RU/s)

400

RU/s

x

730

Hours

Primary Write Region:
East US

400

RU/s

x

730

Hours

x

\$0.016

Per 100 RU/s

per hour

= \$46.72



Storage Taken: Cosmos DB

Storage

Transactional Storage

GB

= \$0.25

Storage

Transactional Storage

GB

= \$1.25



Processed Data – Azure Firewall

Data processed

100	GB	▼
-----	----	---

= \$1.60

Data processed

200	GB	▼
-----	----	---

= \$3.20



Q&A





Break



Poll : Your organization needs a Linux VM (production) for the next three years. Which option saves you the most money?

- Azure Spot VMs
- Saving Plan for Compute
- Reservation
- Hybrid Benefits for Windows Service



Poll : You have several Windows Server licenses. Can you use them with Azure Windows VMs to get a discount?

- Yes
- No



Strategies to Save Cost

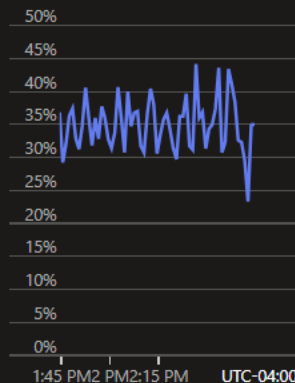
- Right-sizing using metrics
- Use Auto-scaling when possible
- Azure Advisor cost optimization recommendations
- Azure Reservations
- Azure Saving Plans for Compute
- Azure Spot VMs
- Azure Hybrid Benefit for VMs



Right-sizing Using Metrics: App Service Plan

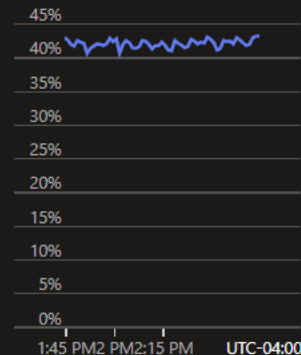
Name	ACU/vCPU	vCPU	Memory (GB)
Standard S3	100	4	7

CPU Percentage



CPU Percentage (Avg), iws-prod-ap

Memory Percentage



Memory Percentage (Avg), iws-proc



Auto-scaling: App Service Plan

Delete warning

The very last or default recurrence rule cannot be deleted. Instead, you can disable autoscale to turn off autoscale.

Scale mode

☒ Scale based on a metric

☐ Scale to a specific instance count

Rules

Scale out

When

(Average) CpuPercentage > 70

Increase count by 1

Scale in

When

(Average) CpuPercentage < 40

Decrease count by 1

+ Add a rule

Instance limits

Minimum * ⓘ

Maximum * ⓘ

Default * ⓘ

2

✓

5

✓

2

✓

Schedule

This scale condition is executed when none of the other scale condition(s) match

Azure Advisor Cost Optimization Recommendations

Dashboard > Advisor

Advisor | Cost

Search

- Overview
- Getting started
- Advisor score
- Workbooks
- Assessments (Preview)

Recommendations

- Cost

Feedback Download as CSV Download as PDF Create alert Create recommendation digest

and optimization capabilities, visit Cost Management

Impact ↑	Description	Potential yearly savings based ... ↑↓	Impact
High	Consider virtual machine reserved instance to save over your on-demand costs	USD 1 Subse	
High	Purchasing a savings plan for compute could unlock lower prices	USD 1 Subse	
High	Consider Azure Data Explorer reserved instance to save over your on-demand costs	USD 1 Subse	



Azure Reservations

- Azure Reservations help you save money if you commit to **one-year** or **three-year** plans.
- “Reduce your resource costs by up to 72% from pay-as-you-go prices.”
- Don't affect the runtime state of your resources

Type ↑↓	Product name ↑↓	Region ↑↓	Renewal ↑↓	Quantity ↑↓	Last Da... ↑↓	7-day ...
Virtual machine	standard_e2-1-5	Central US	Off	16	100%	100%
Virtual machine	Standard_D2	Central US	Off	10	100%	100%
Azure Data Explorer	Azure_...	Global	Off	20	100%	100%
App Services	Azure_A...	Central US	Off	3	100%	100%



Azure Saving Plans for Compute

- It provides savings up to 65% off pay-as-you-go pricing
- When you commit to spend a fixed hourly amount on compute services
- For one or three years.
- Covers:
 - Virtual Machines
 - Azure Dedicated Hosts
 - Container Instances
 - Azure Container Apps
 - Azure Premium Functions
 - Azure App Services
 - Azure Spring Apps / Azure Spring Apps Enterprise



VM Only: Use Spot Virtual Machines

- Take advantage of Azure's unused capacity at a reduced cost.
- The amount of available capacity varies based on size, region, etc.
- You set a maximum price for the Spot VM
- VMs can be evicted based on capacity or the max price you set.
- **Do NOT** use Spot VMs for **Production** workloads or processes which can not tolerate start-overs



VM Only: Azure Hybrid Benefit for Windows Server

- Allows you to use your on-premises Windows Server licenses to run Windows virtual machines on Azure at a reduced cost.



Q&A





Poll : Can I configure a budget so that I get an email when I reach \$300 monthly Azure cost?

- Yes
- No



Poll : Does Azure provide a cost management tool which help me export monthly cost to Excel sheets?

- Yes
- No



Monitoring Cost

- Azure Cost Management portal
- Monitoring subscription cost
- Setting monthly budgets

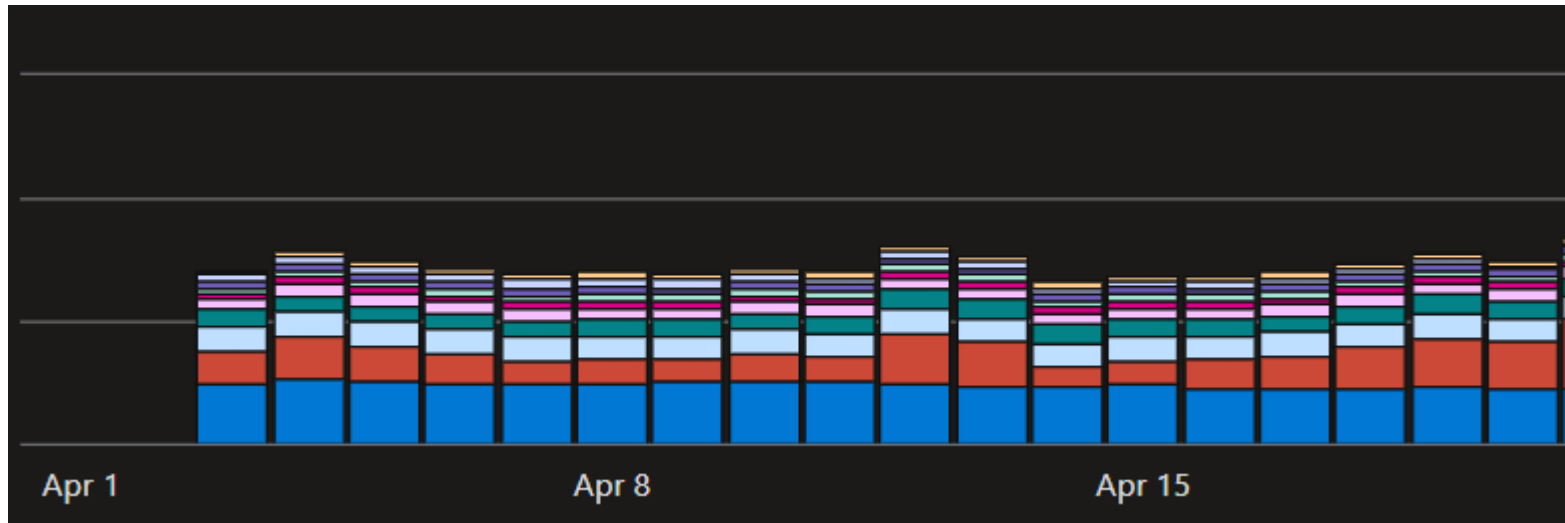


Azure Cost Management and Billing Tool

- A group of tools to help you analyze, manage, and optimize your workloads costs
- Ensures that your organization is taking advantage of the benefits provided by the cloud

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Azure Cost Management and Billing Tool

- Do billing administrative tasks (e.g. paying your bill)
- Download cost and usage data
- Apply data analysis to your costs
- Set spending thresholds + alerts
- Identify opportunities for workload changes that optimize spending



Setting Monthly Budgets

- You can configure alerts based on your actual cost or forecasted cost
- Ensure that your spending is within your organizational spending limit
- Notifications are triggered when the budget thresholds are exceeded
- Resources **aren't** affected, and your consumption **isn't** stopped



Q&A and Thanks you!

- [linkedin.com/in/rezasalehi2008](https://www.linkedin.com/in/rezasalehi2008)
- @zaalion
- <https://github.com/zaalion/Azure-Cost-Management>

The image features the O'Reilly logo in white, centered on a blue background. The logo consists of the word "O'REILLY" in a bold, sans-serif font, followed by a registered trademark symbol (®). To the left of the text, there are two overlapping, semi-transparent blue circles of different sizes, creating a layered effect. The background is a solid blue color with a slight gradient from top to bottom.

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