WEEK 8: COST MANAGEMENT & OPTIMIZATION

TEKsystems Global Services

WORKFORCE DEVELOPMENT

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REVIEW: WEEK 7

We focused on real-world case studies of cloud transformation using Azure.

We highlighted real-world benefits of using Azure to transform businesses.

- Healthcare
- Finance
- Manufacturing
- Retail

- Week 1-2: Introduction to Cloud Technology
- Week 3-5: Cloud Strategy and Architecture
- Week 6-7: Use Cases and Real-World Applications
- **Week 8-9: Benefits and Value Proposition**
- Week 10-12: Challenges and Risks
- Week 13-14: Interactive Simulations and Practical Exercises
- Week 15: Course Review and Final Assessment

OVERVIEW: WEEK 8

Understanding Cloud Economics:

- Evaluate CapEx vs. OpEx, Total Cost of Ownership (TCO), and ROI models
- Learn how cloud economics drive business value and investment decisions

Cost Management Tools and Techniques:

- Explore Azure Cost Management, Pricing Calculator, and Reserved Instance strategies
- Discover budgeting, auto-scaling, and resource optimization best practices

Case Studies on Cost Savings:

- Review real-world examples where strategic cost management led to 30-40% savings
- Analyze how similar strategies can be applied to your organization

INTRODUCTION TO CLOUD ECONOMICS

Definition: Understanding the financial aspects of cloud computing.

Importance: Aligning cloud strategies with business goals.

Scope: CapEx vs. OpEx, TCO, and ROI models.

Objective: Equip leaders with financial insights for cloud decisions.

Outcome: Enhanced investment decision-making.

CAPEX VS OPEX

CapEx (Capital Expenditure): Upfront investments in physical assets.

OpEx (Operational Expenditure): Ongoing costs for operations.

Cloud Shift: Transitioning from CapEx to OpEx.

Financial Flexibility: Benefits of reduced upfront costs.

Budgeting Implications: Impact on financial planning.

TOTAL COST OF OWNERSHIP (TCO)

Definition: Comprehensive cost assessment over asset lifespan.

Components: Direct and indirect costs.

Cloud TCO: Factors influencing cloud computing costs.

Comparison: On-premises vs. cloud TCO.

Decision-Making: Using TCO for strategic planning.

RETURN ON INVESTMENT (ROI)

Definition: Measure of profitability from investments.

Calculation: ROI formula and interpretation.

Cloud ROI: Evaluating returns from cloud investments.

Factors: Elements affecting cloud ROI.

Strategic Use: Leveraging ROI for investment decisions.

CLOUD ECONOMICS DRIVING BUSINESS VALUE

Agility: Rapid scalability and innovation.

Cost Efficiency: Optimizing operational expenses.

Global Reach: Expanding market presence.

Risk Management: Enhancing security and compliance.

Competitive Edge: Staying ahead in the market

FACTORS INFLUENCING CLOUD TOTAL COST OF OWNERSHIP (TCO)

Usage Patterns: Variability in resource consumption.

Service Selection: Choosing appropriate cloud services.

Pricing Models: Understanding pay-as-you-go vs. reserved instances.

Geographic Considerations: Data center locations affecting costs.

Compliance Requirements: Costs associated with regulatory adherence

STRATEGIES TO OPTIMIZE CLOUD TCO

Right-Sizing Resources: Aligning resources with actual needs.

Auto-Scaling: Adjusting resources based on demand.

Reserved Instances: Leveraging cost savings for predictable workloads.

Efficient Architecture: Designing for cost-effective performance.

Continuous Monitoring: Regularly reviewing and adjusting resource usage.

POP QUIZ:

Which of the following best describes OpEx in cloud computing?

A. Upfront capital investments
B. Ongoing operational expenses
C. Total cost over asset lifespan
D. Revenue generated from cloud services

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B. Auto-scaling
C. Reserved instances
D. Continuous monitoring

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OVERVIEW OF AZURE COST MANAGEMENT

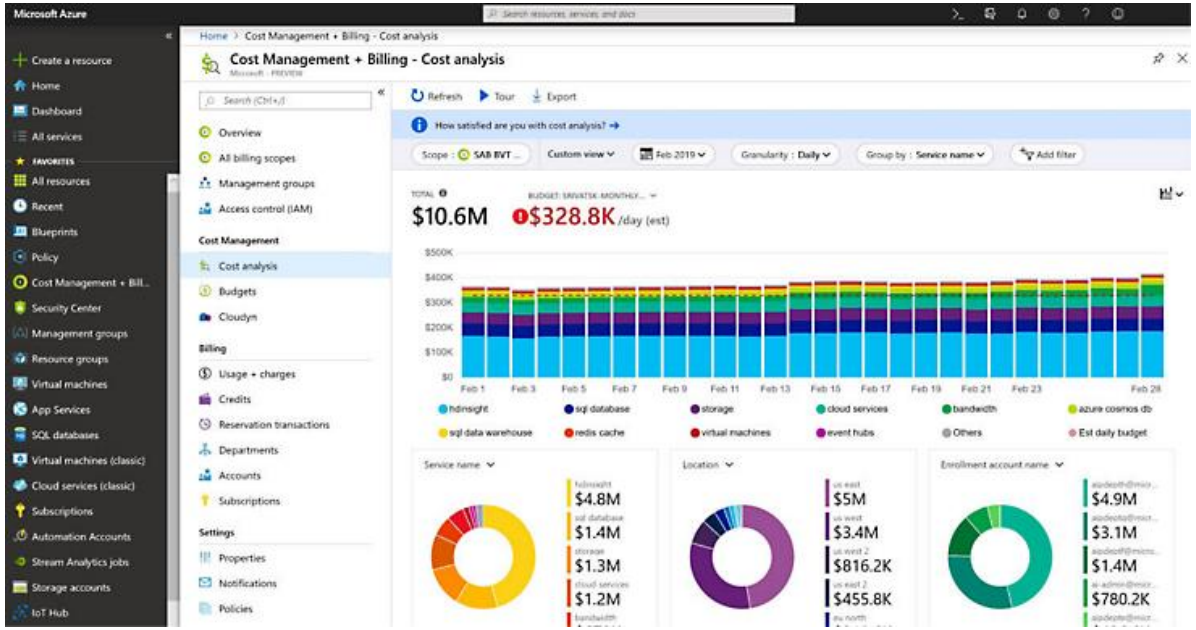
Comprehensive Cost Analysis: Provides detailed insights into cloud spending across services and resources.

Budgeting and Forecasting: Enables setting budgets and predicting future costs based on usage trends.

Cost Allocation: Allows distribution of costs across departments or projects for accountability.

Anomaly Detection: Identifies unexpected spending patterns to prevent budget overruns.

Integration Capabilities: Seamlessly integrates with other Azure services and third-party tools.



Cloud Cost Optimization | Microsoft Azure

MICROSOFT COST MANAGEMENT

Microsoft Cost Management is a suite of FinOps tools designed to help organizations analyze, monitor, and optimize their Microsoft Cloud costs.

Accessibility: Available to anyone with access to a billing account, subscription, resource group, or management group.

Integration: Can be accessed within the billing and resource management experiences or as a standalone tool.

Automation: Supports automation and extension of native capabilities to maximize organizational visibility and accountability.

Optimization: Helps achieve optimization and efficiency goals faster.

KEY FEATURES OF MICROSOFT COST MANAGEMENT

Cost Analysis: Report on and analyze costs in the Azure portal, Microsoft 365 admin center, or Power BI.

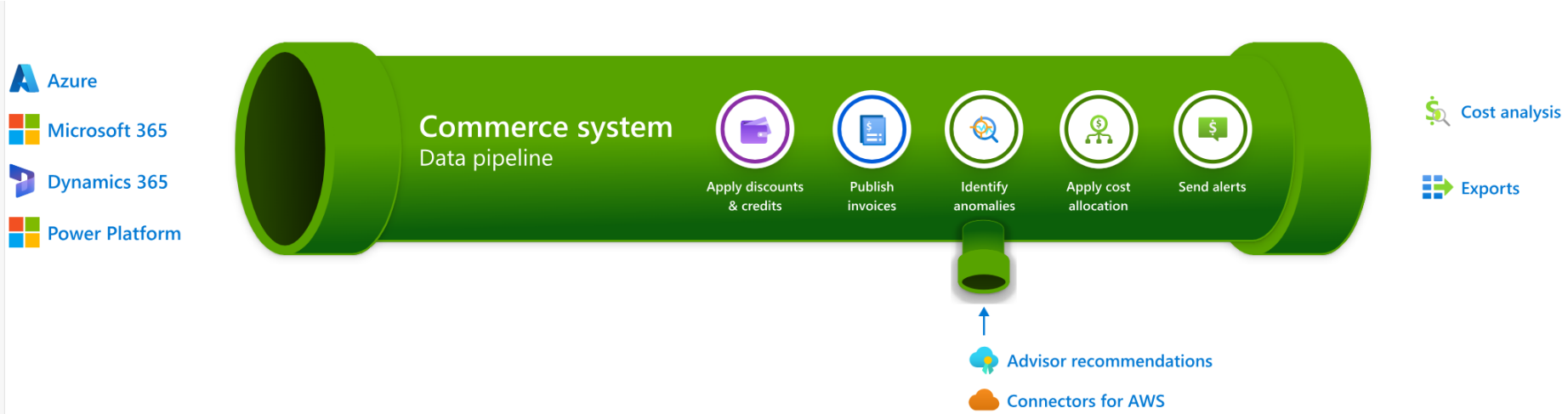
Proactive Monitoring: Monitor costs with budget, anomaly, reservation utilization, and scheduled alerts.

Cost Allocation: Enable tag inheritance and split shared costs with cost allocation rules.

Data Export: Automate business processes or integrate cost data into external tools by exporting data.

Visibility: Provides comprehensive visibility into costs across multiple scopes.

UNDERSTANDING HOW CHARGES ARE PROCESSED



learn.microsoft.com/en-us/azure/cost-management-billing/costs/media/overview-cost-management/

Commerce System: Microsoft Commerce is a data pipeline that underpins all Microsoft commercial transactions.

Usage Measurement: Azure, Microsoft 365, Dynamics 365, and Power Platform services measure usage and purchase quantities.

Rating System: Applies discounts based on specific price sheets and generates rated usage.

Billing Process: Credits are applied, and invoices are published at the end of the billing period.

DATA INCLUDED IN COST MANAGEMENT

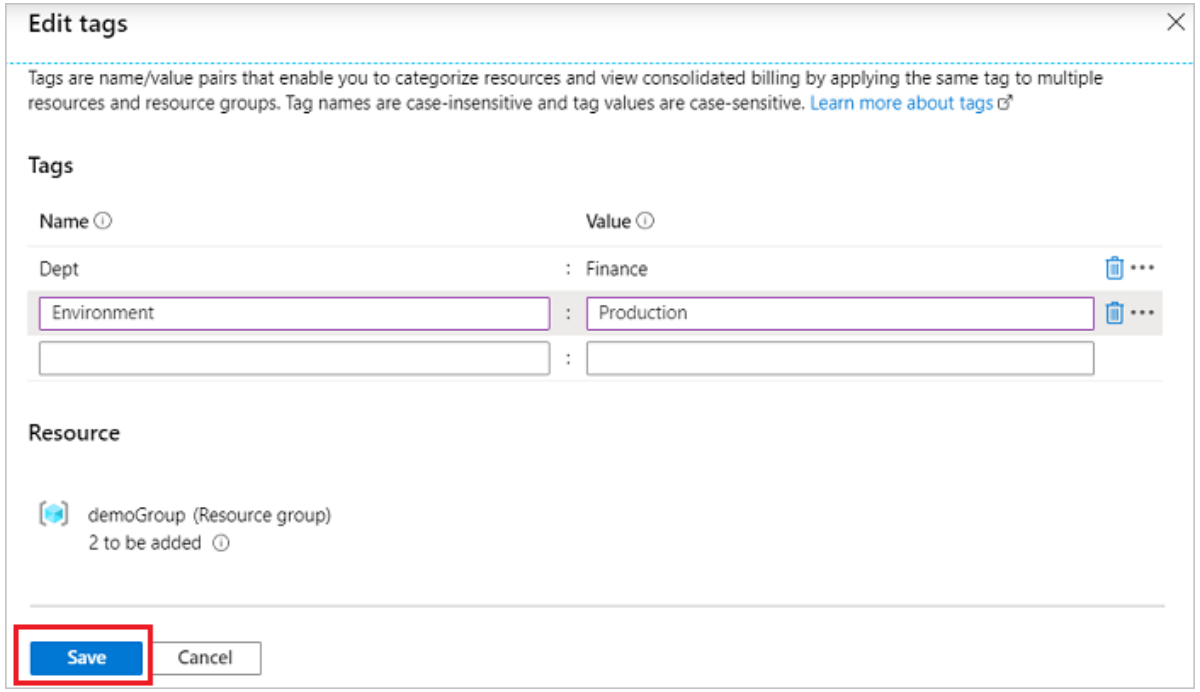
Products and Subscriptions: Manage all products, subscriptions, and recurring purchases.

Credits and Invoices: Review credits and commitments, view and pay invoices.

Exclusions: Cost Management doesn't include credits, taxes, and some purchases like support charges.

Transition: Classic CSP and sponsorship subscriptions will be supported after transitioning to Microsoft Customer Agreement.

ORGANIZING AND ALLOCATING COSTS



Subscription Hierarchy: Organize subscriptions and resources for natural reporting.

Billing Profiles and Invoice Sections: Group subscriptions into invoices for different business units.

Management Groups: Group subscriptions with inherited access and multiple levels.

Resource Tags: Add business context to cost details for applications, business units, and environments.

ORGANIZING AND ALLOCATING COSTS – CONT'D

Consistent Tagging Conventions: Establishing standardized tags for all resources.

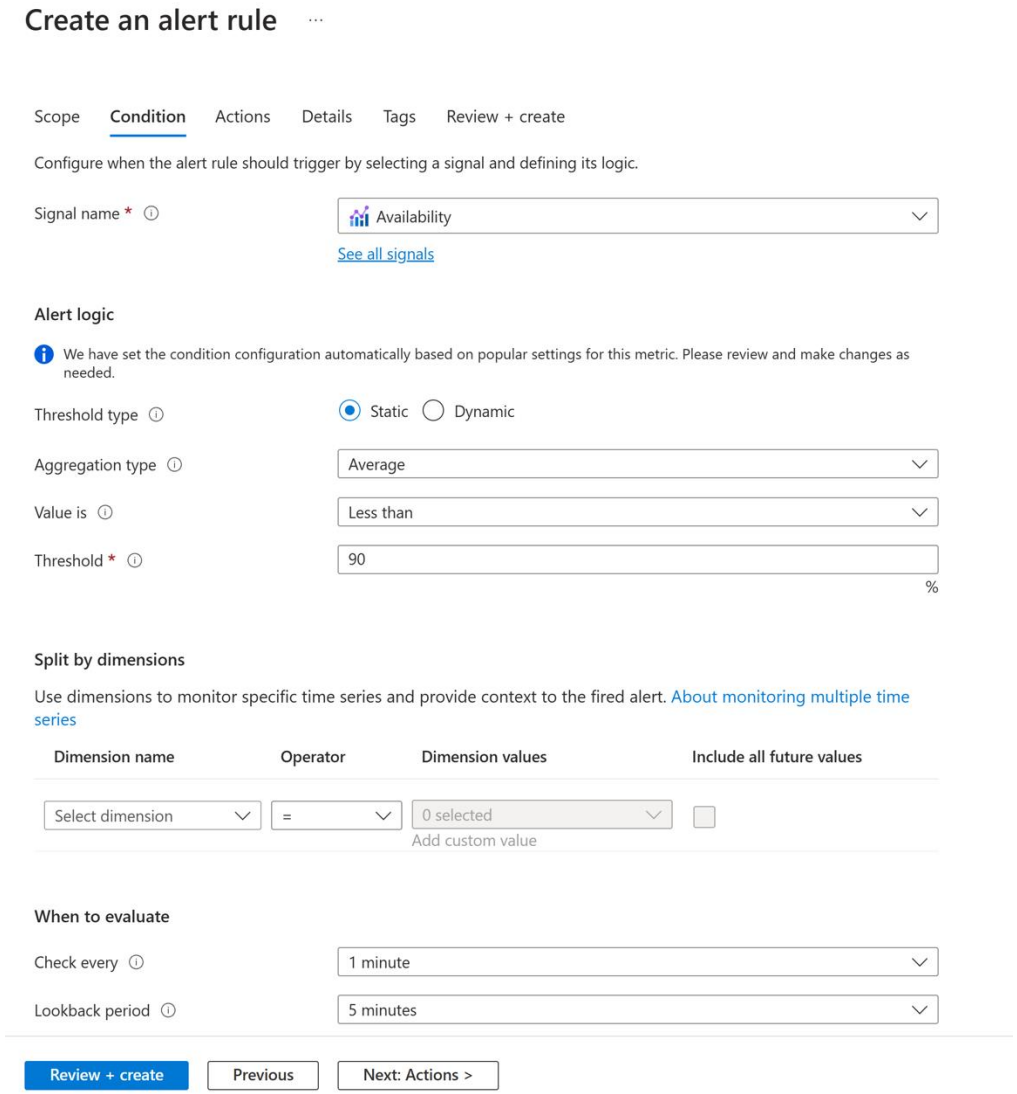
Departmental Allocation: Assigning resources to specific departments for precise cost tracking.

Project-Based Tagging: Categorizing resources by project to monitor spending effectively.

Environment Identification: Differentiating between development, testing, and production environments.

Automated Tag Enforcement: Utilizing policies to ensure compliance with tagging standards.

MONITORING COSTS WITH ALERTS



Budget Alerts: Notify when costs exceed predefined amounts.

Anomaly Alerts: Detect unexpected changes in daily usage.

Scheduled Alerts: Provide regular updates on costs based on saved views.

EA Commitment Balance Alerts: Notify when commitment balance is 90% or 100% used.

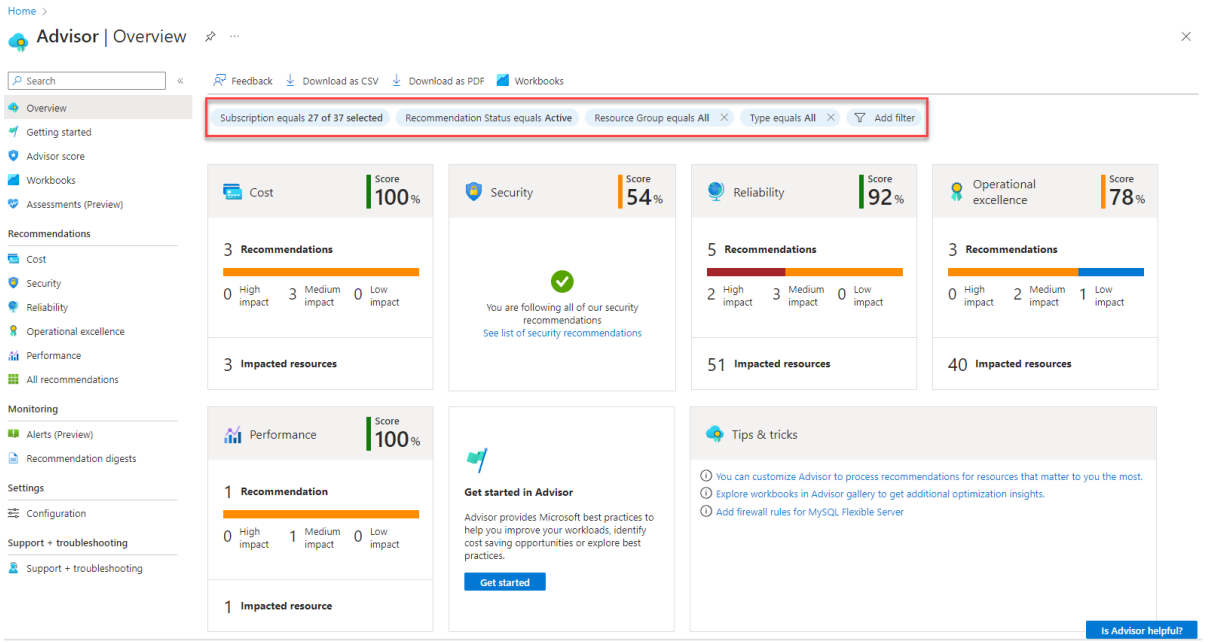
OPTIMIZING COSTS

Azure Advisor: Provides cost recommendations based on usage patterns.

Azure Savings Plans: Save up to 65% on Azure compute resources.

Azure Reservations: Save up to 72% by pre-committing to usage.

Azure Hybrid Benefit: Reduce costs using existing licenses on Azure.



Introduction to Azure Advisor - Azure Advisor | Microsoft Learn

POP QUIZ:

What is the primary function of Billing in Microsoft Cost Management?

A) Analyzing costs

B) Managing billing accounts and paying invoices

C) Optimizing cloud resources

D) Monitoring security policies

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A) Measures usage

B) Applies discounts and generates rated usage

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ESTIMATING YOUR CLOUD COSTS

TCO Calculator: Helps estimate the cost of moving on-premises infrastructure to the cloud.

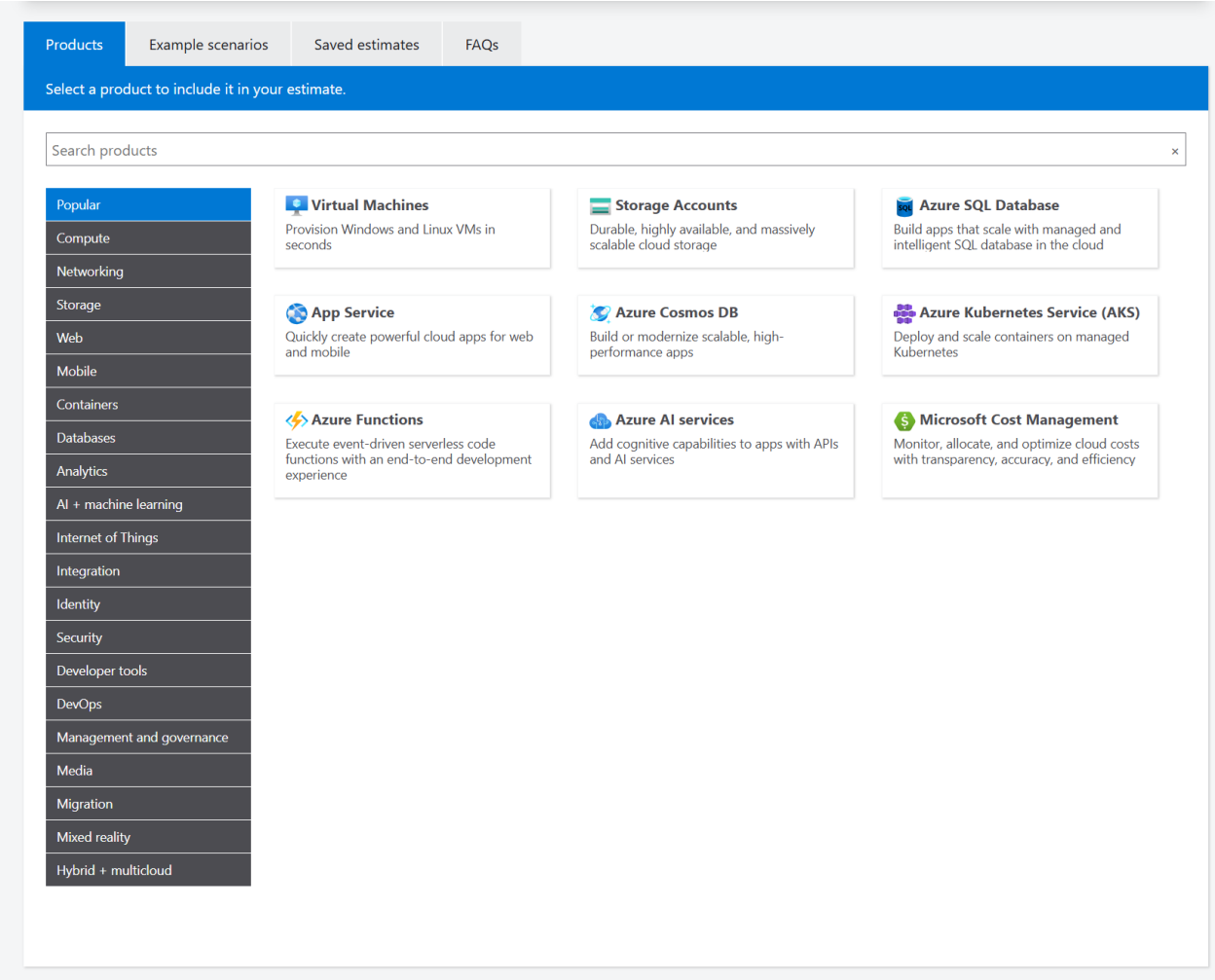
Azure Migrate: Analyzes on-premises workloads and plans cloud migration.

Azure Pricing Calculator: Estimates costs for new or expanded deployments.

VM Selector Tool: Finds the best VMs for your solutions.

Azure Hybrid Benefit Calculator: Estimates savings using existing licenses on Azure.

UTILIZING THE PRICING CALCULATOR



Customizable Estimates: Tailor cost estimates based on specific service selections and configurations.

Scenario Planning: Evaluate costs for various deployment scenarios and usage patterns.

Currency Selection: View estimates in multiple currencies for global financial planning.

Exportable Reports: Generate detailed reports for stakeholder review and decision-making.

Regular Updates: Reflects the latest pricing to ensure accurate estimations.

INTRODUCTION TO THE TCO CALCULATOR

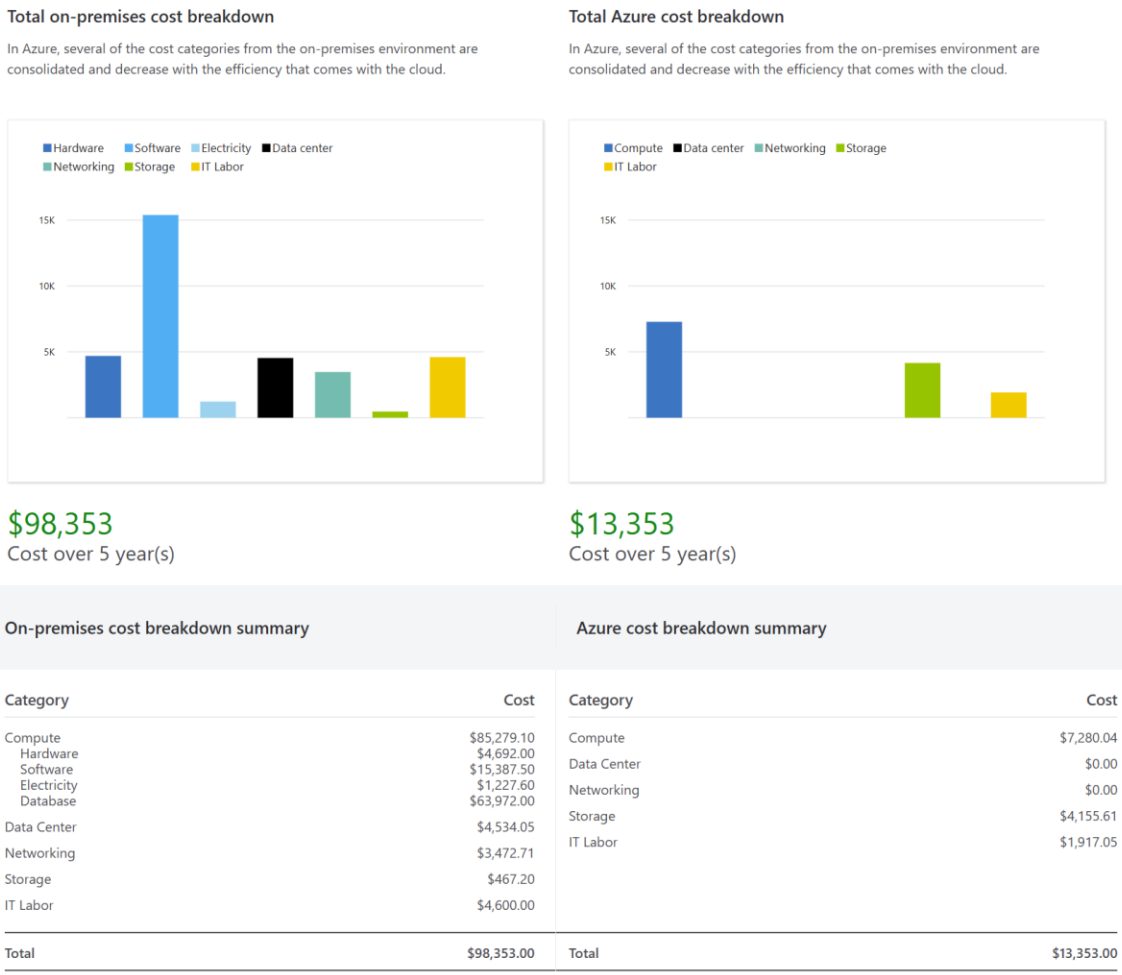
Purpose: Estimate cost savings by migrating workloads to Azure.

Workload Details: Enter on-premises workload details for accurate analysis.

Components: Includes servers, databases, storage, and networking.

Customization: Adjust assumptions to match your environment.

Report Generation: View detailed cost comparison reports.



Total on-premises cost breakdown

In Azure, several of the cost categories from the on-premises environment are consolidated and decrease with the efficiency that comes with the cloud.

Hardware Software Electricity Data center Networking Storage IT Labor

15K 10K 5K

$98,353
Cost over 5 year(s)

Total Azure cost breakdown

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Compute Data center Networking Storage IT Labor

15K 10K 5K

$13,353
Cost over 5 year(s)

On-premises cost breakdown summary

Category	Cost
Compute	$85,279.10
Hardware	$4,692.00
Software	$15,387.50
Electricity	$1,227.60
Database	$63,972.00
Data Center	$4,534.05
Networking	$3,472.71
Storage	$467.20
IT Labor	$4,600.00
Total	**$98,353.00**

Azure cost breakdown summary

Category	Cost
Compute	$7,280.04
Data Center	$0.00
Networking	$0.00
Storage	$4,155.61
IT Labor	$1,917.05
Total	**$13,353.00**

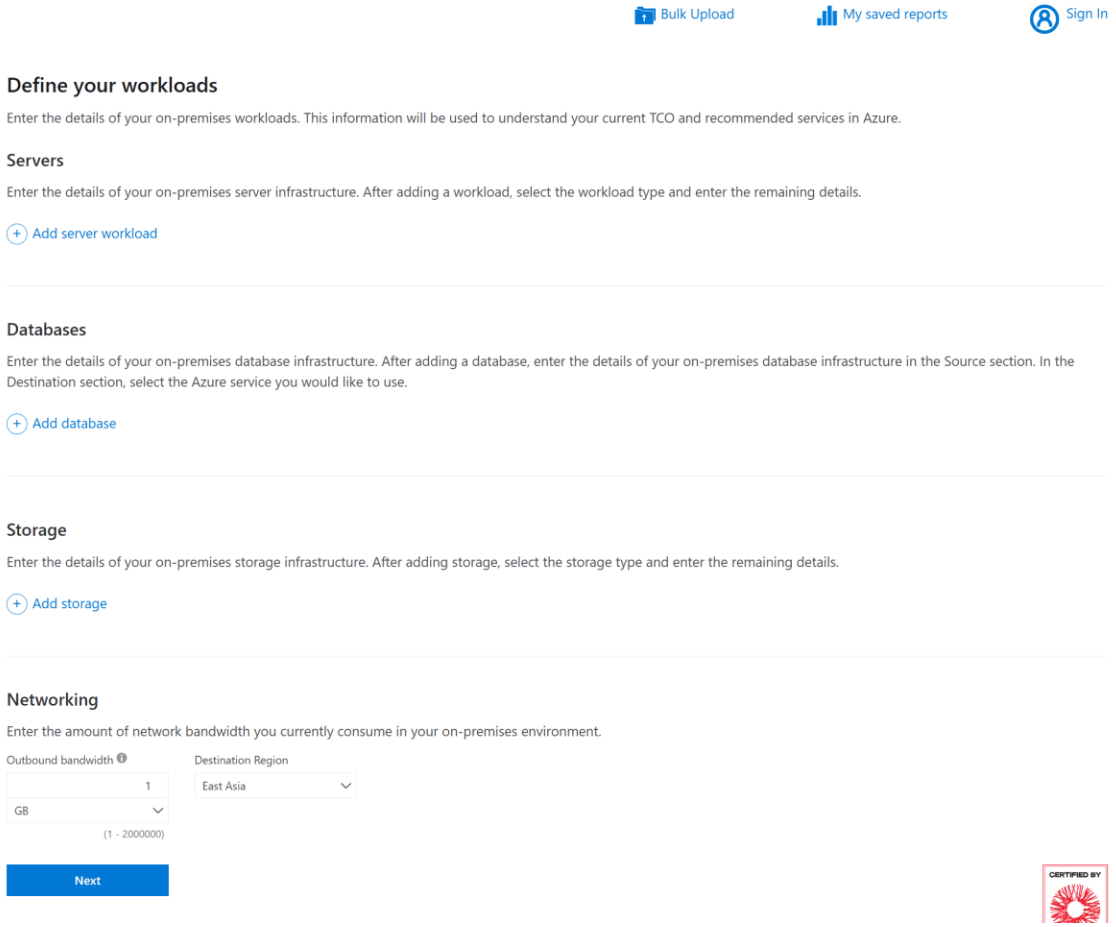
DEFINING YOUR WORKLOADS

Servers: Enter details of on-premises server infrastructure.

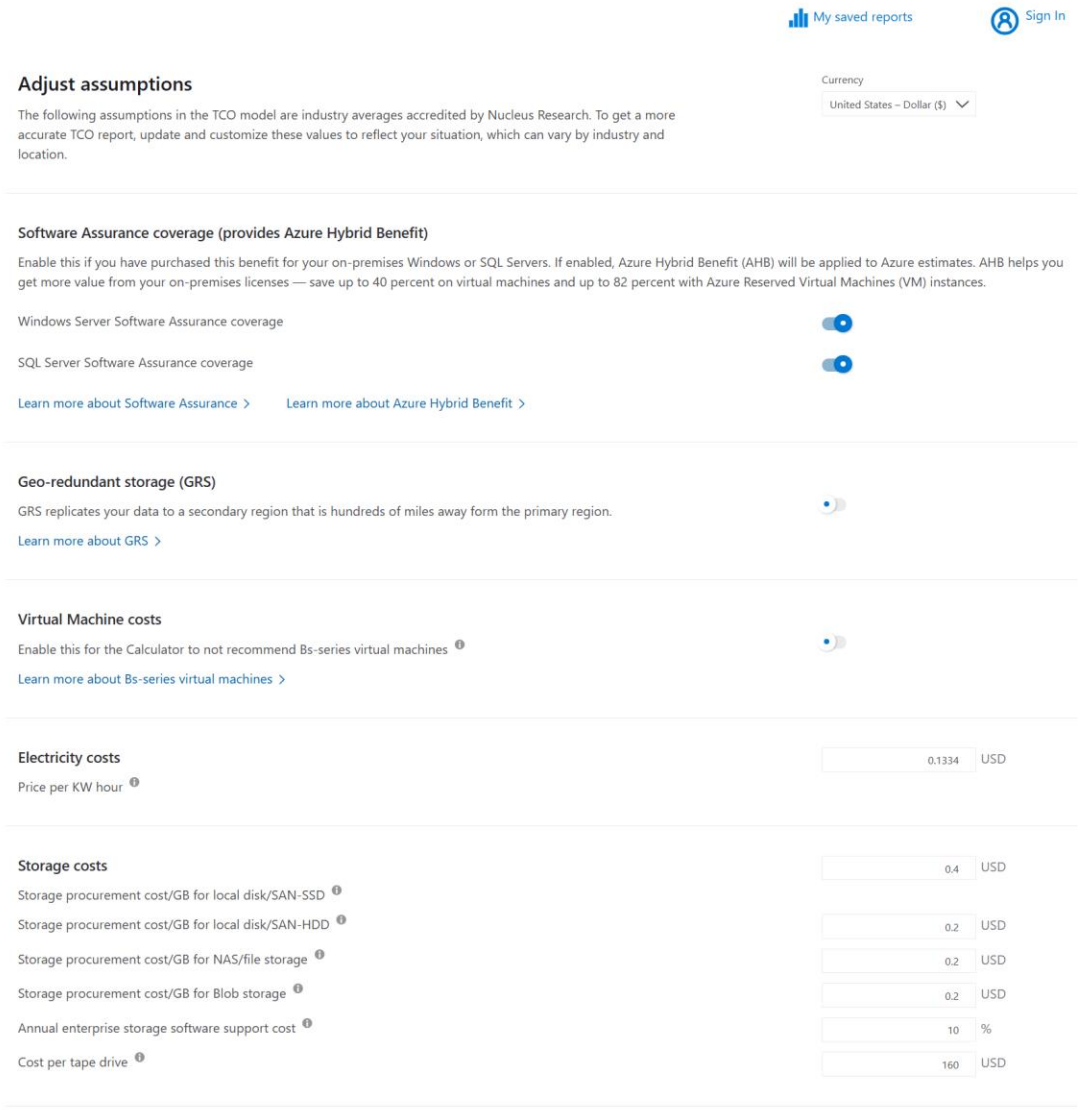
Databases: Provide information on on-premises database infrastructure.

Storage: Specify details of on-premises storage infrastructure.

Networking: Enter the amount of network bandwidth consumed.



ADJUSTING ASSUMPTIONS



Customization: Tailor assumptions to match your environment.

Cost Factors: Adjust factors like hardware costs, software costs, and labor costs.

Usage Patterns: Modify usage patterns to reflect actual consumption.

Scalability: Consider future growth and scalability needs.

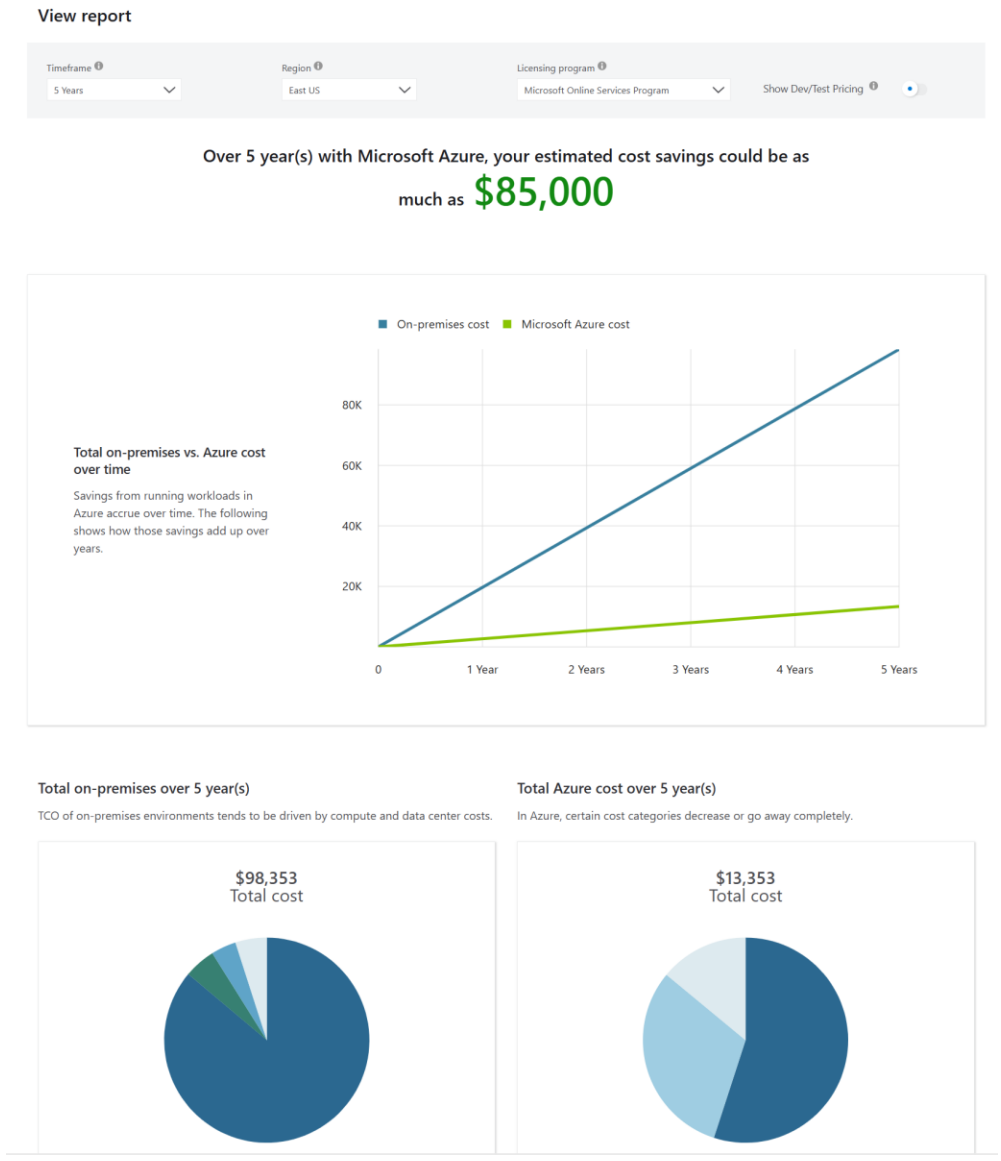
TCO REPORT

Cost Comparison: Detailed comparison of on-premises vs. Azure costs.

Savings Breakdown: Highlights potential savings in various areas.

Recommendations: Provides recommendations for optimizing costs.

Export Options: Export the report for further analysis and sharing.



BENEFITS OF USING THE TCO CALCULATOR

Accurate Estimates: Provides accurate cost estimates for migration.

Informed Decisions: Helps make informed decisions about cloud migration.

Cost Optimization: Identifies areas for potential cost savings.

Strategic Planning: Supports strategic planning and budgeting.

CASE STUDY: ENGLEWOOD HEALTH'S MIGRATION TO AZURE

Overview: Englewood Health, a healthcare provider with over 3,700 employees, migrated its IT infrastructure to Azure.

Challenges: Fragmented IT architecture, underutilized resources, and the need for performance and efficiency improvements.

Solution: CloudIQ helped consolidate and migrate Englewood's IT infrastructure to Azure, enhancing productivity and optimizing resources.

Azure Migrate: Used to assess on-premises workloads and plan the migration.

Cost Estimation: TCO Calculator provided detailed cost savings estimates.

CASE STUDY: CUSTOMER CHALLENGES

Fragmented IT Architecture: Various solutions adopted piecemeal, leading to inefficiencies.

Underutilized Resources: Existing infrastructure was not fully optimized.

Performance and Efficiency: Needed improvements in overall performance and task automation.

Cost Estimation: Required accurate cost estimates for migration.

CASE STUDY: PARTNER SOLUTION

CloudIQ Partnership: Englewood Health partnered with CloudIQ for the migration.

Azure Migrate: Assessed on-premises workloads and planned the migration.

TCO Calculator: Provided detailed cost savings estimates.

Phased Migration: Application dependencies were studied and mapped, and a cluster-based migration plan was devised.

CASE STUDY: CUSTOMER BENEFITS

Enhanced Security: Modern hybrid Azure infrastructure with updated network infrastructure.

Cost Reduction: VM consolidation and modernization reduced costs using Azure Hybrid Benefit.

Performance Boost: Significant performance improvements with CPU utilization of 60-70%.

Better Decision-Making: Improved infrastructure helps make better decisions and enhance overall care.

POP QUIZ:

Which tool helps you estimate the cost of moving on-premises infrastructure to the cloud?

A) Azure Migrate

B) Azure Pricing Calculator

C) TCO Calculator

D) VM Selector Tool

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RESERVED INSTANCE STRATEGIES

Cost Savings: Potentially reduce costs by up to 72% compared to pay-as-you-go pricing.

Flexible Terms: Offers one-year or three-year commitment options to suit organizational needs.

Instance Size Flexibility: Allows adjustments within a specific VM family to accommodate changing requirements.

Exchange and Refund Options: Provides the ability to modify or cancel reservations under certain conditions.

Scope Application: Apply reservations to specific subscriptions or shared across the organization.

BUDGETING BEST PRACTICES

Define Clear Objectives

Establish specific financial goals aligned with organizational priorities

Implement Alerts

Configure notifications for approaching or exceeding budget thresholds

Promote Accountability

Assign budget ownership to relevant teams or departments to encourage responsible spending

Set Realistic Budgets

Base budgets on historical data and anticipated future needs

Regular Reviews

Conduct periodic evaluations to adjust budgets based on actual usage and business changes

LEVERAGING AUTO-SCALING FOR COST EFFICIENCY

Demand-Driven Resource Allocation: Automatically adjusts resources based on real-time workload demands.

Cost Reduction: Minimizes expenses by scaling down resources during periods of low demand.

Improved Performance: Ensures optimal application performance during peak usage times.

Policy-Based Scaling: Utilize predefined policies to govern scaling actions, maintaining control over resource adjustments.

Integration with Monitoring Tools: Combine with monitoring solutions for proactive management and optimization.

AUTOMATION IN COST MANAGEMENT

Automated Resource Provisioning: Deploying resources based on predefined templates to prevent over-provisioning.

Policy-Driven Automation: Enforcing cost policies through automated workflows.

Automated Scaling: Adjusting resource capacity in real-time based on demand fluctuations.

Cost Anomaly Detection: Utilizing machine learning to identify and alert on unusual spending patterns.

Automated Decommissioning: Retiring unused resources without manual intervention.

TRAINING & AWARENESS

Cost Management Training Programs: Educating teams on best practices and tools.

Regular Workshops: Conducting sessions to share updates and strategies.

Accessible Documentation: Providing clear guidelines and resources for cost management.

Leadership Engagement: Ensuring leadership understands and supports cost management initiatives.

Feedback Mechanisms: Establishing channels for continuous improvement

WEEK 8 ACTIVITY

Objective: Learn how to use Azure Cost Management & Billing to track cloud expenditures

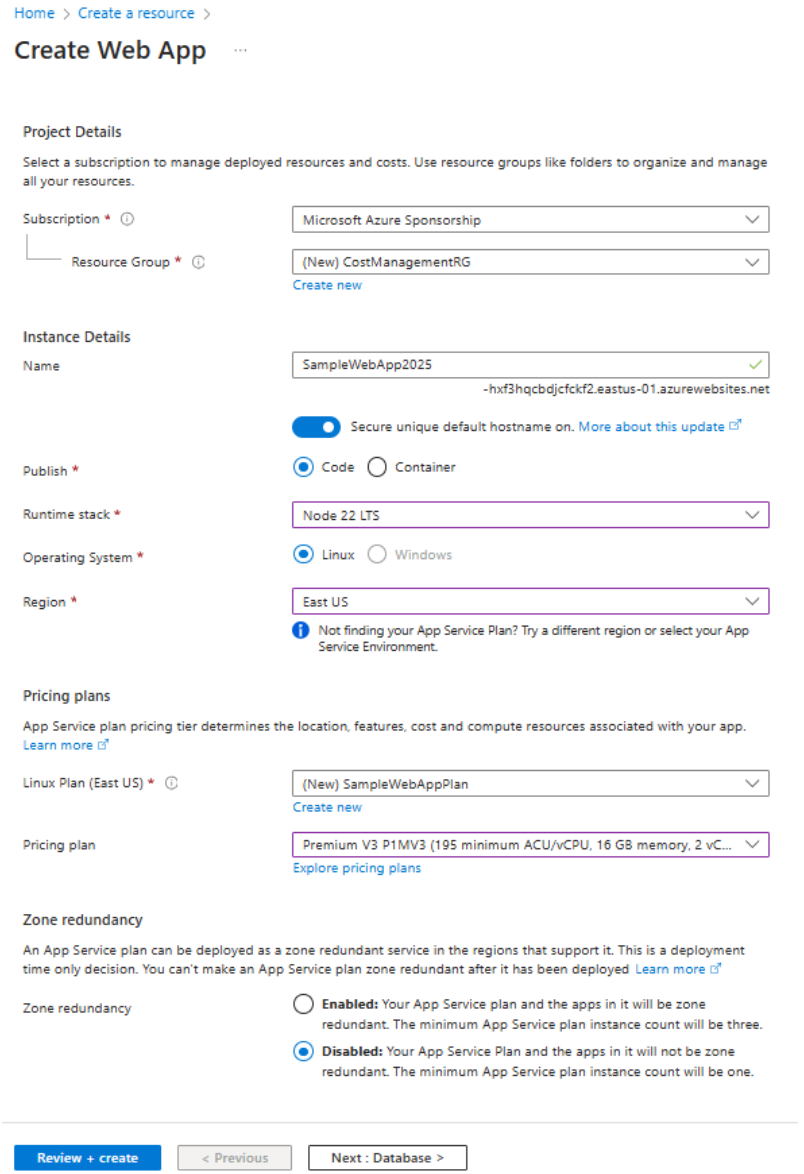
Lab Requirements:

- An **Azure account** (Your instructor will provide you with a student account)
- Access to the **Azure portal** (portal.azure.com).

STEP 1: CREATE A WEB APP TO GENERATE COST DATA

Replace **YourName** with your actual name in the instructions that follow:

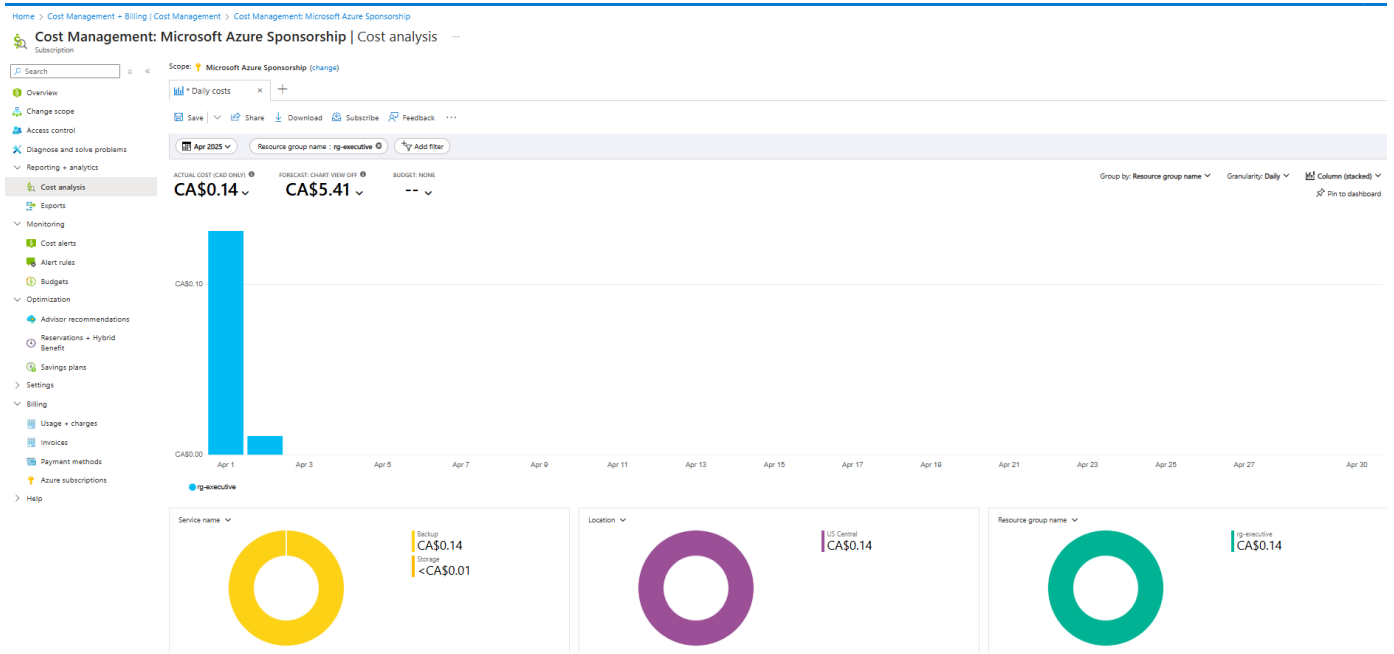
- **Log in** to the Azure portal.
- Click on **+ Create a resource** at the top left.
- **Search for "Web App"** and select it.
- Click **Create** and fill out the basic details:
  - **Subscription:** Your subscription.
  - **Resource Group:** Create a new resource group called "CostManagementRGYourName".
  - **Name:** Enter a unique name (e.g., "SampleWebAppYourName2025").
  - **Publish:** Code.
  - **Runtime Stack:** Choose Node 22 LTS.
  - **Operating System:** Leave Linux as the selected choice
  - **Region:** Select East US
  - **Linux Plan:** Click Create New and name it "SampleWebAppPlanYourName"
  - **Pricing Plan:** Select Premium V3 P0V3
- Leave Zone Redundancy as is
- Click on **Review + create**
- Click on **Create** and wait for deployment to complete
- Click on **Go to resource** after deployment completes



STEP 2: AZURE COST ANALYSIS

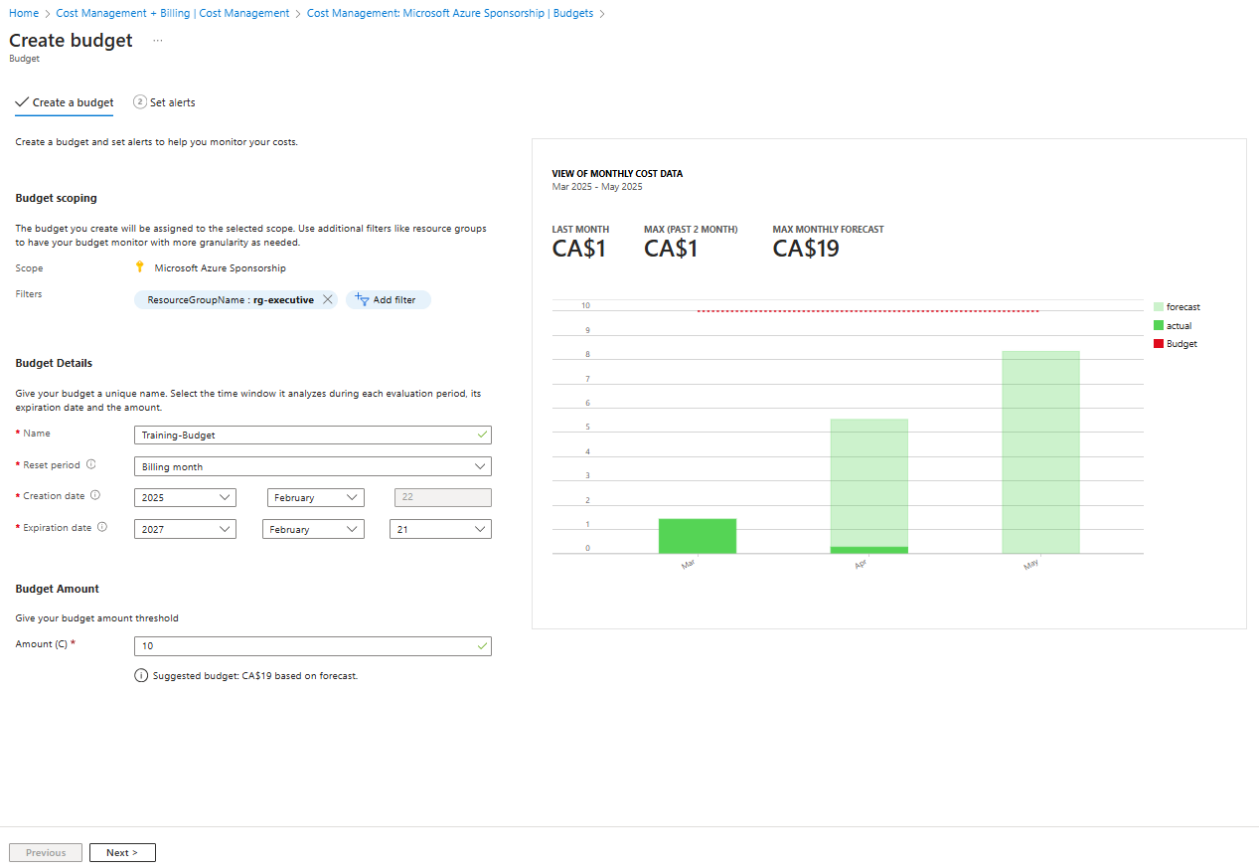
The purpose of this activity is for you to familiarize with the Azure Cost Analysis. You will not get any data on the report if you have just created a new account or resource. It takes a few hours for Azure to show the data.

- In the **Azure portal**, click on the search bar and type “Cost Management + Billing”, then select it.
- Click on **Cost Analysis** to view an overview of your current spending.
- Since you just created resources, you’ll see zero or minimal cost data. This is expected in a blank account.



STEP 3: SET A BUDGET

- In **Cost Management + Billing**, go to **Budgets** (located on the left panel under Monitoring).
- Click **+ Add** to create a new budget.
- Set the **Filter** to your newly created resource group "CostManagementRGYourName".
- Name your budget (e.g., "Training-Budget").
- Enter a **budget amount** (e.g., $10 for the month—this low amount reflects the minimal usage).
- Click **Next** to set up alerts

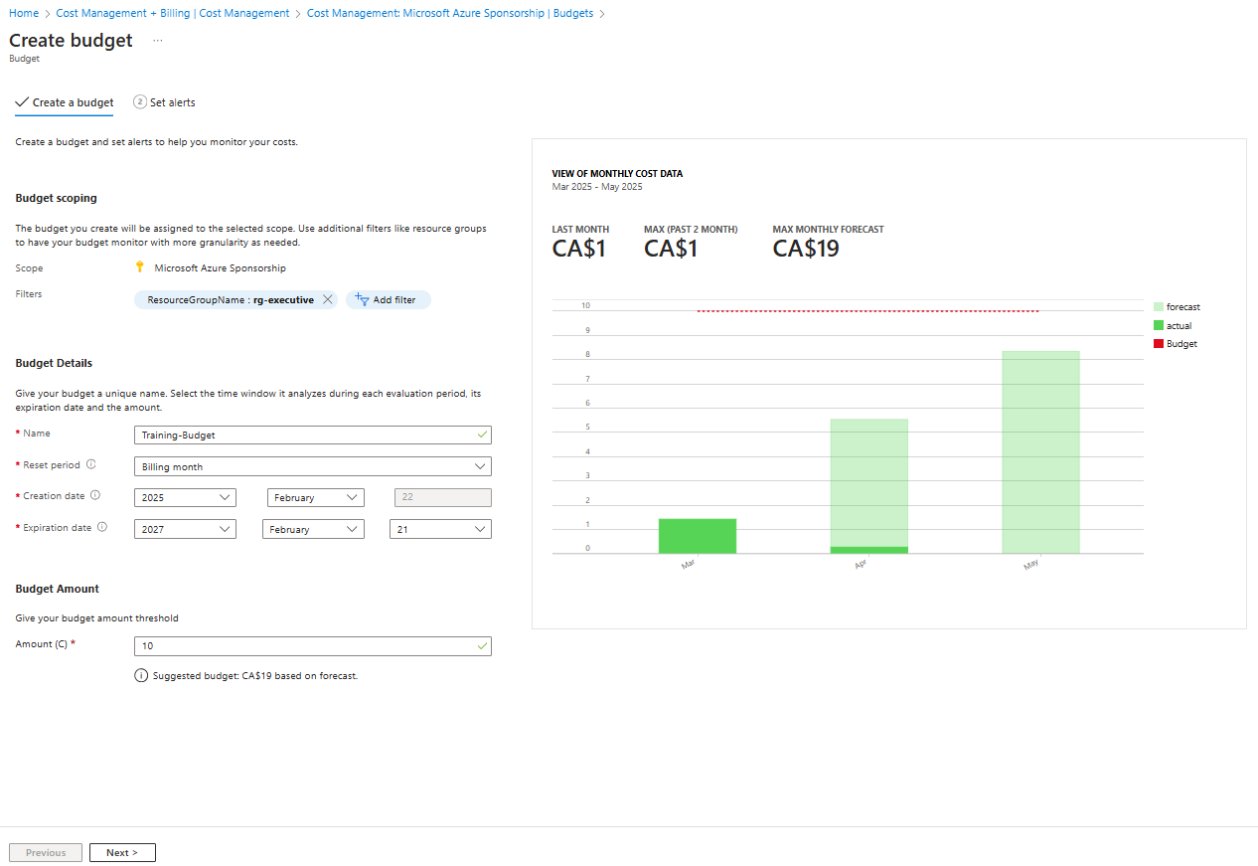


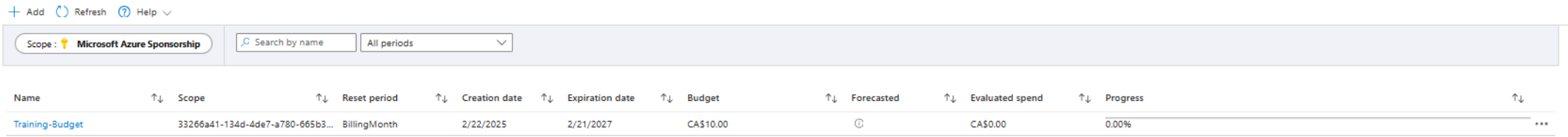
STEP 4: SETUP BUDGET ALERTS

- In the **Set alerts** step, go to alert conditions and enter the following:
  - **Type:** Actual
  - **% of budget:** 10
  - **Leave the Action group blank**
- **Alert recipients email:** Enter the email(s) to send alerts to
- Click **Create** to finish setting up your budget

NB: The budget takes a few hours to be active.

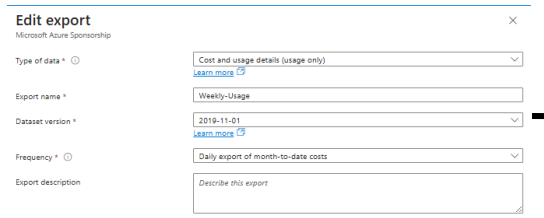
To learn more visit: [Tutorial - Create and manage budgets - Microsoft Cost Management | Microsoft Learn]

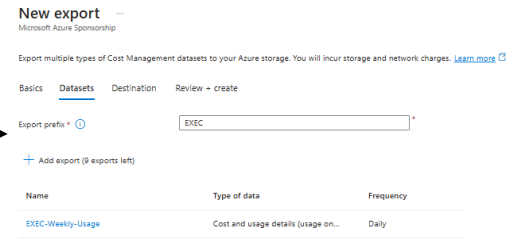


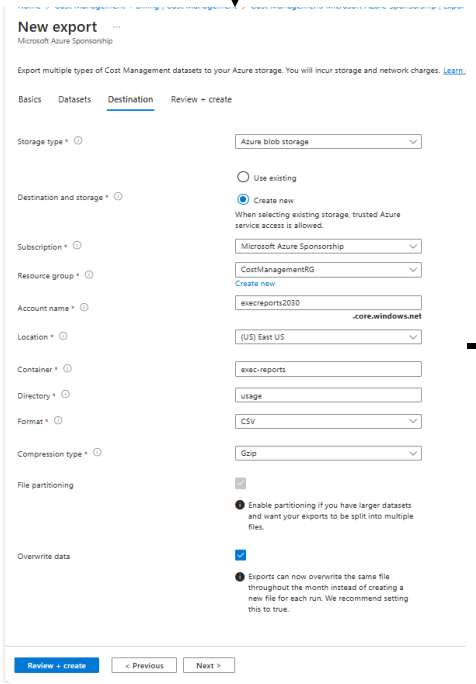


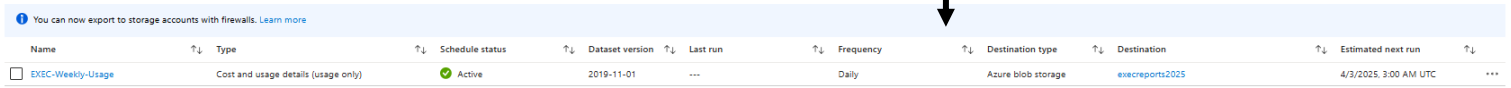
STEP 5: CREATE A COST REPORT

- In **Cost Management + Billing**, click on **Exports** under Reporting + analytics
- Click **+ Create** to create a new export report.
- Click on **Create your own export**
- Define the export
  - **Type of data:** Cost and usage details
  - **Export name:** Daily-Usage
  - **Data version:** Leave default
  - **Frequency:** Daily export of month-to-date costs
- Click **Add**
- Enter an Export Prefix e.g. EXEC
- Click **Next** to add a destination
  - **Storage type:** Azure blob storage
  - **Destination and storage:** Create new
  - **Resource group:** CostManagementYourNameRG
  - **Account name:** enter a globally unique name
  - **Container:** exec-reports
  - **Directory:** usage
  - **Leave all other fields as default**
  - Click **Review + create**
  - Then click on **Create**



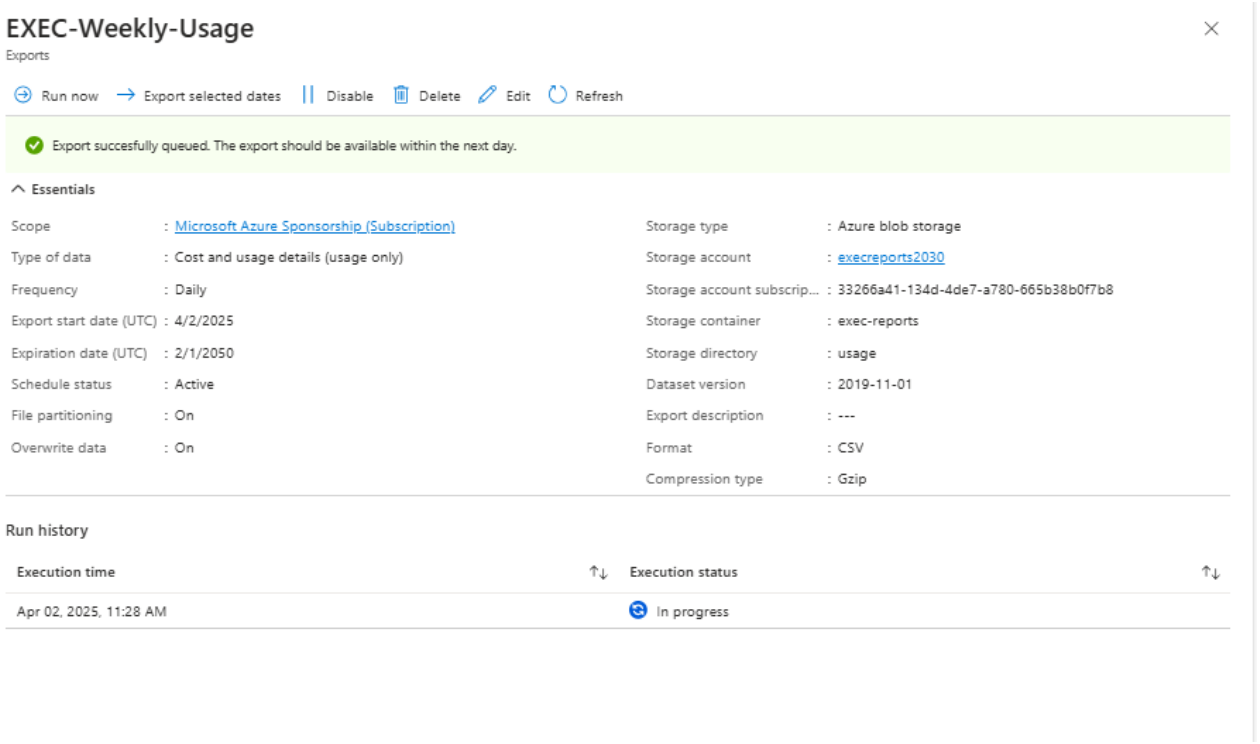






STEP 6: RUNNING A REPORT EXPORT

- In **Cost Management + Billing**, click on **Exports** under Reporting + analytics
- Click on your report e.g. **EXEC-Daily-Usage**
- Click on **Run now** to schedule an export
- The report will be generated the following day if you selected Daily export of month-to-date costs when setting up the exports.



INDIVIDUAL KEY TAKEAWAYS

Write down three key insights from today's session.

Highlight how these take aways influence your work.

COURSE REVIEW

We explored the comprehensive suite of tools and strategies available in Microsoft Cost Management. We delved into key features such as cost analysis, proactive monitoring, and cost allocation, and examined how these tools can help organizations optimize their cloud spending.

Additionally, we discussed the importance of accurate cost estimation using tools like the TCO Calculator and Azure Migrate, and highlighted real-world case studies to illustrate the practical benefits of these solutions.

- Week 1-2: Introduction to Cloud Technology
- Week 3-5: Cloud Strategy and Architecture
- Week 6-7: Use Cases and Real-World Applications
- **Week 8-9: Benefits and Value Proposition**
- Week 10-12: Challenges and Risks
- Week 13-14: Interactive Simulations and Practical Exercises
- Week 15: Course Review and Final Assessment

NEXT WEEK: INNOVATION & AGILITY

- Accelerating time-to-market
- Enabling innovation through cloud services
- Examples of innovative cloud-based solutions

Q&A AND OPEN DISCUSSION


THANK
YOU