Microsoft Azure

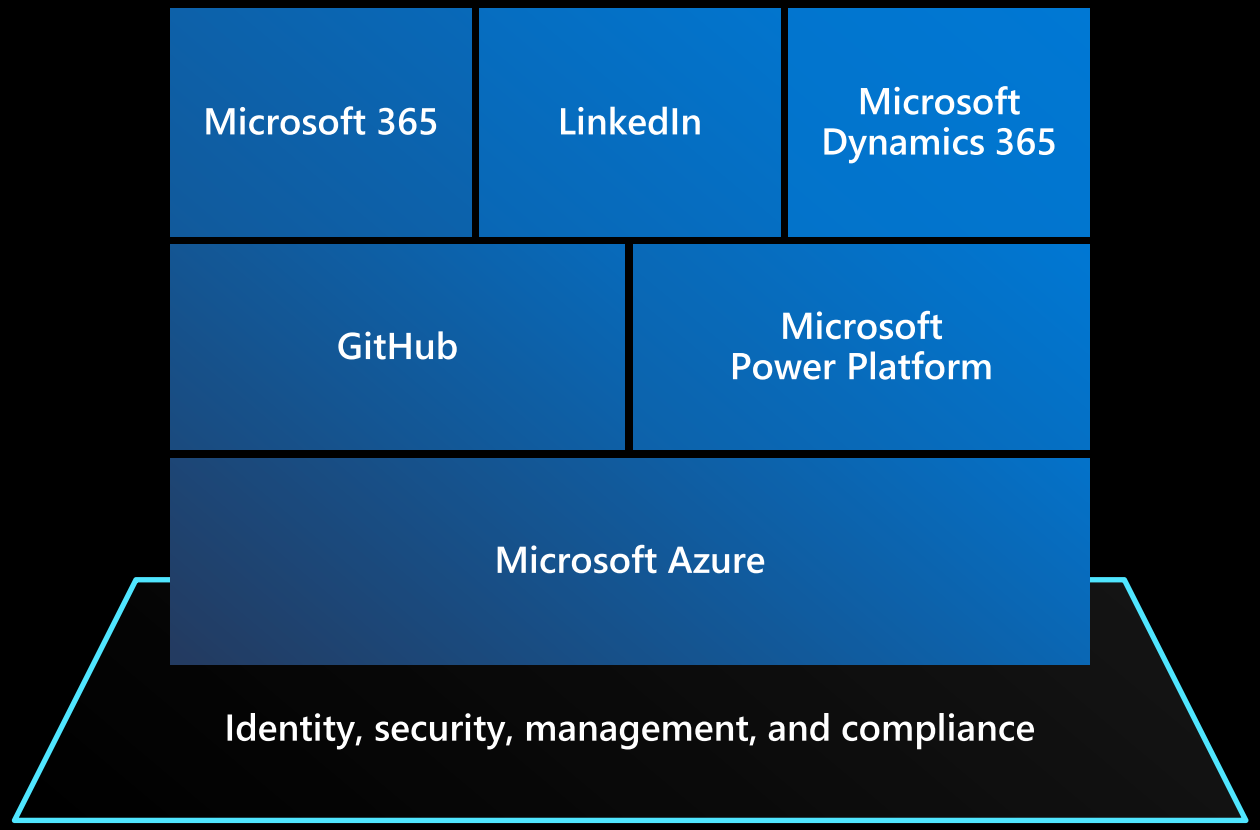
Microsoft Azure Well-Architected

Joni Leskinen
Sr. Cloud Solution Architect

Agenda

- Why is being well-architected important?
- Overview: Microsoft Azure Well-Architected
- Cost optimization
- Reliability
- Azure Advisor
- Resources

Microsoft Cloud



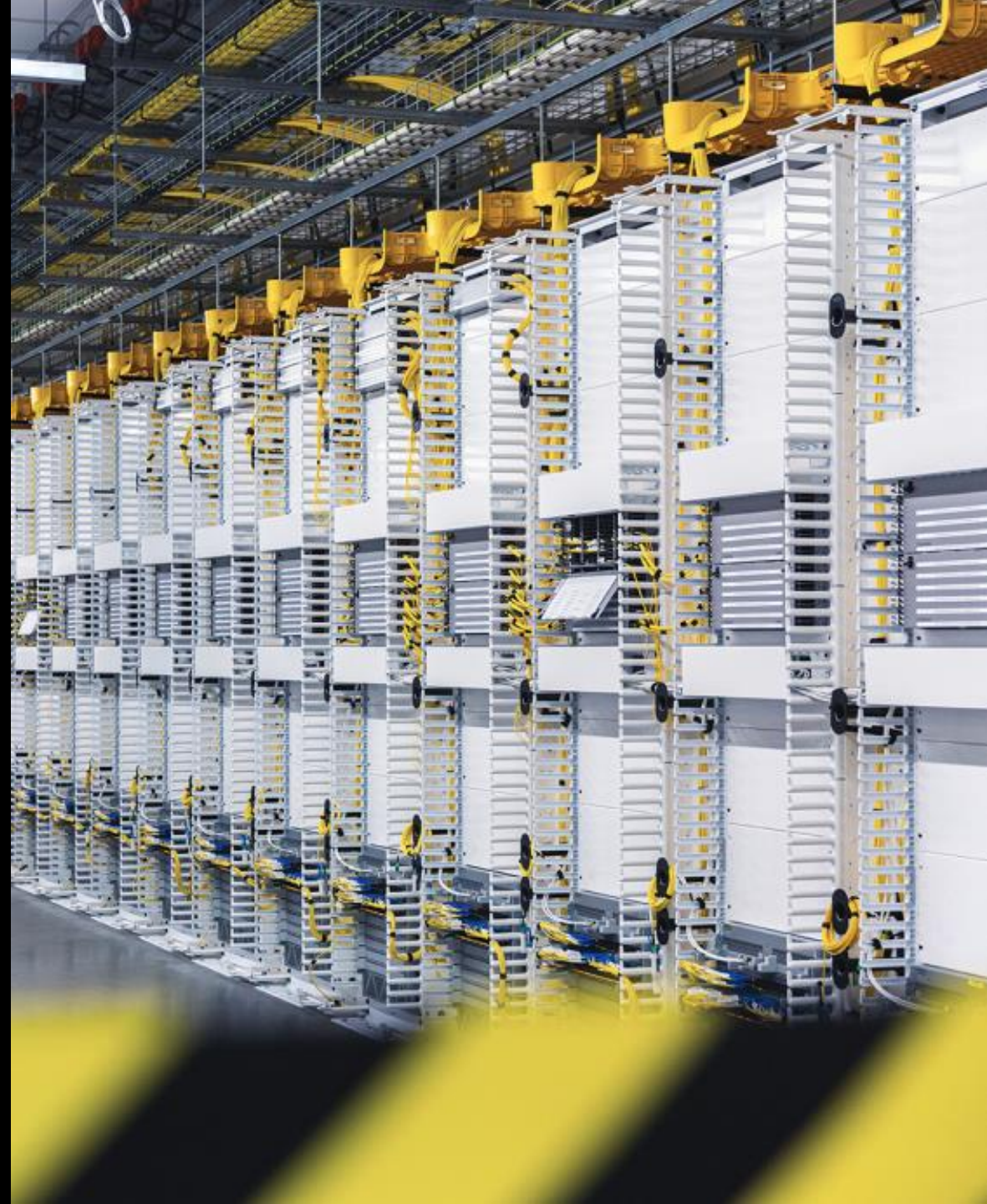
It's real. It's tangible. It happens.

*The **average total cost per breach** has increased from $3.54 million in 2006 to **$8.19 million in 2019.**[1]*

*Companies with incident response teams with testing of IR plans **—saved over $1.2 million.**[2]*

*Customers expect their **cloud spend** to further **increase by 47%** in the next 12 months.*[2]

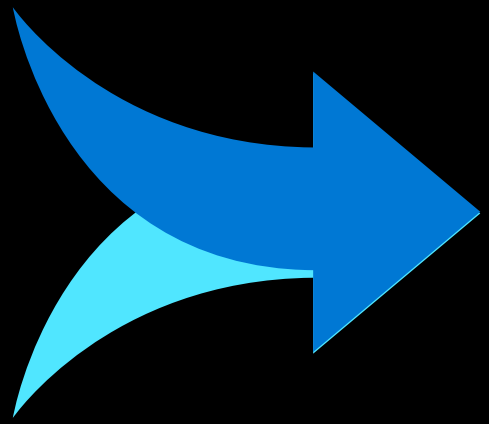
***Encryption reduced breach costs** by an average of $360,000.*[3]



1 What Is The Cost Of A Data Breach? By Marty Puranik. Forbes. Dec 2019
2 Flexera 2020 State of the Cloud Report
3 The Cost of a Data Breach Report, IBM Security, 2019. Conducted by Ponemon Institute LLC.

The value of running well-architected cloud workloads

- ☑ Manage budget
- ☑ Improve workloads security
- ☑ Increase incident response
- ☑ Streamline internal processes
- ☑ Avoid costly mistakes
- ☑ Efficient performance

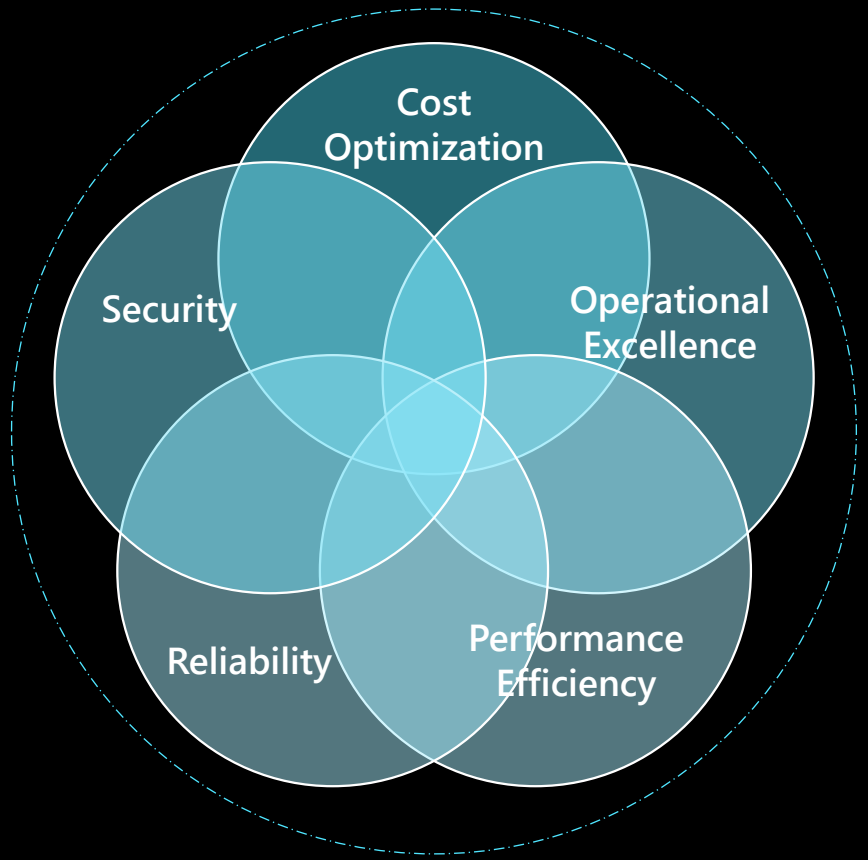


Expenses, losses

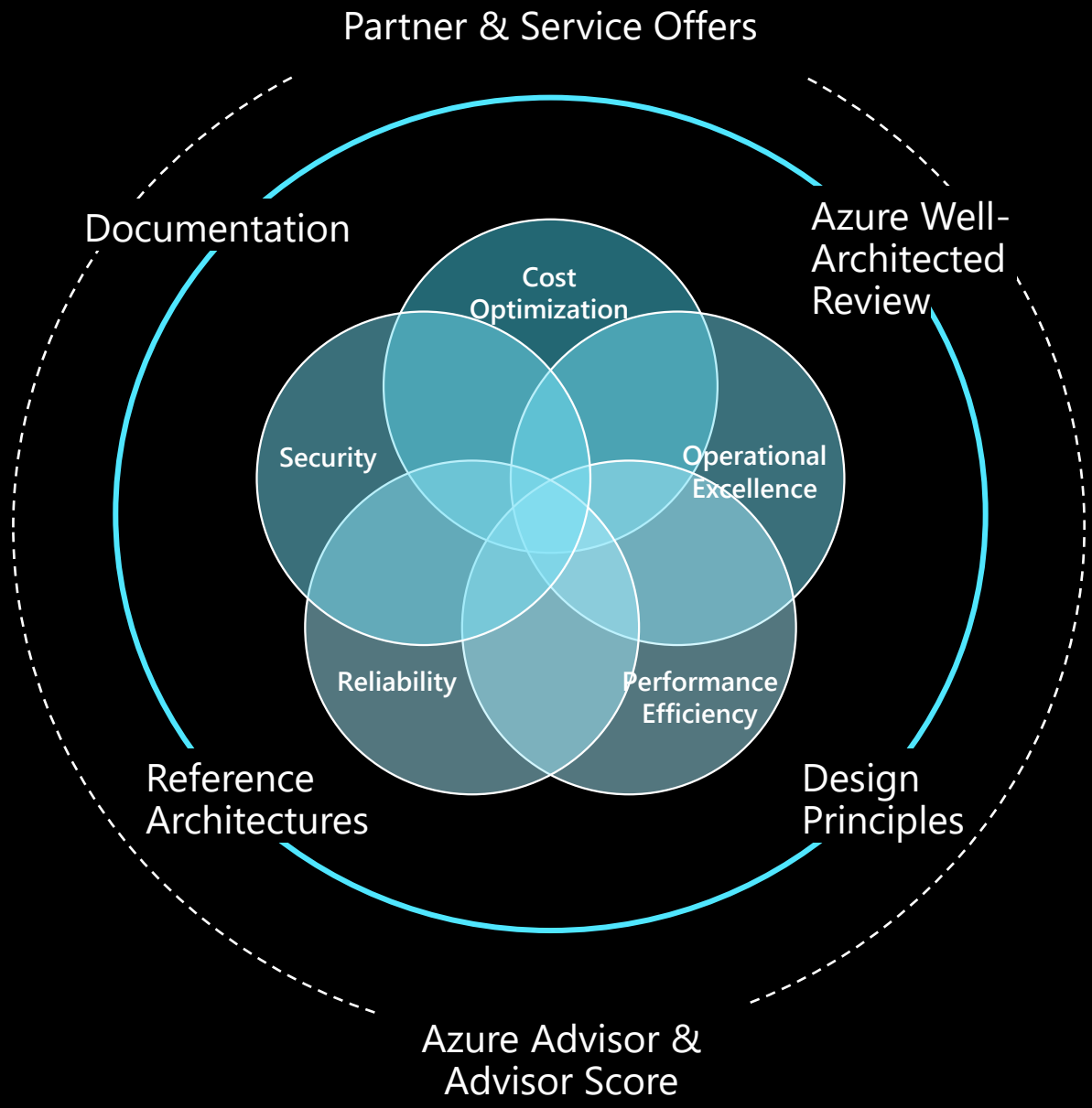
Trust

Damages

Microsoft Azure Well-Architected Framework



Microsoft Azure Well-Architected



Microsoft Azure Well-Architected Framework

Architecture guidance and best practices, created for architects, developers and solution owners, to improve the quality of their workloads, based on 5 aligned and connected pillars

Cost Optimization

Operational Excellence

Performance Efficiency

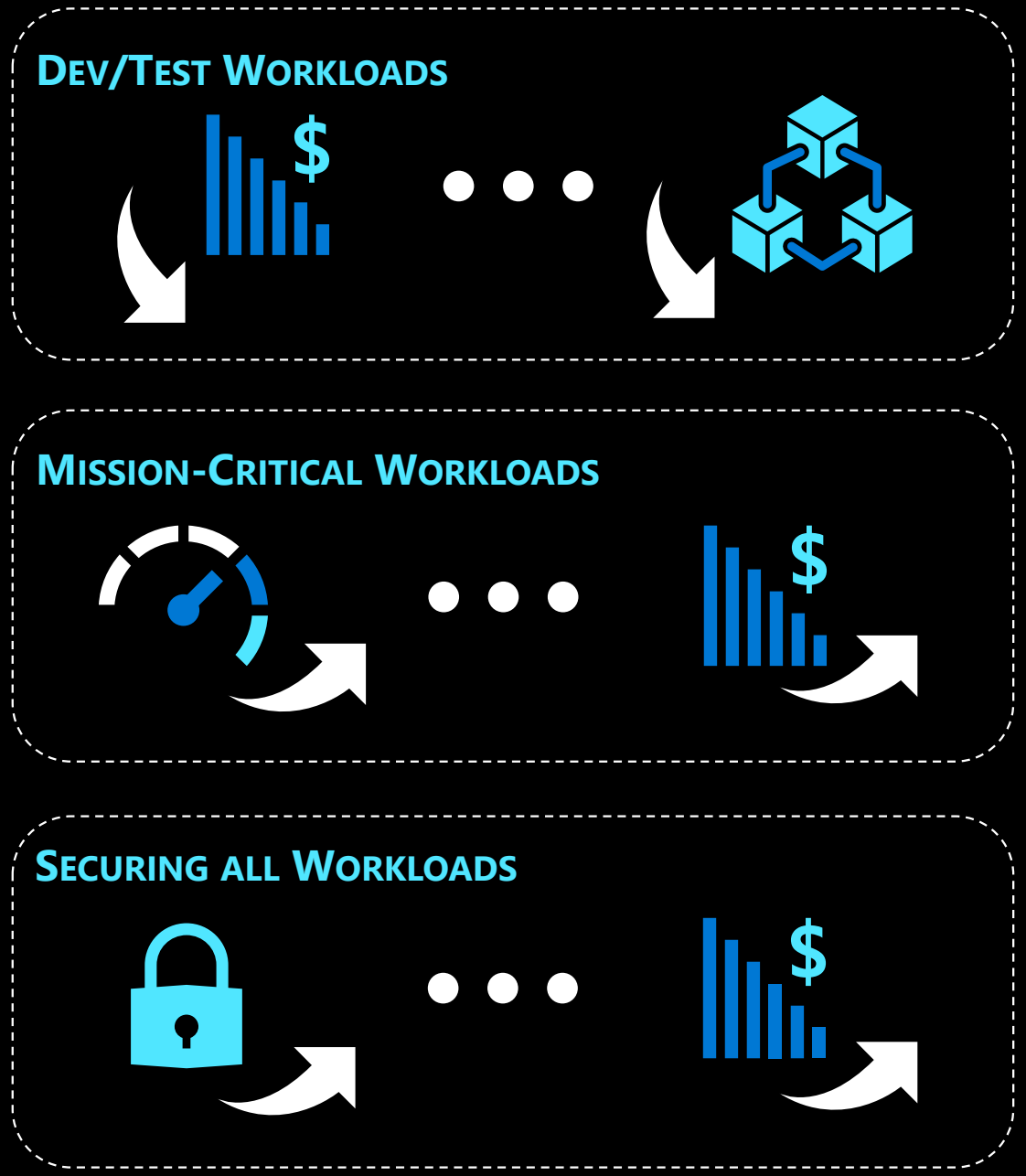
Reliability

Security

https://aka.ms/wellarchitected/framework

It's all about the trade-offs

Business requirements influence workload architecture decisions



https://aka.ms/wellarchitected/framework

Overcoming workload quality inhibitors

Cost Optimization

- No cost and usage monitoring
- Unclear on underused or orphaned resources
- Lack of structure billing management
- Budget reductions due to lack of support for cloud adoption by LT/board

Operational Excellence

- Lack of rapid issue identification
- No deployment automation
- Absence of communication mechanisms and dashboards
- Unclear expectations and business outcomes
- No visibility on root cause for events

Performance Efficiency

- No monitoring new services
- No monitoring current workloads health
- No design for scaling
- Lack of rigor and guidance for technology and architecture selection

Reliability

- Unclear on resiliency features/capabilities for better architecture design
- Lack of data back up practices
- No monitoring current workloads health
- No resiliency testing
- No support for disaster recovery

Security

- No access control mechanism (authentication)
- No security threat detection mechanism
- Lack of security thread response plan
- No encryption process

https://aka.ms/wellarchitected/framework

Best practices to drive workload quality

Cost Optimization

- ✓ Azure Hybrid Benefit
- ✓ Reserve Instances
- ✓ Shutdown
- ✓ Resize
- ✓ Move to PAAS

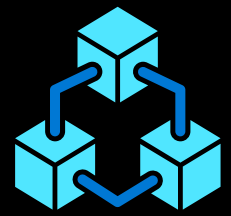
Operational Excellence

- ✓ DevOps
- ✓ Deployment
- ✓ Monitor
- ✓ Processes and cadence

Performance Efficiency

- ✓ Design for scaling
- ✓ Monitor performance

Reliability



- ✓ Define requirements
- ✓ Test with simulations and forced failovers
- ✓ Deploy consistently
- ✓ Monitor health
- ✓ Respond to failure and disaster

Security

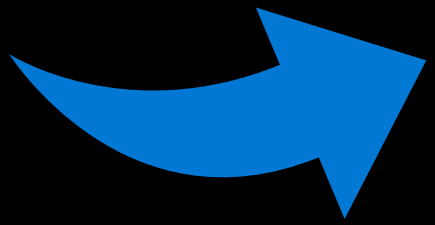
- ✓ Identity and access management
- ✓ Infra protection
- ✓ App security
- ✓ Data encryption and sovereignty
- ✓ Security operations

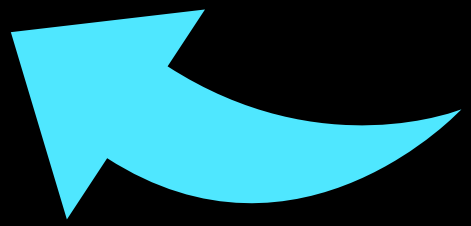
https://aka.ms/wellarchitected/framework

When to think about getting well-architected?

DESIGN & DEPLOY **NEW** WORKLOADS

- ☑ Align workload architecture to business priorities
- ☑ Review Well-Architecture Framework
- ☑ Leverage the Azure Well-Architected Review to assess workload architecture design
- ☑ Consider architecture design trade offs to achieve business goals
- ☑ Build, deploy and manage workloads on Azure





OPTIMIZE **EXISTING** WORKLOADS

- ☑ Leverage Azure Advisor Score to identify optimization opportunities
- ☑ Understand changes needed or incidents occurred
- ☑ Review Well-Architecture Framework
- ☑ Consider architecture design trade offs to achieve business goals
- ☑ Define and implement recommendations
- ☑ Establish a regular cadence for workload optimization

Assessment

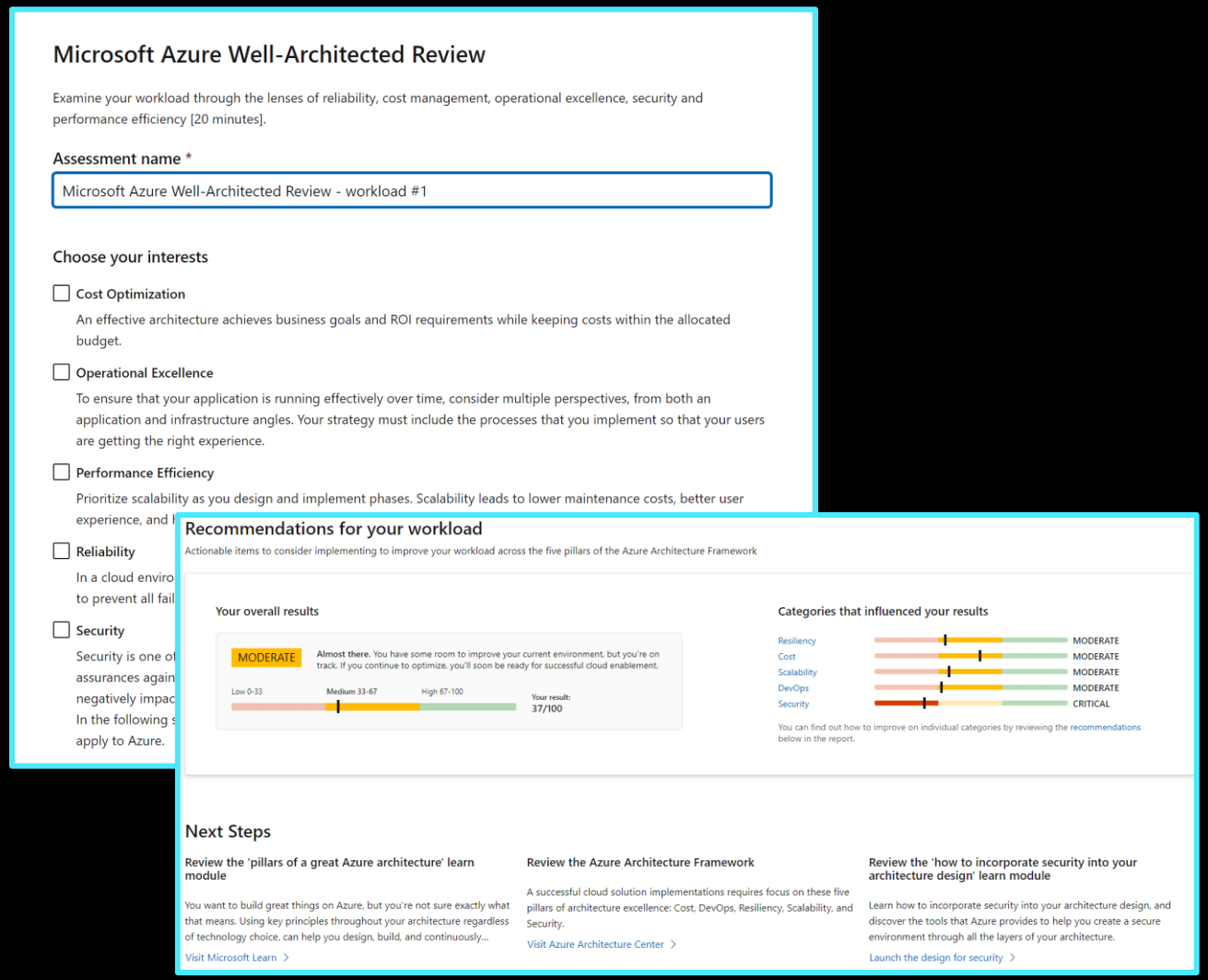
Microsoft Azure Well-Architected Review

https://aka.ms/architecture/review

Using the Azure Well-Architected Review

This web-based assessment helps improve the quality of a workload by

- **Examining the workload** pillars of the Azure Well Architected Framework (Reliability, Cost Optimization, Security, Operations Excellence, and Performance Efficienc
- **Providing specific guidance** improve architecture and overcome detected hurdles effectively
- **Proactively focusing** on the pillar where most attention is needed

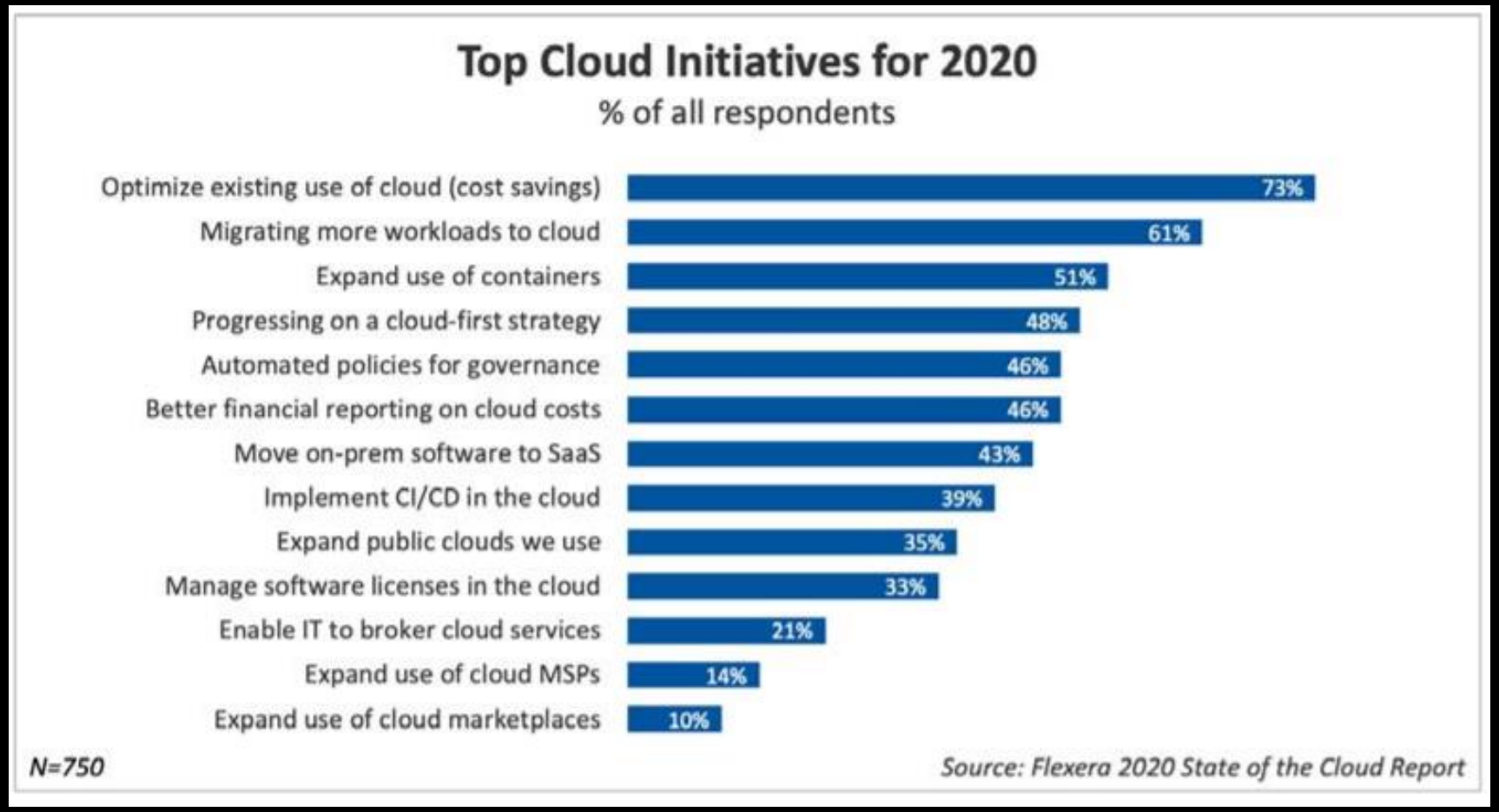


https://aka.ms/architecture/review

Microsoft

Cost optimization

Optimizing spend is top cloud initiative for the fourth year running



Manage and optimize your Azure costs with tools, offers, and guidance from Microsoft

Understand and forecast your costs

- Monitor your bill, set budgets, and allocate spending to teams and projects with Azure Cost Management + Billing
- Forecast costs for future investments with the Azure pricing and TCO calculator

Cost optimize your workloads

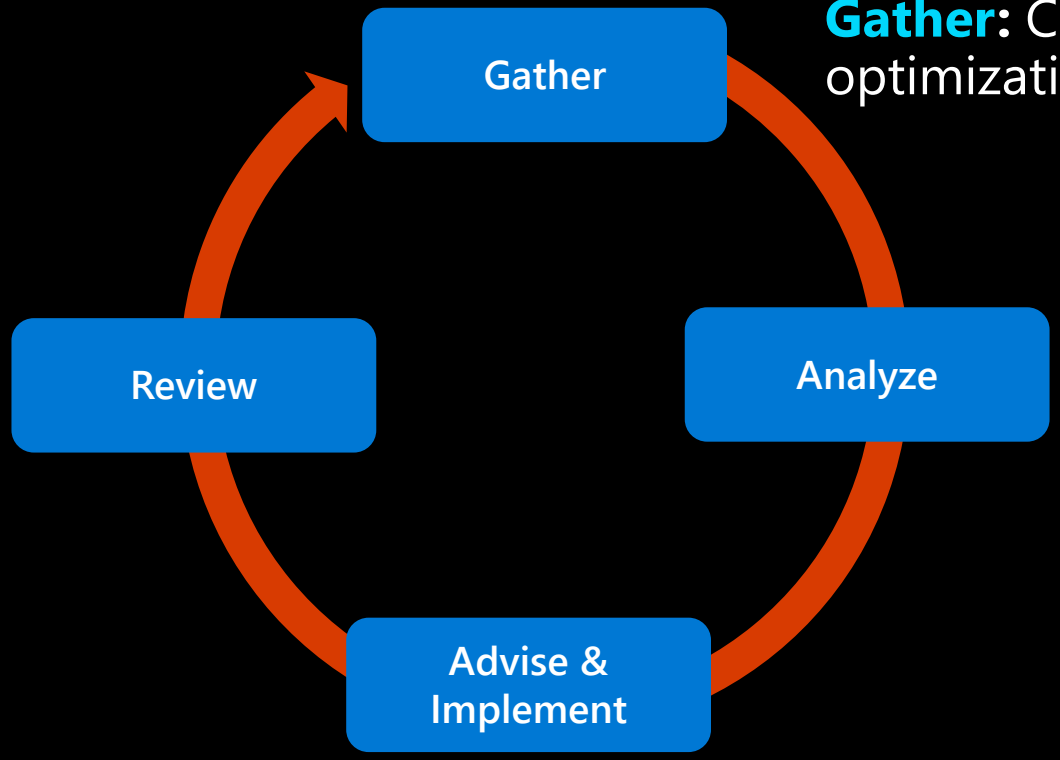
- Optimize your resources with Azure Advisor
- Follow workload design best practices with the Azure Well-Architected Framework
- Save with Azure offers and licensing terms like the Azure Hybrid Benefit and Reservations

Control your costs

- Establish spending objectives and policies using the Microsoft Cloud Adoption Framework for Azure
- Implement cost controls in Azure Policy so your teams can go fast while complying with policy

Learn more: aka.ms/costoptimization

Cost optimization process



Gather: Collect data to identify optimization opportunities

Analyze: Confirm optimization opportunities

Advise: Present and implement optimization recommendations

Review: Assess results, plan for ongoing optimizations

Cost optimization categories

Organizational

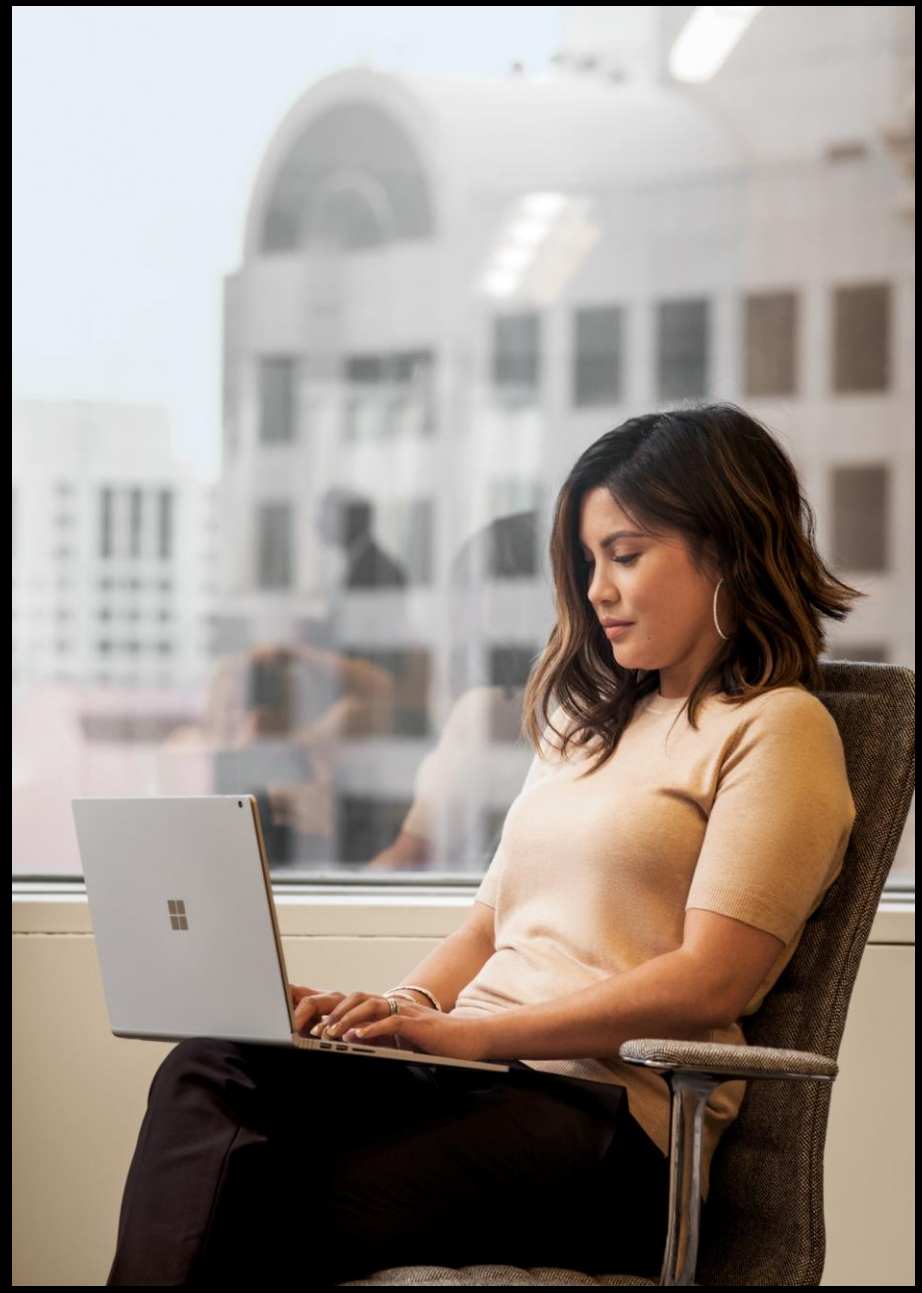
- Tagging
- Charge/Show back models
- ACM Budgets and Alerts

Architectural

- Azure Hybrid Benefit (AHB) for SQL and Windows
- PaaS and serverless considerations

Tactical

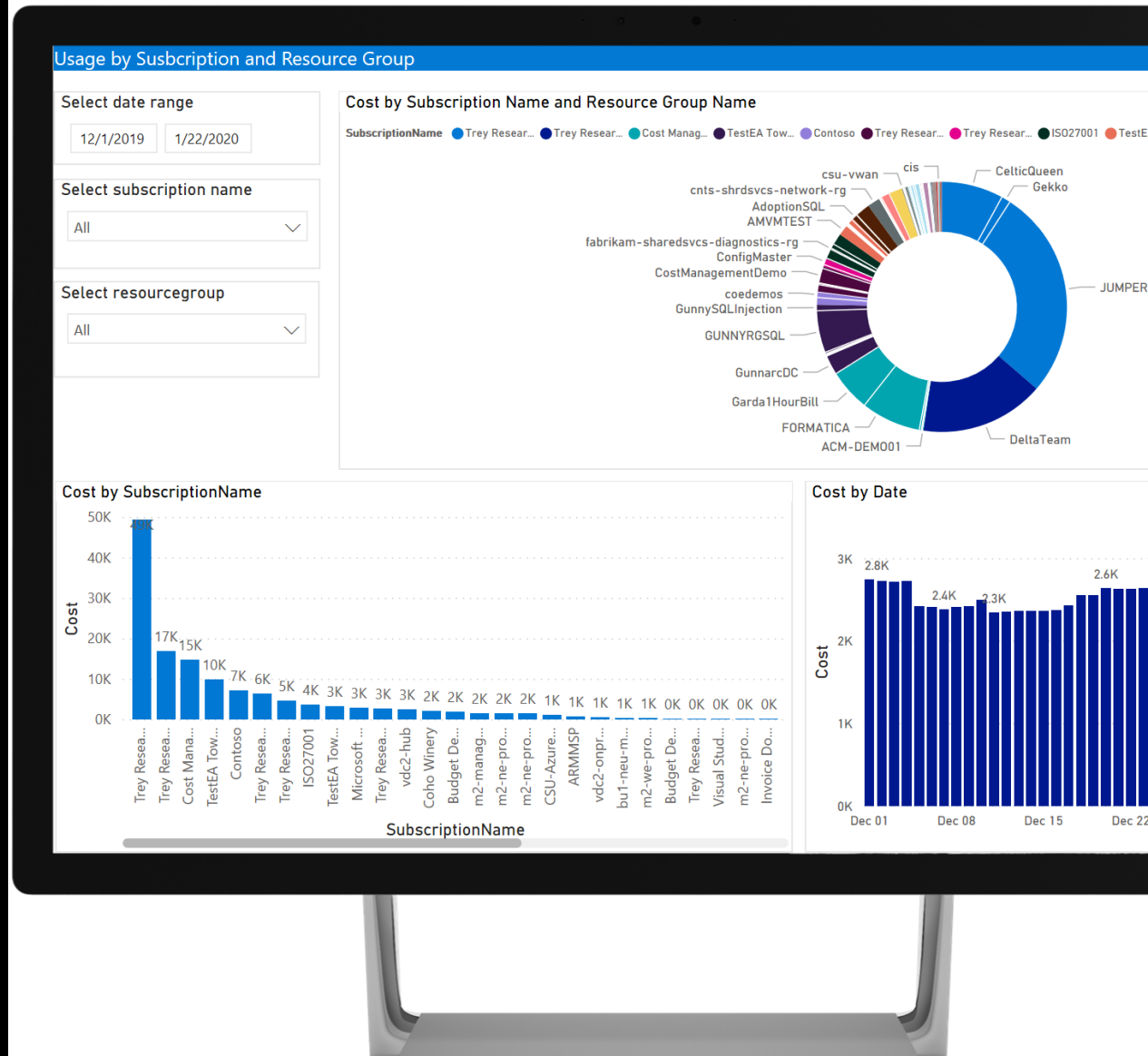
- Auto-shutdown
- Right Sizing
- Reserved Instances



Azure Cost Management + Billing Power BI App

Reports included:

- Account overview
- Usage by Subscriptions and Resource Groups
- Top 5 Usage drivers
- Usage by Services
- Windows Server AHB Usage
- VM RI Coverage (shared recommendation)
- VM RI Coverage (single recommendation)
- RI Savings
- RI Chargeback
- RI purchases
- Pricesheet



Microsoft

Reliability

Why is Reliability Important?

Avoiding failure is impossible in the public cloud, applications require *resilience* to respond to failures and deliver *reliability*

Reliability

Reliability is the '**what**'.

It is the goal for production systems, to ensure availability of their services.

The goal is to maintain reliable systems, with the appropriate level of availability/uptime.

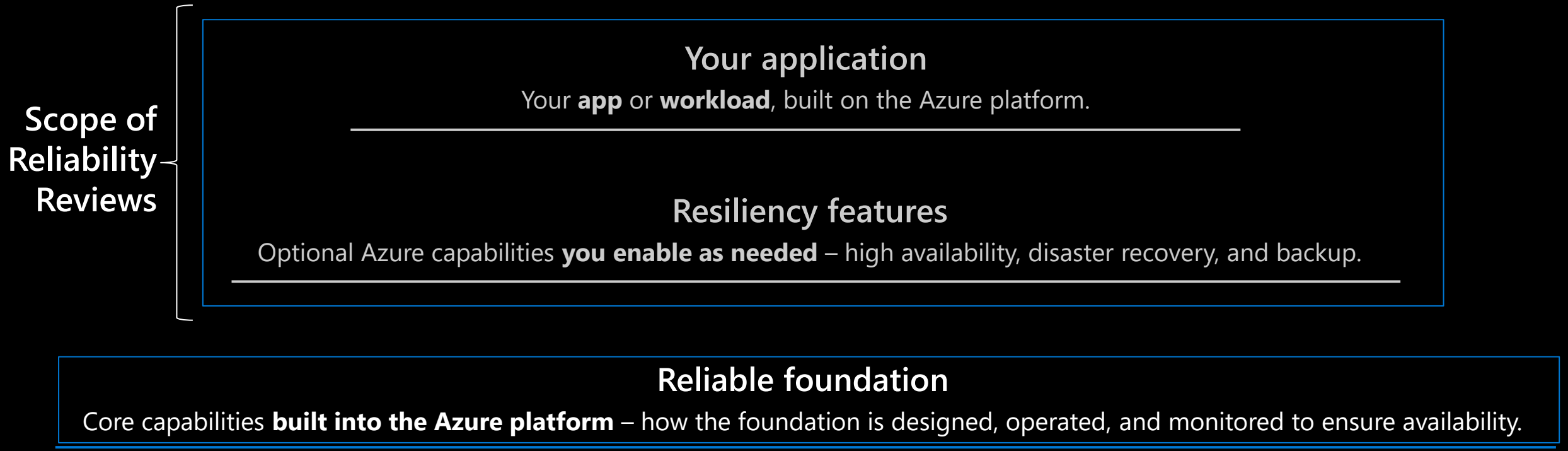
Resilience

Resilience is the '**how**'.

It is the way in which production systems can achieve reliability.

The objective is not to avoid all failures – it is to ***respond to failure in a way that avoids downtime and data loss***.

Building reliable systems is a **shared responsibility**



Building reliable systems is a shared responsibility

Your application

Your **app** or **workload** architecture, built on the below.

Resiliency features

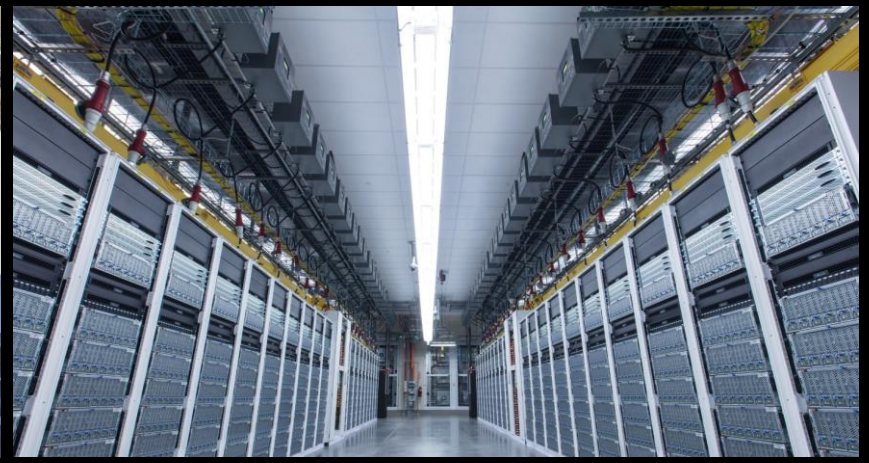
Optional Azure capabilities **you enable as needed** – high availability, disaster recovery, and backup.

Resilient foundation

Core Azure capabilities **built into the platform** – how the foundation is designed, operated, and monitored to ensure availability.

Resilient foundation

Our investments in global infrastructure, service management, and ensuring transparency



Design

Global network

Data center infrastructure

Storage protection

Operate

Safe deployment

Maintenance & control

ML & failure prediction

Observe

Communications philosophy

Service health & alerts

Scheduled events

What are Well-architected Reliability Reviews?

- Comprehensive **end-to-end review of an existing application or proposed design**, to identify critical reliability optimizations
  - Covers a range of technical topics from Compute, Data and Networking to DevOps, but **always through a focused *reliability* lens**

- **Identify critical risks** to the reliability of an application deployed to Azure
  - Have a set of **prioritized and actionable recommendations** to address each area of concern

Review Flow & Where to Start

1. Always start with the **big-picture** and work top-down

Understand the architectural context and business purpose of the application

Walk through the critical system flow and explore each component including shared services and dependencies

2. Explore expectations for reliability: RTO, RPO, NFRs, SLAs

Goal is to identify risks, especially those preventing the application from meeting expectations
Do these expectations apply to the whole application?

3. Failure-Mode Analysis

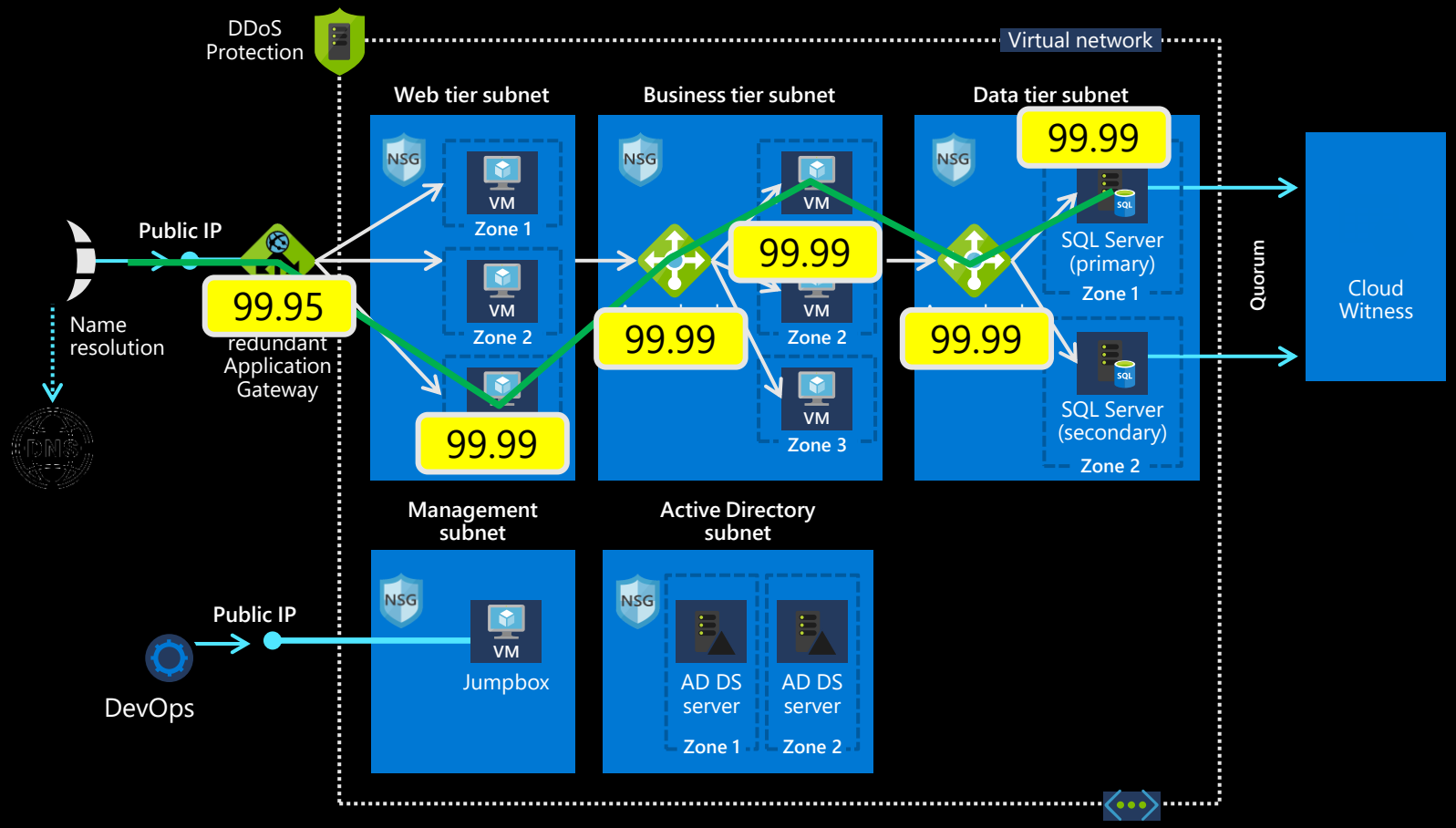
How will the system respond if any part(s) failed including application code; work level by level

4. Deep dive into key technical domains

Expectations for Reliability

- Goal is to identify aspects of the application that prevent it from meeting the expectations of reliability
  - That means knowing the expectations
  - Never move forward without a definition of goal state (e.g. Target SLA/SLO/RTO/RPO)
- Service Level Availability (SLA)
  - Azure service SLAs are specified in an availability percentage (e.g. 99.99%) over a month
  - Align these measurement details with the customer's SLA expectations
    - Some customers internally monitor their SLA/SLO measurements over a different period (e.g. Daily, Weekly, etc)
  - Understand the specifics of what is and is not covered by an Azure service SLA
- Calculating a Composite SLA Estimate for an Application
  - Composite platform SLA measurement for key operation flows
  - Does not account for poorly written application code
  - Provides an upper bounds for overall availability target
  - It points to specific places in the architecture that need attention

Pathwise Analysis of Operations



- Pathwise Analysis applied to Sample Architecture
- 99.9% Composite SLA Estimate

Key Outcomes

Identify key risks to the reliability of the application

Propose actionable and prioritized recommendations to address identified risks

P0 – Critical short-term remediation

P1 – Strongly recommended mid-term improvements

P2 – Long-term sustainability recommendations

Capture key findings and associated recommendations in a **reliability report** focused on the reviewed application

Assess your understanding on implementing critical short-term recommendations

Microsoft

Azure Advisor

Azure Advisor recommendations

Guides you to improve your Azure resources across four categories

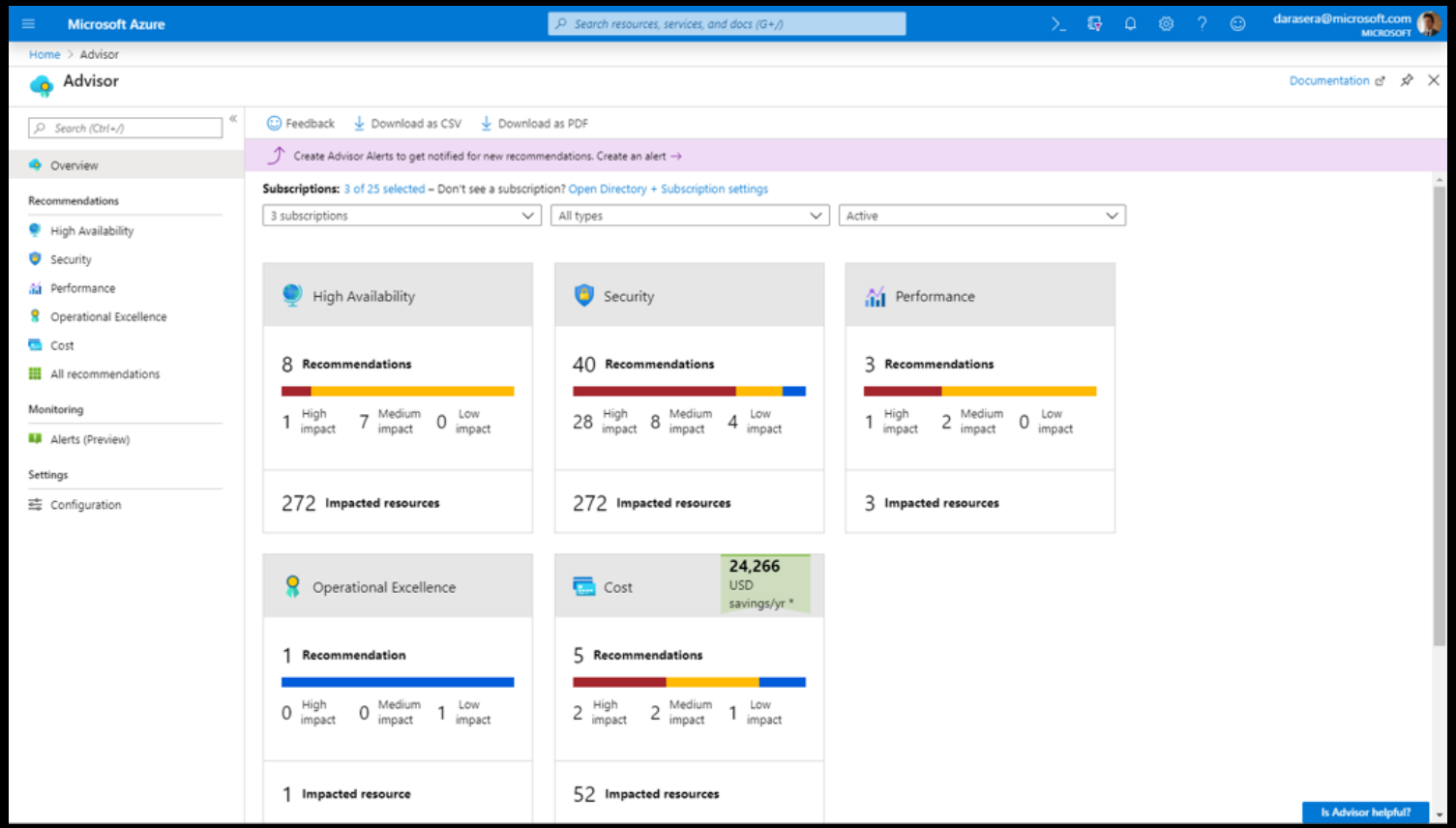
High Availability	Security	Performance	Cost
Improve resource availability to ensure continuity of your mission critical applications	Enhance security to protect your deployments from potential security threats	Boost performance to make the most of your Azure resources	Optimize your Azure resource cost to get more from your IT budget

Cost Optimization

Get cost recommendations based on your usage and configurations, such as:

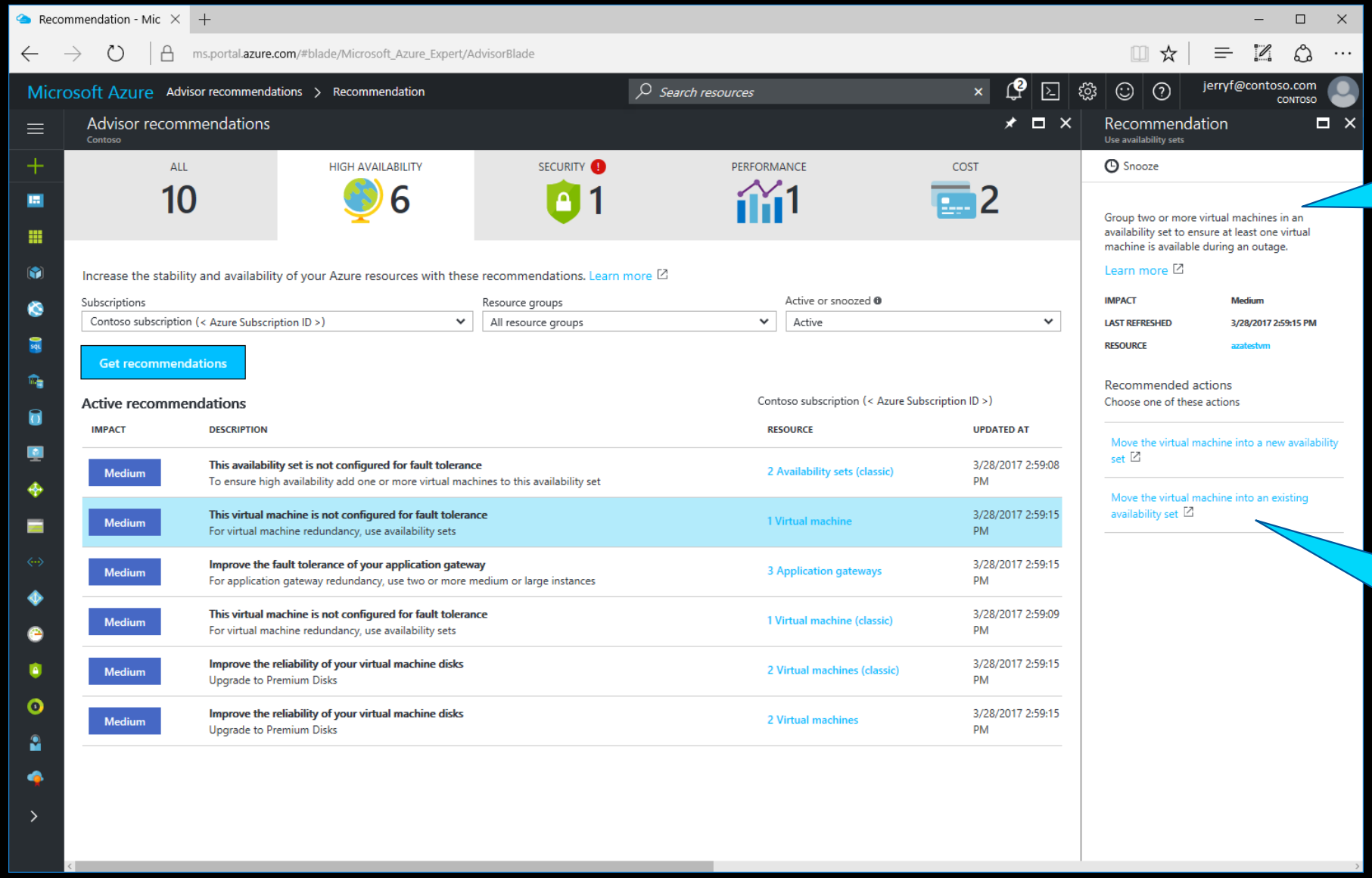
- Shut down unused VMs
- Rightsize underused VMs
- Buy Reserved Instances for consistent resources
- Delete idle network gateways

Remediate recommendations easily with step-by-step guidance



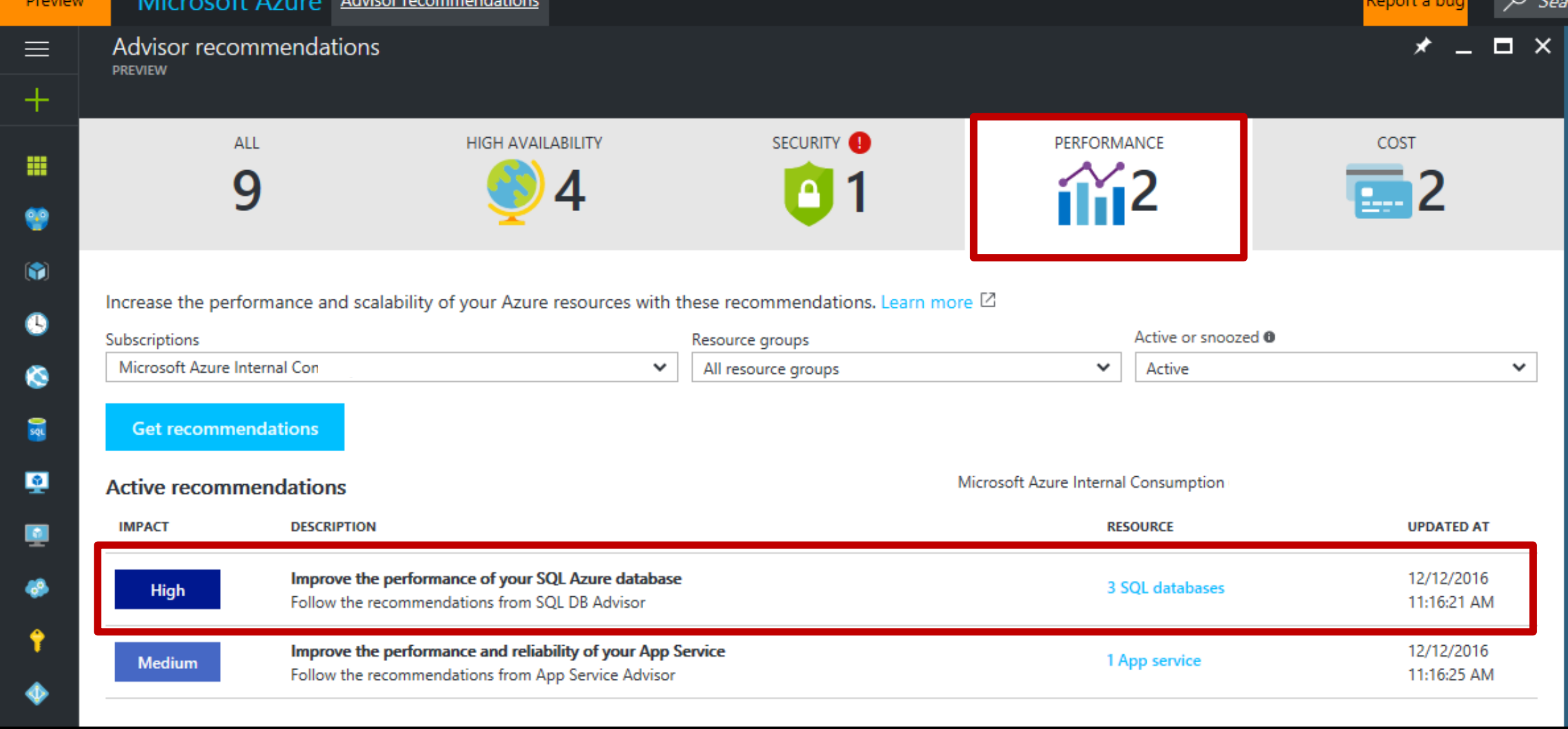
Review your Advisor recommendations in the Azure portal: aka.ms/azureadvisor

Improve resource availability



Advisor identifies virtual machines that are not configured to meet the current Azure SLA

Recommendations with “inline actions” empower you to address potential issues within Advisor itself


Preview
Microsoft Azure
Advisor recommendations
Report a bug
Advisor recommendations
PREVIEW
ALL
9
HIGH AVAILABILITY
4
SECURITY
1
PERFORMANCE
2
COST
2
Increase the performance and scalability of your Azure resources with these recommendations. Learn more
Subscriptions
Microsoft Azure Internal Con
Resource groups
All resource groups
Active or snoozed
Active
Get recommendations
Active recommendations
Microsoft Azure Internal Consumption
IMPACT
DESCRIPTION
RESOURCE
UPDATED AT
High
Improve the performance of your SQL Azure database
Follow the recommendations from SQL DB Advisor
3 SQL databases
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Improve the performance and reliability of your App Service
Follow the recommendations from App Service Advisor
1 App service
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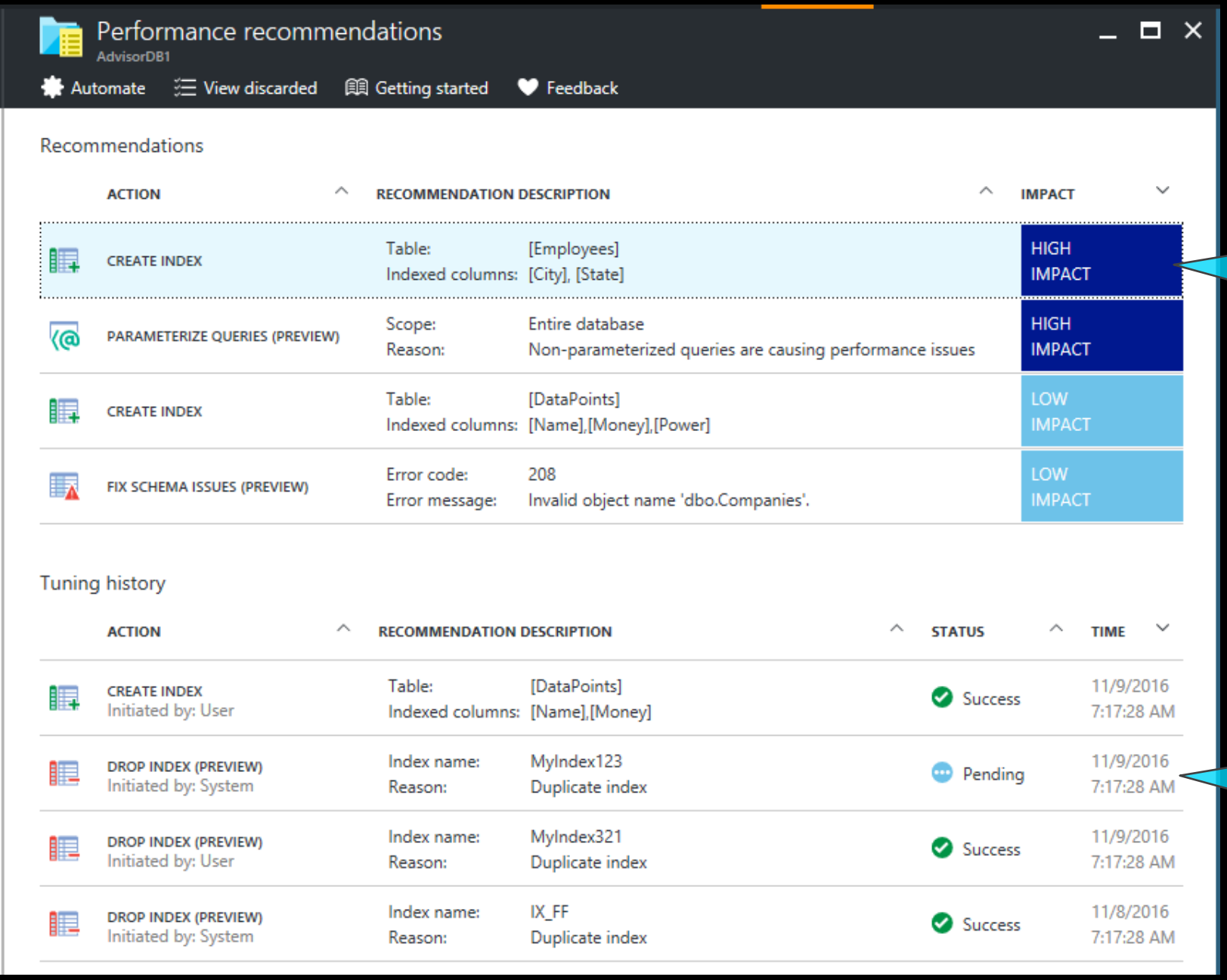
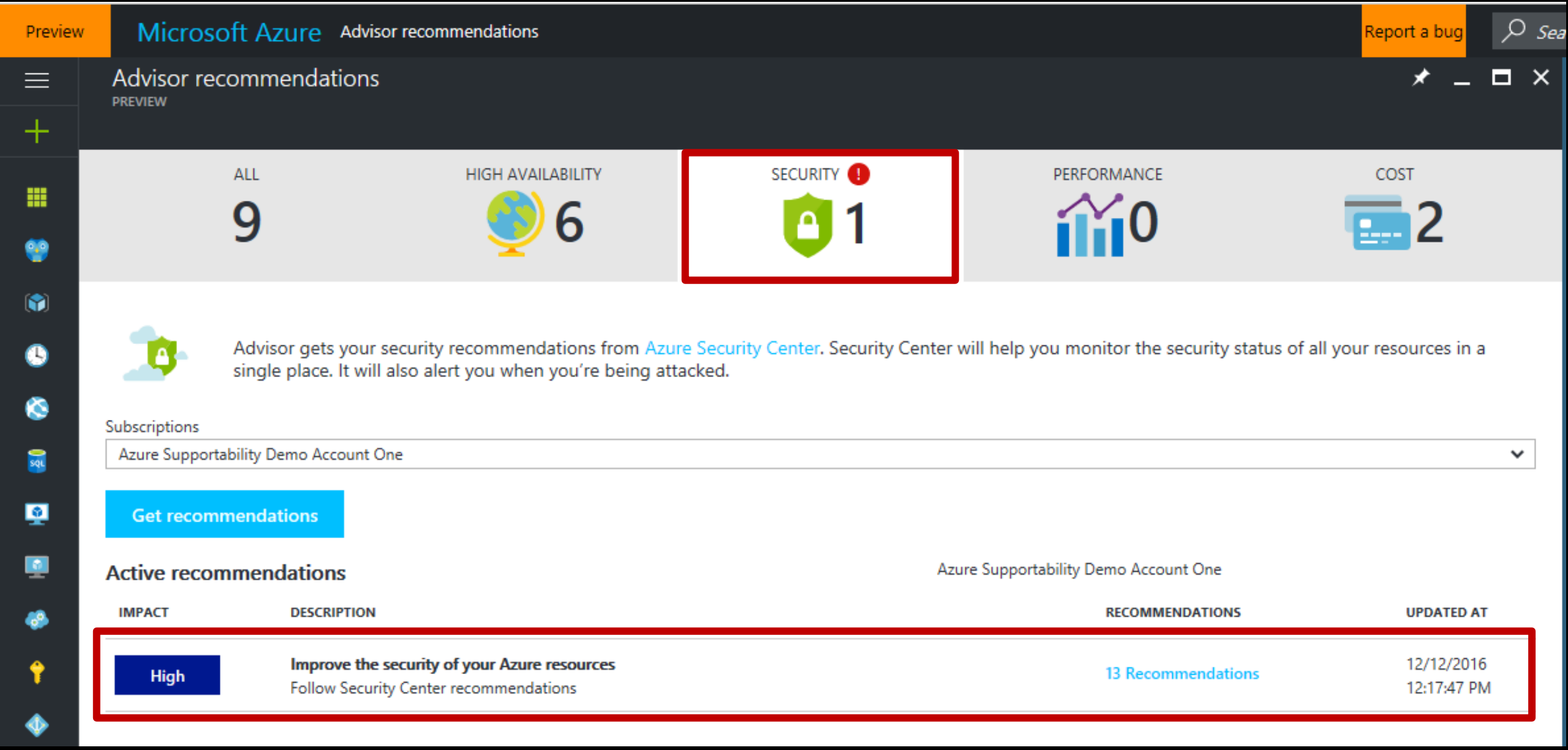
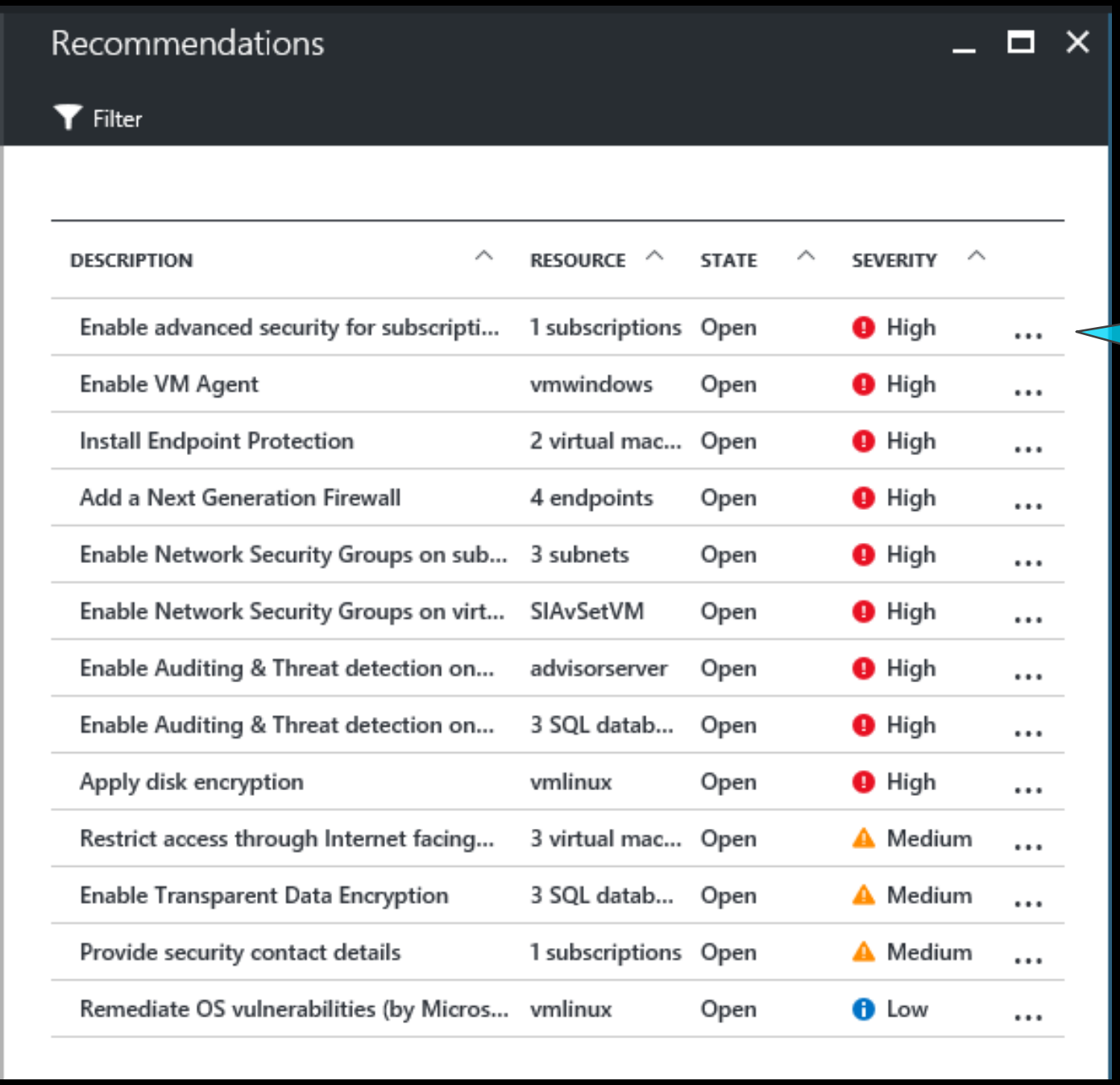


SQL DB Advisor recommendations help improve the performance of your application accessing a SQL Azure database

*Implemented recommendations are monitored for an additional day and **auto-reverted** if a performance regression is discovered*


Preview
Microsoft Azure
Advisor recommendations
Report a bug
Advisor recommendations
PREVIEW
ALL
9
HIGH AVAILABILITY
6
SECURITY
1
PERFORMANCE
0
COST
2
Advisor gets your security recommendations from Azure Security Center. Security Center will help you monitor the security status of all your resources in a single place. It will also alert you when you're being attacked.
Subscriptions
Azure Supportability Demo Account One
Get recommendations
Active recommendations
Azure Supportability Demo Account One
IMPACT
DESCRIPTION
RECOMMENDATIONS
UPDATED AT
High
Improve the security of your Azure resources
Follow Security Center recommendations
13 Recommendations
12/12/2016
12:17:47 PM



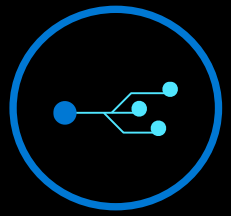
Advisor integrates with Azure Security Center to bring you security recommendations

Architect & optimize workloads for success, with these Microsoft resources

Leverage assessment
Azure Well-Architected Review
(aka.ms/wellarchitected/review)

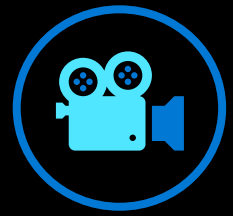
Get trained
Well-Architected Learning Path
(aka.ms/wellarchitected/learn)

Browse Reference Architectures
Azure Architectures
(aka.ms/wellarchitected/referencearch)



Review Design Principles
Well-Architected Design Principles
(aka.ms/wellarchitected/designprinciples)

Review the Documentation
Azure Well-Architected Framework
(aka.ms/wellarchitected/framework)



Azure Enablement Show
Channel 9 Show
(aka.ms/azenable)

NEW

Microsoft

Kehitä Azure osaamistasi ja tuo osaamisesi näkyväksi sertifioinnilla!

Marja Aho
Partner Enablement Lead, Microsoft
https://www.linkedin.com/in/marjaaho/

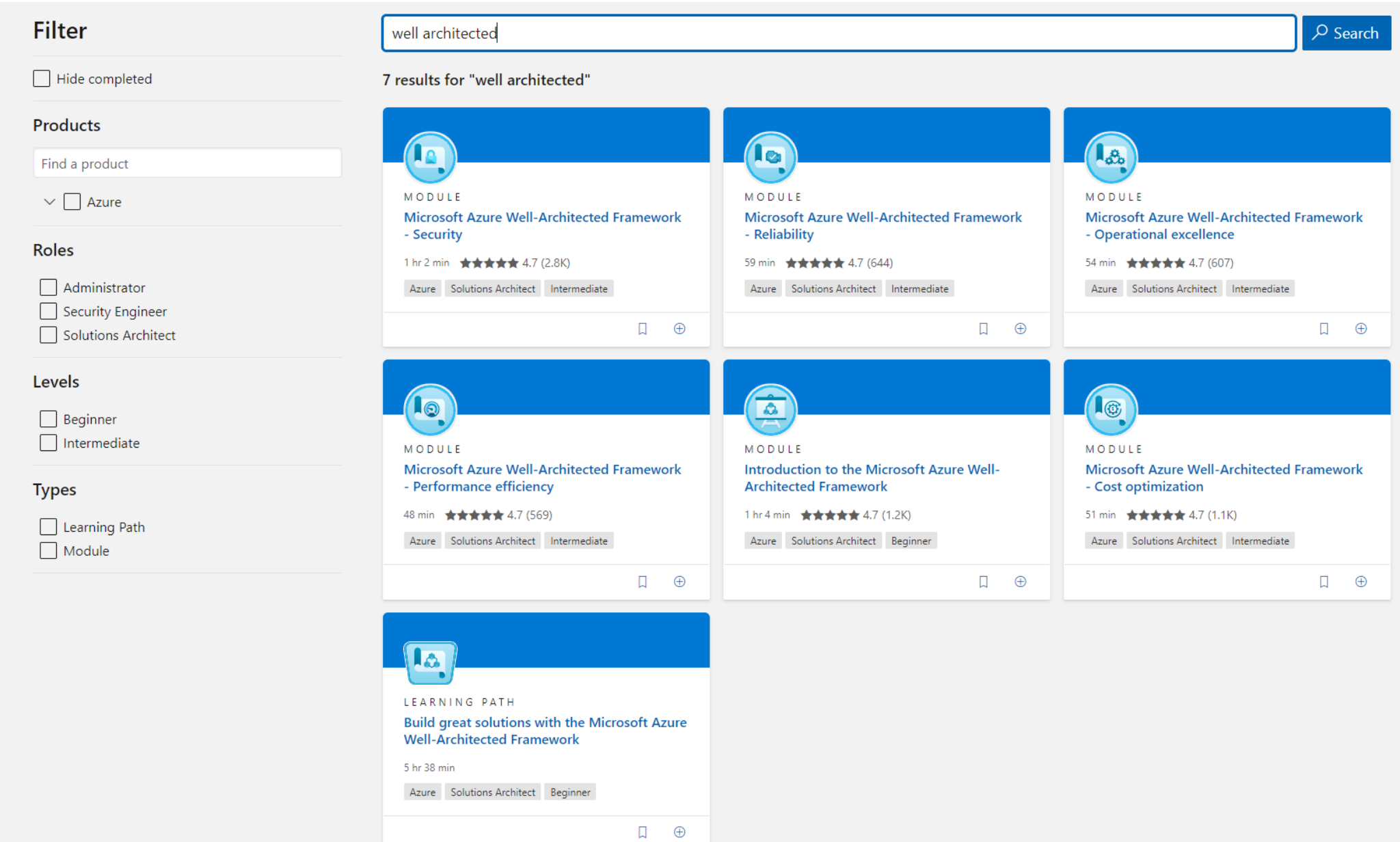
Lisää Well Architected Framework koulutusta

Introduction to the Azure Well-Architect Framework (VTS) on-demand

Azure Well Architected training 09Feb-10Feb: coming soon to aka.ms/kumppanikoulutukset

Browse all

Learn new skills and discover the power of Microsoft products with step-by-step guidance. Start your journey today by exploring our learning paths and modules.



Muista Microsoft Learn!

microsoft.com/learn

microsoft.com/certifications
microsoft.com/traincertposter

Benefits for an individual of getting certified

Stand out
Certified employees **get greater recognition** of skills due to validation [1]

Earn more
23% of Microsoft certified technologists **earn up to 20% more** [2]

Advance
49% believe cloud certifications **increase employability**[3]

[1] 2017 IDC-Microsoft, Cloud Skills and Organizational Influence: How Cloud Skills Are Accelerating the Careers of IT Professionals white paper

[2] 2017 Pearson VUE, Value of Certification white paper

[3] 2017 Nigel Frank International Microsoft Technology for Business Salary Survey

Microsoft Azure certifications

Role-based
Expand your technical skill set

Associate

- Azure Administrator **(AZ-104)**
- Azure Developer (AZ-204)
- Azure Security Engineer (AZ-500)
- Azure Data Scientist (DP-100)
- Azure AI Engineer (AI-100)
- Azure Data Engineer (DP-200 + DP-201)
- Azure Database Administrator (DP-300)
- Data Analyst **(DA-100)**

Expert

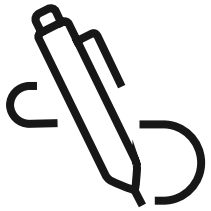
- Azure Solutions Architect (DP-303 + AZ-304)
- DevOps Engineer **(AZ-400)**

Specialty
Deepen your technical skills and manage industry solutions

- Azure for SAP Workloads (AZ-120)
- Azure IoT Developer **(AZ-220)**

Fundamentals
Master the basics

- Azure Fundamentals (AZ-900)
- Azure AI Fundamentals **(AI-900)**
- Azure Data Fundamentals **(DP-900)**



Get started

1 Identify roles, skills and learning paths

aka.ms/Certification

2 Schedule an exam at a test center or online

(Good to have a deadline in studies)

3 Begin with self-studies

microsoft.com/learn

aka.ms/enablevilt

4 Attend Microsoft Virtual Training Days (Fundamentals)

Utilize learning partner's courses
e.g. Sovelto, Sulava, Zure, Tieturi

Utilize free Microsoft exam preps and practice test sessions available in partner training calendar

5 Link you personal Certification account to your organization in Partner Center
Guide

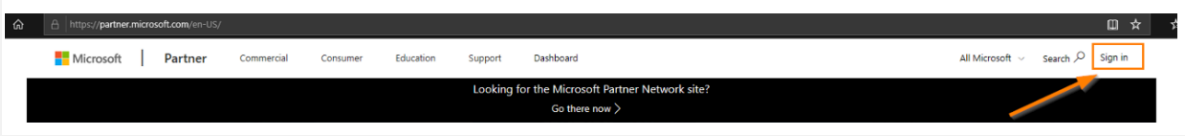
Sertifiointien linkittäminen kumppaniprofiiliin Partner Centerissä. Miten ja miksi?

Näin linkität sertifiointisi kumppaniprofiiliin Partner Centerissä

Kun varaat sertifiointitestiajan tai kun kirjaudut MS Learniin, tarvitset henkilökohtaisen **Microsoft Live ID sähköpostitilin** (esim. @outlook.com). Tämä on sähköpostiosoite on samalla Microsoft Learning tilisi käyttäjätunnus. Läpäistyäsi sertifiointitestin, liitetään Microsoft Learning tiliisi niin kutsuttu MCP (Microsoft Certified Professional) ID todisteeksi sertifiointisuorituksesta. **Partner Centerissä linkitetään kyseinen Learning tili**, jonka sisältämät sertifioinnit näkyvät Partner Centerin raporteissa ja näinollen luetaan hyväksi kompetenssivaatimuksiin.
Microsoft Certified Professional (MCP) sertifioinnin linkityksen (tai poiston) kumppaniprofiiliin voi tehdä vain MCP ID:n haltija itse – henkilötietosuojan takia.
Linkitystä varten tarvitset **Partner Center tilin**. Sinulla ei tarvitse olla admin oikeuksia – matalimman tason oikeudet riittää.
Partner Center käyttäjätunnukset saat Partner Center pääkäyttäjältäsi. Tarkat ohjeet Partner Center pääkäyttäjille täällä.

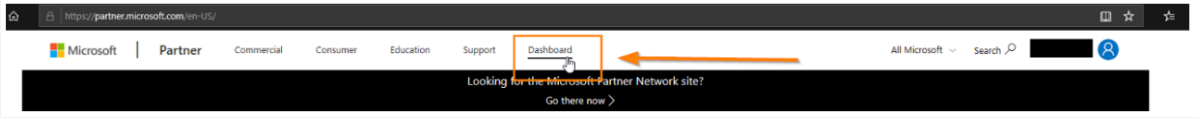
Kohta 1:

Kirjaudu Partner Centeriin.
Saat tunnukset Partner Center Adminiltasi.
https://partner.microsoft.com/



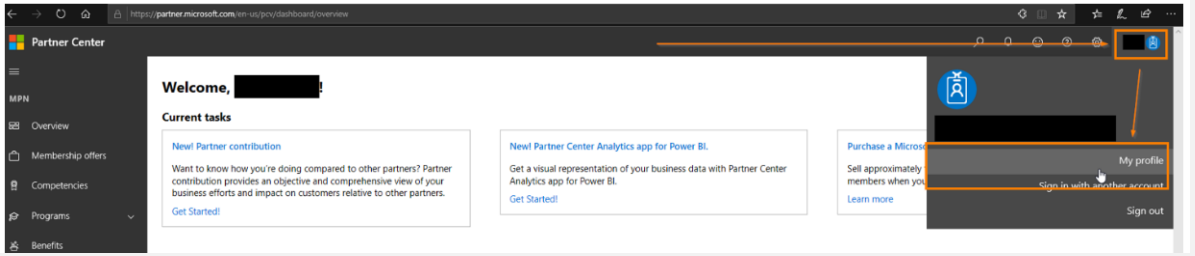
Kohta 2:

Mene valikkoon: **Dashboard**.



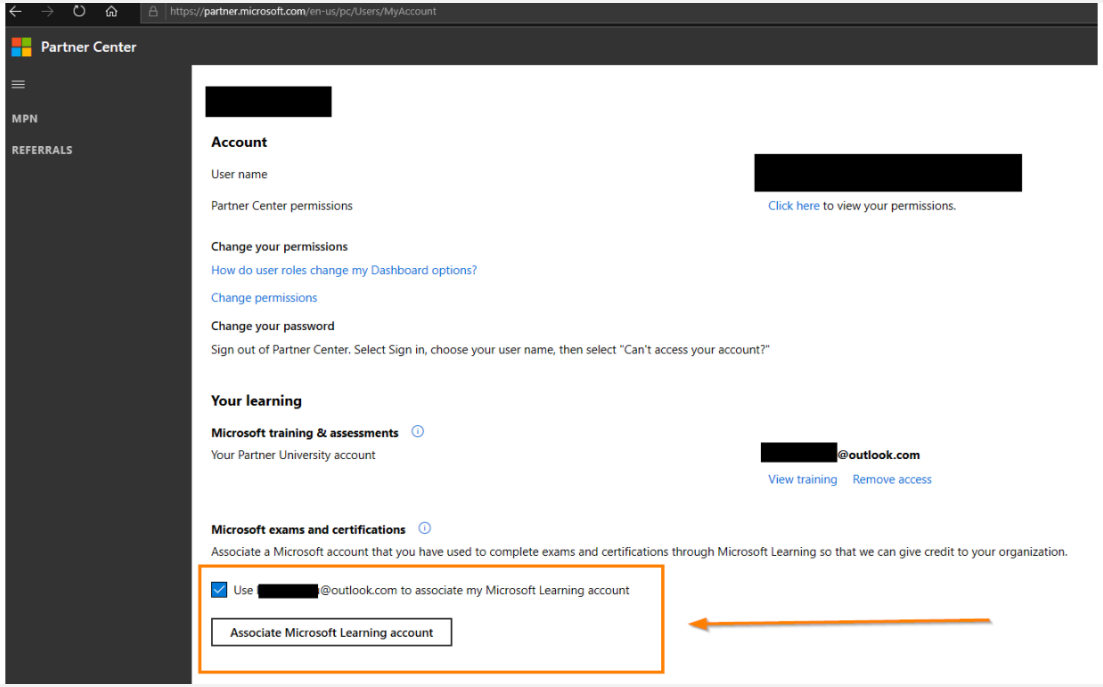
Kohta 3:

Napsauta sivun oikeassa yläkulmassa olevaa kuvaketta ja mene kohtaan **“My Profile”.**



Kohta 4:

Kohdassa “Microsoft exams and certification“ laita rasti ruutuun ja napsauta **“Associate Microsoft Learning Account“.** Sinut ohjataan Sign in sivulle, johon sinun tulee syöttää henkilökohtainen sähköpostiosoitteesi ja salasanasi, joita käytit sertifiointitestin varaamiseen.



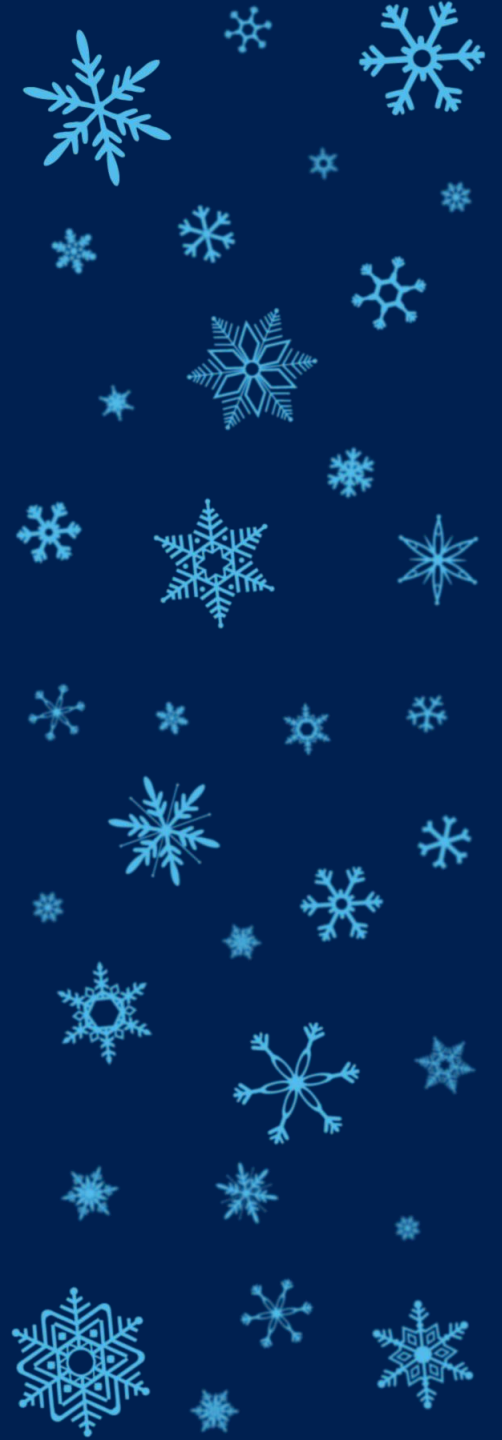
Laita nämä itselle suosikeiksi!

- **Partner training calendar** aka.ms/kumppanikoulutukset
- **Virtual Instructor Led trainings:** aka.ms/enablevilt
- **Microsoft Learn** - itseopiskelumateriaalit: aka.ms/learn
- **Kumppanifoorumi** – suomenkielinen viestintä ja keskustelukanava kumppaneille: aka.ms/kumppanifoorumi

Kumppanitunnit jatkuvat 22.1. joka toinen perjantai klo 9-10

aka.ms/kumppanitunti

Hyvää Joulua!!



QA

Thank you!