



# Microsoft Azure: Performance



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# Performance Agenda

- **JoeG - How to help customers assess what they'll need as they move to Azure**
  - Azure Migration
  - Pricing Calc
- **JoeG - Achieving performance with Azure at the right price**
  - Auto-scaling, Right-sizing, Turn-off, auto deploy, capacity planning, Scale-up
- **JoeL - Tools and technologies that will help you monitor and optimize your workloads**
  - Azure Monitor --> Log Analytics
  - Azure Advisor
  - Azure Security Center - agentless
- **JoeL - Methods to modernize applications for Azure**
  - Resources to put solutions together
  - IaaS to PaaS -> Refactor, ReArch, Rebuild
  - Talk about App Modernization Strategy
- **JoeG - Ways you can take advantage of SYNNEX reseller support to drive profits**

# Azure Migrate

## Step-by-Step Tutorials

Learn how to assess and migrate VMware VMs to Azure

[Prepare VMware VMs for assessment and migration to Azure](#)

[Assess VMware VMs for migration to Azure](#)

[Migrate VMware VMs to Azure with agentless migration](#)

[Migrate VMware VMs to Azure with agent-based migration](#)

Learn how to assess and migrate Hyper-V VMs to Azure

[Prepare Hyper-V VMs for assessment and migration to Azure](#)

[Assess Hyper-V VMs for migration to Azure](#)

[Migrate Hyper-V VMs to Azure](#)

Learn how to migrate physical servers, virtualized machines, and cloud VMs to Azure

[Migrate physical or virtualized servers to Azure](#)



## Migrate your on-premises datacenter to Azure

Discover, assess and migrate your on-premises applications using Microsoft or third-party tools, or find [an expert](#) to help with your migration. [Learn more](#)



### Discover, assess and migrate servers

Discover, assess and migrate your on-premises VMware and Hyper-V virtual machines or Physical servers to Azure.

[Assess and migrate servers](#)



### Assess and migrate databases

Assess and migrate your on-premises databases to Azure SQL Database Managed Instance or Azure SQL Database.

[Assess and migrate databases](#)

### Assess and migrate web apps to Azure

Assess and migrate .NET and PHP web apps to Azure's Platform-as-a-Service, Azure App Service.

[Assess and migrate web apps](#)

### Migrate on-premises data to Azure

Use the Data Box offline family of products to move large amount of data to Azure.

[Order a Data Box](#)

## Quick Starts

Learn how to onboard to Azure...

[TCO Calculator](#)

Learn about the available tools...

- [Azure Migrate: Server Assessment](#)
- [Azure Migrate: Server Migration](#)
- [Azure Migrate: Database Assessment](#)
- [Azure Migrate: Database Migration](#)

Need help?

[FastTrack for Azure](#)







# Azure Migrate

[Home](#) > [Azure Migrate - Servers](#) > [Add a tool](#)

## Add a tool

[Migrate project](#) [Select assessment tool](#) [Select migration tool](#) [Review + add tool\(s\)](#)

Start by choosing a server discovery and assessment tool. We recommend that you discover and assess your datacenter to determine migration readiness.

TOOL	PRICING	SUPPORTED WORKLOADS	FEATURES	LEARN MORE
 <b>Azure Migrate: Server Assessment</b>	<a href="#">View</a>	VMware virtual machines Hyper-V virtual machines	Agentless discovery Cost planning and optimal right sizing Application dependency analysis Cloud migration planning	<a href="#">Learn more</a>
 <b>Cloudamize: Cloud Assessment</b>	<a href="#">View</a>	VMware virtual machines Hyper-V virtual machines Physical machines Workloads on other public clouds	Agentless or agent-based discovery Cost planning and optimal right sizing Application dependency analysis Cloud migration planning	<a href="#">Learn more</a>
 <b>Corent Tech: SurPaaS MaaS</b>	<a href="#">View</a>	VMware virtual machines Hyper-V virtual machines Physical machines Workloads on other public clouds	Agentless or agent-based discovery Cost planning and optimal right sizing Application dependency analysis Cloud migration planning	<a href="#">Learn more</a>
 <b>Device42: Device42</b>	<a href="#">View</a>	VMware virtual machines Hyper-V virtual machines Physical machines Workloads on other public clouds	Agentless discovery Cost planning and optimal right sizing Application dependency analysis Application workload grouping	<a href="#">Learn more</a>
 <b>Turbonomic: Turbonomic</b>	<a href="#">View</a>	VMware virtual machines Hyper-V virtual machines Physical machines Workloads on other public clouds	Agentless discovery Cost planning and optimal right sizing Application dependency analysis Cloud migration planning	<a href="#">Learn more</a>
 <b>UnifyCloud: CloudRecon</b>	<a href="#">View</a>	VMware virtual machines Hyper-V virtual machines Physical machines Workloads on other public clouds	Agentless or agent-based discovery Cost planning and optimal right sizing Application dependency analysis Cloud migration planning	<a href="#">Learn more</a>

Note: Visit the ISV tool's website to learn more about tool capabilities.






# Azure Migrate

[Home](#) > [Azure Migrate - Databases](#) > [Add a tool](#)

## Add a tool

[Migrate project](#) [Select assessment tool](#) [Select migration tool](#) [Review + add tool\(s\)](#)

Choose a tool to migrate your on-premises databases to Azure.

TOOL	PRICING	SUPPORTED WORKLOADS	FEATURES	LEARN MORE
 <b>Azure Migrate: Database Migration</b>	<a href="#">View</a>	SQL Server, Oracle, MySQL, PostgreSQL, MongoDB	Supports Azure SQL Database Supports Azure SQL VM Near zero migration downtime Migrations at scale	<a href="#">Learn more</a>

Note: Visit the ISV tool's website to learn more about tool capabilities.

Don't see a tool that you are looking for? We are continuously adding support for more ISV tools. [Learn more](#)



# Azure Migrate

Microsoft App Service Migration Home Assess Download Readiness Checks Partners

## Migrate to Azure App Service

Assess any app with an endpoint scan. Download the Migration Assistant and start your .NET and PHP app migration to Azure App Service.

### Assess

Provide a public URL to assess to start your migration process.

### Download

For internal .NET and PHP apps, download the Migration Assistant.

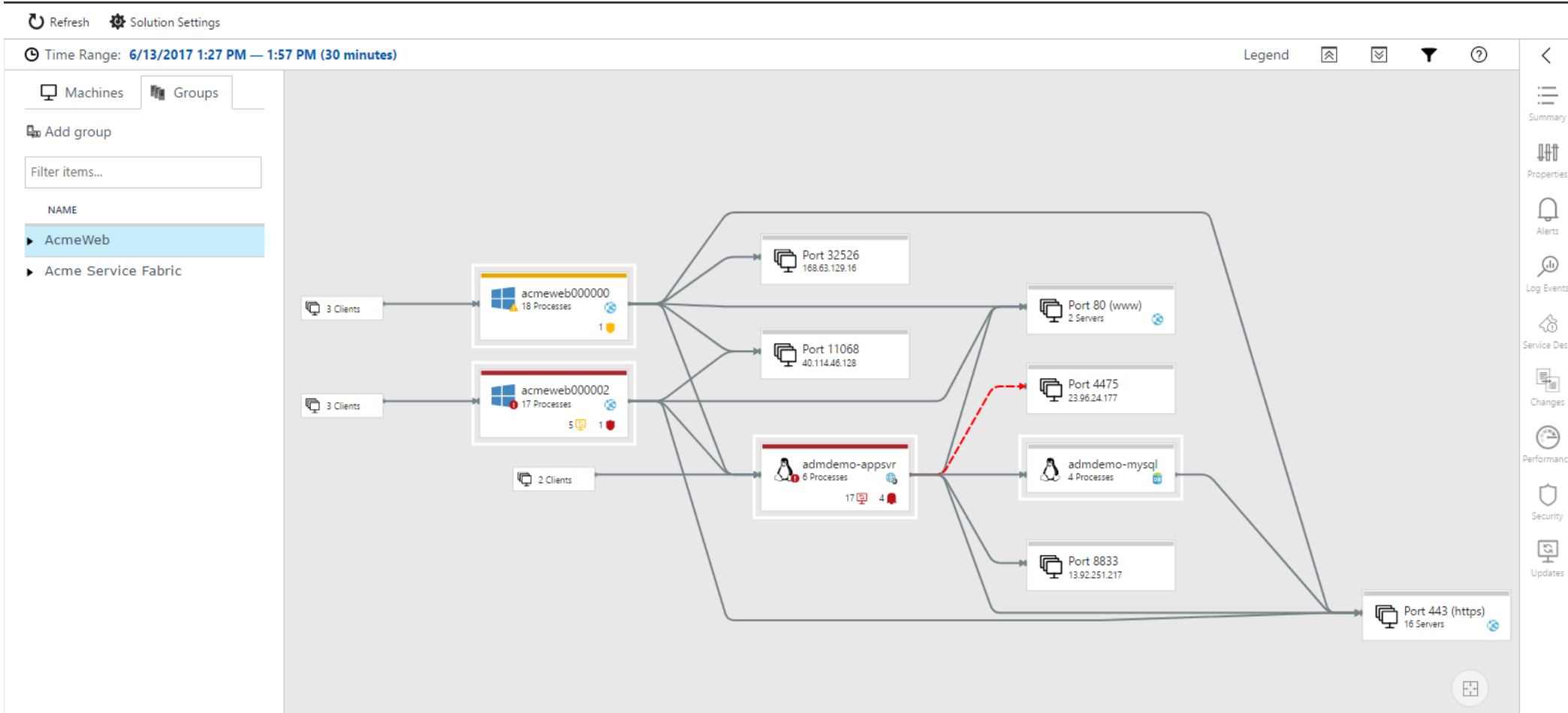
Start your assessment by entering a public facing endpoint to scan.

https:// Assess your site by entering a public URL

Assess



# Azure Migrate



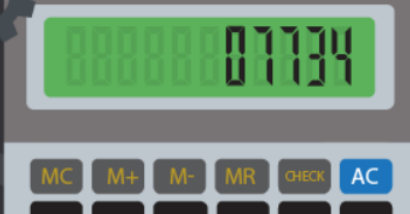
# Azure Pricing

Microsoft Azure Contact Sales: 1-800-867-1389 Search My account Portal Joe

Overview Solutions Products Documentation **Pricing** Training Marketplace Partners Support Blog Free account >

## Pricing calculator

Configure and estimate the costs for Azure products



Products Example Scenarios Saved Estimates FAQ

Select a product to include it in your estimate.

- Featured
- Compute
- Networking
- Storage
- Web
- Mobile

**Virtual Machines**  
Provision Windows and Linux virtual machines in seconds

**Storage Accounts**  
Durable, highly available, and massively scalable cloud storage

**Azure SQL Database**  
Managed, intelligent SQL in the cloud

**App Service**  
Quickly create powerful cloud apps for web and mobile

**Azure Cosmos DB**  
Globally distributed, multi-model database for any scale




**Azure Kubernetes Service (AKS)**  
Simplify the deployment, management, and operations of Kubernetes










# Azure Pricing

Your Estimate +

---

Your Estimate Estimate total: \$700.84

Virtual Machines: Medium Office Subscript...	 	1 DS3 v2 (4 vCPU(s), 14 GB RAM) x 744 Hours; Windows...	\$366.11
Storage Accounts	 	Managed Disks, Premium SSD, P15 Disk Type 1 Disks, S...	\$44.16
Azure Backup	 	Azure VMs Type, 1 Instance(s) x 384 GB, GRS Redundan...	\$42.69
VPN Gateway	 	VPN Gateways type, VpnGw1 tier, 744 gateway hour(s), ...	\$147.89
<b>Support</b>			
SUPPORT:			
<input type="text" value="Standard"/> 			\$100.00





# Microsoft Azure:

**Achieving performance with  
Azure at the right price**

# Azure Scaling

Home > Virtual machines > vm1-westus2

**vm1-westus2**  
Virtual machine

Search (Ctrl+/)

Connect Start Restart Stop Capture Delete Refresh

Resource group (change) : donp-westus2	Computer name : vm1-westus2
Status : Running	Operating system : Windows (Windows Server 2012 R2 Datacenter)
Location : West US 2	Size : Standard B1s (1 vcpu, 1 GiB memory)
Subscription (change) : Azure Subscription 2	Ephemeral OS disk : N/A
Subscription ID : 9195459d-fde0-4154-a8c3-cf947c7d4e23	Public IP address : 52.183.121.91
	Private IP address : 10.1.2.4
	Virtual network/subnet : donp-westus2-vnet/default
	DNS name : Configure

Tags (change) : [Click here to add tags](#)

Show data for last: 1 hour 6 hours **12 hours** 1 day 7 days 30 days

**CPU (average)**

Percentage CPU (Avg) vm1-westus2  
**0.96%**



# Azure Scaling

Home > Virtual machines > vm1-westus2 - Size

**vm1-westus2 - Size**  
Virtual machine

Search (Ctrl+/)

- Overview
- Activity log
- Access control (IAM)
- Tags
- Diagnose and solve problems
- Settings
  - Networking
  - Disks
  - Size**
  - Security
  - Extensions
  - Continuous delivery (Preview)
  - Availability set
  - Configuration
  - Identity
  - Properties
  - Locks
  - Export template
- Operations
  - Auto-shutdown
  - Backup

**Info** If the virtual machine is currently running, changing its size will cause it to be restarted.

Search by VM size... Clear all filters

Size : **Small (0-6)** Generation : **2 selected** Family : **General purpose** Premium disk : **Supported** Add filter

Showing 11 of 109 VM sizes. | Subscription: Azure Subscription 2 | Region: West US 2 | Current size: Standard\_B1s

VM SIZE	OFFERING	FAMILY	VCPUS	RAM (GI...	DATA DISKS	MAX IOPS	TEMPORARY STORAGE	PREMIUM DISK SUPPORT	COST/MONTH (ESTIMA...
B1ls	Standard	General purpose	1	0.5	2	200	1	Yes	Unavailable
B1ms	Standard	General purpose	1	2	2	640	4	Yes	Unavailable
<b>B1s</b>	Standard	General purpose	1	1	2	3200	2	Yes	Unavailable
B2ms	Standard	General purpose	2	8	4	1920	16	Yes	Unavailable
B2s	Standard	General purpose	2	4	4	1280	8	Yes	Unavailable
B4ms	Standard	General purpose	4	16	8	2880	32	Yes	Unavailable
D2s_v3	Standard	General purpose	2	8	4	3200	16	Yes	Unavailable
D4s_v3	Standard	General purpose	4	16	8	6400	32	Yes	Unavailable
DS1_v2	Standard	General purpose	1	3.5	4	3200	7	Yes	Unavailable
DS2_v2	Standard	General purpose	2	7	8	6400	14	Yes	Unavailable
DS3_v2	Standard	General purpose	4	14	16	12800	28	Yes	Unavailable

**Resize** Prices presented are estimates in your local currency that include only Azure infrastructure costs and any discounts for the subscription and location. The prices don't include any applicable software costs. [View Azure pricing calculator](#). Final charges will appear in your local currency in cost analysis and billing views.



# Azure Scaling

Home > New > Marketplace > Everything > Virtual machine scale set > Create virtual machine scale set

## Create virtual machine scale set

**BASICS**

- \* Virtual machine scale set name: myScaleSet ✓
- \* Operating system disk image: Windows Server 2016 Datacenter ✓  
[Browse all images](#)
- \* Subscription: [Empty] ✓
- \* Resource group: (New) myResourceGroup ✓  
[Create new](#)
- \* Location: East US ✓
- Availability zone: None ✓
- \* Username: azureuser ✓
- \* Password: [Redacted] ✓
- \* Confirm password: [Redacted] ✓

**INSTANCES**

- \* Instance count: 2
- \* Instance size: **Standard DS1 v2**  
1 vcpu, 3.5 GB memory  
[Change size](#)
- Deploy as low priority:  No  Yes

**Create** Automation options

### Scale rule

Metric source: Current resource (myScaleSet)

Resource type: Virtual machine scale sets

Resource: myScaleSet

**Criteria**

- \* Time aggregation: Average
- \* Metric name: Percentage CPU (1 minute time grain)
- \* Time grain statistic: Average
- \* Operator: Greater than
- \* Threshold: 70
- \* Duration (in minutes): 10

**Action**

- \* Operation: Increase percent by
- \* Instance count: 20 ✓
- \* Cool down (minutes): 5

**Add**





# Microsoft Azure:

Tools and technologies that will help  
you monitor and optimize your  
workloads



# Azure Advisor:

## Your free, personalized guide to Azure proven practices



Optimize resources for availability, security, performance, and cost

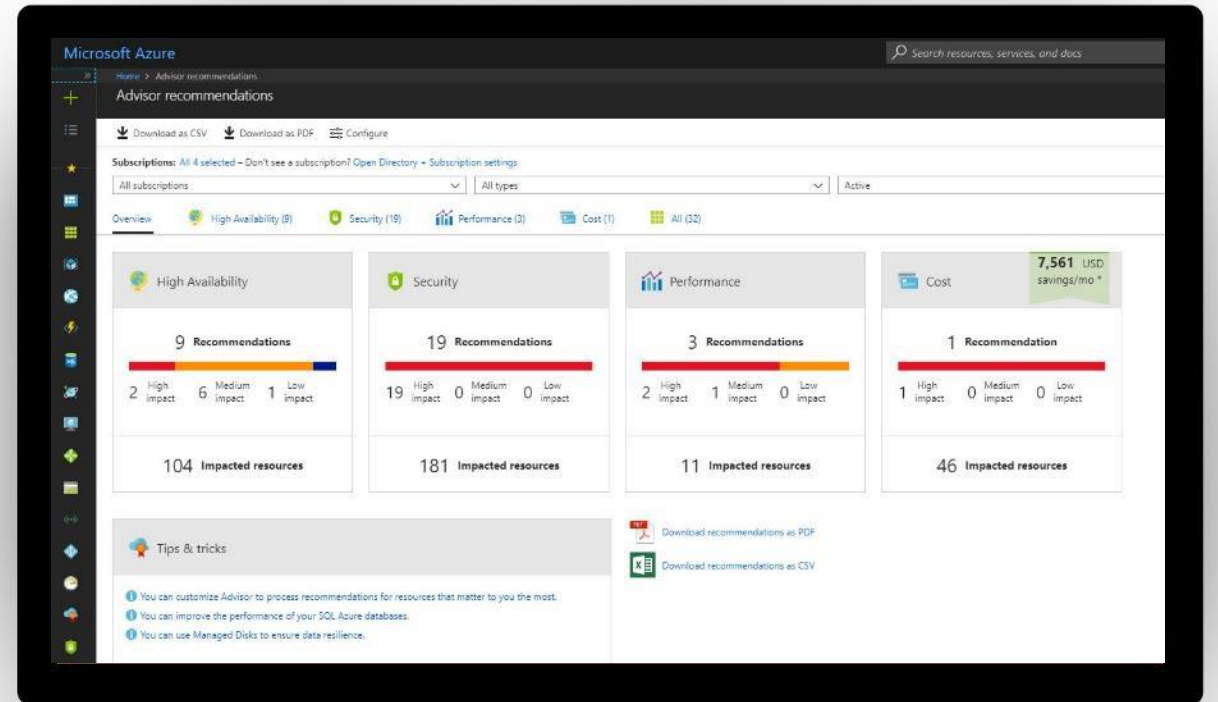


Implement personalized recommendations with ease






Access proven practice optimizations at no additional cost

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



# Azure Advisor

## Your free, personalized guide to Azure best practices

-  Optimize resources for high availability, security, performance, and cost
-  Implement personalized recommendations with ease
-  Access best practice optimizations at no additional cost

### High availability

Increase availability of your business-critical apps

### Security

Better protect your Azure resources from security threats

### Performance

Boost the speed and responsiveness of your resources

### Cost

Maximize the return on your Azure investment

### Advisor recommendations

Download as CSV Download as PDF Configure

Subscriptions: All 4 selected - Don't see a subscription? Open Directory + Subscription settings

All subscriptions All types Active No grouping

Overview High Availability (9) Security (20) Performance (3) Cost (1) All (33)

**High Availability**

**9 Recommendations**

2 High impact 6 Medium impact 1 Low impact

**106 Impacted resources**

**Security**

**20 Recommendations**

20 High impact 0 Medium impact 0 Low impact

**182 Impacted resources**

**Performance**

**3 Recommendations**

2 High impact 1 Medium impact 0 Low impact

**11 Impacted resources**

**Cost**

**5,827 USD savings/mo \***

**1 Recommendation**

1 High impact 0 Medium impact 0 Low impact

**40 Impacted resources**

**Tips & tricks**

- You can customize Advisor to process recommendations for resources that matter to you the most.
- You can improve the performance of your SQL Azure databases.
- You can use Managed Disks to ensure data resilience.

Download recommendations as PDF

Download recommendations as CSV



### Advisor - configuration

Focus on what matters to you the most

Resources Rules

You can configure Advisor to exclusively process recommendations for resources that matter to you the most. [Learn more](#)

4 selected

SUBSCRIPTION	INCLUDE
Agile-BI-Azure-Subscription-2	<input checked="" type="checkbox"/>
Contoso IT - demo	<input checked="" type="checkbox"/>
A-Management	<input checked="" type="checkbox"/>
AIRG	<input checked="" type="checkbox"/>
akscontosoretail1	<input checked="" type="checkbox"/>
AKSContosoRetailRG	<input checked="" type="checkbox"/>
ApplicationInsights	<input checked="" type="checkbox"/>
Appservice-demo	<input checked="" type="checkbox"/>
asr01	<input checked="" type="checkbox"/>
asr01-asr	<input checked="" type="checkbox"/>
ASRAutomation	<input checked="" type="checkbox"/>
asrkn	<input checked="" type="checkbox"/>
azmgmtsf	<input checked="" type="checkbox"/>
AZTest	<input checked="" type="checkbox"/>

Apply

Cancel

# Performance recommendations

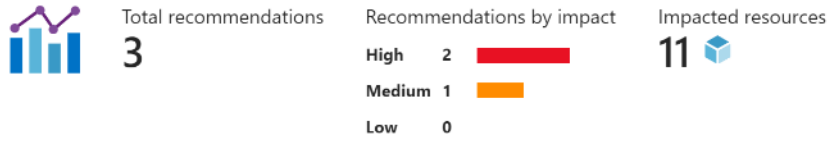
### Advisor recommendations

Download as CSV Download as PDF Configure

Subscriptions: All 4 selected - Don't see a subscription? [Open Directory + Subscription settings](#)

All subscriptions All types Active No grouping

Overview High Availability (9) Security (20) Performance (3) Cost (1) All (33)



IMPACT	DESCRIPTION	POTENTIAL BENEFITS	IMPACTED RESOURCES	UPDATED AT
High	<a href="#">Configure DNS Time to Live to 20 seconds</a>	Improve availability by failing over to healthy endpoints	2 Traffic Manager profiles	8/13/2018, 7:44:58 AM
High	<a href="#">Follow SQL DB Advisor recommendations</a>	Improved database performance	3 SQL databases	8/13/2018, 11:42:03 AM
Medium	<a href="#">Configure DNS Time to Live to 60 seconds</a>	Improve availability by failing over to healthy endpoints faster	6 Traffic Manager profiles	8/13/2018, 7:45:05 AM

Performance recommendations  
AdDB1

Automate View discarded Getting started Feedback

You don't have write permissions for this database. Recommendation management is disabled.

Recommendations

ACTION	RECOMMENDATION DESCRIPTION	IMPACT
CREATE INDEX	Table: [Employees] Indexed columns: [City], [State]	High
PARAMETERIZE QUERIES	Scope: Entire database Reason: Non-parameterized queries are causing performance issues	High
CREATE INDEX	Table: [DataPoints] Indexed columns: [Name],[Money],[Power]	Low

Tuning history

ACTION	RECOMMENDATION DESCRIPTION	STATUS	TIME
CREATE INDEX Initiated by: User	Table: [DataPoints] Indexed columns: [Name],[Money]	Success	7/12/2017 4:23:33 AM
DROP INDEX Initiated by: System	Index name: MyIndex123 Reason: Duplicate index	Pending	7/12/2017 4:23:33 AM
DROP INDEX Initiated by: User	Index name: MyIndex321 Reason: Duplicate index	Success	7/12/2017 4:23:33 AM
DROP INDEX Initiated by: System	Index name: IX_FF Reason: Unused index	Pending	7/12/2017 4:23:33 AM
DROP INDEX Initiated by: System	Index name: IX_FF Reason: Duplicate index	Success	7/11/2017 4:23:33 AM

# Cost recommendations



### Advisor recommendations

Download as CSV Download as PDF Configure

Subscriptions: All 4 selected - Don't see a subscription? Open Directory + Subscription settings

All subscriptions All types Active No grouping

Overview High Availability (9) Security (20) Performance (3) Cost (1) All (33)

For more cost management and optimization capabilities, try Azure Cost Management

Total recommendations: 1

Recommendations by impact: High 1, Medium 0, Low 0

Impacted resources: 40

Potential monthly savings: 5,827 USD

IMPACT	DESCRIPTION	POTENTIAL MONTHLY SAVINGS*	IMPACTED RESOURCES	UPDATED AT
High	<a href="#">Right-size or shutdown underutilized virtual machines</a>	5,827.01 USD	40 Virtual machines	8/12/2018, 3:45:46 PM

## Shut down or resize your virtual machine

😊 Feedback ⬇️ Download as CSV ⬇️ Download as PDF ⚙️ Configure recommendation rule

### Recommendation details

We've analyzed the usage patterns of your virtual machine over the past 14 days, and identified virtual machines with low usage. While certain scenarios can result in low utilization by design, you can often save money by managing the size and number of virtual machines. [Learn more](#)

potential monthly savings\*  
**5,827.01 USD**

### Impacted resources

4 selected subscriptions | No grouping

40 Virtual machines

VIRTUAL MACHINE	RECOMMENDED ACTIONS	POTENTIAL SAVINGS*	SUBSCRIPTION	RECOMMENDATION RULE	UPDATED AT	POSTPONE
—	Shut down the virtual machine	—	—	—	—	—
sqlserver-1	<a href="#">Resize the virtual machine</a> <a href="#">View Usage Patterns</a> <a href="#">Shut down the virtual machine</a>	348.19 USD	Contoso IT - demo	Average CPU < 20%	8/12/2018, 3:45:46 PM	<a href="#">Postpone</a>
k8s-agent-26B291EE-0	<a href="#">Resize the virtual machine</a> <a href="#">View Usage Patterns</a> <a href="#">Shut down the virtual machine</a>	101.18 USD	Contoso IT - demo	Average CPU < 20%	8/12/2018, 3:45:46 PM	<a href="#">Postpone</a>
nt1vm_0	<a href="#">Resize the virtual machine</a> <a href="#">View Usage Patterns</a> <a href="#">Shut down the virtual machine</a>	93.74 USD	Contoso IT - demo	Average CPU < 20%	8/12/2018, 3:45:46 PM	<a href="#">Postpone</a>
nt1vm_1	<a href="#">Resize the virtual machine</a> <a href="#">View Usage Patterns</a> <a href="#">Shut down the virtual machine</a>	93.74 USD	Contoso IT - demo	Average CPU < 20%	8/12/2018, 3:45:46 PM	<a href="#">Postpone</a>
nt1vm_2	<a href="#">Resize the virtual machine</a> <a href="#">View Usage Patterns</a>	93.74 USD	Contoso IT - demo	Average CPU < 20%	8/12/2018, 3:45:46 PM	<a href="#">Postpone</a>

Is this recommendation helpful?

\*You can save up to the stated amount if you choose to shut down the virtual machine. Your actual savings may vary.



### Metrics

Diagnostics settings + Add metric alert (classic)

Launch the preview of the new metrics experience.

\* Subscription

Contoso IT - demo

\* Resource group

Type to start filtering ...

Resource type

3 selected

\* Resource

Type to start filtering ...

#### Available metrics

Host

Filter metrics...

You can only select metrics of the same unit (%)

- [Host] CPU Credits Consumed
- [Host] CPU Credits Remaining
- [Host] Data Disk QD (Preview)
- [Host] Data Disk Read Bytes/Sec (Preview)
- [Host] Data Disk Read Operations/Sec (Preview)
- [Host] Data Disk Write Bytes/Sec (Preview)
- [Host] Data Disk Write Operations/Sec (Preview)
- [Host] Disk Read Bytes
- [Host] Disk Read Operations/Sec
- [Host] Disk Write Bytes
- [Host] Disk Write Operations/Sec
- [Host] Network In
- [Host] Network Out
- [Host] OS Disk QD (Preview)
- [Host] OS Disk Read Bytes/Sec (Preview)
- [Host] OS Disk Read Operations/Sec (Preview)
- [Host] OS Disk Write Bytes/Sec (Preview)
- [Host] OS Disk Write Operations/Sec (Preview)
- [Host] Percentage CPU

No title

NO SUBTITLE

Chart type

Line

Time range

Custom (Relative)

Days

7

Hours

0

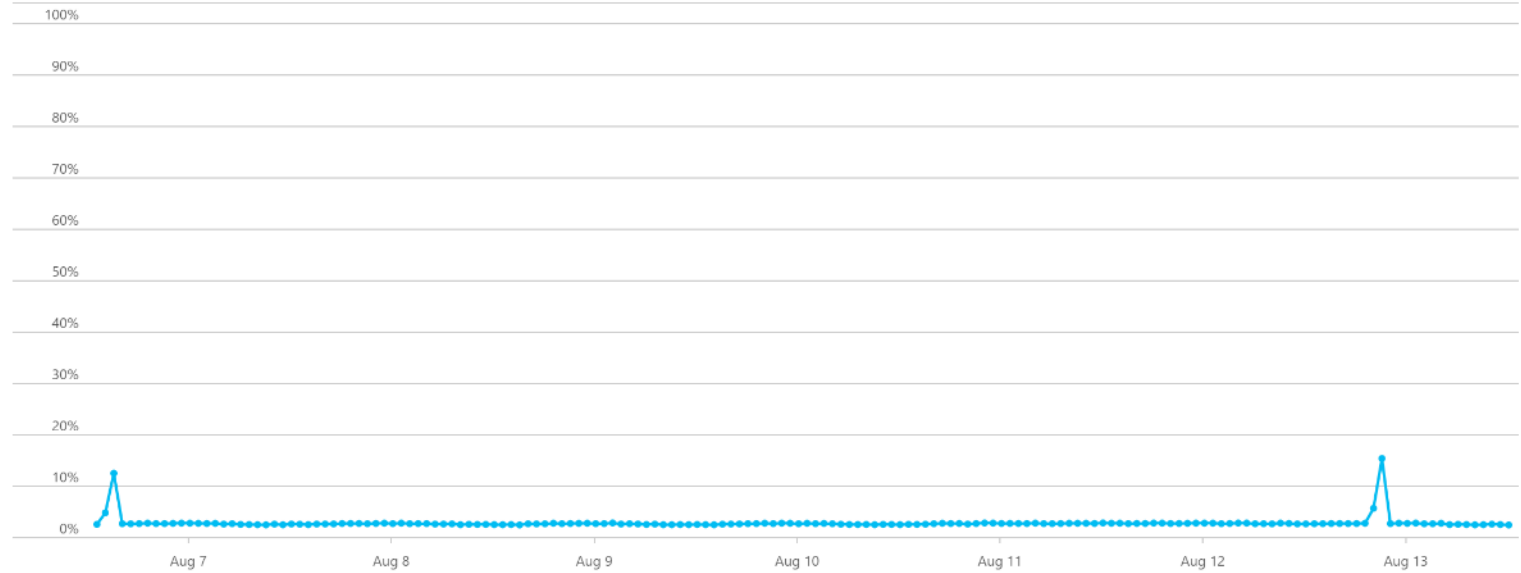
Minutes

0

Seconds

0

Pin to dashboard

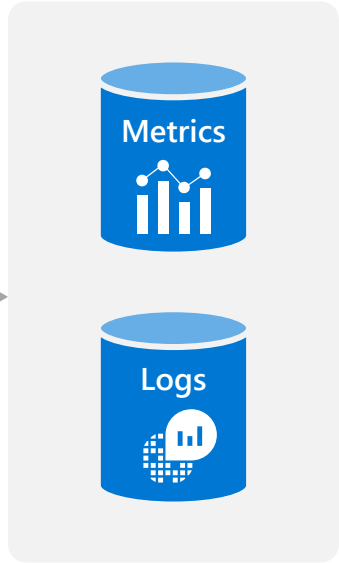


PERCENTAGE CPU 2.87 %



# Azure Monitor

- Application
- Operating System
- Azure Resources
- Azure Subscription
- Azure Tenant
- Custom Sources



## Insights

- Application
- Container
- VM
- Monitoring Solutions

## Visualize

- Dashboards
- Views
- Power BI
- Workbooks

## Analyze

- Metrics Explorer
- Log Analytics

## Respond

- Alerts
- Autoscale

## Integrate

- Event Hubs
- Logic Apps
- Ingest & Export APIs



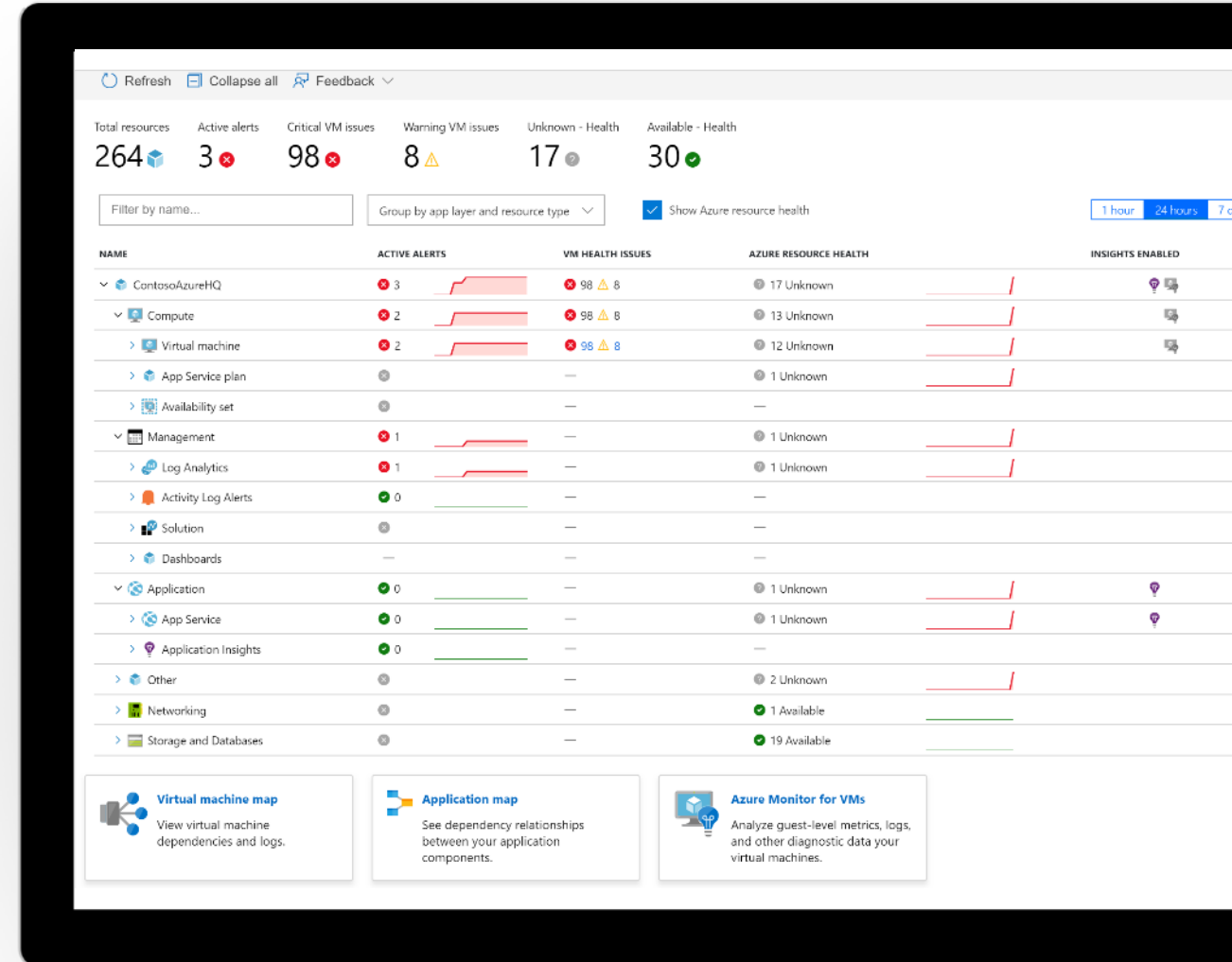
# Full Stack Visibility in Resource Groups

Monitor health state of all resources

See alerts firing across app & infra

Jump to Application Map or VM Map

Drill down into failures or perf issues



# Rich insights for Virtual Machines



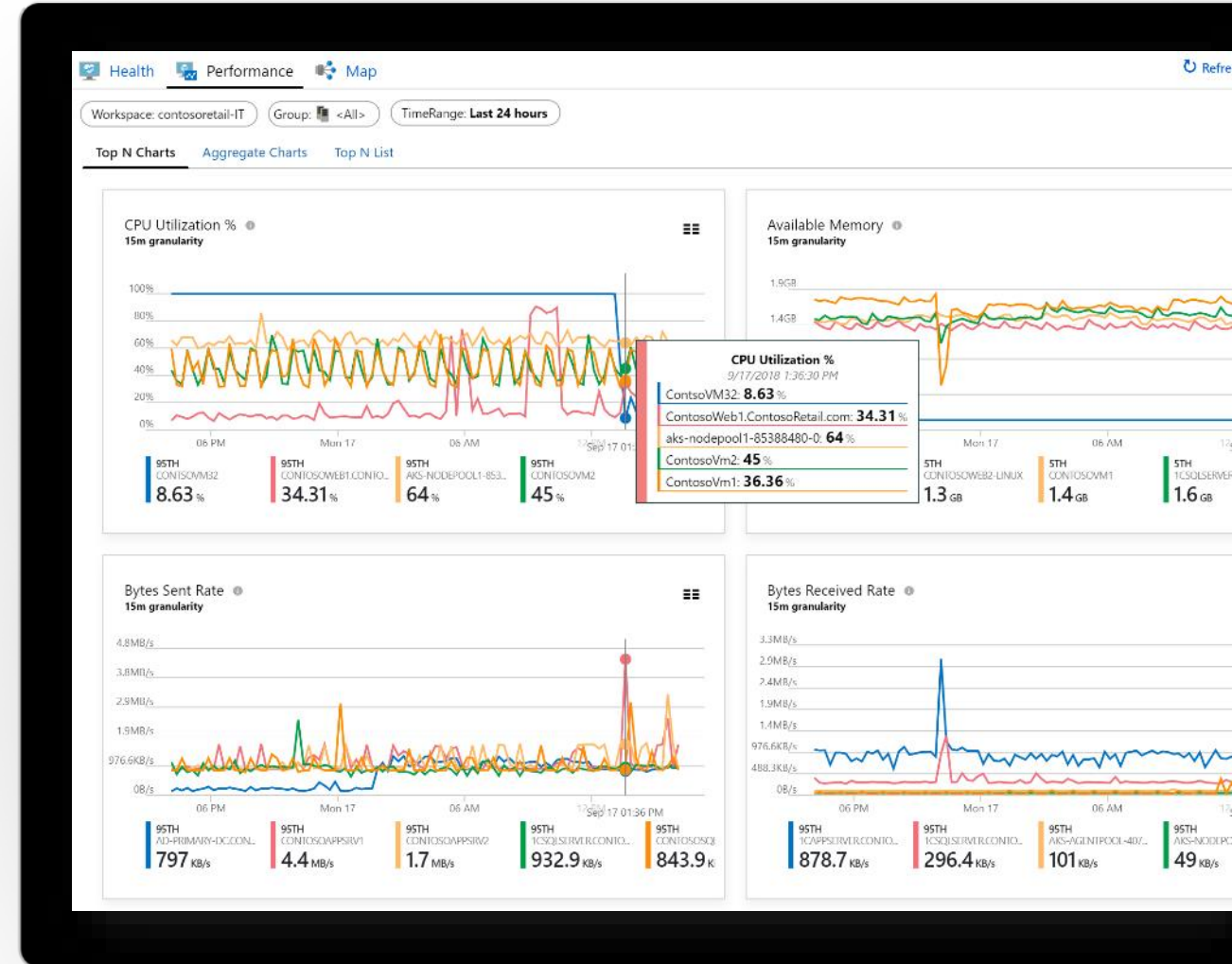
Monitor single VMs or at scale

Identify & isolate host-level or guest-level health problems

Troubleshoot perf issues like CPU, memory, disk, and network

Visualize service dependencies & connection failures in Maps

Onboard at scale using PowerShell or Azure Policy





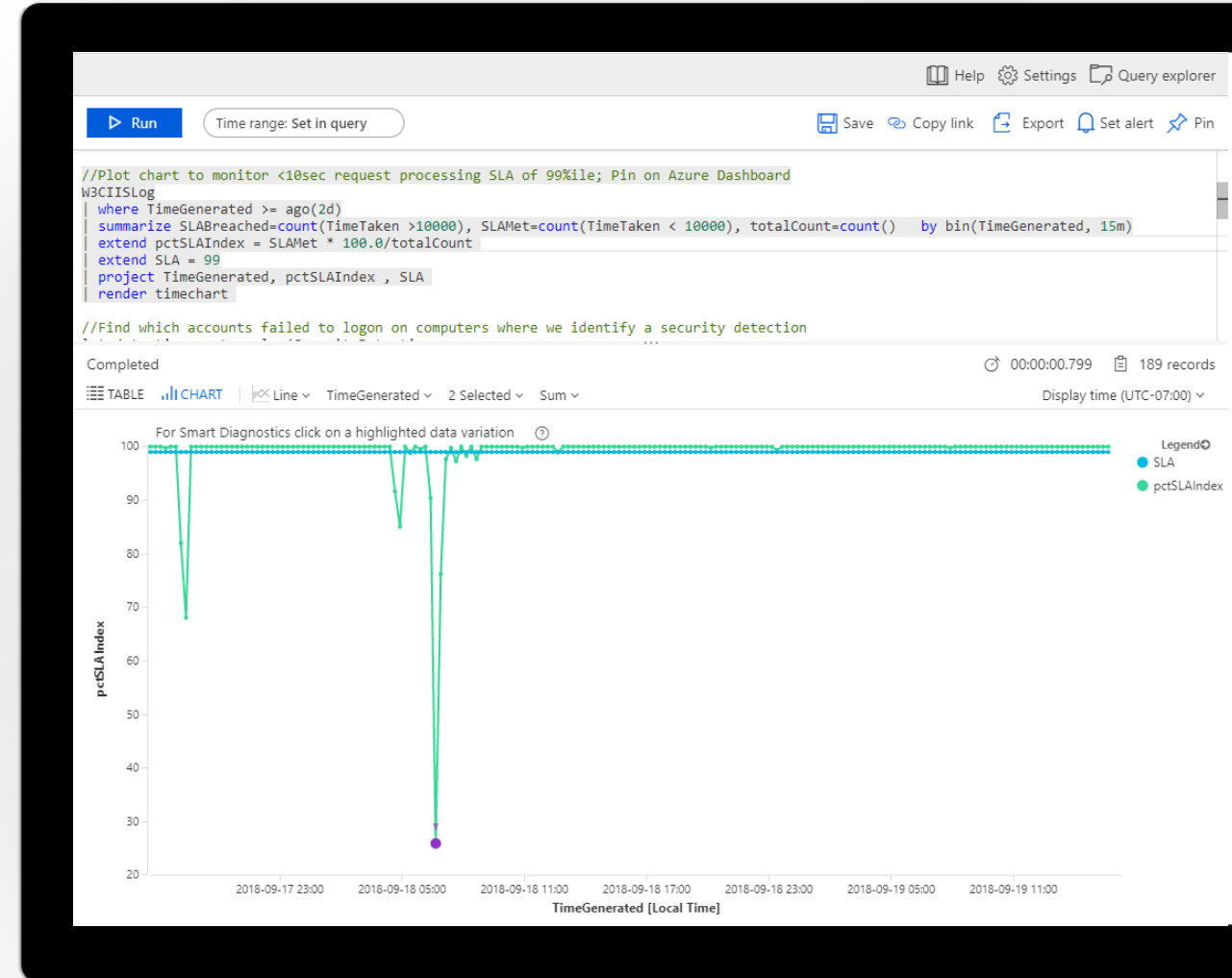
# Advanced Queries with Log Analytics

Log Analytics advanced query experience now in Azure Portal **NEW!**

Central Analytics Platform across Monitoring, Management, Security

Run queries for investigations, statistics & root cause/trend analyses

Utilize ML algorithms for clustering and anomaly detection



# Artificial Intelligence for IT Ops (AIOps)



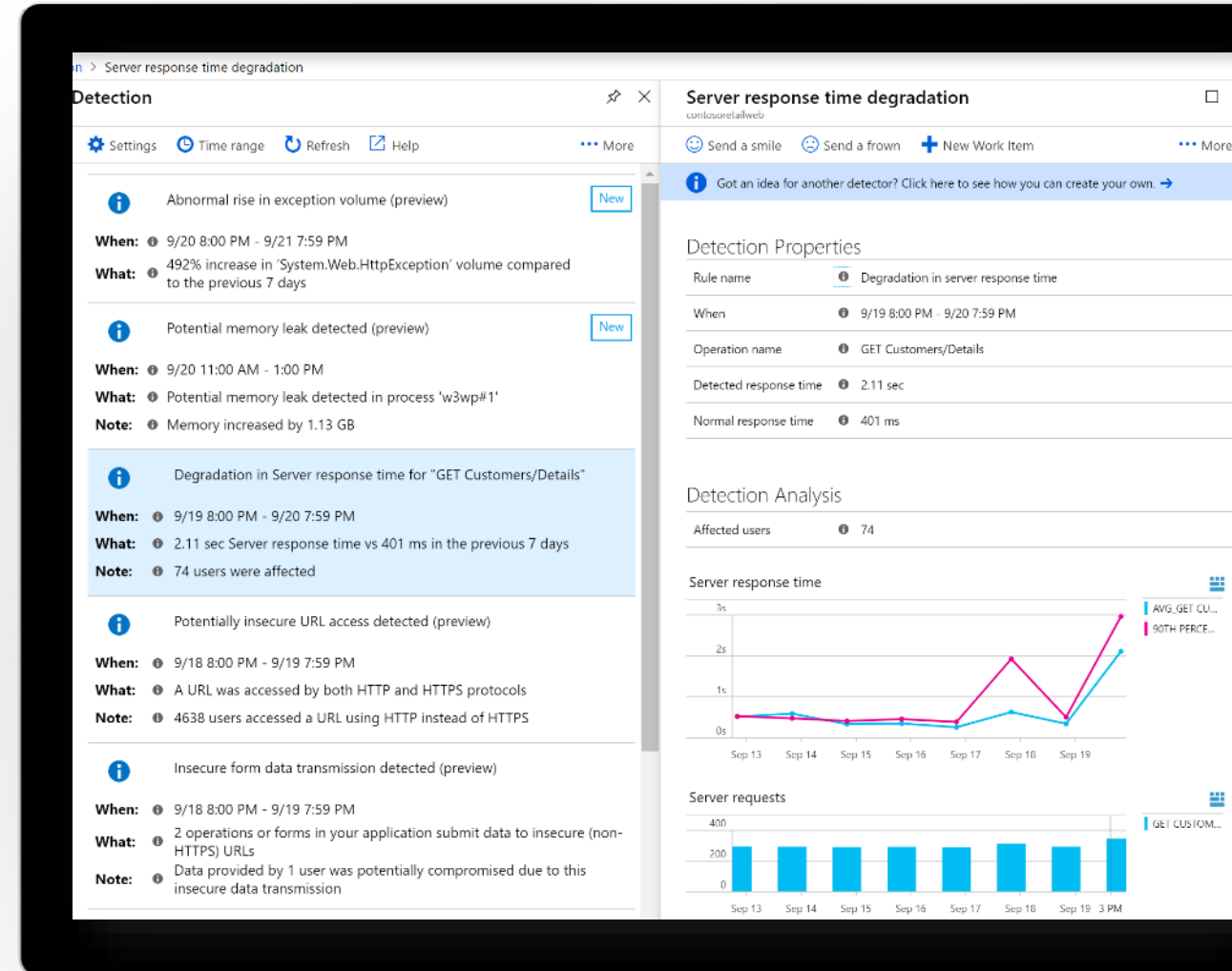
Proprietary AI based Smart Detection for discovering anomalies

Smart Alerts with Dynamic Thresholds for automatic baselining

Smart Groups in Alerts to reduce noise **NEW!**

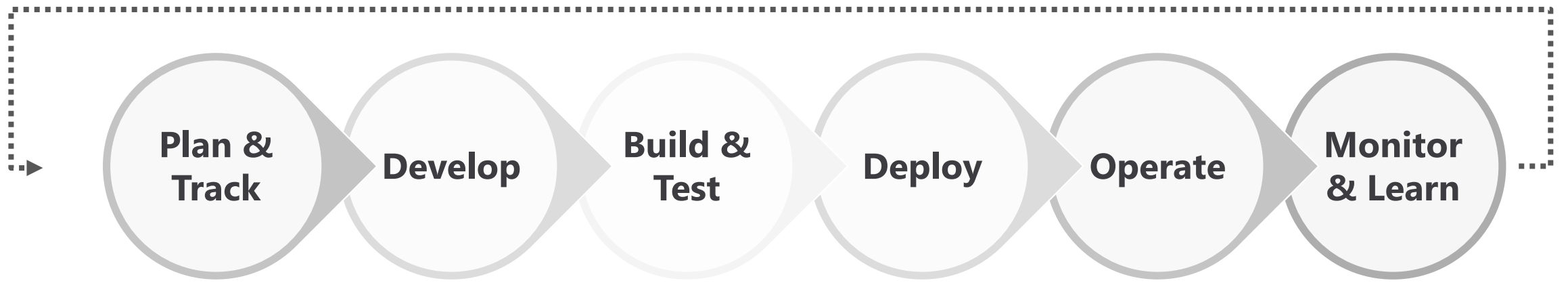
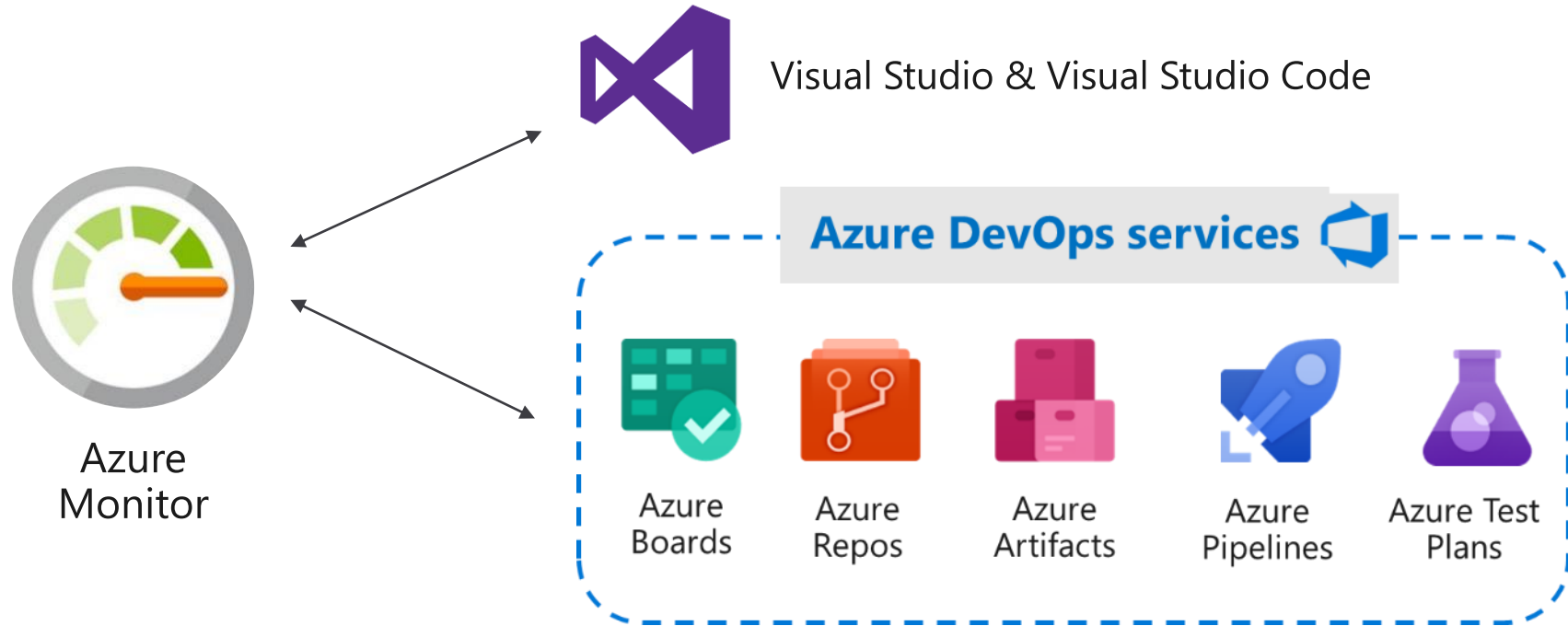
Smart Diagnostics for ML based root cause analyses in Log Analytics

Working with ML partners internal/ external to bring deeper intelligence for DevOps/SRE teams





# Continuous Monitoring (CM) for DevOps



A close-up photograph of a person's hand holding a black laptop. The person is wearing a grey, textured wool coat. The laptop lid is visible, showing the Windows logo. The background is a blurred cityscape at night.

“Technology-driven disruption is providing exponential growth opportunities”.

Gene Hall, Gartner CEO

# Challenges

## Keeping up with the speed of business



### Code

More resilient and scalable applications

Adding new features and functionality without taking applications down

Future-proof applications



### Infrastructure

Heterogeneous workloads

Hybrid deployments

Security and management

Continuous monitoring

Cost management



### Data

Data growth and data silos

Incongruent data types

Performance constraints

Complexity of solutions

Rising data maintenance costs

Security issues and data breaches



### Application Delivery

Shorter release cycles

Improved software quality

Responding faster to bugs and security incidents

Learning from real usage to continuously improve applications

# Are your applications ready?



Application silos, built in isolation

Limited set of platforms and form factors

Overabundance of data

Servers and infrastructure to manage

Upfront capacity planning, fixed scale



Multi-channel applications, covering all touchpoints

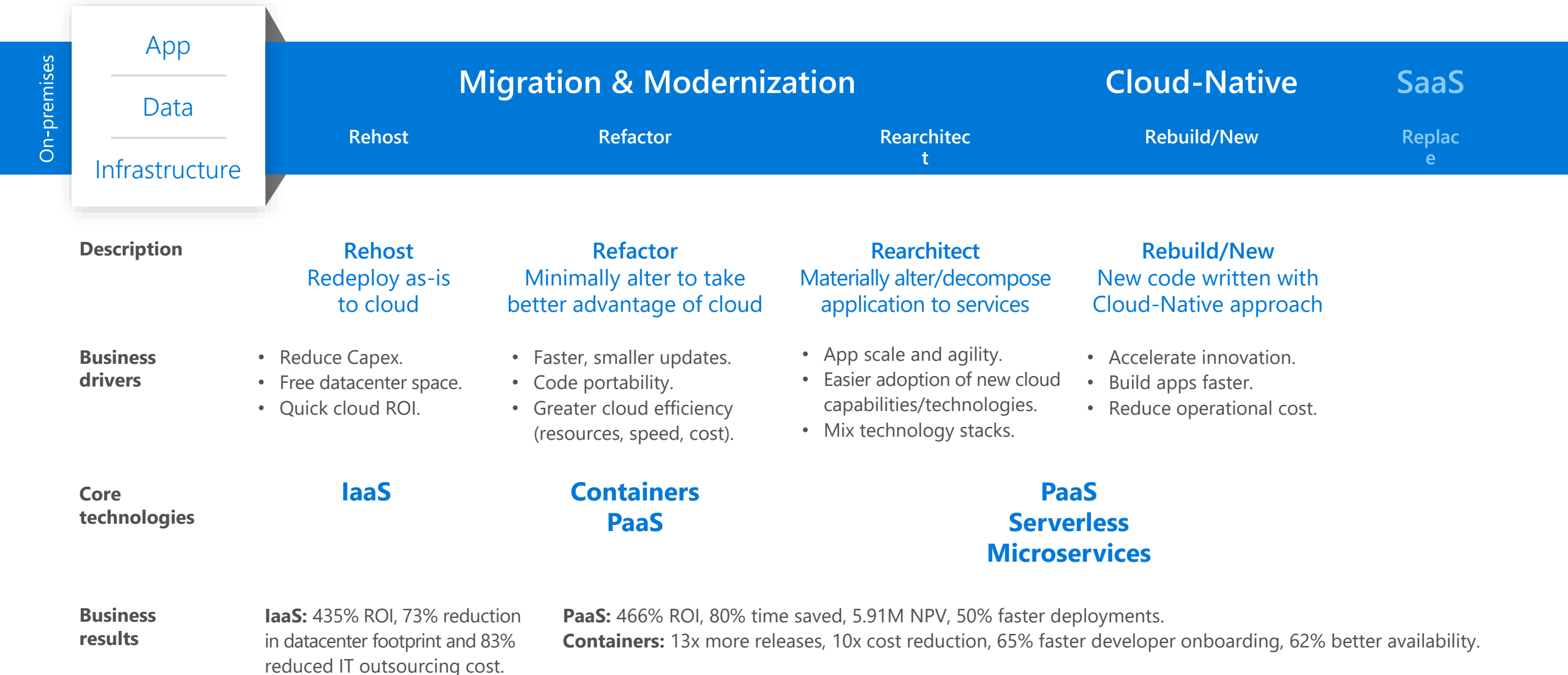
Many platforms, devices and form factors

Data-driven intelligence in applications

Focus on application functionality, not infrastructure

Elastic, unlimited scale

# Different paths - one journey to the cloud

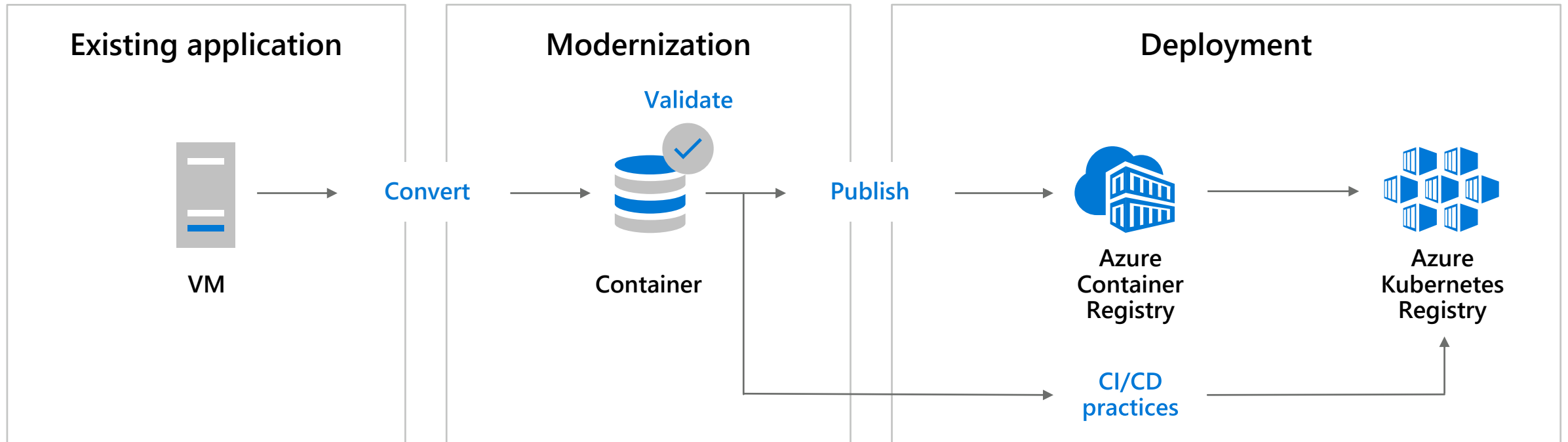


Objective	Rehost	Refactor	Rearchitect	Rebuild	Cloud model
<b>Deliver new and breakthrough capabilities faster</b> Optimize for developer productivity, build apps faster				✓	PaaS
<b>Enable multichannel access, including mobile and IoT</b> Enable secure access to apps and data, on a wide range of devices				✓	PaaS
<b>More easily integrate with other web and cloud apps</b> Leverage PaaS, increase productivity with serverless			✓	✓	PaaS
<b>Enable business agility with continuous innovation</b> Increase agility across teams and deliver better software, faster		✓	✓	✓	PaaS
<b>Meet scalability requirements of existing apps cost effectively</b> Optimize application architecture for cloud scale		✓	✓		PaaS
<b>Leverage existing investments</b> Across DevOps, developer tooling, management, infrastructure and app services	✓	✓	✓		PaaS
<b>Free up data center space quickly</b> Free up/consolidate resources for apps that must reside on-premises	✓				IaaS
<b>Reduce capital expenditure of existing applications</b> Switch to pay-as-you-go model, realize better budget forecasting	✓				IaaS
<b>Achieve rapid time to cloud</b> Allow migration with minimal architectural impact	✓				IaaS

# Refactoring with container technology

## Faster application deployment with integrated CI/CD tools and orchestration

- Containers support all frameworks and technology stacks across clouds and on-premises
- No OS overhead means improved packing density and more resource efficiency
- Faster application deployment with integrated CI/CD tools and orchestration



# Rearchitecting with microservices

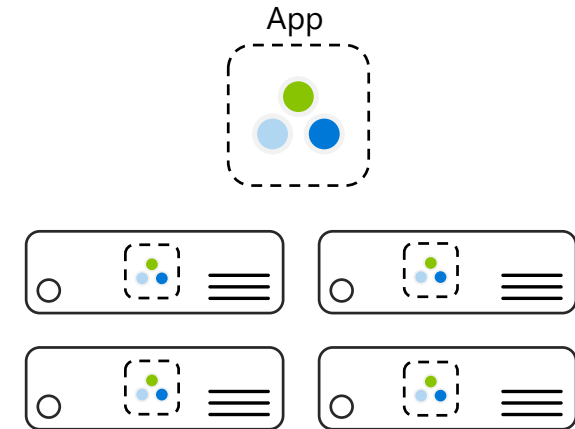
More agile, scalable and resilient applications

Individual services can be upgraded, changed or taken down without impacting the application

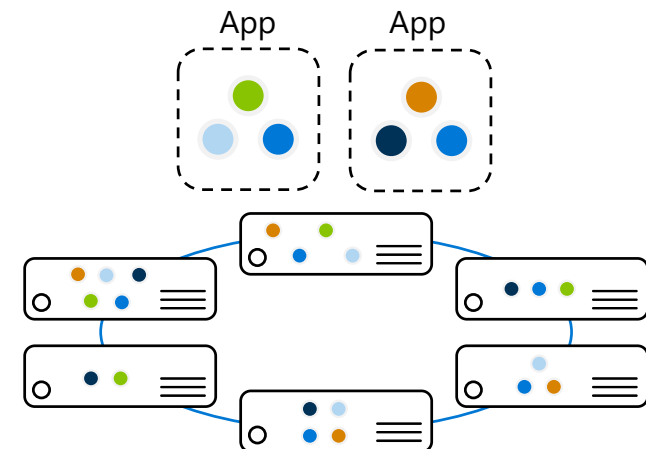
Developers work on individual services, which are smaller, easier to manage and understand

If individual services should fail, the application will continue to work without interruption

**Monolithic**  
Large, all-inclusive app



**Microservices**  
Small, independent services

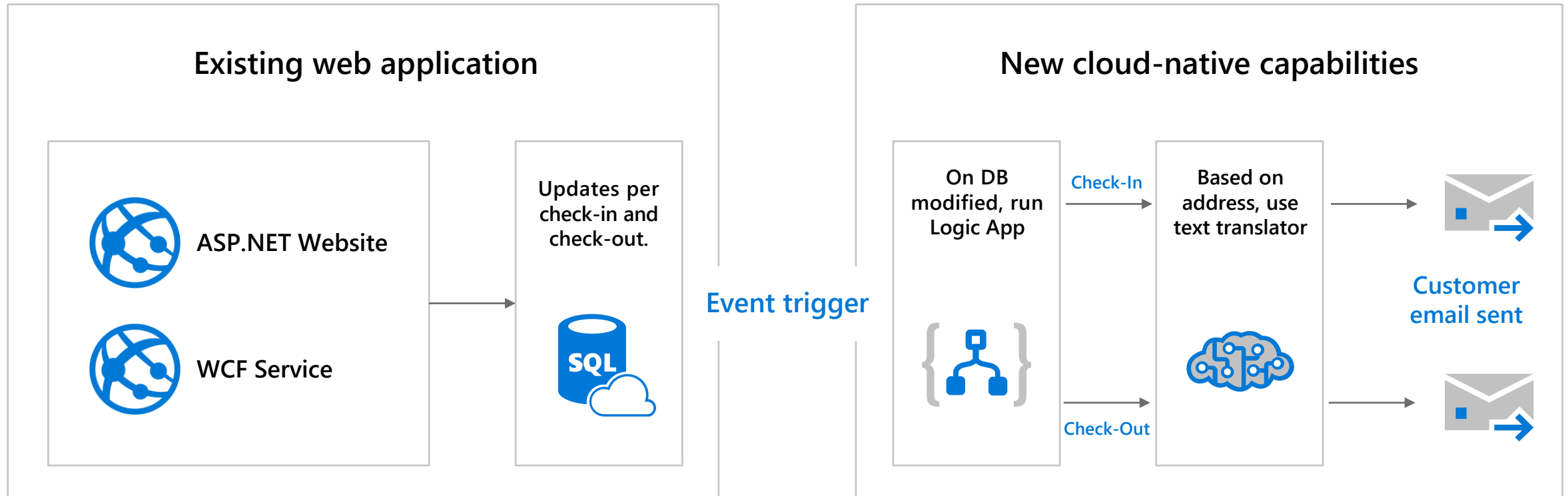




# Future-proofing applications with serverless

## Adding new capabilities to existing applications

- Existing code and functionality is left as-is and moved to managed cloud services
- New capabilities are added incrementally using serverless functions triggered by events



# Breakthrough productivity and performance with large workloads



## Azure SQL Database solutions

- ✓ Support for 100TB+ databases with Hyperscale
- ✓ Faster app development and reduced database ops with a fully managed service
- ✓ Multi-tenant apps easily built in a preferred environment

# Hyperscale your database

A new, highly scalable service tier that adapts on-demand to your workload's needs, auto-scaling up to 100TB per database.

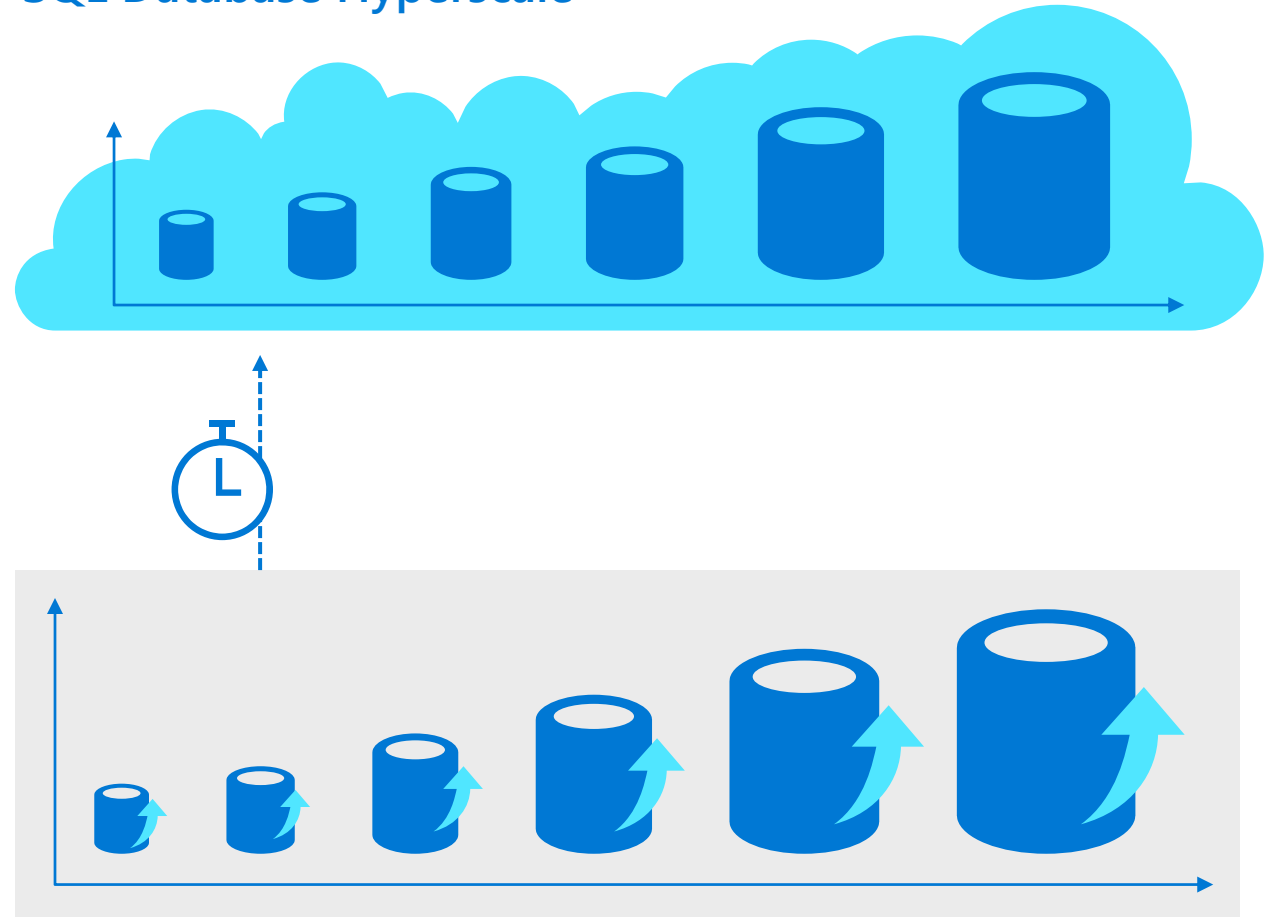
Storage dynamically adapts to your workloads' needs, auto-scaling up to 100TB.

Provision one or more additional compute nodes that can serve your read-only workload and use them as a hot-standby, in case of failover.

Perform operations in constant time, regardless of the size of the data operation.

Compute and storage resources scale rapidly and independently without sacrificing performance.

## SQL Database Hyperscale



# Azure Cosmos DB guarantees high performance anywhere in the world

## Run your NoSQL app on world-class infrastructure

Only service with financially-backed SLAs for millisecond latency at the 99th percentile, 99.999% HA and guaranteed throughput and consistency

High performance at global scale - turnkey global distribution allowing developers to replicate data anywhere in the world in minutes

Multi-Master support across all Azure regions

Only database that offers choice of consistency models

Enterprise-grade security



**Latency**

<10 ms  
99<sup>th</sup> percentile



**High Availability**

99.999%



**Throughput**

Guaranteed



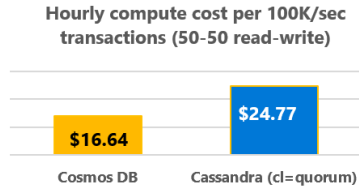
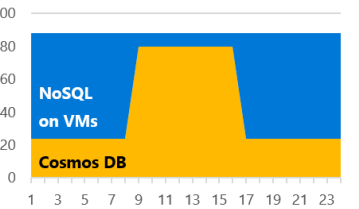
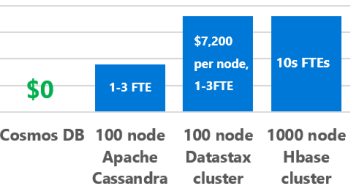
**Consistency**

Guaranteed

# Save vs MongoDB on IaaS

## Cloud MongoDB TCO challenges

Cassandra	Cosmos DB
High DevOps and license fees	No DevOps or license fees
	Up to 30% savings
Limited elasticity. Over-provisioning	Instant and limitless elasticity
	Up to 25% savings
Not Cloud-optimized. Poor compute, network, and storage utilization.	Azure-optimized. High compute and network utilization.
	Up to 40% savings



## TCO savings with Azure Cosmos DB

\$16,949/mo

MongoDB licenses

Bandwidth

Virtual Machines and storage

12 node (L16) Enterprise cluster w support

\$12,149/mo

Bandwidth

Virtual Machines and storage

18 node (L16) MongoDB cluster

\$2,574/mo

Bandwidth

Storage

Throughput

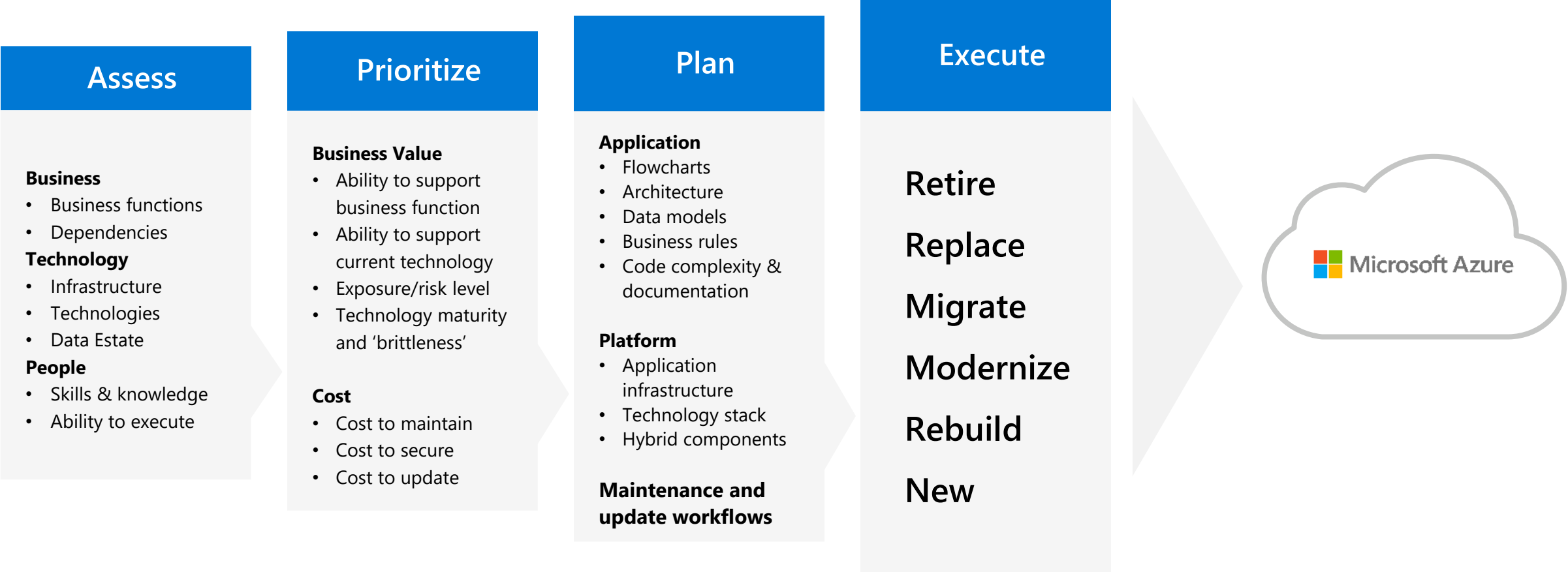
Azure Cosmos DB (list prices)

5-6x savings

2TB workload, 20K TPS, 50-50 read-write split observed among our customers, off-peak to peak ratio is 40%, 1K objects. 4 shards, 3-way replication, L16 VMs used per Azure guidance. MongoDB license assumed \$4,800 / year per node. Azure monthly consumption prices were used. Workload is smaller than Cassandra due to observed reliability/performance challenges with MongoDB at high load. Findings based on Microsoft calculations.

# Application portfolio assessment

Creating a migration and modernization roadmap



Application Portfolio  
assessment

# SYNNEX Services Ecosystem for Cloud

End-To-End Services from Assessment to Implementation and Managed Services



	Security	Networking	Cloud	IoT	UCC
Assessment	Vulnerability	Performance	Cloud Readiness	WLAN Heatmaps	Bandwidth
	Pen Testing	Optimization	Cloud App ROI	Site Surveys	VOIP / Jitter
Presales / Consultative	Risk Assessment	NW Engineers	Cloud Engineers	IoT Engineers	Pro AV Engineers
	Vendor PSSEs	SW Engineers	Cloud Team	IoT Team	UCC Team
	Security Experts		Azure, Google, RHEL	Azure / IoT	
Implementation	Remote / Onsite	Remote / Onsite	Private / Public	Commercial	Remote / Onsite
	Install / Config	Install / Config	IaaS / PaaS	Industrial	Install / Config
Managed	Managed Sec.	SYNNEX NOC	Email / Backup		Hosted UCC
	FW / WLAN-aaS	NW Vendor Certs			UCC Onboarding
Training	Sec Vendor Certs	Net+, CCNA, etc.	Azure / Google	IoT Webinars	End User Training
	Sec+, CISSP, DoD	Custom Builds	Cloud Certs.		Solution Bundles
Integration	Security Bundles	CTO / BTO / Hyve			