Options for Migrating On-Premises Web Apps to Azure

Scott Snyder
Solutions Architect
RBA

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Solutions Architect

Scott Snyder is a Solutions Architect and Software Engineer with nearly 20 years of experience, primarily within the Microsoft stack. He's worked in both the corporate and consulting space, from small firms to fortune 500 companies.

He is a result driven architect and software engineer personally motivated to exceed expectations.

Professionally Scott has worked with, and is proficient in, a wide range of the Microsoft technology stack from the cloud to databases to presentation. He takes pride in his work and feels quality is essential in providing the best user experience for the end user.

Recent Experience

International Logistics

Assisted in enterprise wide migration of an on-premises Identity Provider to a cloud based IdP spanning hundreds of applications including both APIs and UIs.

Consumer Packaged Goods

Contributed to the flagship website suite which serviced over 650MM page views per year.

Financial Services – Portfolio Risk Management

Provided technical leadership and mentoring focusing on code modernization and software architecture.

Financial Services – Travel and Expense Management

Strategized with CEO and Product Manager on long term business goals and technological need. Lead a team of developers covering the entire Microsoft stack. Drove CI/CD adoption and code base modernization.

Skills & Expertise

Software Tools/ Technologies

- Microsoft Azure
- C#/VB.NET
- ASP.NET
- Web Services
- SQL/T-SQL
- MSTest/NUnit
- Moq
- Javascript/JQuery
- Jasmine
- XML
- HTML/CSS
- Java/Groovy

Microsoft CERTIFIED
AZURE SOLUTIONS ARCHITECT
EXPERT ★★★

Education

Bachelor of Science - Computer Science
University of Wisconsin - Madison

RBA
A Digital and Technology Consultancy

Motivations

- What problem(s) are you trying to solve?
- How is success measured?
- Cloud Adoption Framework from Microsoft

Most common cloud motivation?

Cost Savings

MYTH

Modernization

Processes & Techniques

- Agile
- DevOps
- Automated Testing

Design Patterns

- Microservices
- Inversion of Control (IoC)
- Circuit Breaker

Technologies

- Containers
- Automation Servers
  - Jenkins
  - Azure DevOps Pipelines

Infrastructure

- Automatic Scaling
- Platform-as-a-Service (PaaS)
- Serverless
- Infrastructure-as-Code (IaC)
  - Terraform
  - Azure Resource Manager (ARM) Templates

Modernization

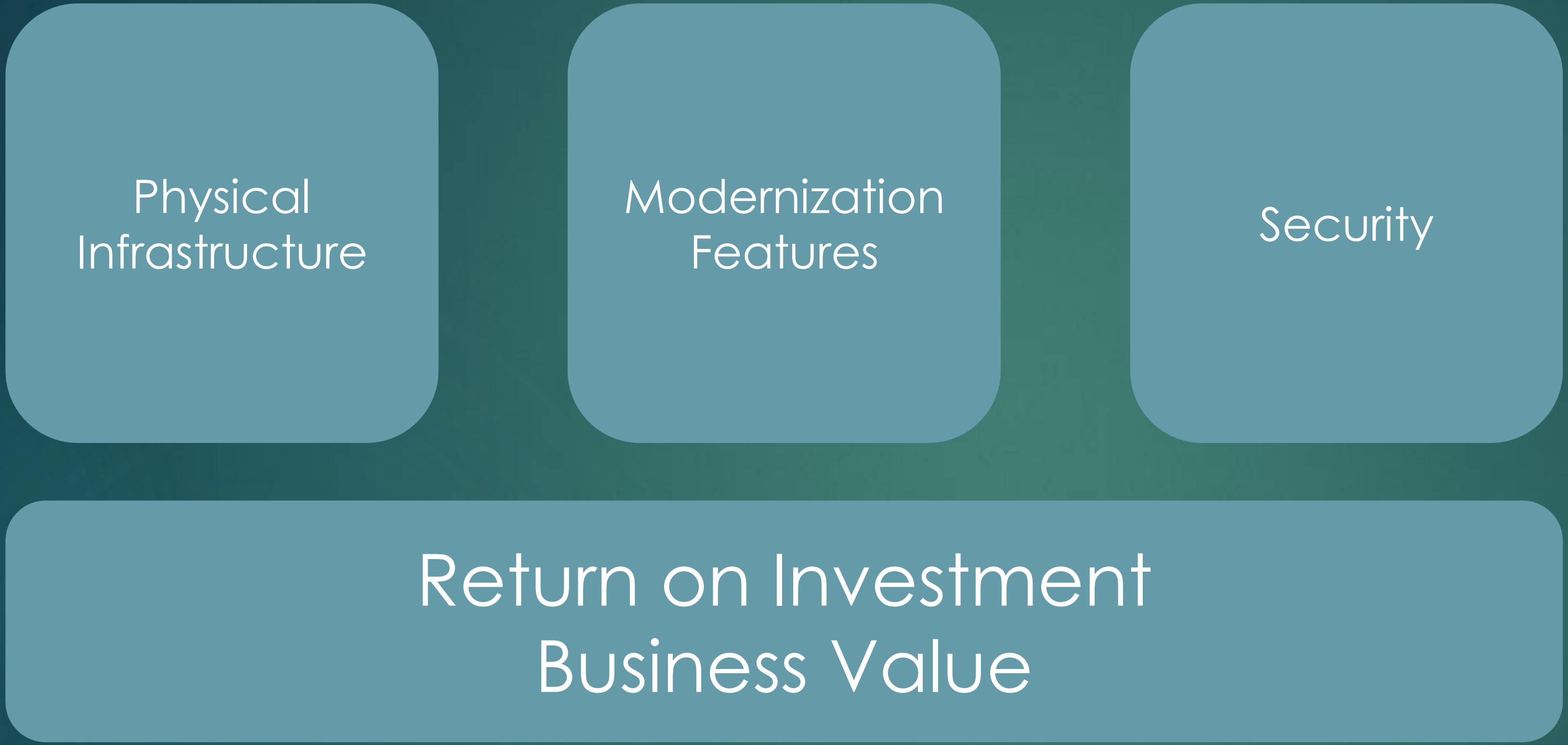
What does that get us?

- It allows IT to be more nimble to business needs and strategy which increases our value to the business.

For the business

- Modernization means reducing time to market, and enabling an organization to be more effective, efficient and agile.

Where does Azure Fit?



Physical Infrastructure

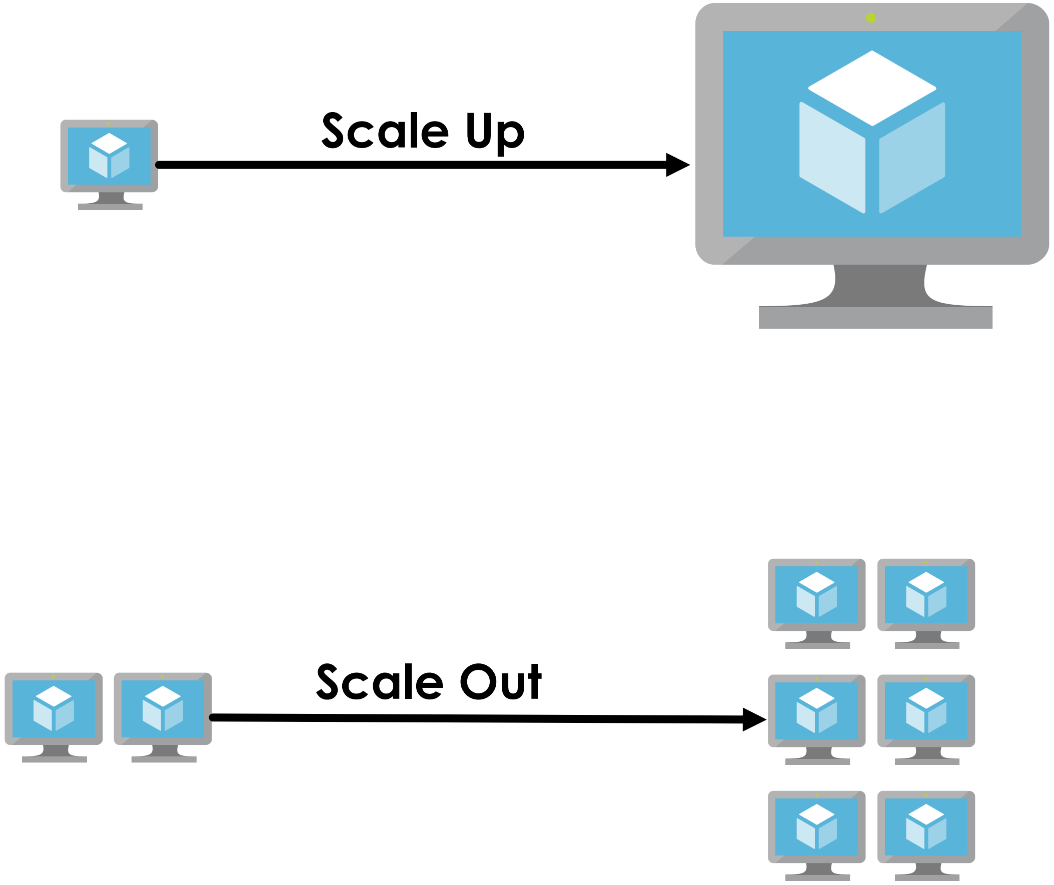
Modernization Features

Security

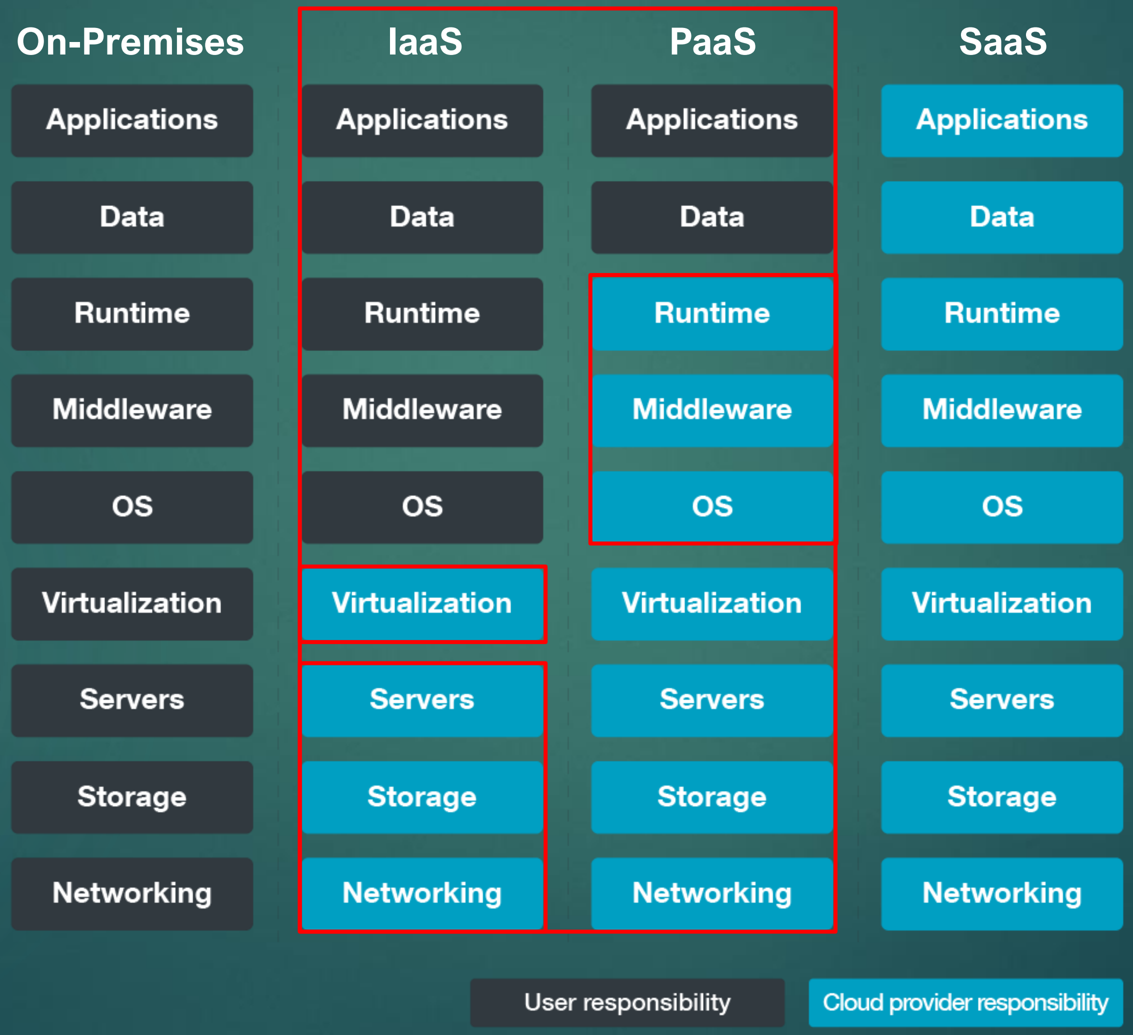
Return on Investment
Business Value

Scaling

- Improves Usability
- Helps Manage Cost
- Autoscaling



Cloud Responsibility Model



On-Premises	IaaS	PaaS	SaaS
Applications	Applications	Applications	Applications
Data	Data	Data	Data
Runtime	Runtime	Runtime	Runtime
Middleware	Middleware	Middleware	Middleware
OS	OS	OS	OS
Virtualization	Virtualization	Virtualization	Virtualization
Servers	Servers	Servers	Servers
Storage	Storage	Storage	Storage
Networking	Networking	Networking	Networking

User responsibility

Cloud provider responsibility

Infrastructure-as-a-Service

Virtual Machine

- Straight up lift and shift
- Easiest/Quickest option
- Urgency

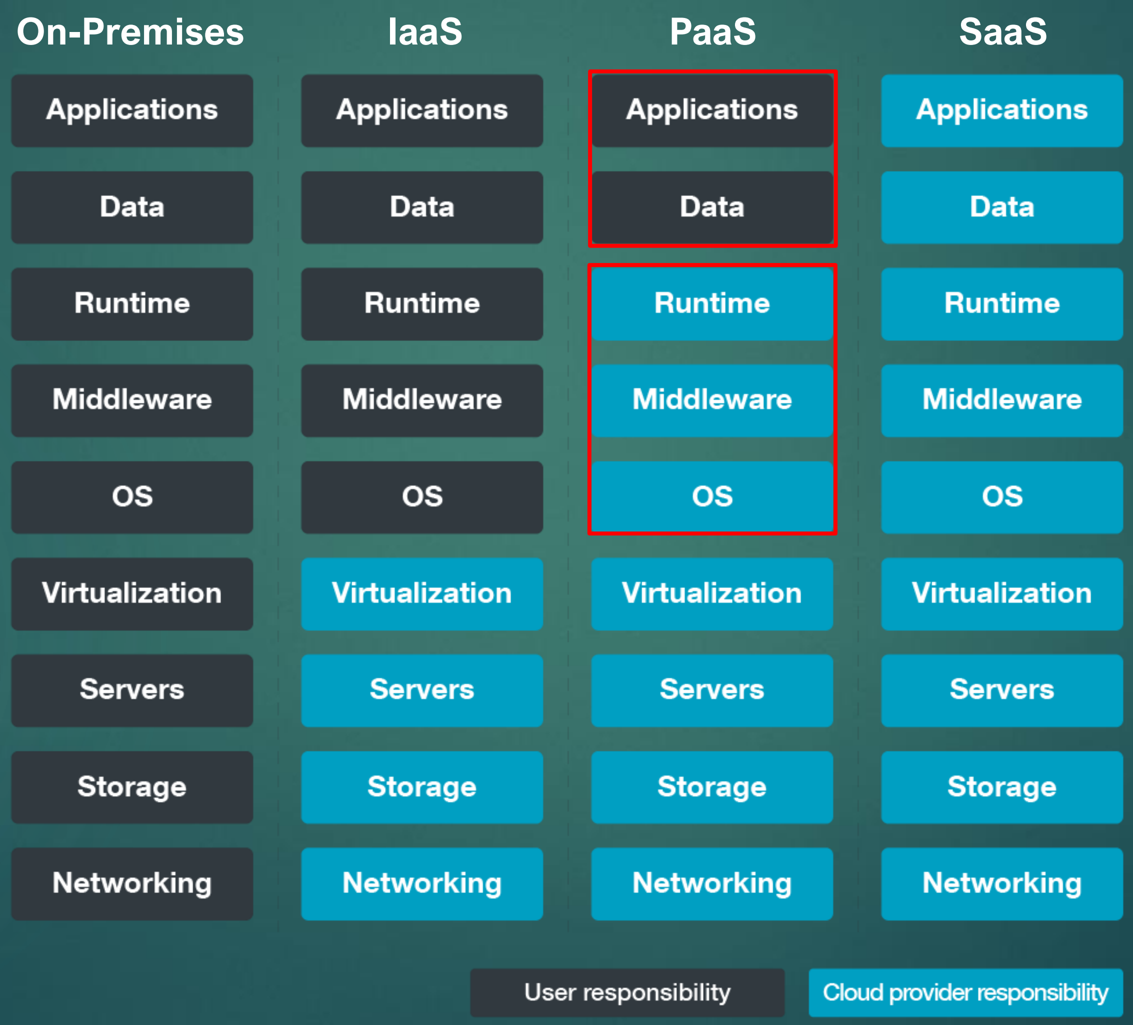
Virtual Machine Scale Set

- Autoscaling
- More dramatic change to deployment process

Reasons to choose IaaS

- Urgency (i.e. end of life of owned hardware)
- Full Access to VM or specific OS customizations
- Installed 3rd party software
- More configuration flexibility - especially much larger
- Isolation

Cloud Responsibility Model

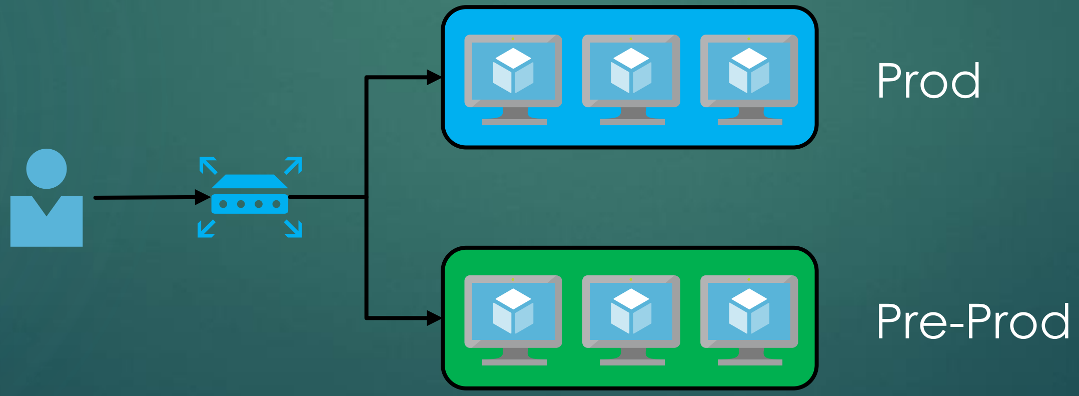


On-Premises	IaaS	PaaS	SaaS
⬛ Applications	⬛ Applications	⬛ Applications	🟦 Applications
⬛ Data	⬛ Data	⬛ Data	🟦 Data
⬛ Runtime	⬛ Runtime	🟦 Runtime	🟦 Runtime
⬛ Middleware	⬛ Middleware	🟦 Middleware	🟦 Middleware
⬛ OS	⬛ OS	🟦 OS	🟦 OS
⬛ Virtualization	🟦 Virtualization	🟦 Virtualization	🟦 Virtualization
⬛ Servers	🟦 Servers	🟦 Servers	🟦 Servers
⬛ Storage	🟦 Storage	🟦 Storage	🟦 Storage
⬛ Networking	🟦 Networking	🟦 Networking	🟦 Networking

⬛ User responsibility 🟦 Cloud provider responsibility

PaaS - App Services

- Additional layer of abstraction over the VM
- Microsoft managed OS and runtime
- Autoscaling
- Basic Load Balancing
- Deployment Slots (Blue/Green deployments)



PaaS - App Services

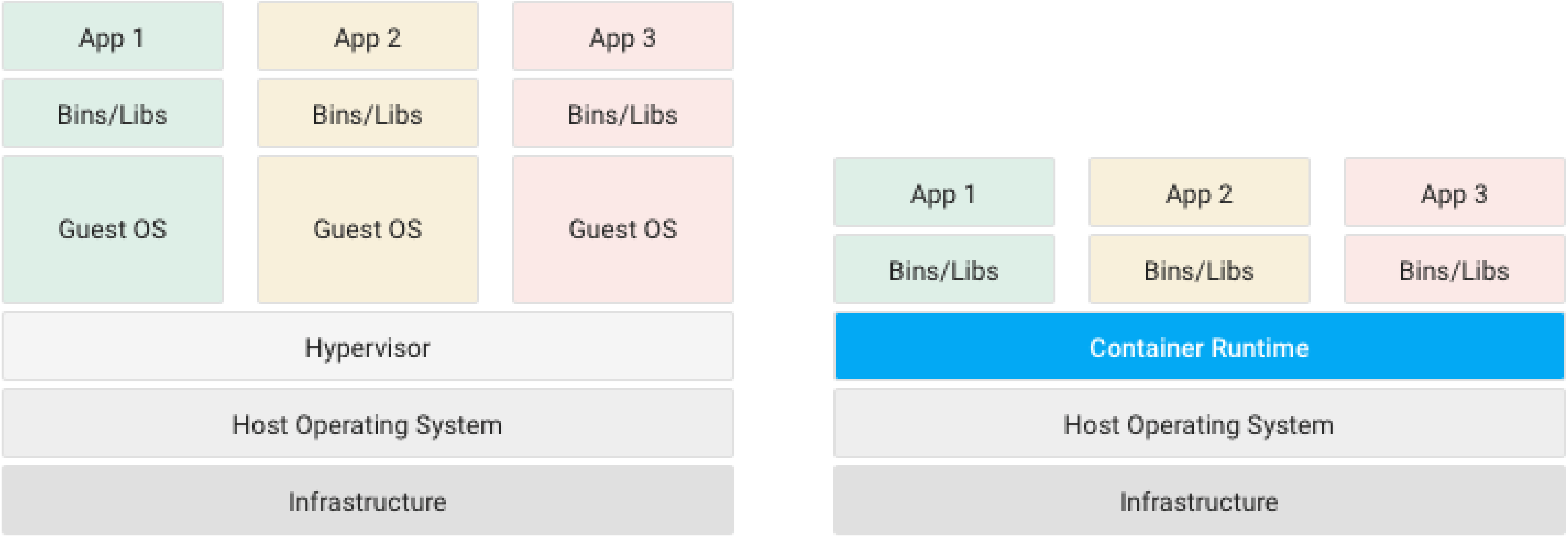
Limitations

- No access to GAC
- Can’t save files to disk
- No email from within the app
- All apps deployed to an App Service run under a single app pool

Workarounds

- Package assemblies with app
- Send to blob storage
- Send to a queue to get picked up/processed/sent

Containers



App 1 | App 2 | App 3

Bins/Libs | Bins/Libs | Bins/Libs

Guest OS | Guest OS | Guest OS

Hypervisor

Host Operating System

Infrastructure

Virtual Machines

App 1 | App 2 | App 3

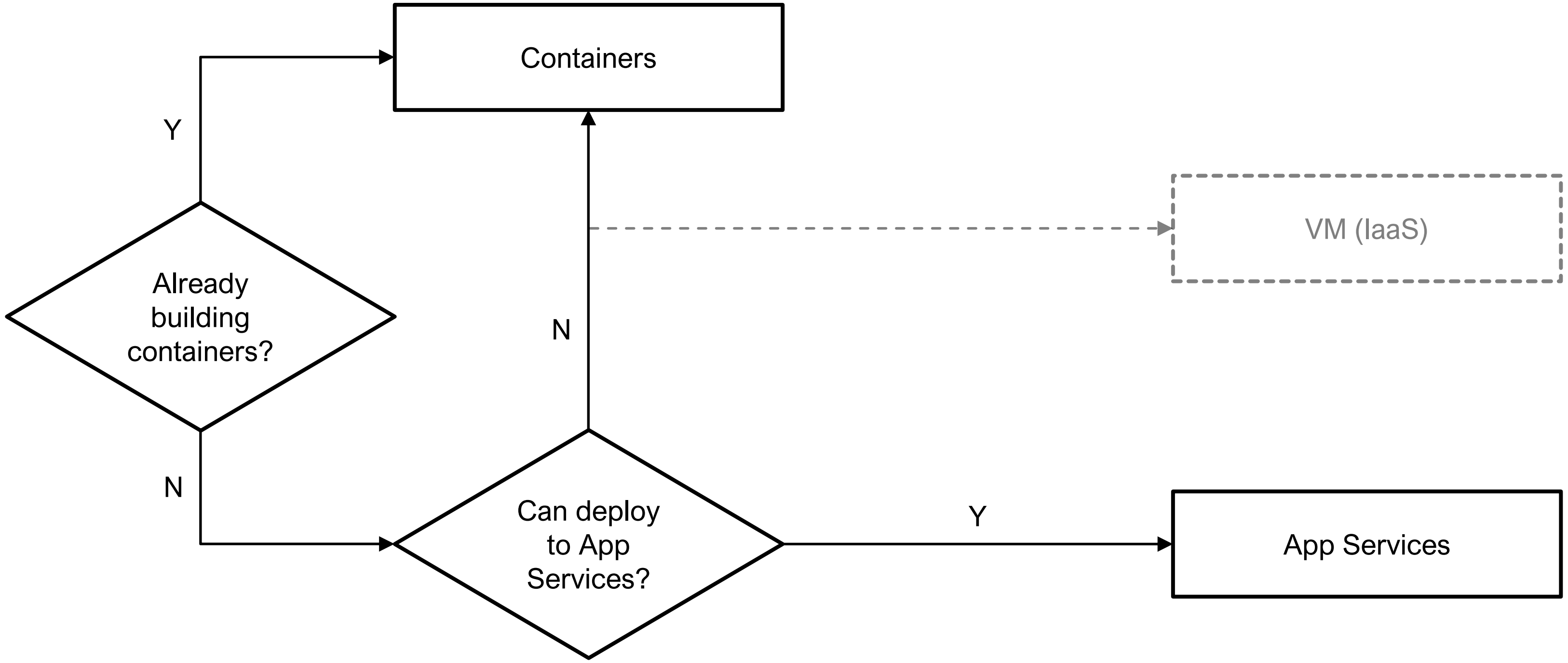
Bins/Libs | Bins/Libs | Bins/Libs

Container Runtime

Host Operating System

Infrastructure

Containers



PaaS - Containers

PaaS - Containers - Deployment

Service Fabric

- Dead (not really)
- Container orchestration moving away from Service Fabric

Azure Container Instances (ACI)

- Not for always on containers.
- Best for:
  - Container Image Development
  - Proof-of-Concept (POC)
  - Batch Jobs
  - Elastic Bursting (i.e. CI/CD)

PaaS - Containers - Deployment

App Services for Containers

- Same benefits as deploying directly to App Services
  - Microsoft managed OS and runtime
  - Autoscaling
  - Basic load balancing
  - Etc.

Azure Kubernetes Service (AKS)

- Complex
- You'll end up here eventually
- All of Kubernetes benefits
- Microsoft manages Kubernetes
- Don't pay for cluster management

Compute Summary

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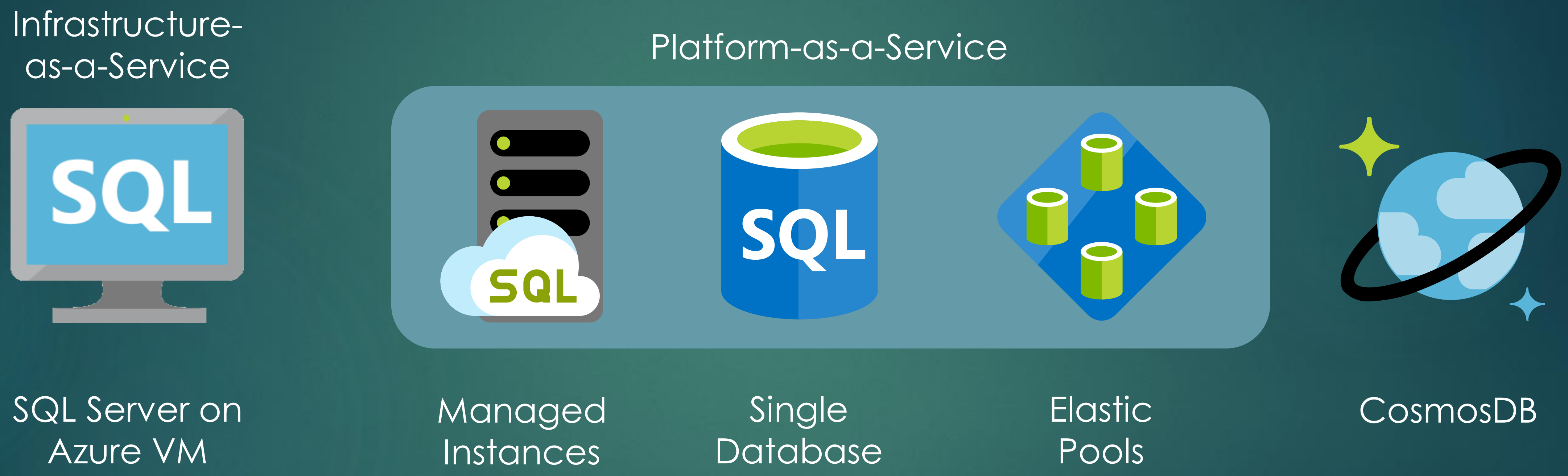
Infrastructure-as-a-Service

- Virtual Machines
- Virtual Machine Scale Sets

Platform-as-a-Service

- App Services
- Containers
  - App Services
  - AKS

Databases



Infrastructure-as-a-Service

Platform-as-a-Service

SQL Server on Azure VM

Managed Instances

Single Database

Elastic Pools

CosmosDB

IaaS - SQL Server an Azure VM

- Lift and Shift
- Complete control of OS and SQL Server
- If you need SQL Agent

PaaS - Azure SQL

- Microsoft maintains OS and SQL Server
- High Availability (99.99%)
- Built in backups (RA-GRS)

PaaS - Azure SQL

Managed Instances

- Near 100% compatibility
- Full SQL Server access
- Expensive, complex, and hard to set up

Single Database

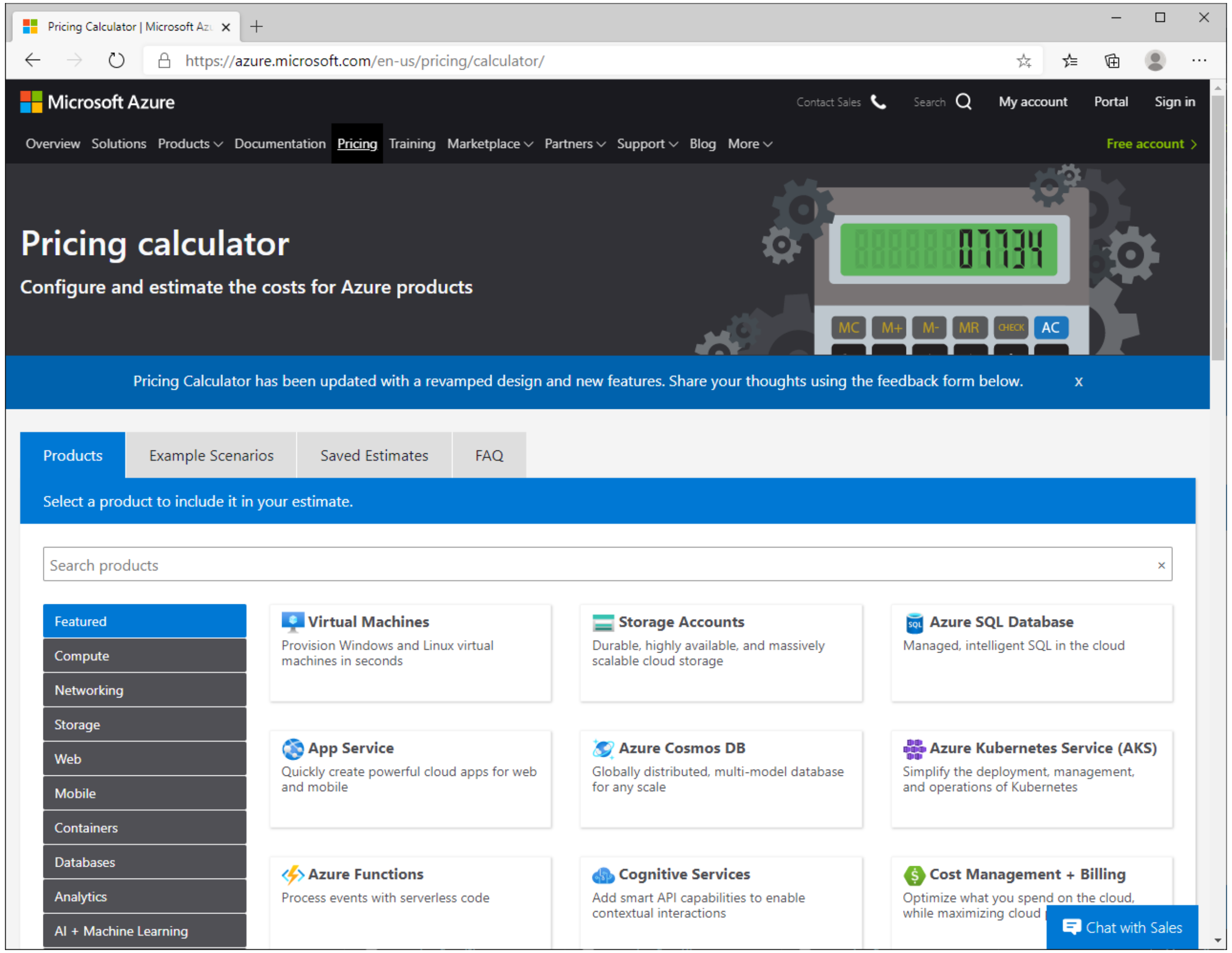
- For predictable usage
- Dedicated resources
- Scale manually or programmatically

Elastic Pool

- Collection of databases with varying and unpredictable usage
- Autoscale within the pool's resources
- DBs can be moved in and out of a pool

Cost Management

- Azure Cost Calculator



Pricing calculator

Configure and estimate the costs for Azure products

Pricing Calculator has been updated with a revamped design and new features. Share your thoughts using the feedback form below. x

Select a product to include it in your estimate.

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

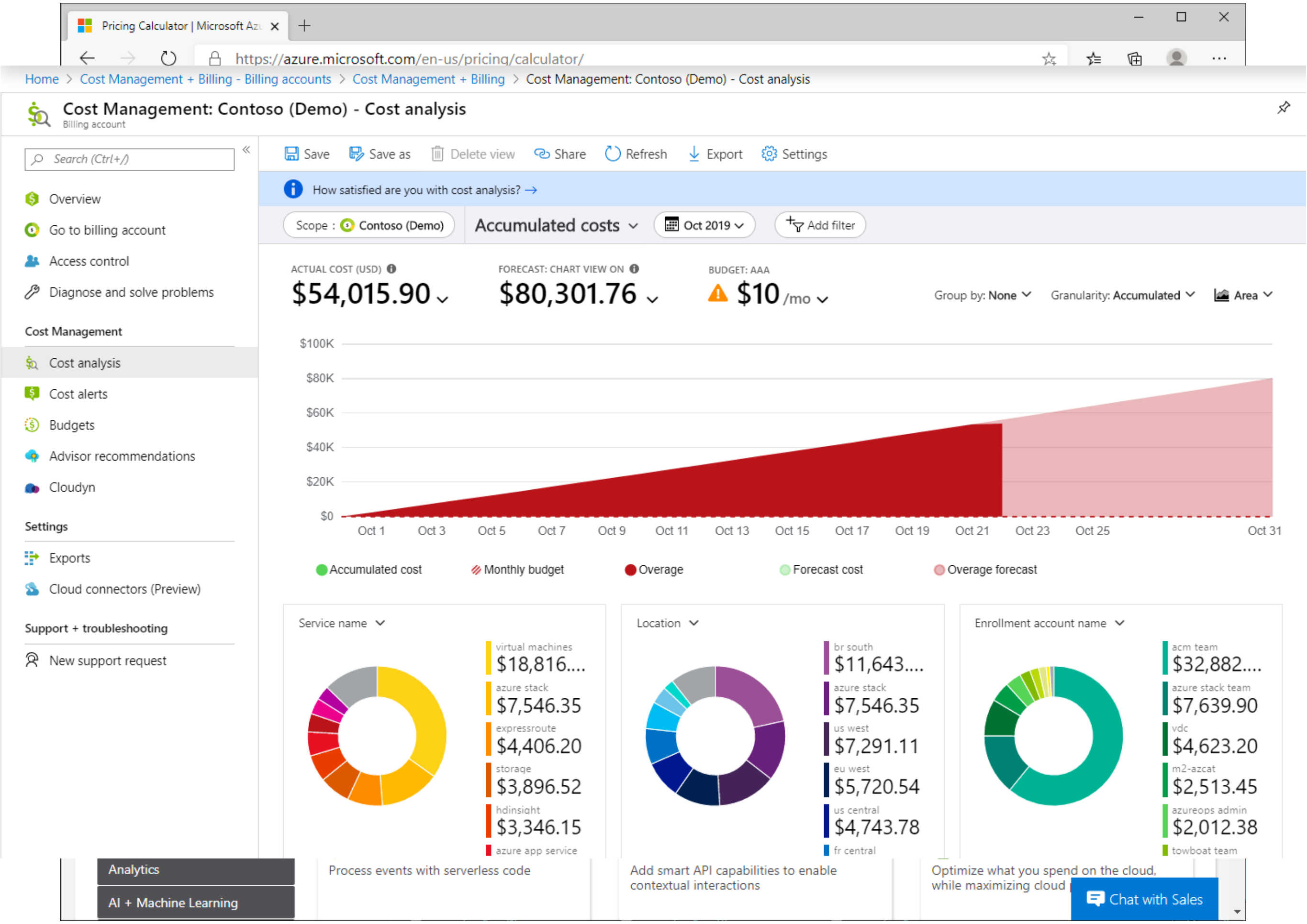
Azure Functions
Process events with serverless code

Cognitive Services
Add smart API capabilities to enable contextual interactions

Cost Management + Billing
Optimize what you spend on the cloud, while maximizing cloud

Cost Management

- Azure Cost Calculator
- Azure Cost Management (portal)
- Save over pay-as-you-go
  - Enterprise Agreements
  - Azure Hybrid Benefit
  - Reserved Instances
- It's a process, not a one-time exercise



Pricing Calculator | Microsoft Az

https://azure.microsoft.com/en-us/pricing/calculator/

Home > Cost Management + Billing - Billing accounts > Cost Management + Billing > Cost Management: Contoso (Demo) - Cost analysis

Cost Management: Contoso (Demo) - Cost analysis

Billing account

How satisfied are you with cost analysis? →

Scope : Contoso (Demo) | Accumulated costs | Oct 2019 | Add filter

ACTUAL COST (USD): $54,015.90

FORECAST: CHART VIEW ON: $80,301.76

BUDGET: AAA: $10 /mo

Group by: None | Granularity: Accumulated | Area

Process events with serverless code

Add smart API capabilities to enable contextual interactions

Optimize what you spend on the cloud, while maximizing cloud

RBA

Cost Management

- Cost optimization, not cost minimization
- ROI, not absolute cost
- Right Sizing
- Autoscaling

The architecture is the cost
and the cost is the architecture.
If you don’t like the cost,
then you don’t like the architecture.

Q&A

RBA

A Digital and Technology Consultancy

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