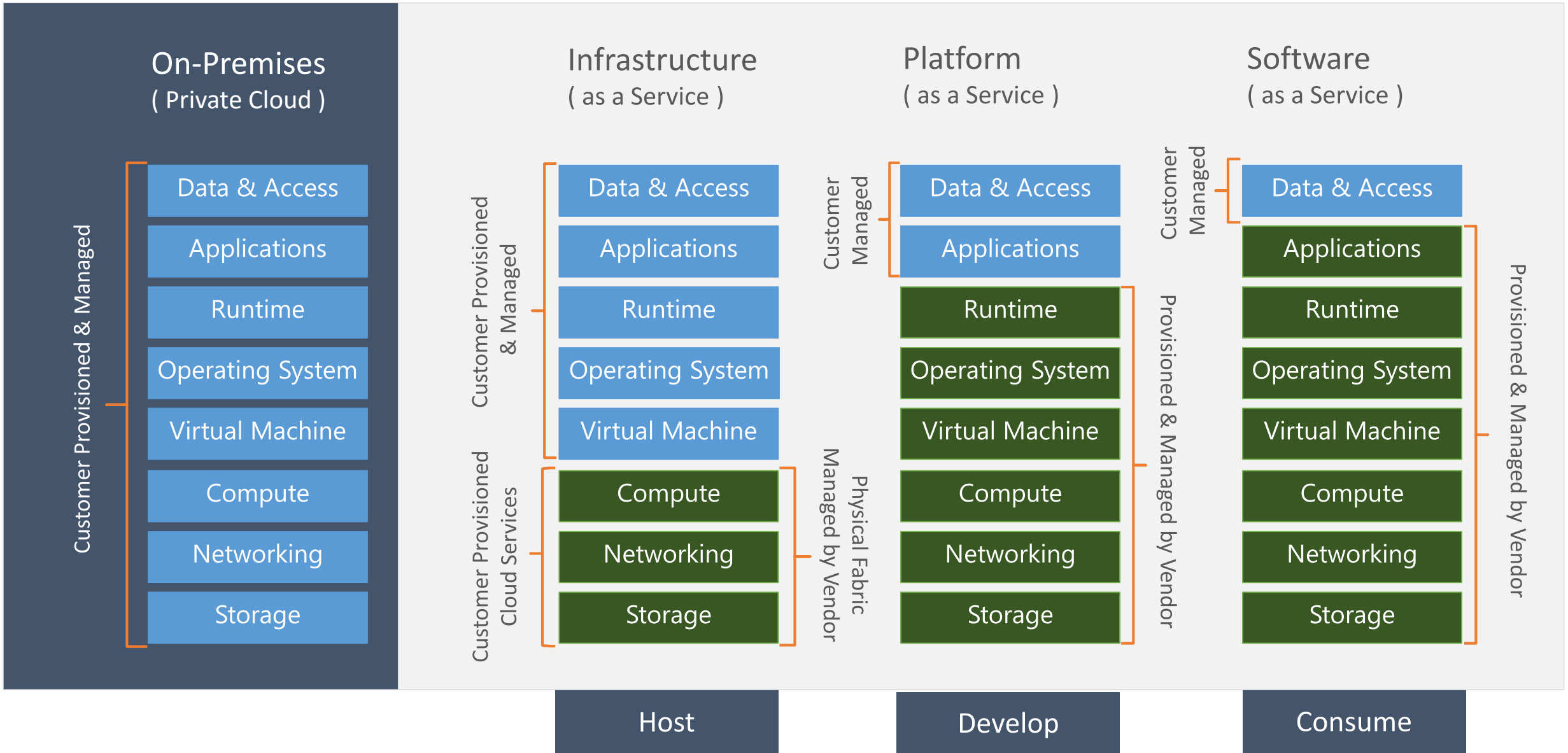
Microsoft

Microsoft Azure

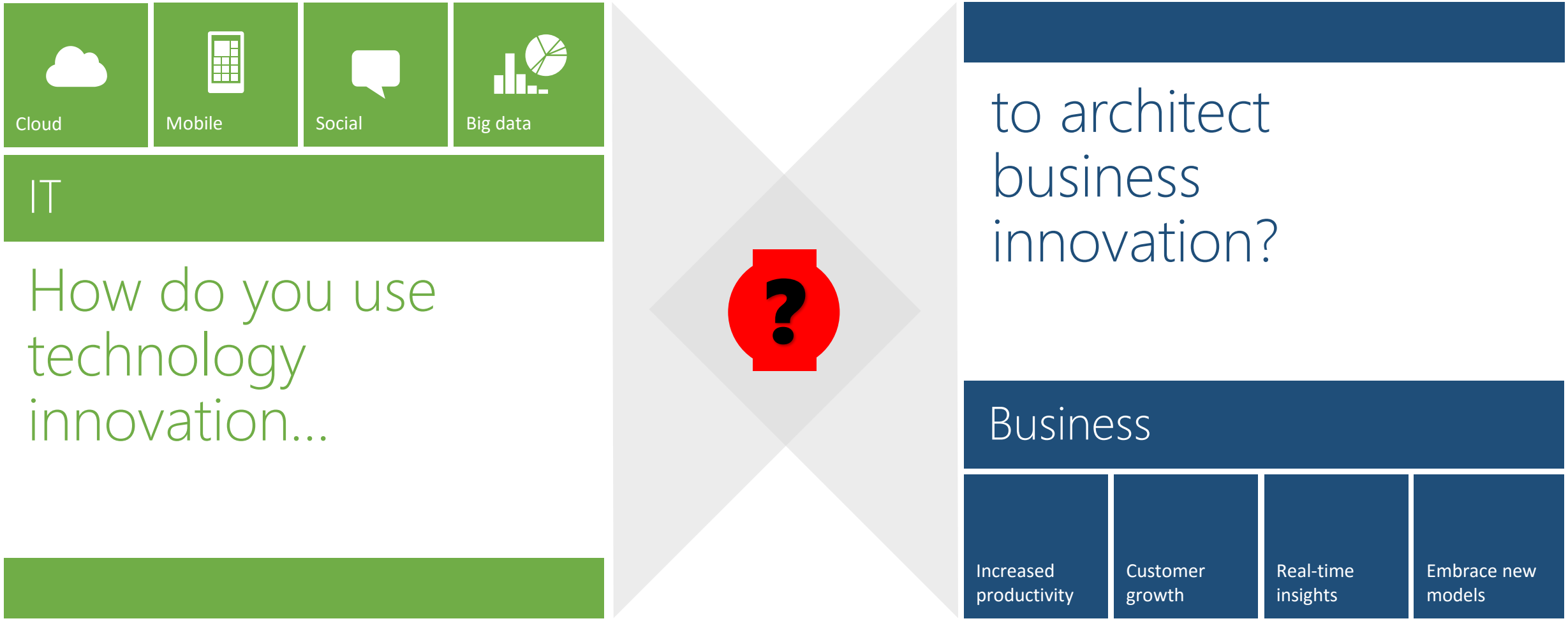
The cloud platform built for business

Mario Cavaldesi
Cloud Solution Architect

Cloud/On-Premises Comparison Chart

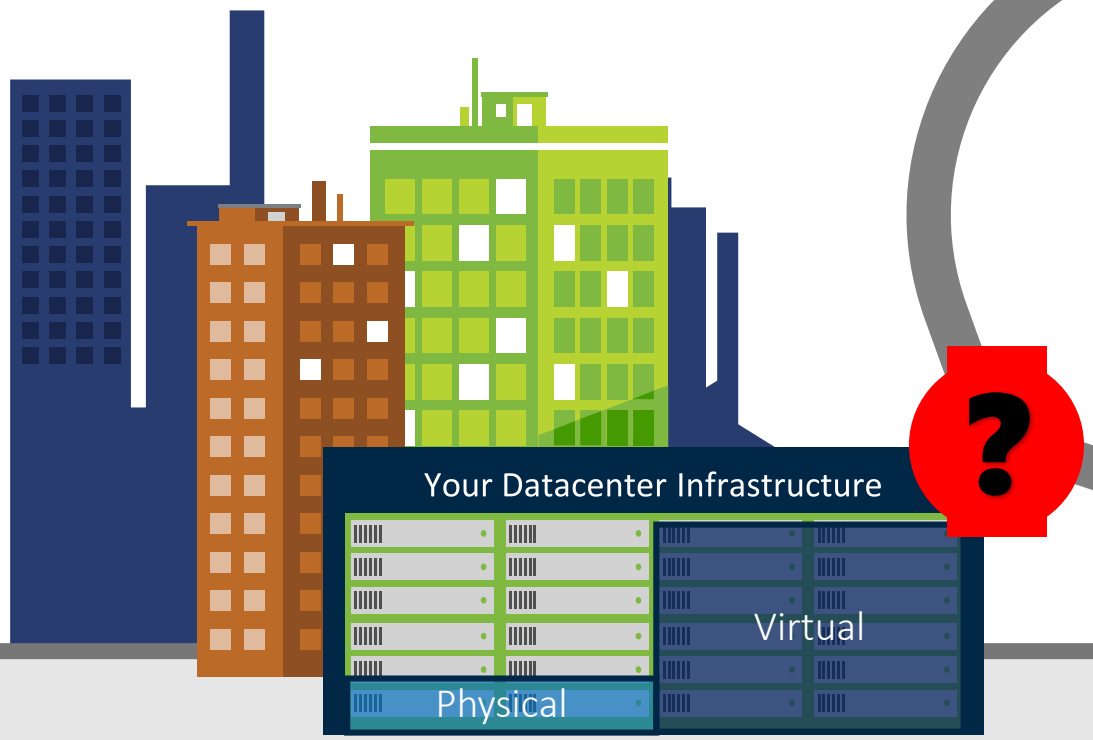


The next strategic opportunity is here

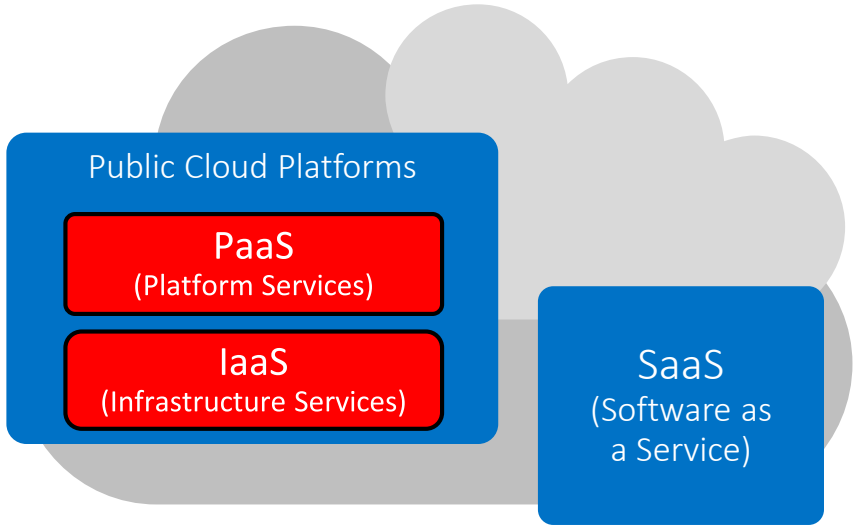


Cloud & IT Strategy

- Virtualization – there must be more..?
- It's cheaper – isn't it..?
- My DC is "constrained"..!
- My Business Groups are using it..!

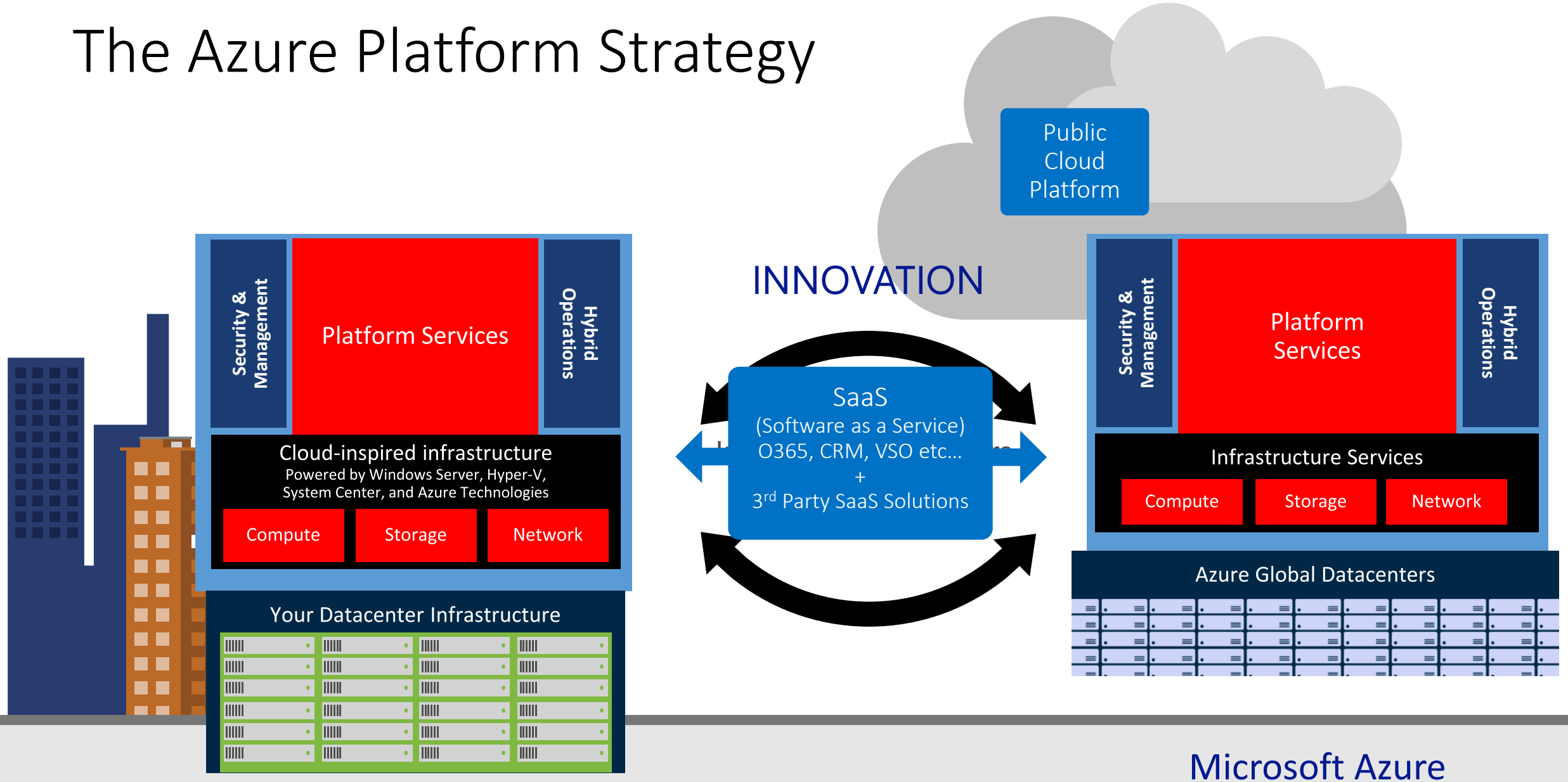


Your Data Center



- Can we STOP doing some things?

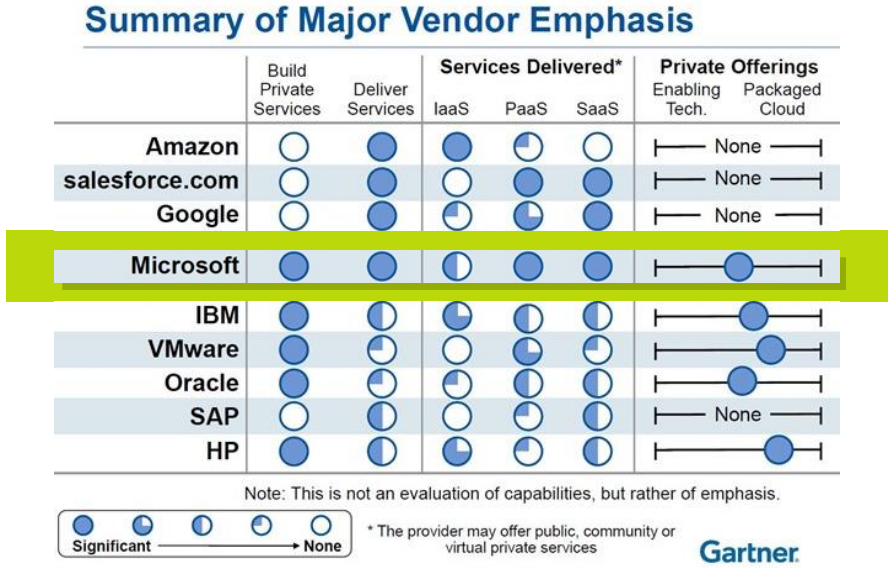
The Azure Platform Strategy



Microsoft Azure Stack
& Cloud Platform System

Microsoft Azure
Public, Global, Shared Datacenters

Industry validation

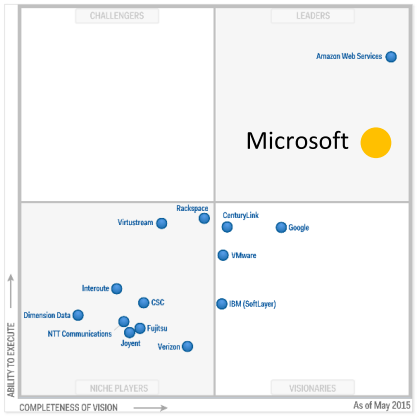


"Microsoft's comprehensive hybrid story, which spans applications and platforms as well as infrastructure, is highly attractive to many companies, drawing them towards the cloud in general."

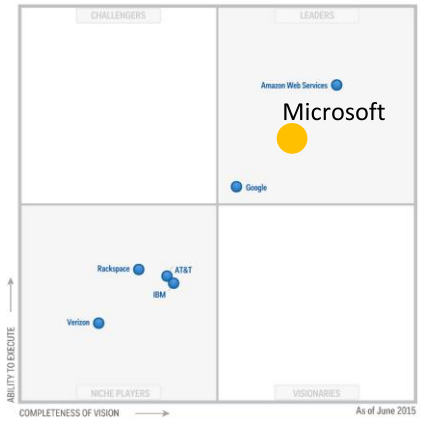
LYDIA LEONG,
GARTNER

Microsoft Leads Everywhere…

Public Cloud IaaS (May 2015)



Cloud Storage (June 2015)



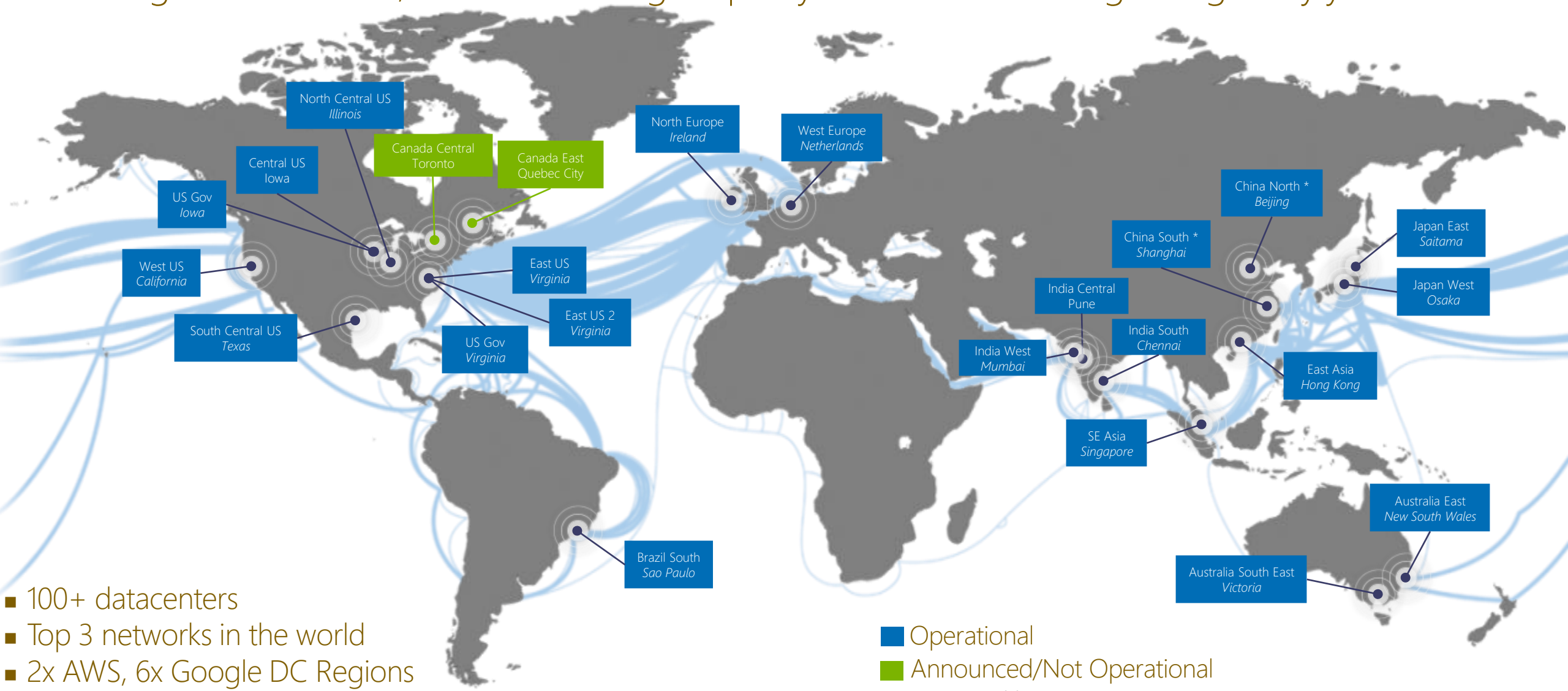
Enterprise App PaaS (Jan 2014)

X86 Server Virt (July 2015)

Operational DBMS Systems (Oct 2014)

Huge infrastructure scale is the enabler

24 Regions Worldwide, 22 ONLINE…huge capacity around the world…growing every year



- 100+ datacenters
- Top 3 networks in the world
- 2x AWS, 6x Google DC Regions
- G Series – Largest VM in World, 32 cores, 448GB Ram, SSD…

Operational

Announced/Not Operational

* Operated by 21Vianet

Azure compliance audits and certifications

Global

- ISO/IEC 27001
- SOC 1
- SOC 2
- PCI DSS L1 version 3
- Cloud Security Alliance Cloud Security Matrix
- ISO / IEC 27018

United States

- FedRAMP
- HIPAA (Healthcare)
- FIPS 140-2
- Life Sciences GxP
- Family Educational Rights & Privacy Act

Regional

- European Union Model Clause
- United Kingdom G-Cloud
- China Multi Layer Protection Scheme
- China CCCPPF
- Singapore Multi-Tier Cloud Security
- Australian Signals Directorate I-RAP Assessment

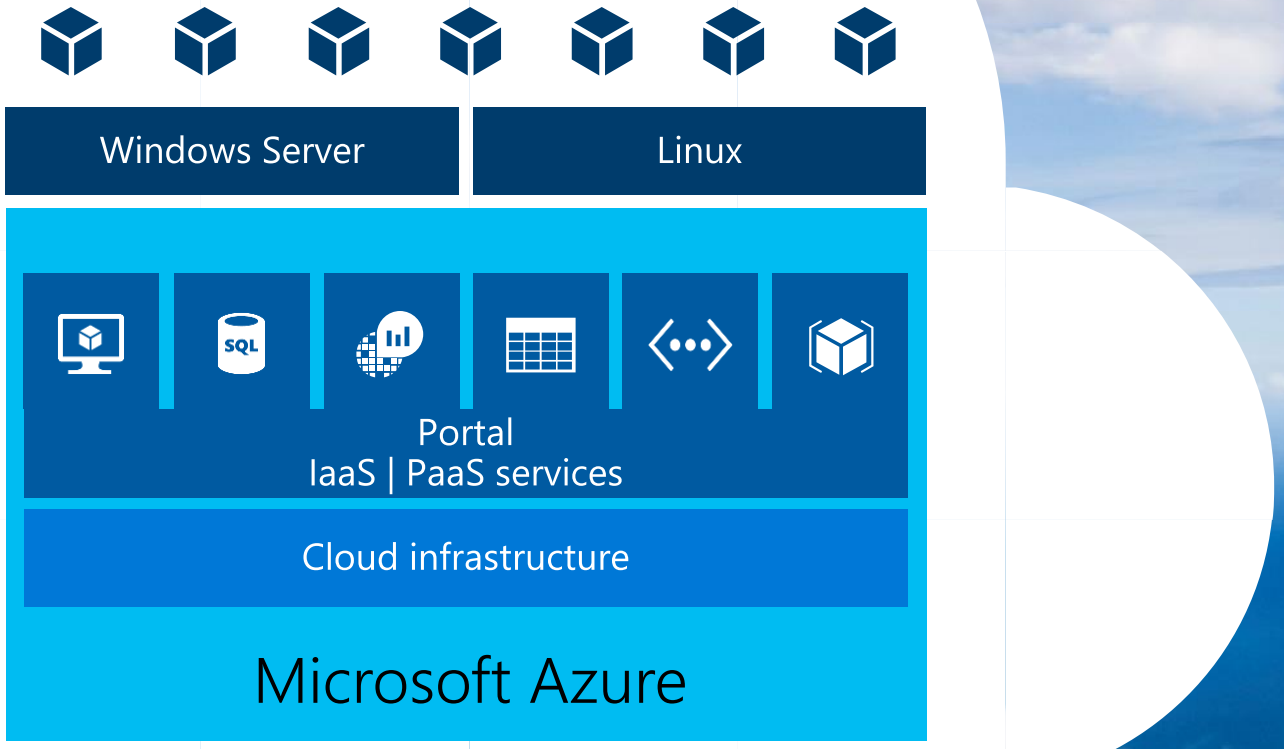
Coming soon

- Sarbanes Oxley
- Criminal Justice Information System
- Defense Information Systems Agency L2
- ITAR
- Defense Information Systems Agency L3-5

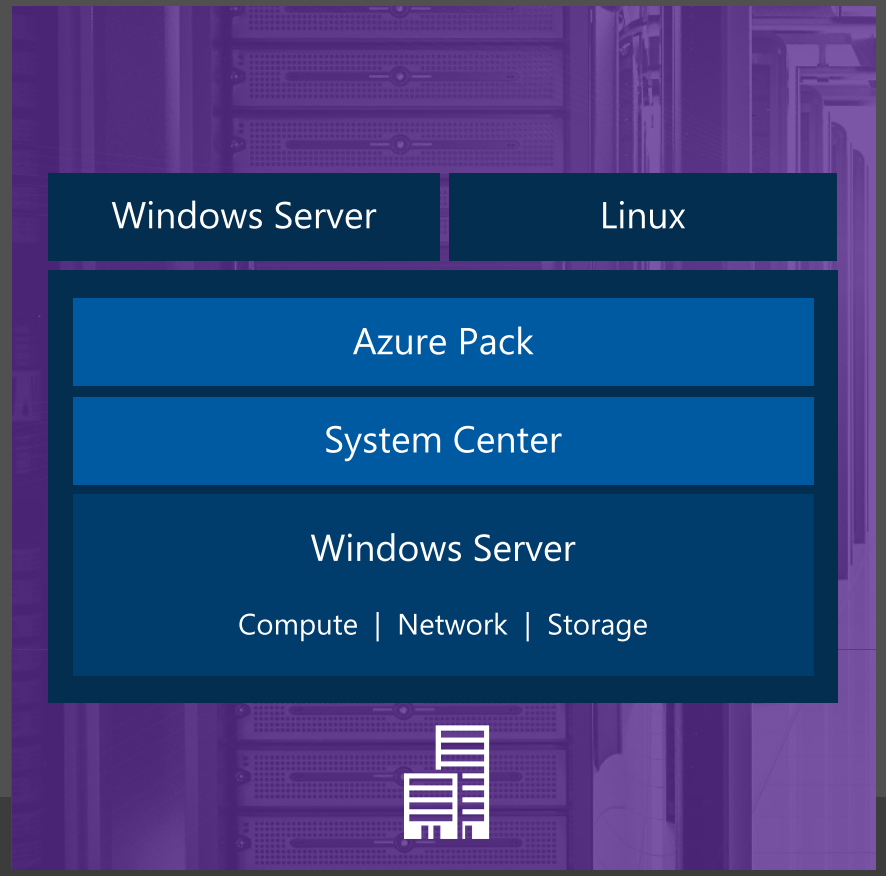
Azure momentum

~100,000 New Azure customer subscriptions/month	20 Million SQL database hours used every day	>50 Trillion Storage objects in Azure	>5 Trillion Storage transactions every month
425 Million Azure Active Directory Users	60 Billion Hits to Websites run on Azure Web App Service	57% Of Fortune 500 Companies use Microsoft Azure	1 Trillion Messages delivered every month with Event Hubs

Anatomy of Microsoft Azure



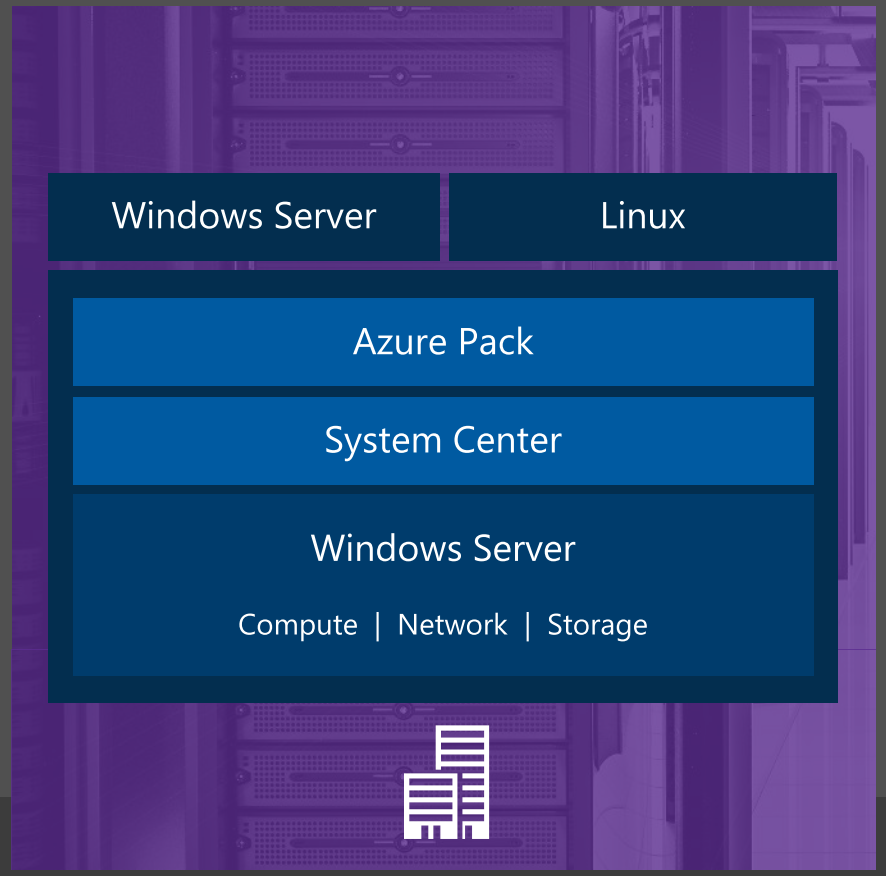
Power of Azure with the control of the datacenter



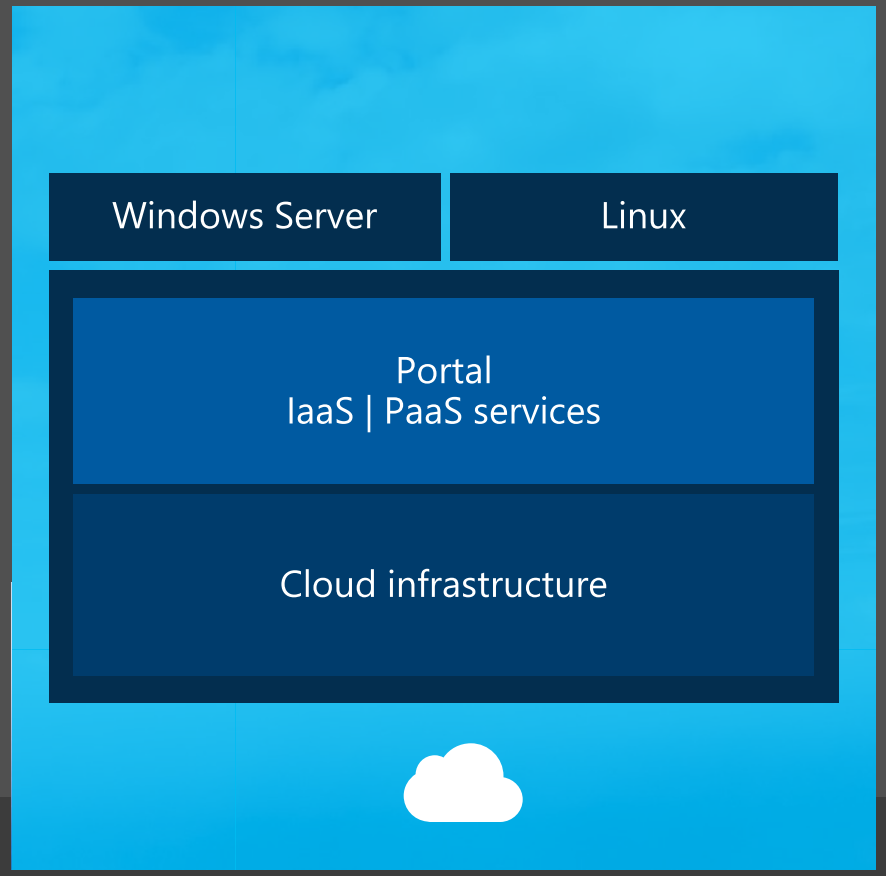
Microsoft Private Cloud
(on premises | hosted)

Microsoft Azure

Power of Azure with the control of the datacenter

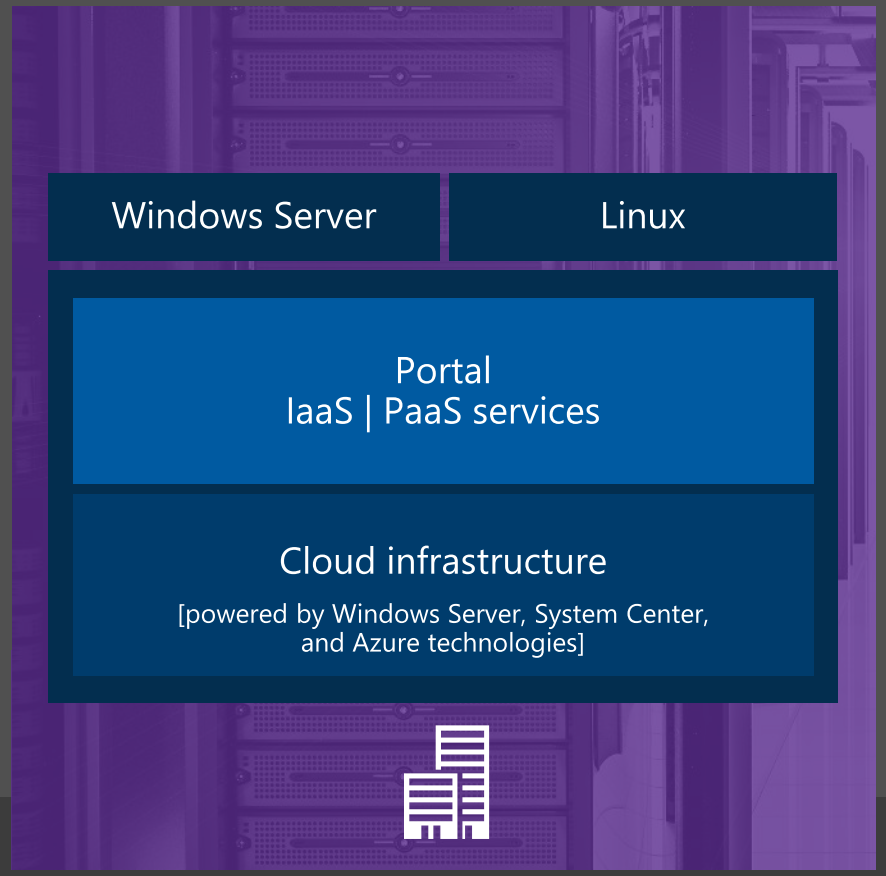


Microsoft Private Cloud
(on premises | hosted)

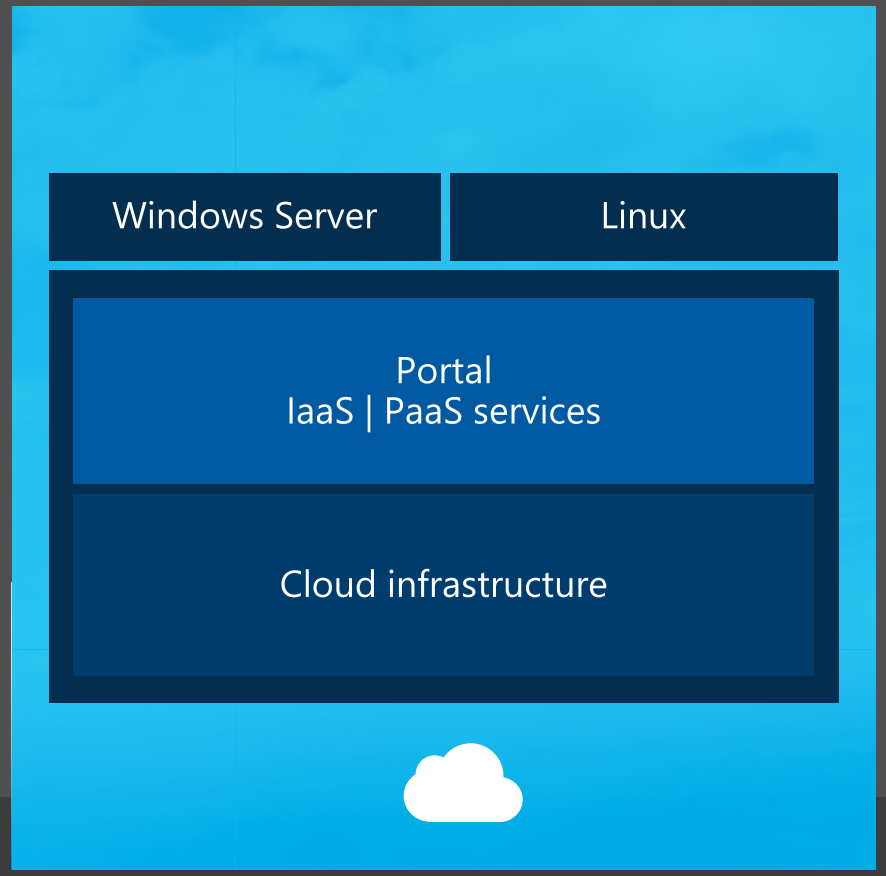


Microsoft Azure

Power of Azure with the control of the datacenter

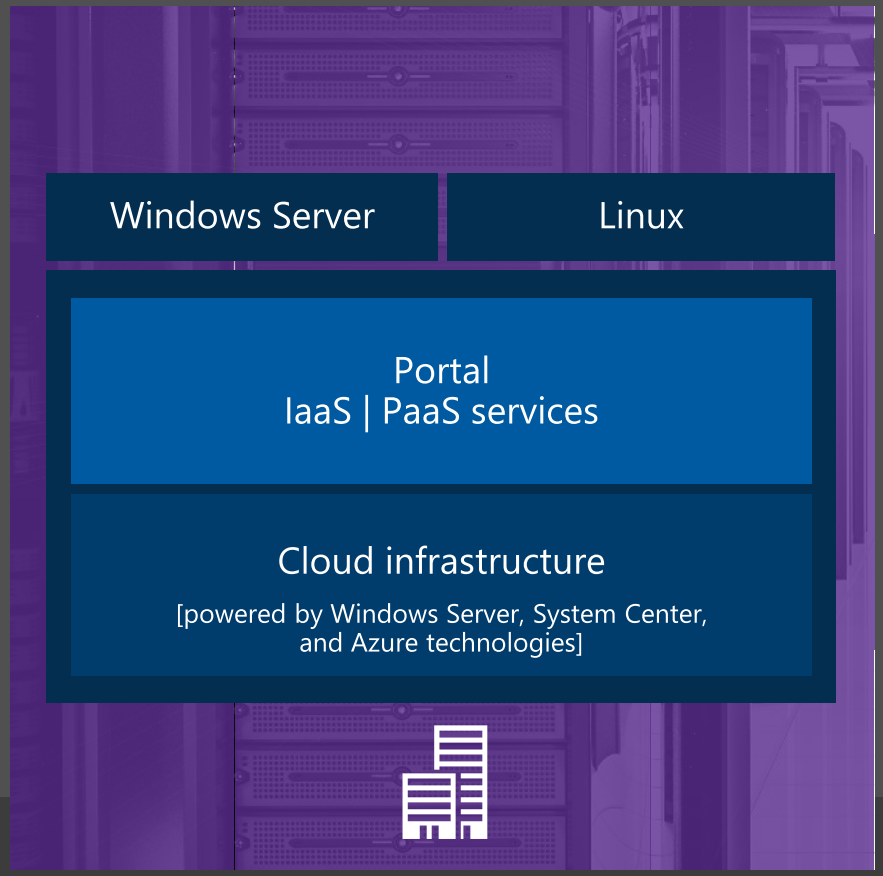


Microsoft Azure Stack
(on premises | hosted)

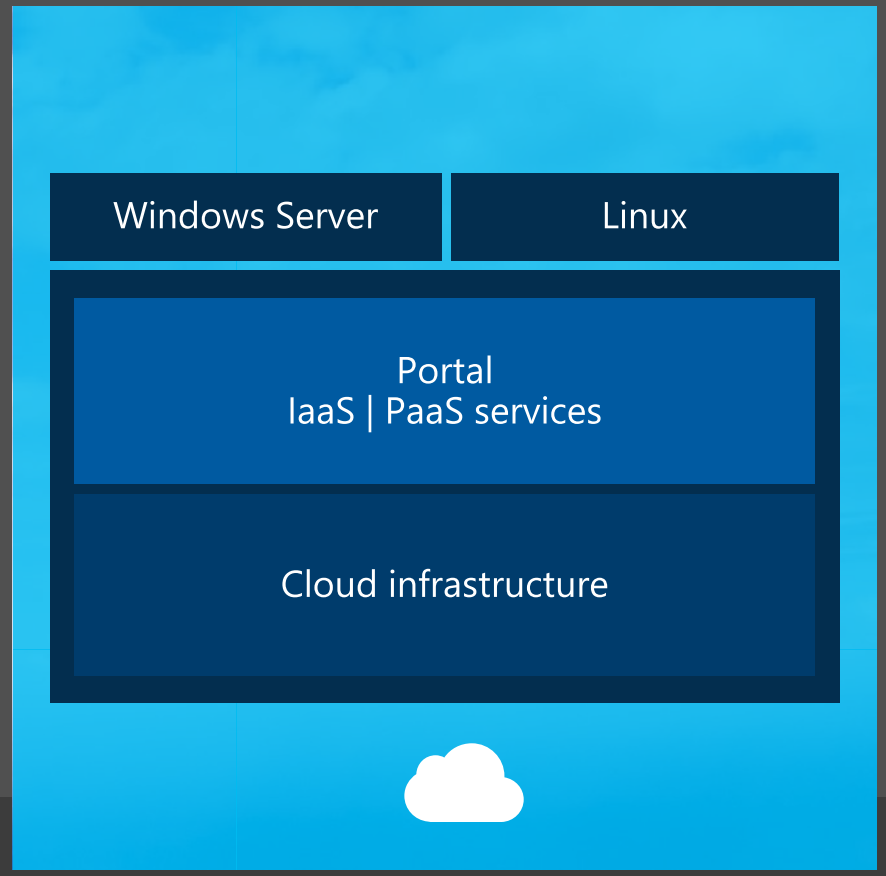


Microsoft Azure

Introducing the Microsoft Azure Stack



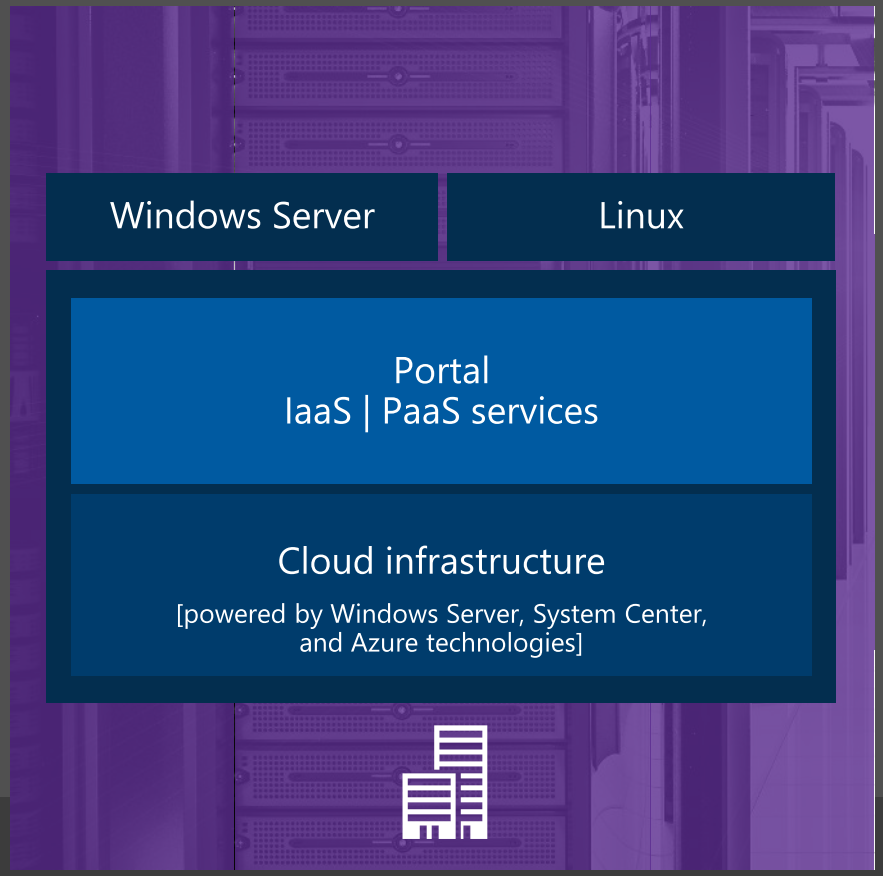
App innovation



Microsoft Azure Stack
(on premises | hosted)

Microsoft Azure

Introducing the Microsoft Azure Stack



Microsoft Azure Stack
(on premises | hosted)

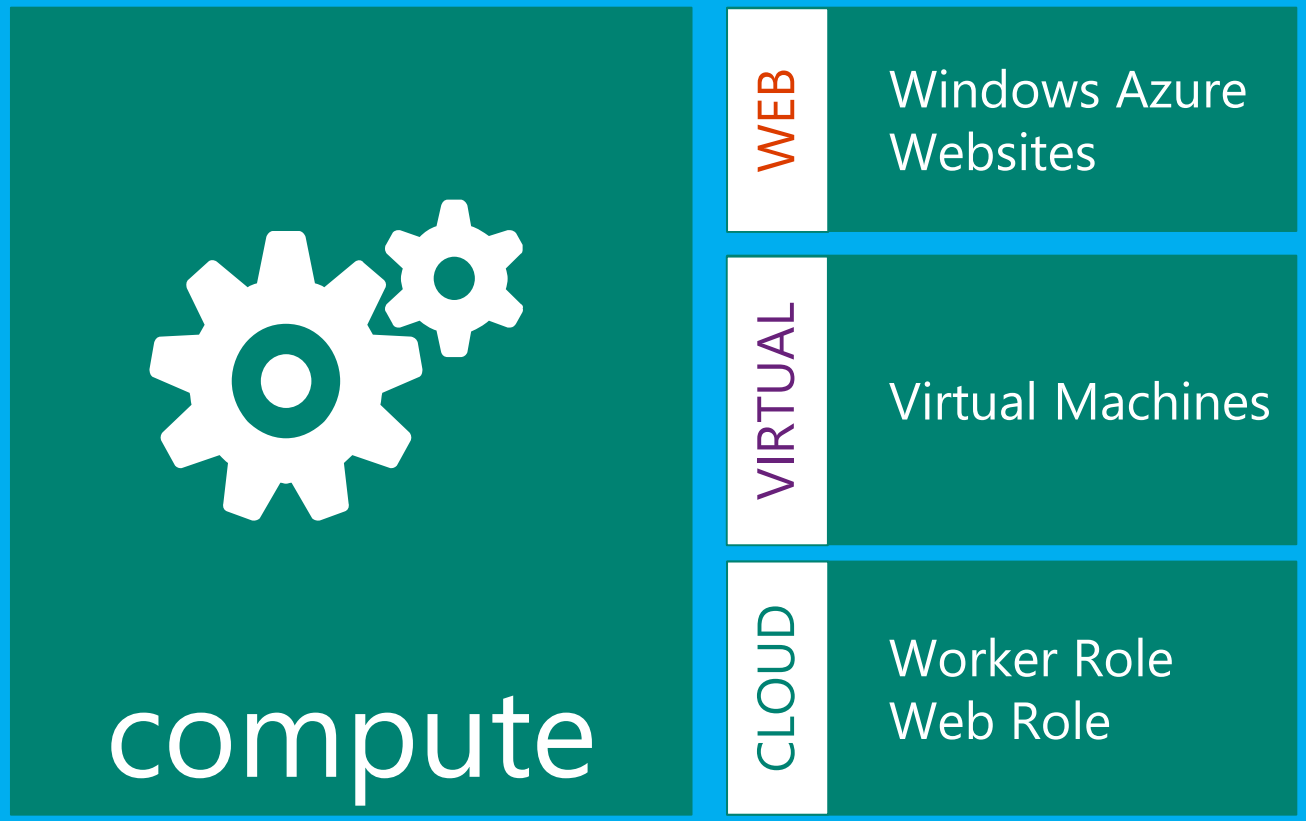
Cloud-optimized
application platform

Cloud-consistent
service delivery

Cloud-inspired
hybrid infrastructure

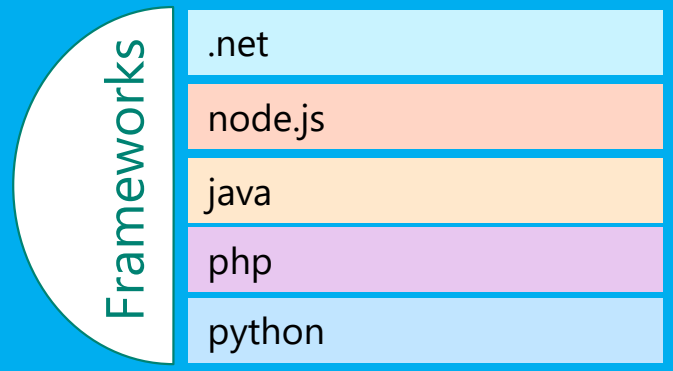
Microsoft Azure Compute

Flexible IaaS and PaaS based hosting options for Cloud, Web, and Virtual Workloads.



Features:

- 99.95% Monthly SLA
- Support for Windows and Linux VM's
- Fault Isolation
- Elastic Capacity
- Open source support (Git, etc…)
- First class .Net Support
- Support for a variety of languages and frameworks -



Typical Scenarios

Windows Azure Web Sites are ideal for:

Modern web apps

Perfect if your app consists of client side markup and scripting, server side scripting and a database. Powerful capability to scale out and up as needed.

Continuous development

Deploy directly from your source code repository, using Git or Team Foundation Service.

Popular open source apps

Launch a professional looking site with a few clicks using apps like WordPress, Joomla!, Drupal, DotNetNuke and Umbraco

Windows Azure Cloud Services (Web Role) are ideal for:

Multi-tier applications

Cloud-based applications that separate application logic into multiple tiers (i.e. caching middle tier, asynchronous background processes like order processing) using both Web and Worker Roles

Apps that require advanced administration

Cloud-based applications that require admin access, remote desktop access or elevated permissions

Apps that require advanced networking

Cloud-based applications that require network isolation for use with Windows Azure Connect or Windows Azure Virtual Network

Windows Azure Virtual Machines are ideal for:

Enterprise server applications

Run your existing enterprise applications in the cloud, such as SQL Server, SharePoint Server or Active Directory.

Porting existing line of business apps

Choose an image from the library or upload your own VHD.

Windows or Linux operating system

Support for Windows Server, along with community and commercial versions of Linux. Connect virtual machines with cloud services to take full advantage of PaaS services.

Microsoft Azure Virtual Machines

Infrastructure as a Service introduces new functionality that allows full control and management of both Windows and Linux virtual machines along with an extensive virtual networking offering.

Easily migrate existing applications as-is to the cloud

Assist New Cloud App Development by Integrating IaaS and PaaS Functionality

Set up new virtual machines in Windows Azure with only a few clicks.

Agentless Deployment for Windows Servers

Start from a pre-built image from our image library

Upload your own VHD from on-premises.

Create Your Own Customized Images

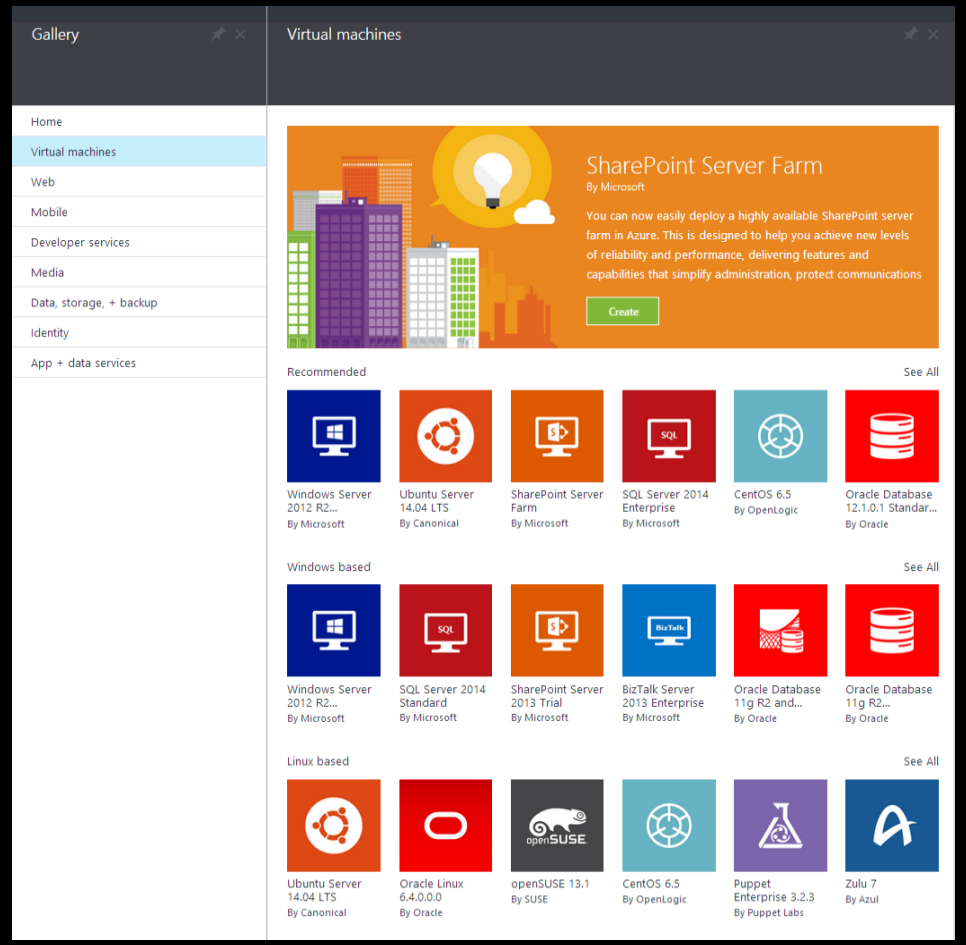
Support for community and commercial versions of Linux

Move images back on premise as necessary

Run enterprise applications such as SQL Server, SharePoint or Active Directory in the cloud

Easily create hybrid cloud and on-premises solutions with VPN connectivity between the Windows Azure Data Center and your own network.

Microsoft Azure Certified



Barracuda Web Application
By Barracuda

DreamFactory 1.6
By Bitnami

SAP HANA Developer Edition
By SAP

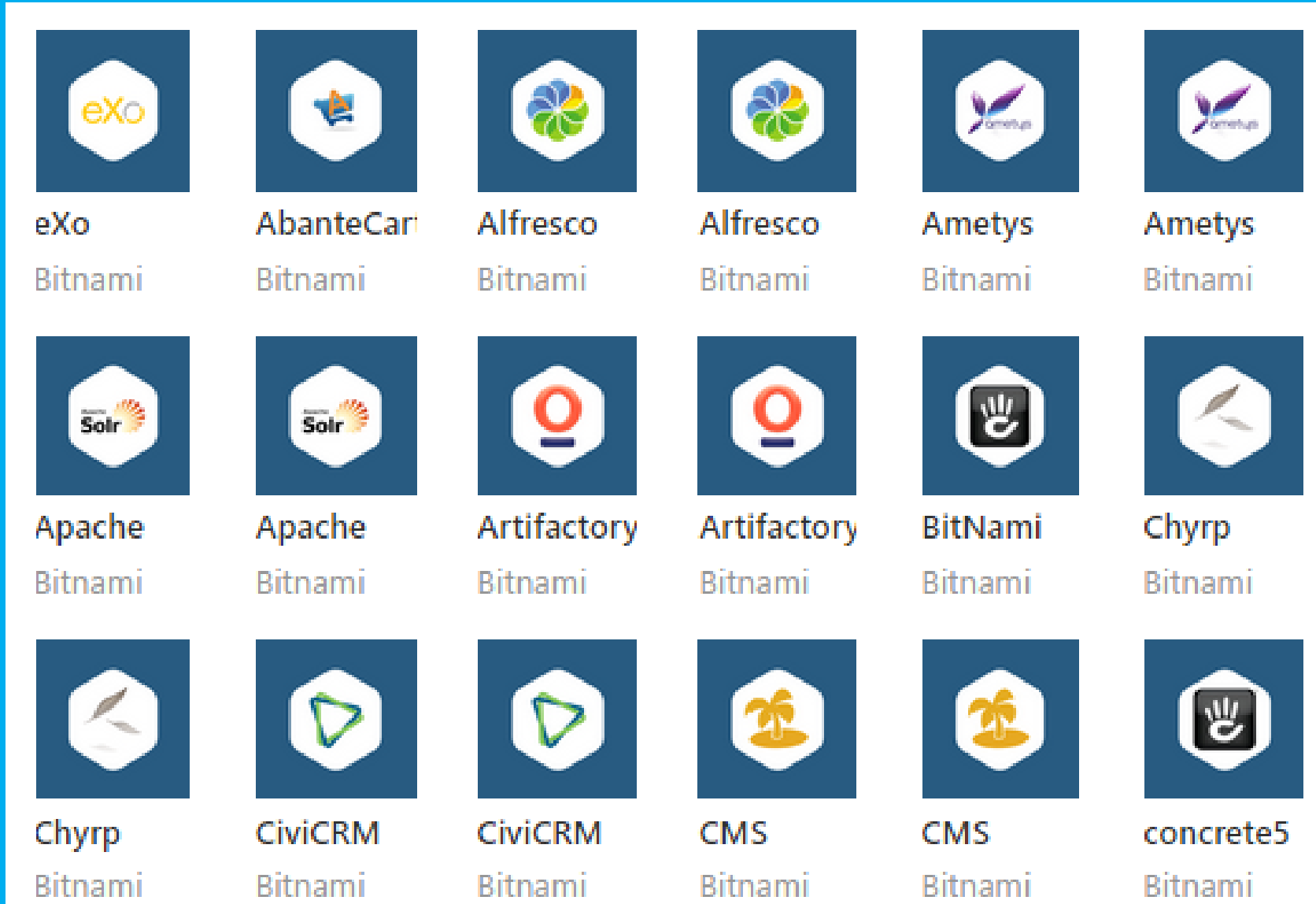
Riverbed SteelHead CX 8.6
By Riverbed Techno...

Oracle Database 12.1.0.1 Enterprise
By Oracle

Zulu 7
By Azul

Linux Distributions

- Ubuntu
- Oracle Linux
- SUSE
- CentOS-Based
- CoreOS
- Community

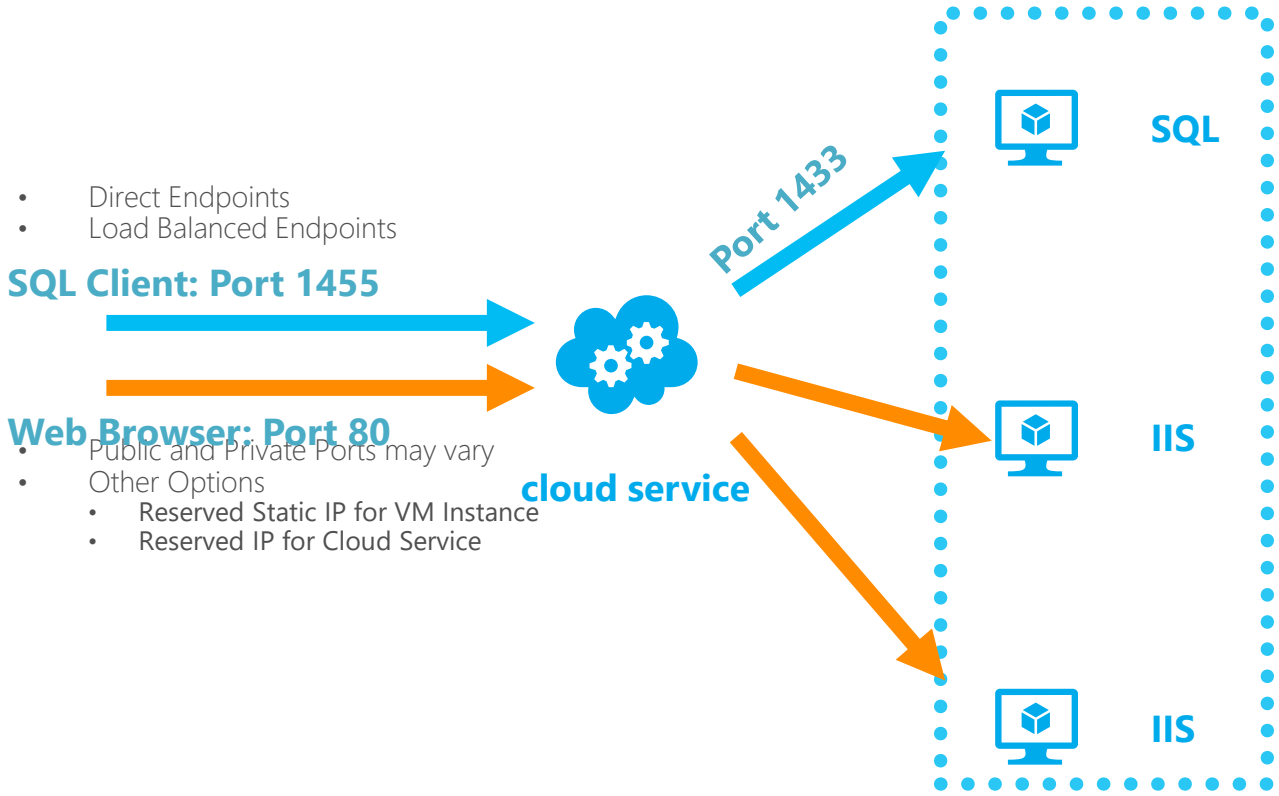


VM Key Concept

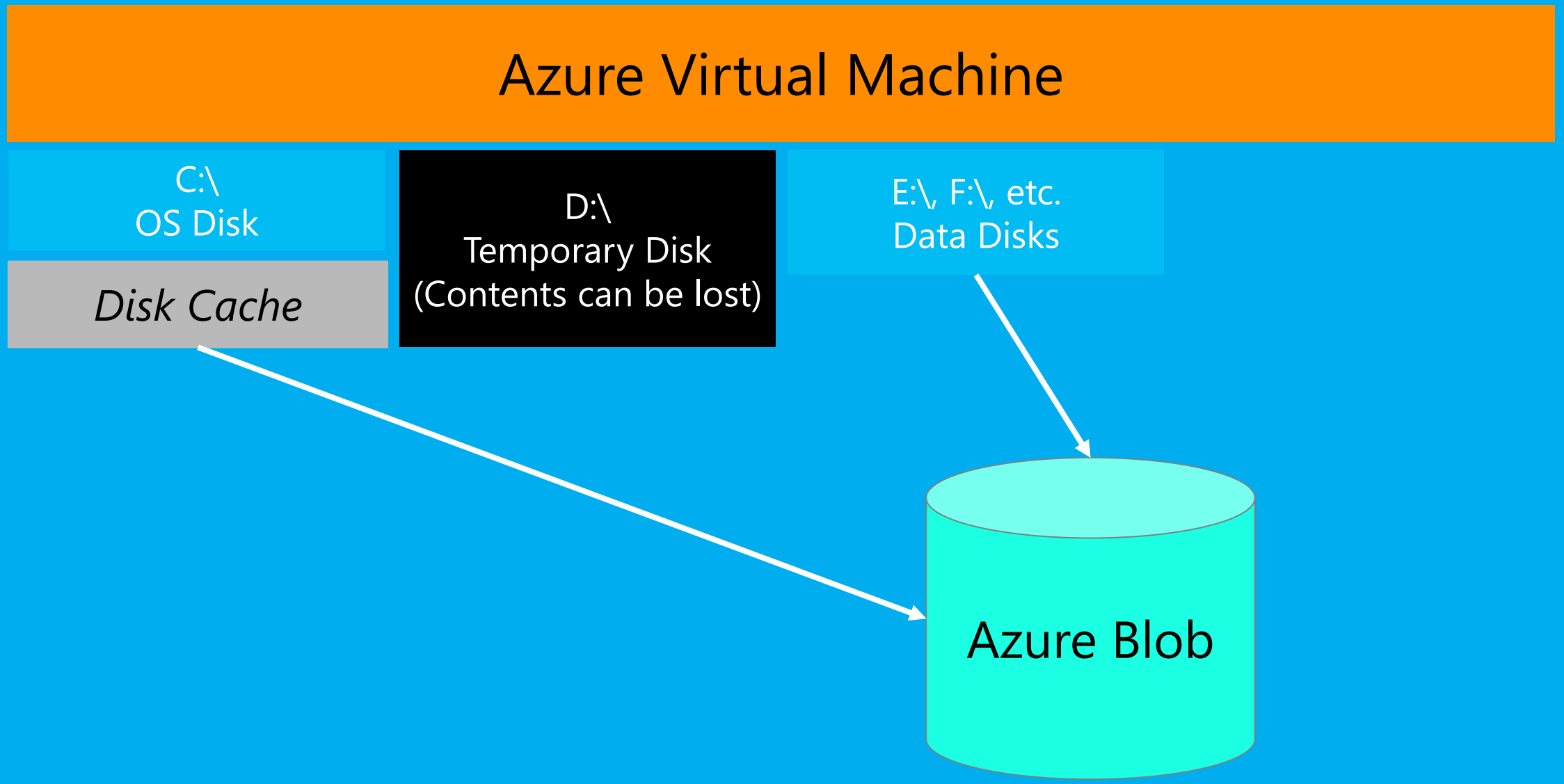
- Cloud Service and Virtual Network
- Load Balancing
- VM Storage Architecture
- Availability Set

Cloud Services and Endpoints

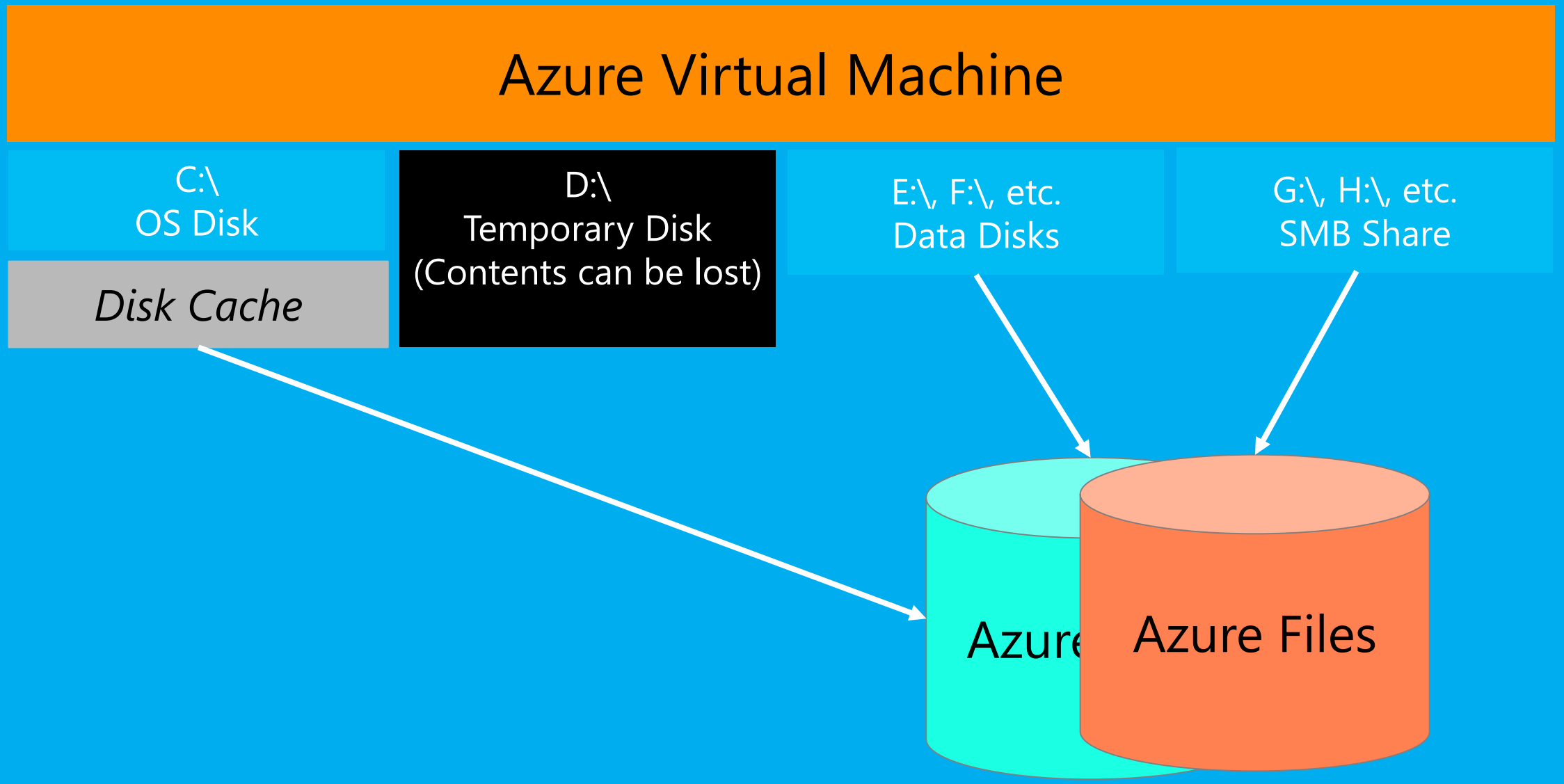
- Enable connectivity to your Virtual Machines
  - Route requests from **Cloud Service** to **Virtual Machine** using an public port and a private port
  - Can be added to a Load-Balanced Set
- Can create a list of allowed/denied IP Address Ranges using Access Control List (ACL)
  - ACL set to **Allow * (all)** by default



Virtual Machine Storage Architecture



Virtual Machine Storage Architecture



Virtual Machine Sizes

Compute Instance Name	Virtual Cores	RAM
Extra Small (A0)	Shared	768 MB
Small (A1)	1	1.75 GB
Medium (A2)	2	3.5 GB
Large (A3)	4	7 GB
Extra Large (A4)	8	14 GB
A5	2	14 GB
A6	4	28 GB
A7	8	56 GB
A8	8	56 GB
A9	16	112 GB

Compute Instance Name	Virtual Cores	RAM
D1	1	3.5 GB
D2	2	7 GB
D3	4	14 GB
D4	8	28 GB
D11	2	14 GB
D12	4	28 GB
D13	8	56 GB
D14	16	112 GB

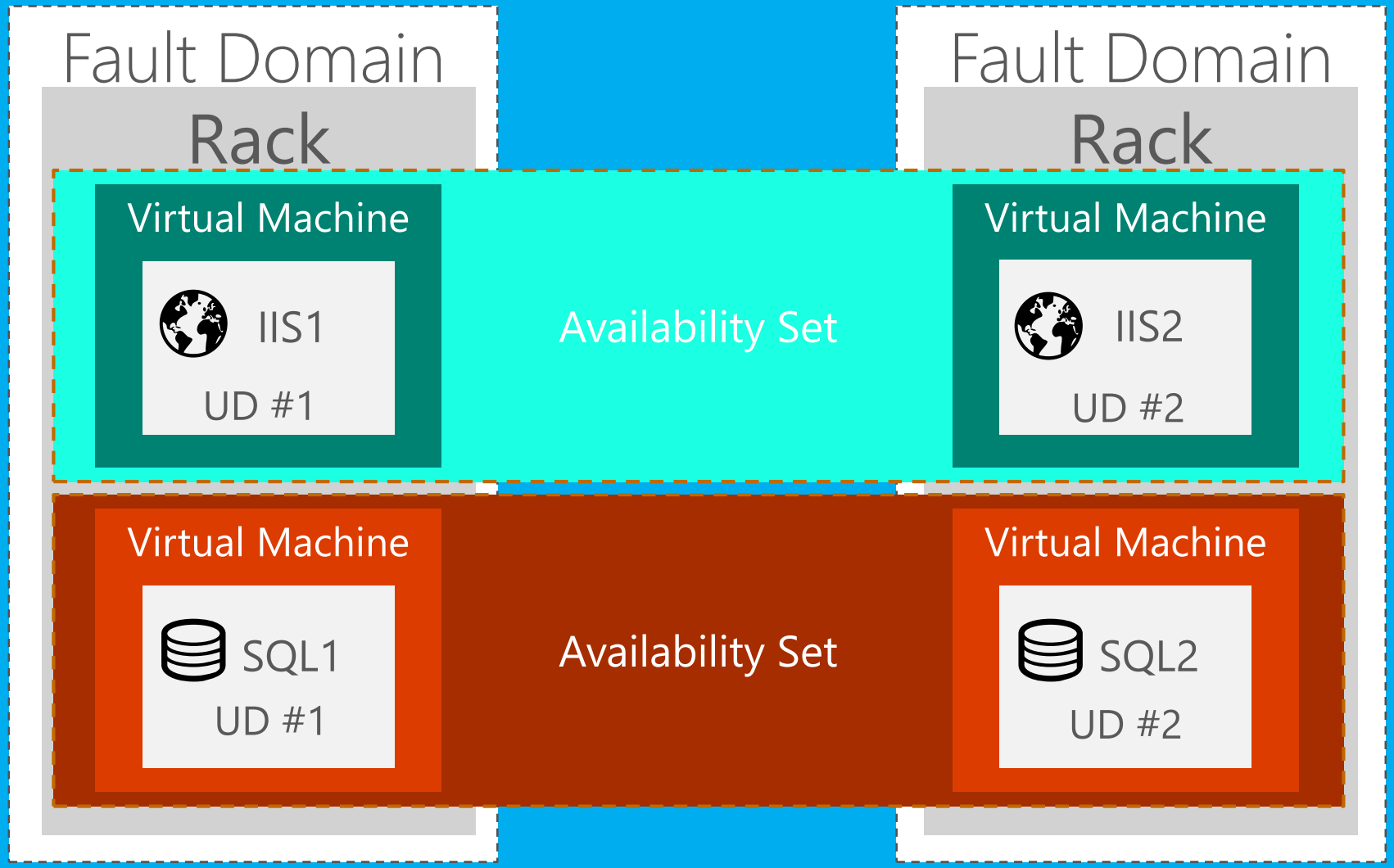
Compute Instance Name	Virtual Cores	RAM
G1	2	28 GB
G2	4	56 GB
G3	8	112 GB
G4	16	224 GB
G5	32	448 GB

http://azure.microsoft.com/en-us/pricing/details/virtual-machines/

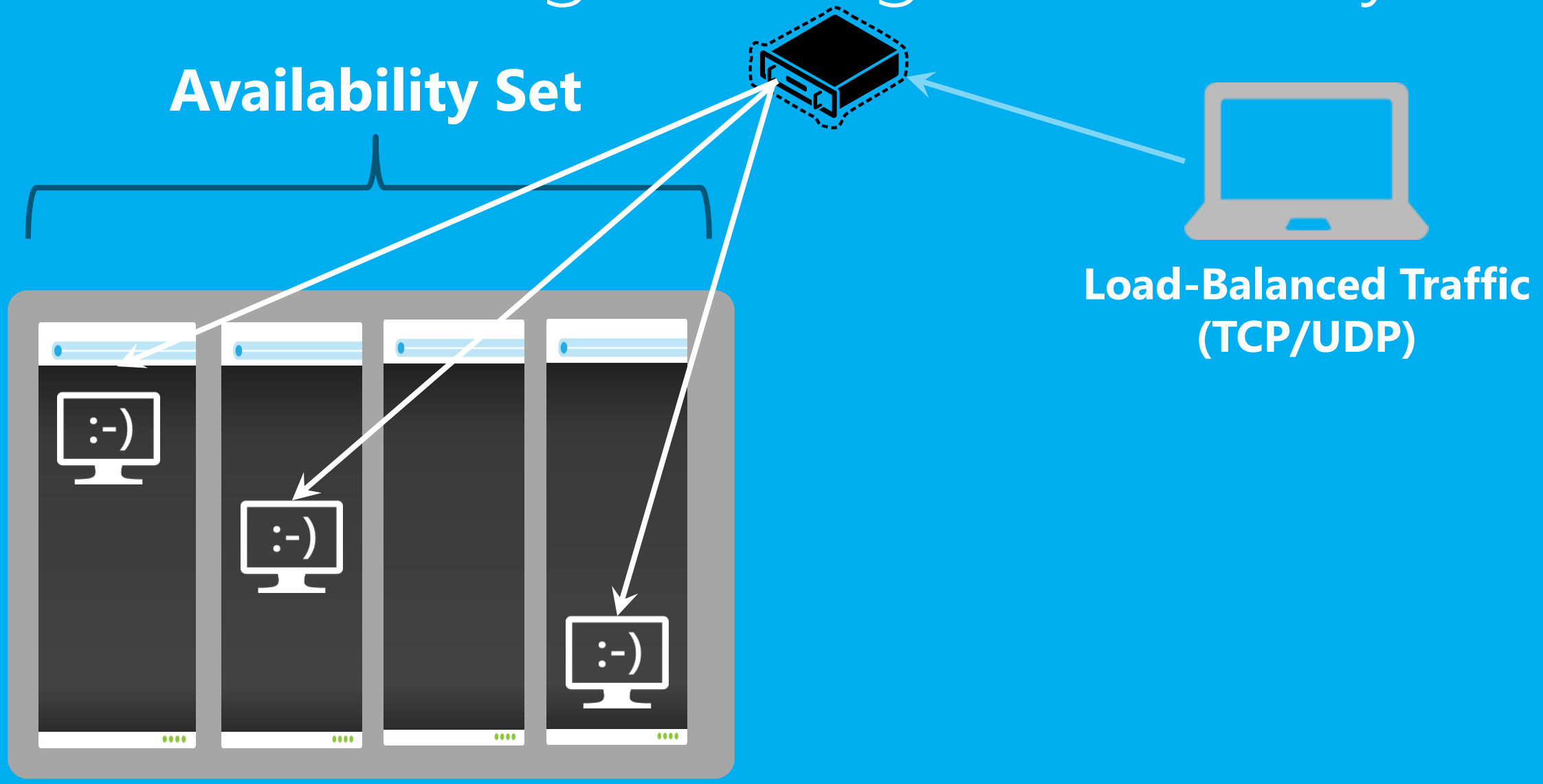
Each Persistent Data Disk Can be up to 1 TB with up to 32 disks per VM

Virtual Machine Availability Sets

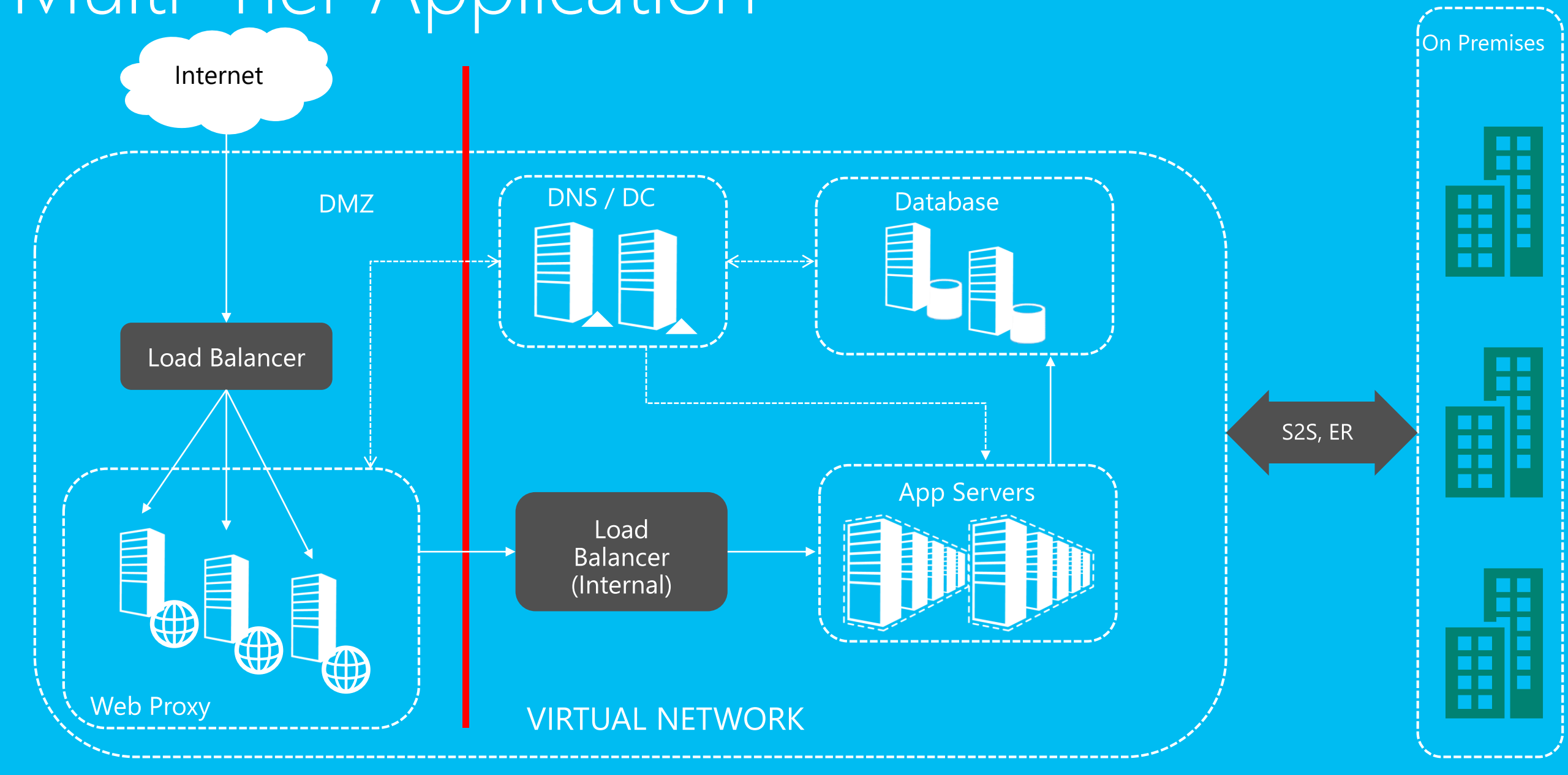
UPDATE DOMAINS ARE HONORED BY HOST OS UPDATES



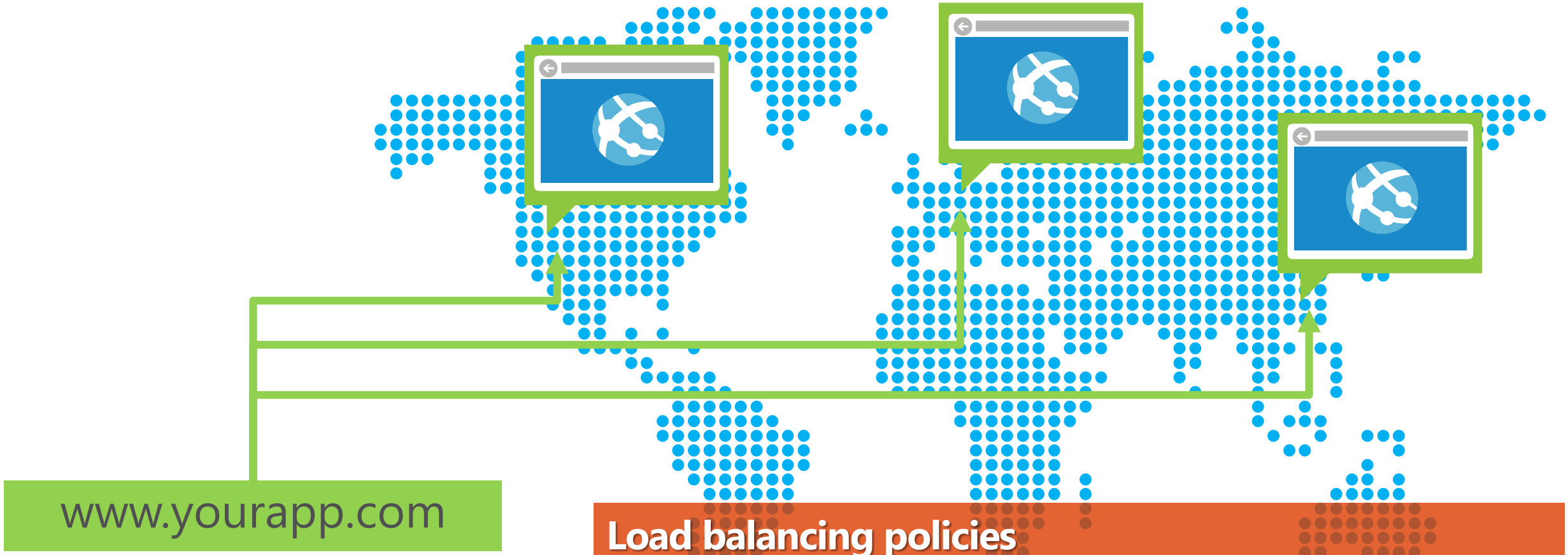
Load Balancing and High Availability



Multi Tier Application

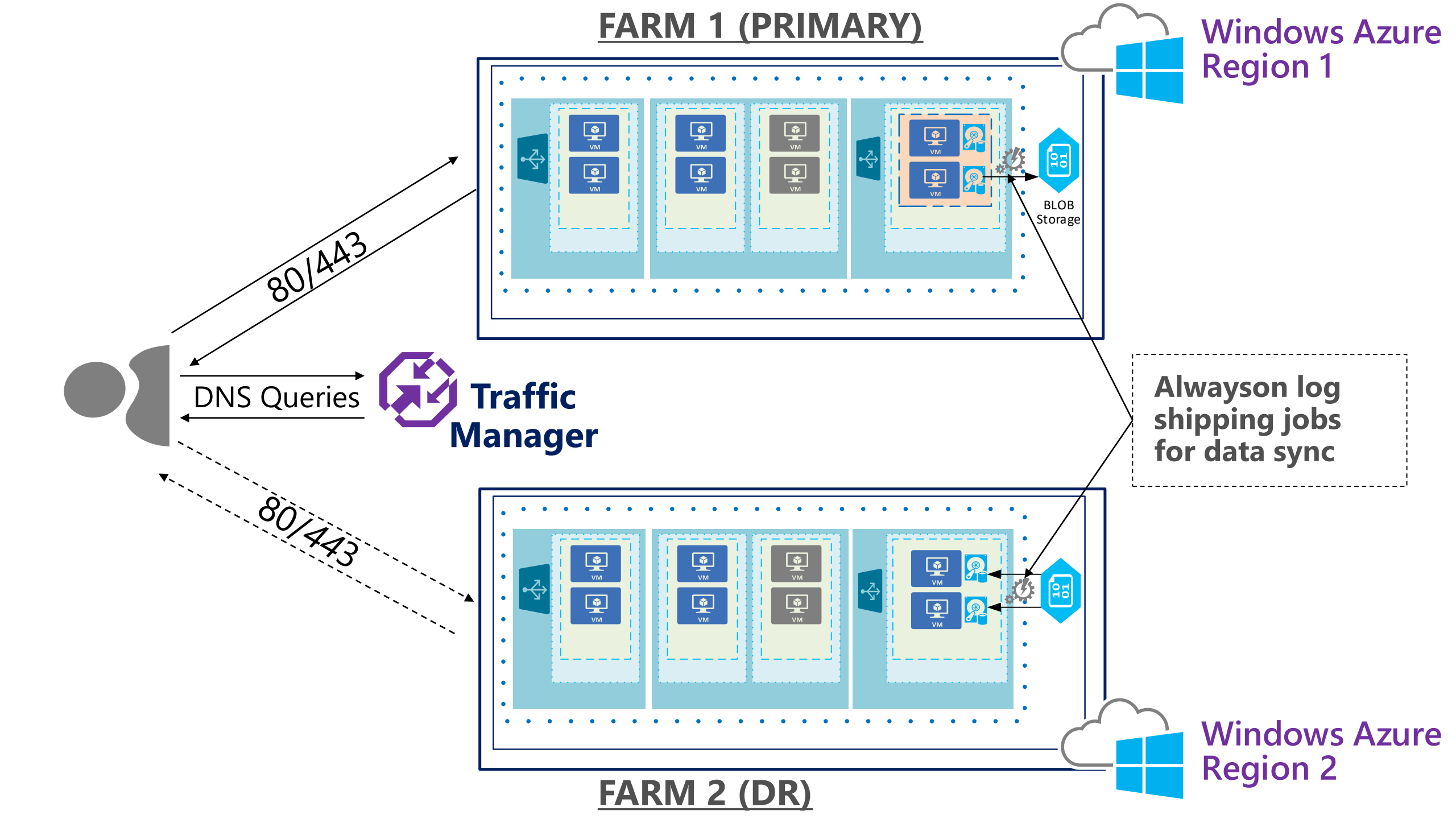


Traffic Manager: DNS-based Load Balancing



Load balancing policies

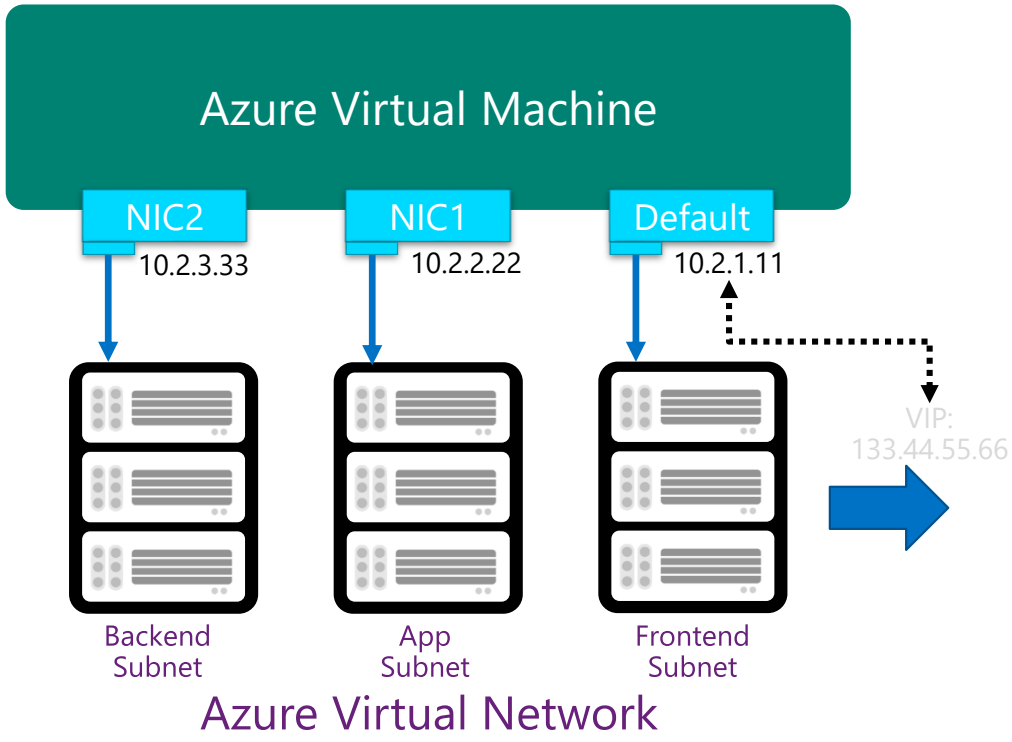
- **Performance - Direct to "closest" service based on network latency**
- **Round-robin - Distribute equally across all services**
- **Failover - Direct to "backup" service if primary fails**
  —also included in other policies


FARM 1 (PRIMARY)
Windows Azure Region 1
VM
BLOB Storage
80/443
DNS Queries
Traffic Manager
Alwayson log shipping jobs for data sync
80/443
FARM 2 (DR)
Windows Azure Region 2

Multiple NICs in Azure VMs

- Multiple NICs enable virtual appliances in Azure
- MAC/IP addresses persist through VM life cycle
- Separate frontend-backend traffic, and management-data planes

Up to 4 NICs per VM



Bring Your Appliances to the Cloud

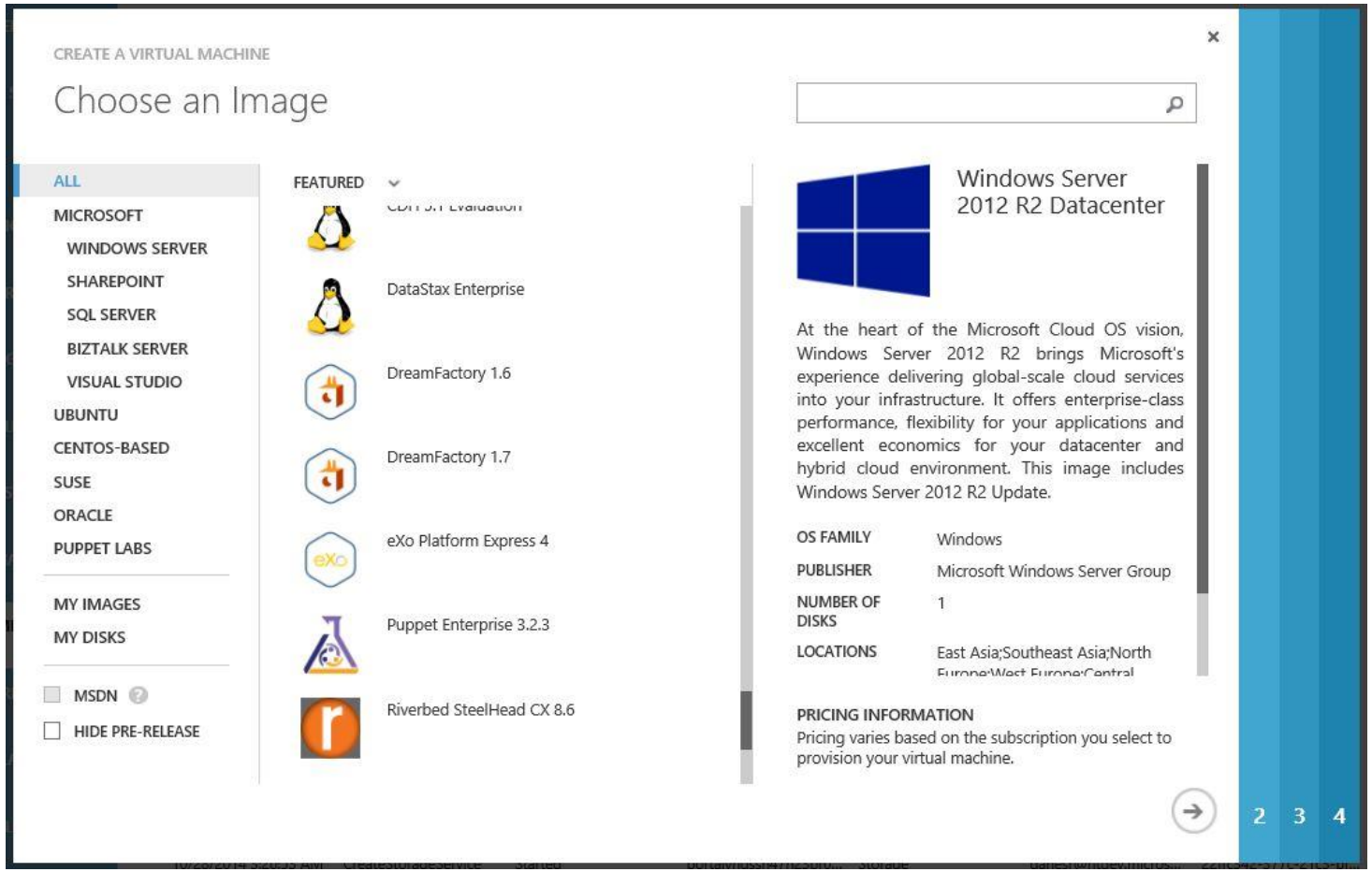
Building blocks

- Multiple NICs
- MAC address persistence

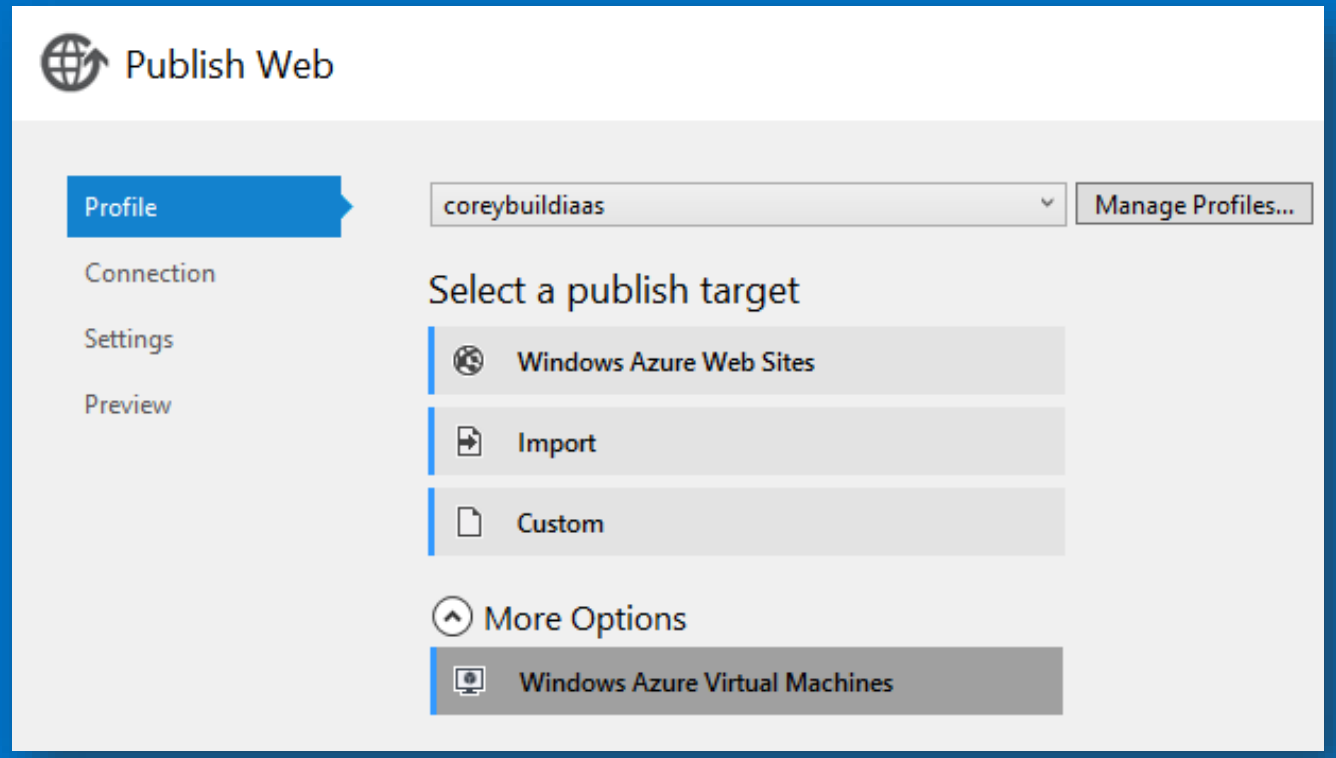
Appliance ecosystem

- Barracuda NG Firewall
- Citrix NetScaler
- Riverbed Steelhead, SteelApp, SteelStore
- More to come!

"Azure Certified"

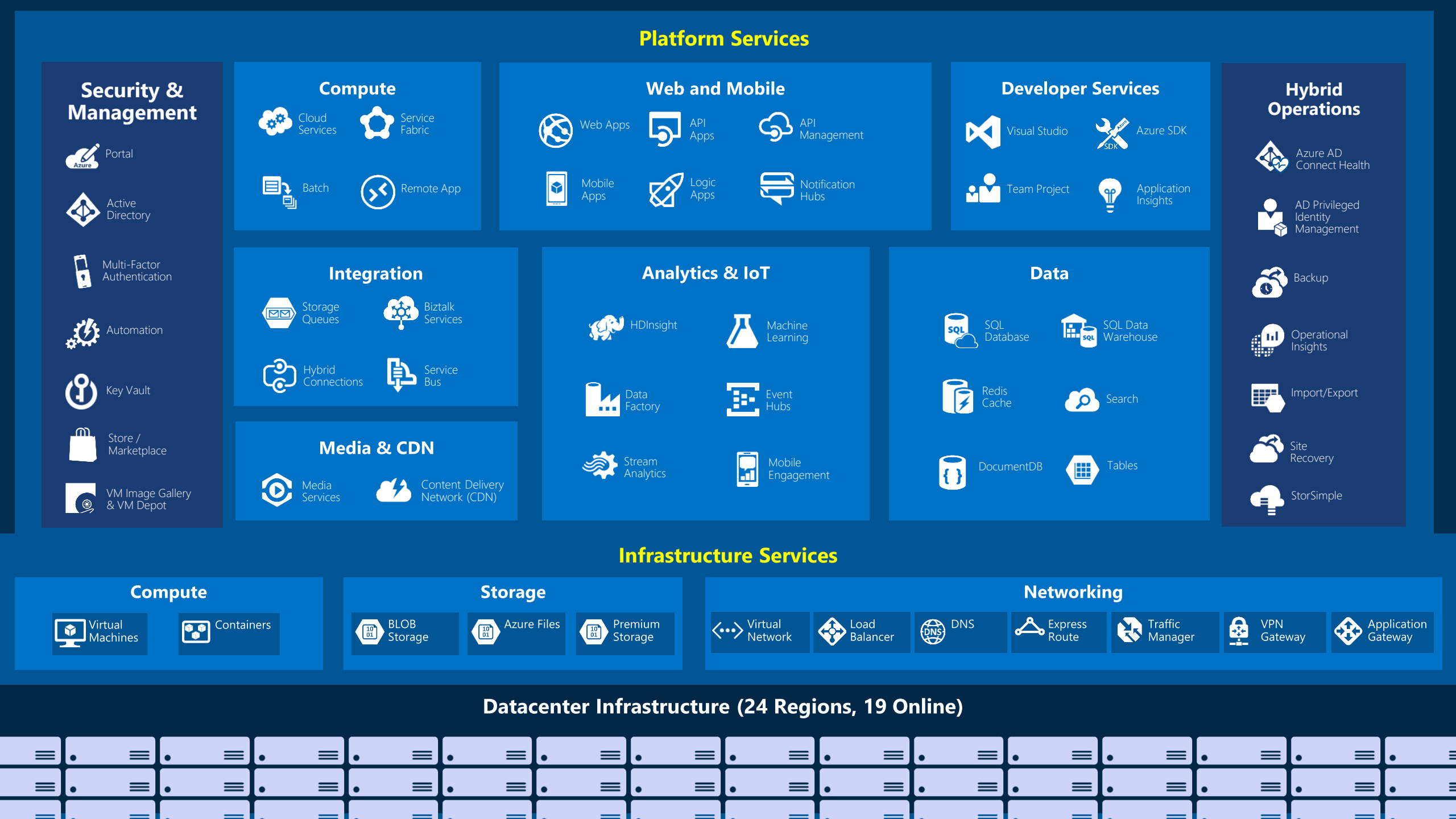


Visual Studio and MSDN



Create and Debug a VM

MSDN specific images for tools


Platform Services
Security & Management
Portal
Active Directory
Multi-Factor Authentication
Automation
Key Vault
Store / Marketplace
VM Image Gallery & VM Depot
Compute
Cloud Services
Service Fabric
Batch
Remote App
Web and Mobile
Web Apps
API Apps
API Management
Mobile Apps
Logic Apps
Notification Hubs
Developer Services
Visual Studio
Azure SDK
Team Project
Application Insights
Hybrid Operations
Azure AD Connect Health
AD Privileged Identity Management
Backup
Operational Insights
Import/Export
Site Recovery
StorSimple
Integration
Storage Queues
Biztalk Services
Hybrid Connections
Service Bus
Media & CDN
Media Services
Content Delivery Network (CDN)
Analytics & IoT
HDInsight
Machine Learning
Data Factory
Event Hubs
Stream Analytics
Mobile Engagement
Data
SQL Database
SQL Data Warehouse
Redis Cache
Search
DocumentDB
Tables
Infrastructure Services
Compute
Virtual Machines
Containers
Storage
BLOB Storage
Azure Files
Premium Storage
Networking
Virtual Network
Load Balancer
DNS
Express Route
Traffic Manager
VPN Gateway
Application Gateway
Datacenter Infrastructure (24 Regions, 19 Online)

Web Apps

Quickly create and deploy mission critical web apps that scale with your business. Azure App Service Web Apps allows you to focus on what is important to you and your application, while letting Microsoft Azure take care of the underlying infrastructure, delivering advanced capabilities

Enterprise Grade Apps

Fully Managed Platform

High Productivity Development

Web Apps Features & Capabilities

Enterprise Grade Apps
Designed for secure mission-critical applications

- Hybrid Connections / VPN Support
- Scheduled Backup
- Azure Active Directory Integration
- Site Resiliency, HA, and DR
- Web Jobs
- Role Base Access Control
- Audit / Compliance
- Enterprise Migration
- Client Certs
- Cache
- IP Restrictions/ SSL
- Web Sockets
- SQL, MySQL, DocDB, & Mongo
- Sticky Sessions
- Authorization/ Authentication

Fully Managed Platform
Optimized for Availability and Automatic scale

- Automated Deployment
- AutoScale
- Built-in Load Balancing
- WW Datacenter Coverage
- End Point Monitoring & Alerts
- App Gallery
- DR Site Support
- WildCard Support
- Dedicated IP address
- HTTP Compression
- CDN Support for Websites
- Premium WordPress
- App Services Environments

Built for DevOps
Agility through Continuous Deployment

- Remote Debugging w/ Visual Studio
- Site Staging Slots
- Testing in Production
- Continuous Integration/Deployment
- Git, Visual Studio Online and GitHub
- App & Site Diagnostics
- OS & Framework Patching
- Site Extensions Gallery
- NET, PHP, Python, Node, Java
- Framework Installer
- Browser-based editing
- Auto-Healing
- Logging and Auditing
- Admin-Site
- Support Site Extension

All features and capabilities are shared across all of App Service application (Web, Mobile, and API)

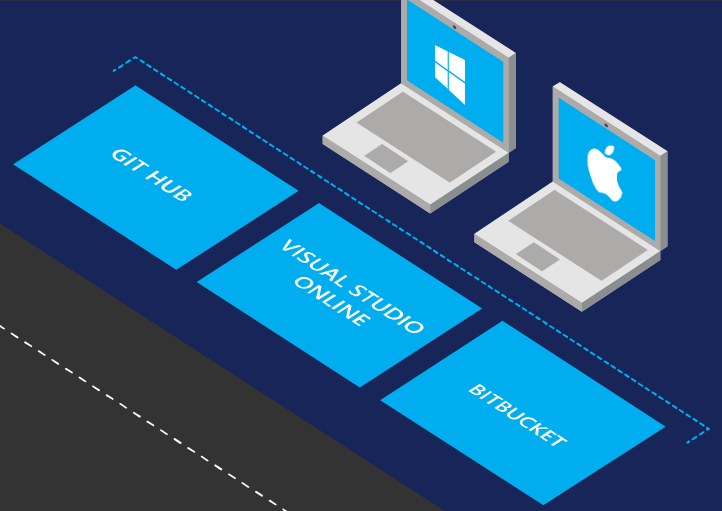
Built For DevOps

App Services DevOps Features

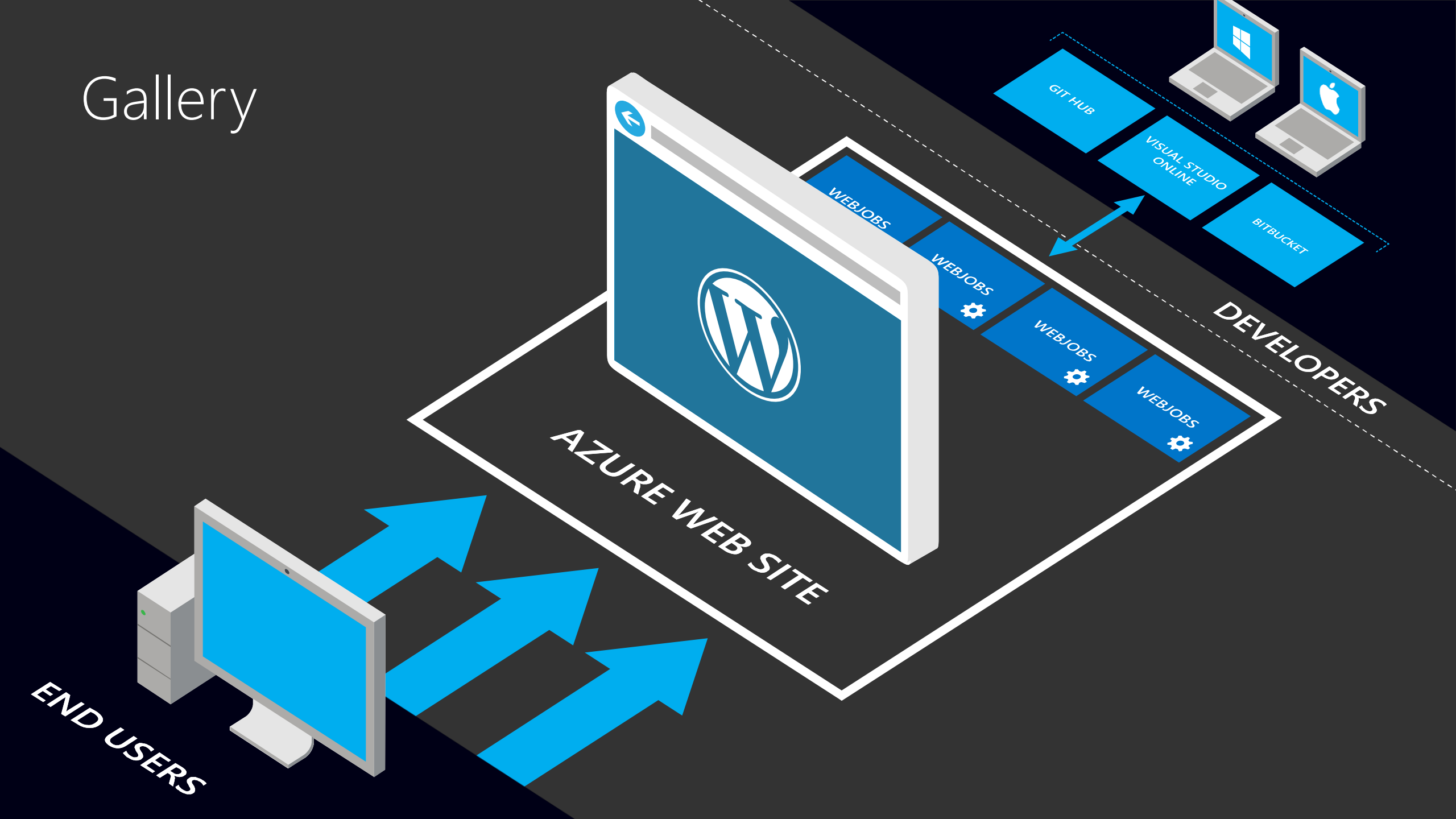
Microsoft

Develop apps with...

.NET	Node.js	PHP
Python	Java	



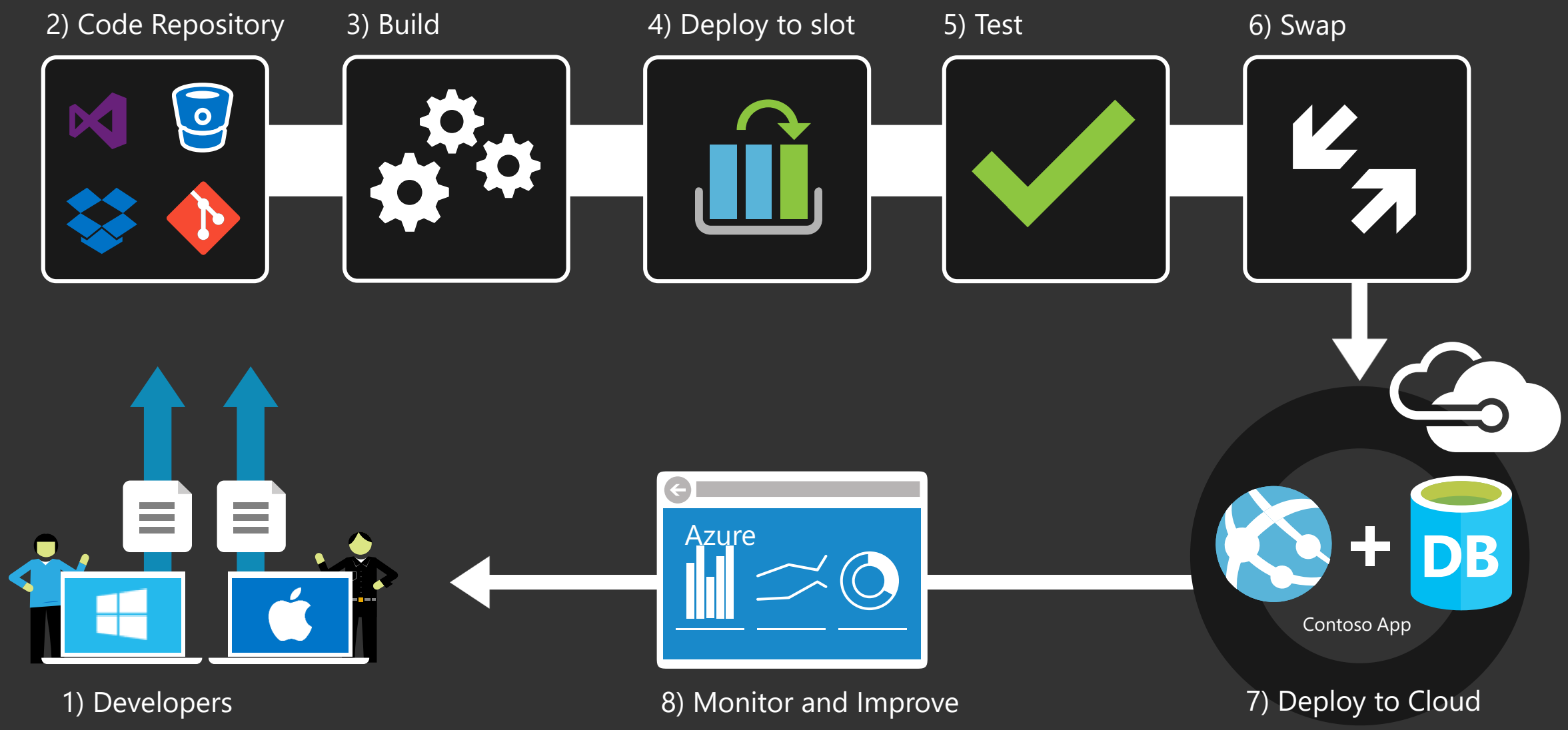
Gallery


GIT HUB
VISUAL STUDIO ONLINE
BITBUCKET
DEVELOPERS
WEBJOBS
WEBJOBS
WEBJOBS
WEBJOBS
AZURE WEB SITE
END USERS

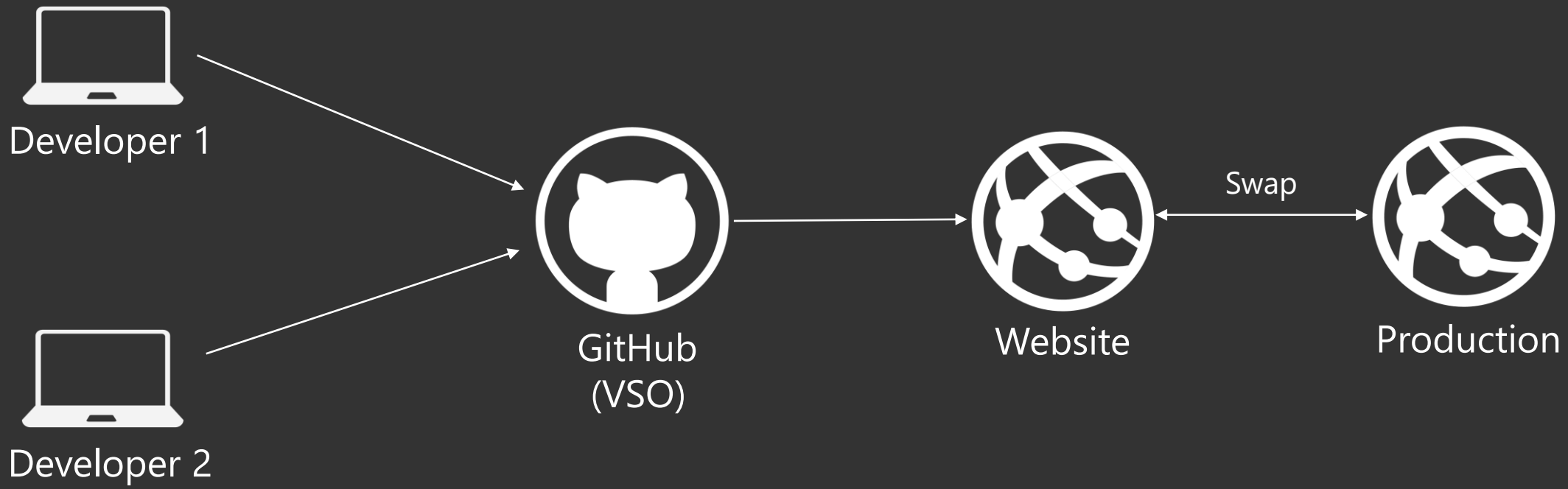
Deployment Options

- The Basic
  - → FTP
  - → WebDeploy
- Source Control / Continue Deployment Integration
  - → VS online
  - → GitHub
  - → BitBucket
- Cool
  - → Dropbox
  - → Debug Console

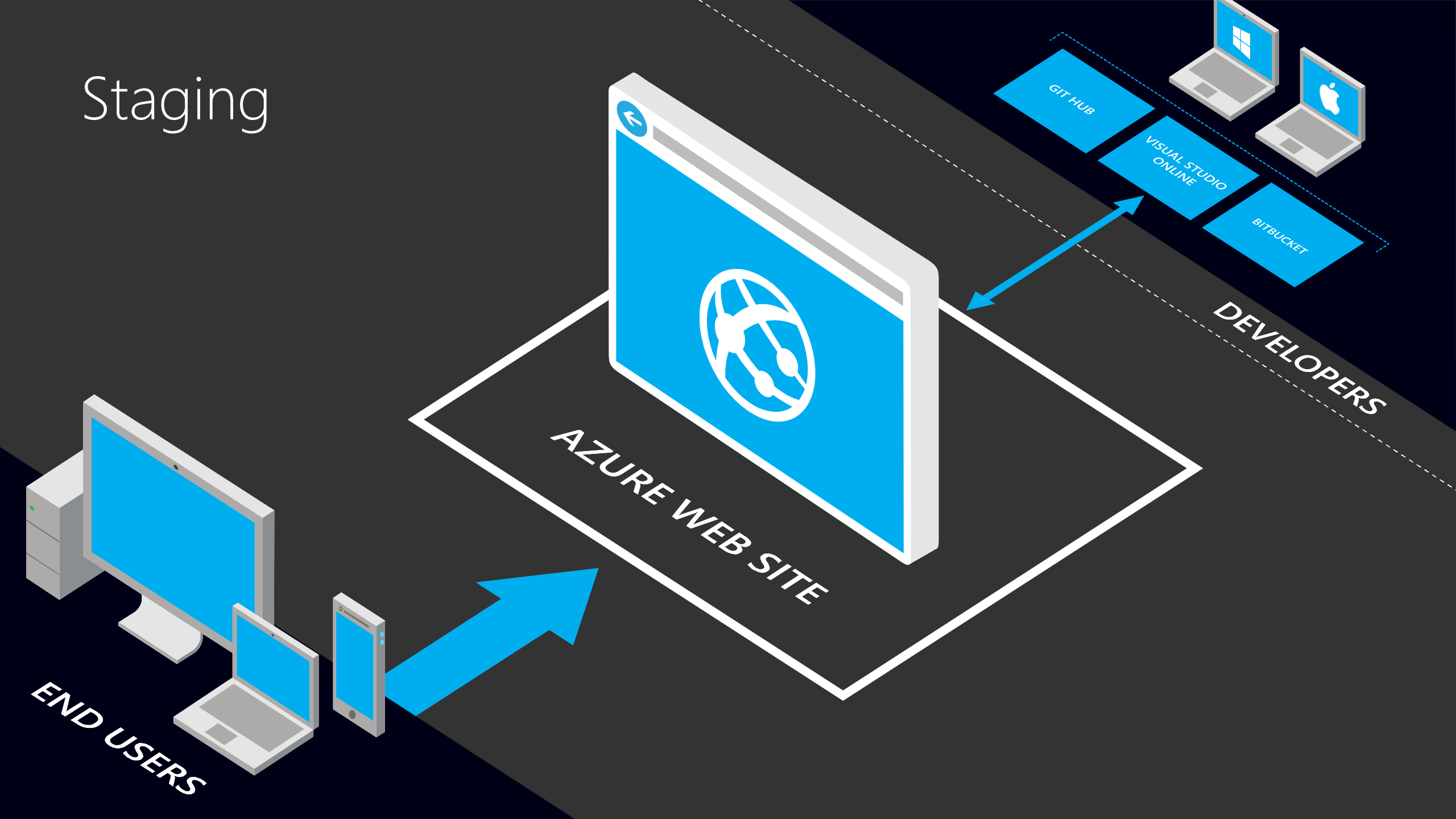
Continuous Integration cycle



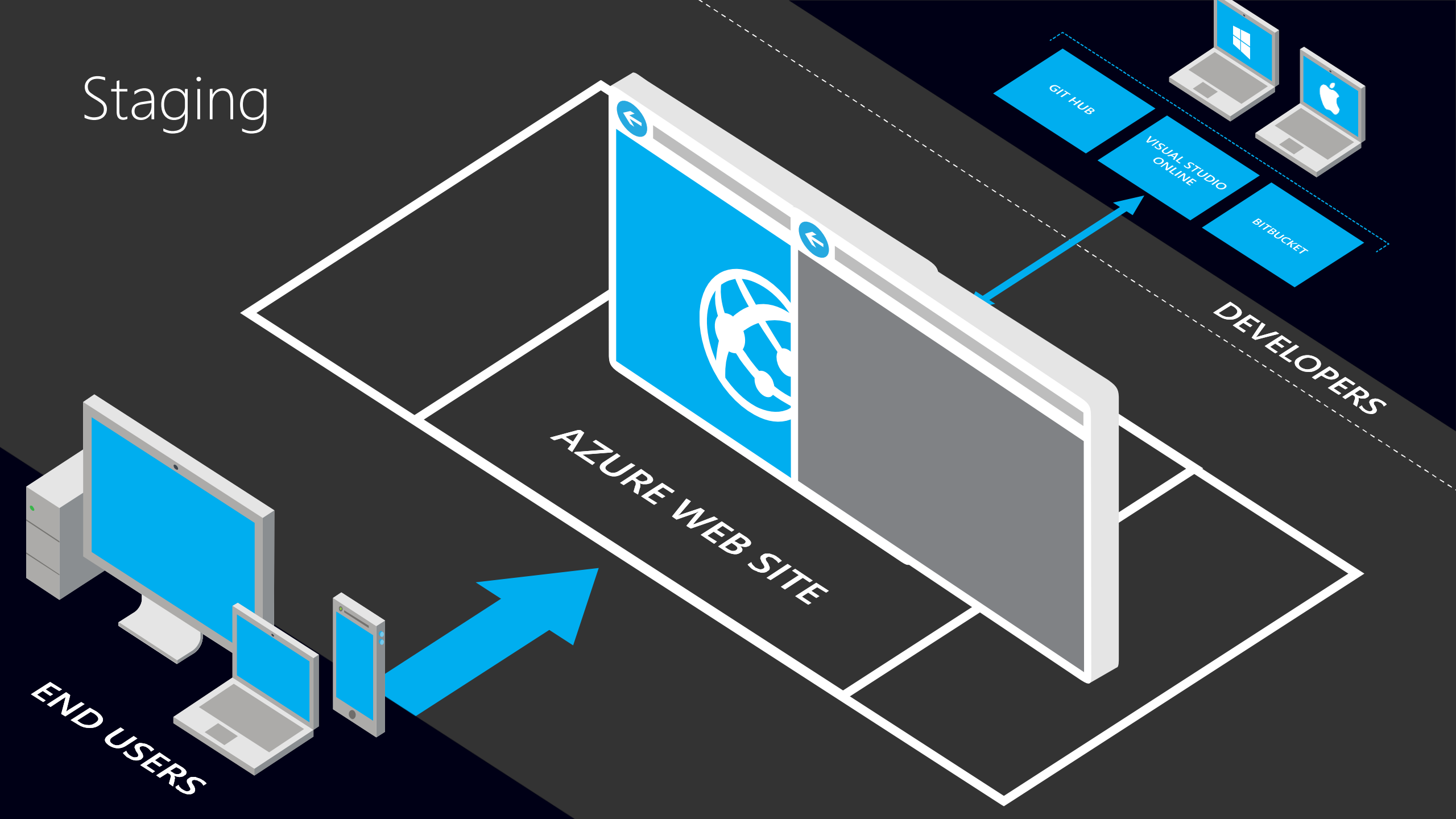
Continuous Integration



Staging


GIT HUB
VISUAL STUDIO ONLINE
BITBUCKET
DEVELOPERS
AZURE WEB SITE
END USERS

Staging


GIT HUB
VISUAL STUDIO ONLINE
BITBUCKET
DEVELOPERS
AZURE WEB SITE
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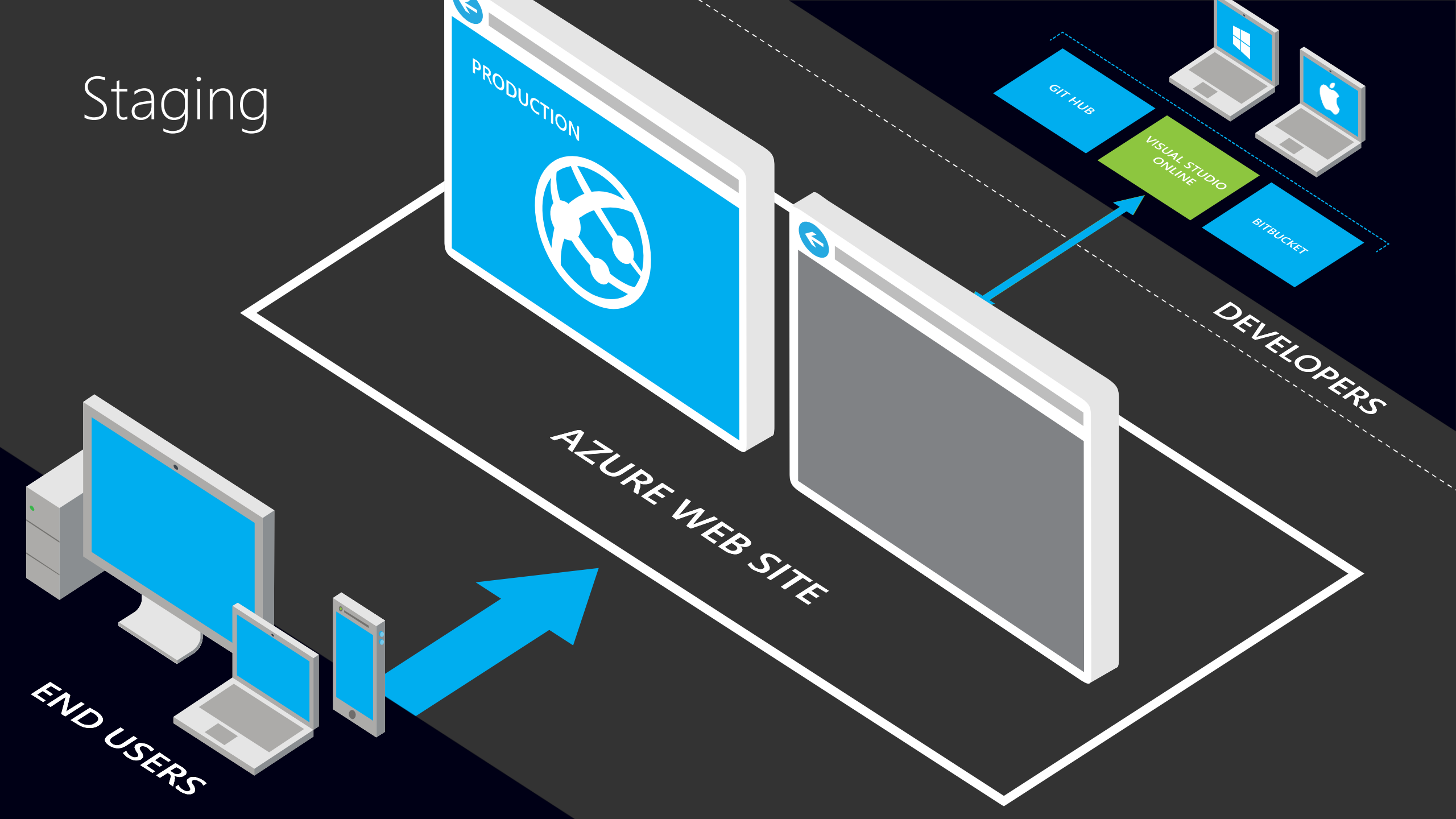
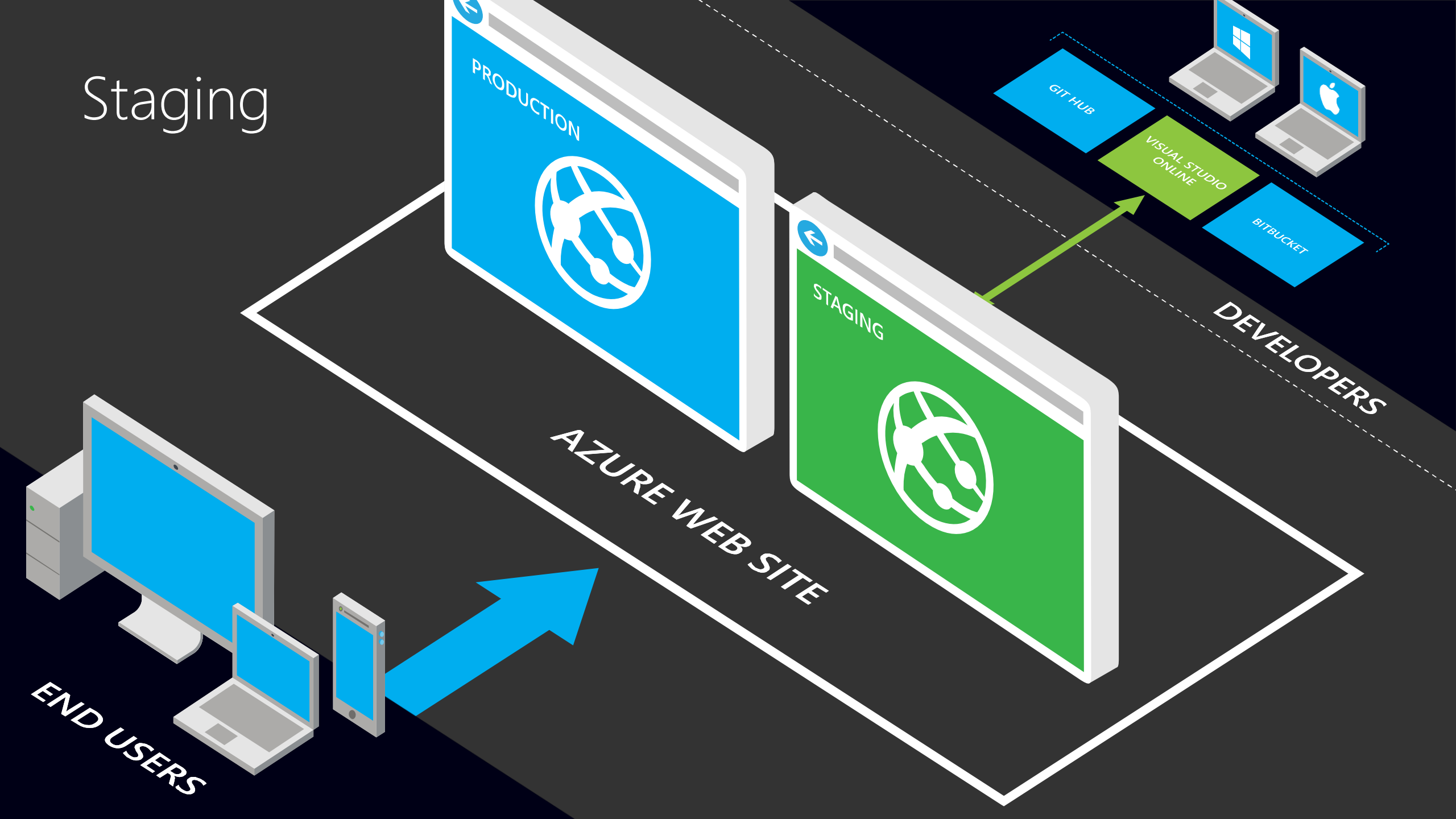
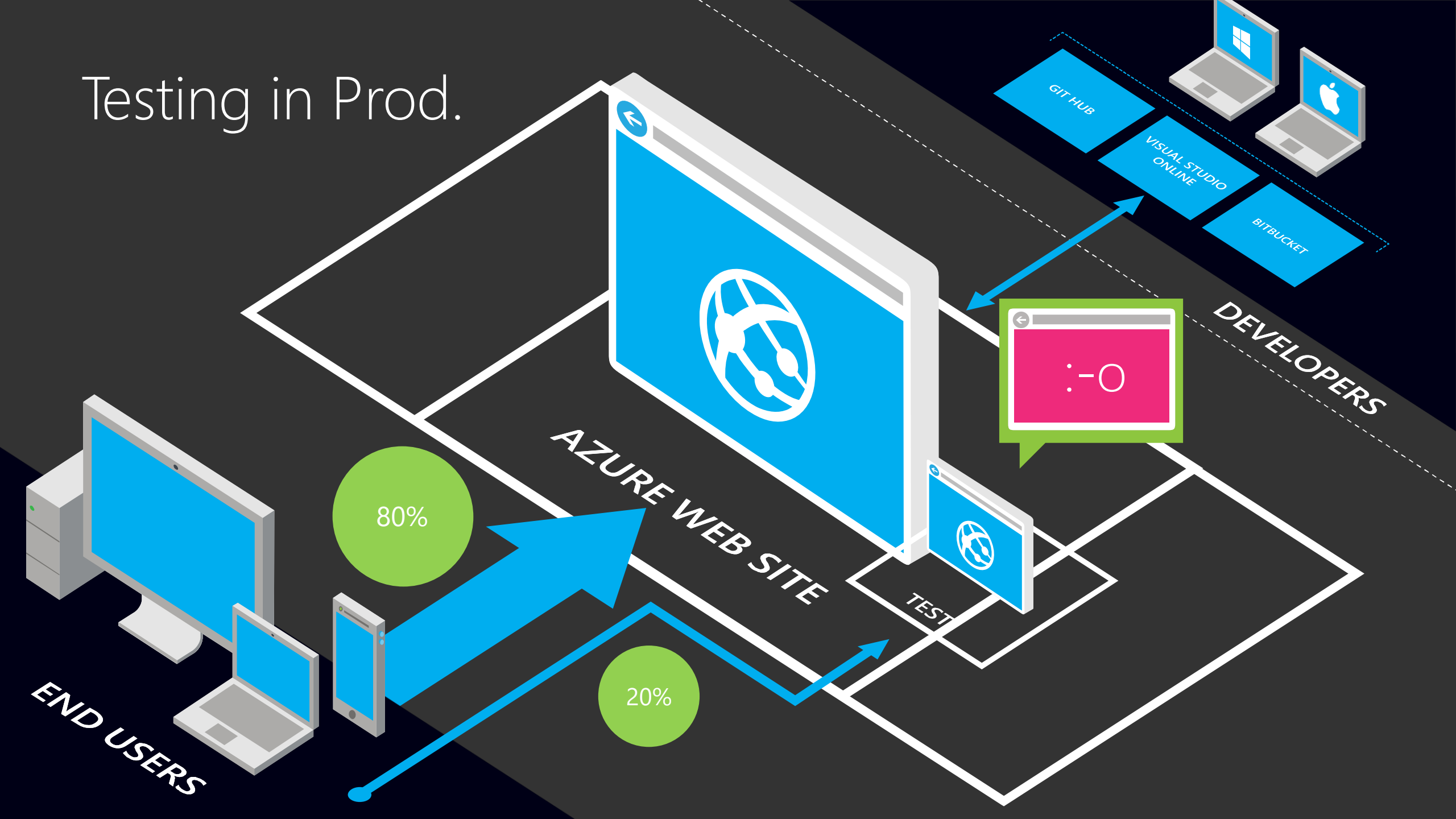
Staging


PRODUCTION
GIT HUB
VISUAL STUDIO ONLINE
BITBUCKET
DEVELOPERS
AZURE WEB SITE
END USERS

Staging

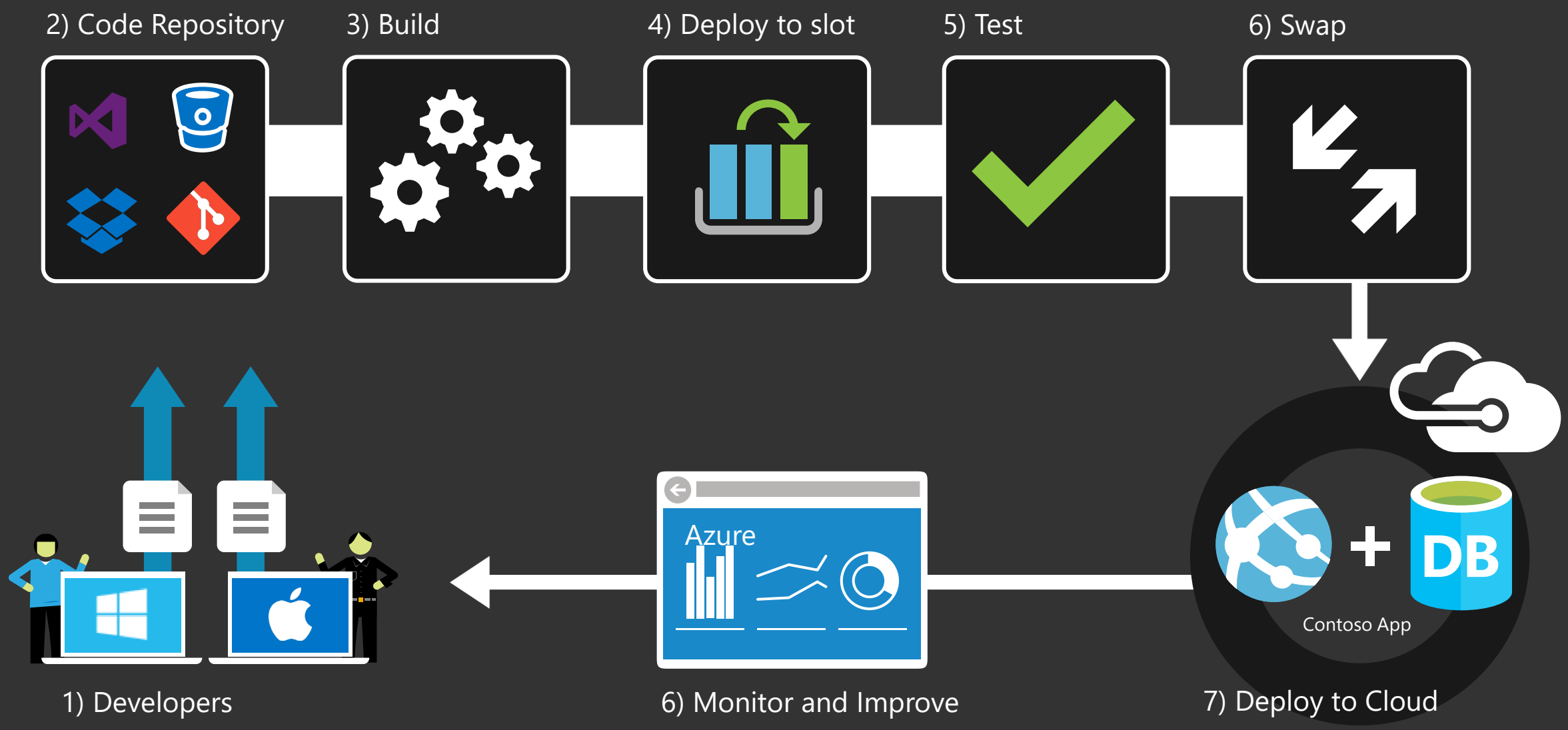

PRODUCTION
STAGING
AZURE WEB SITE
GIT HUB
VISUAL STUDIO ONLINE
BITBUCKET
DEVELOPERS
END USERS

Testing in Prod.

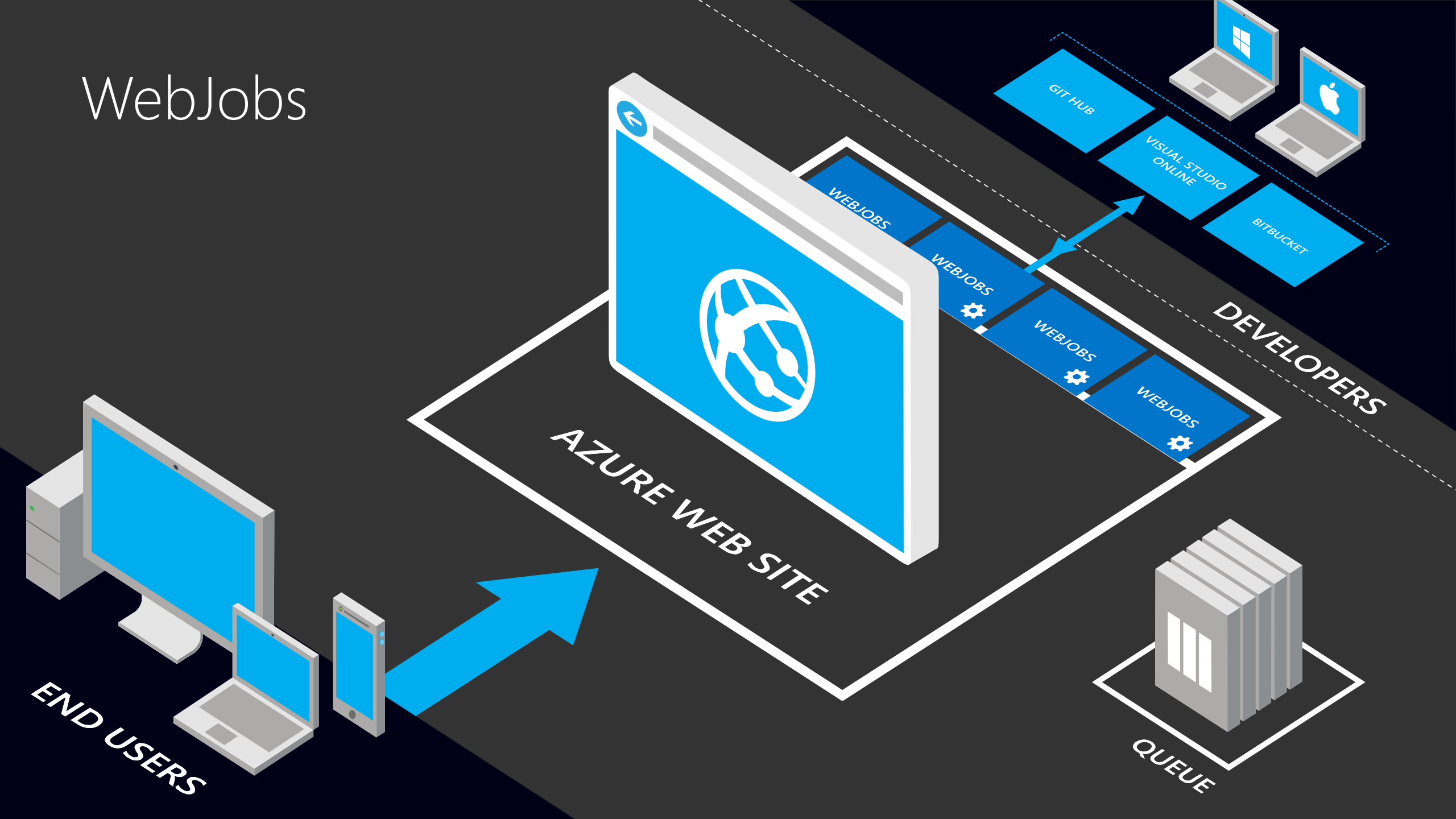


In-depth app monitoring

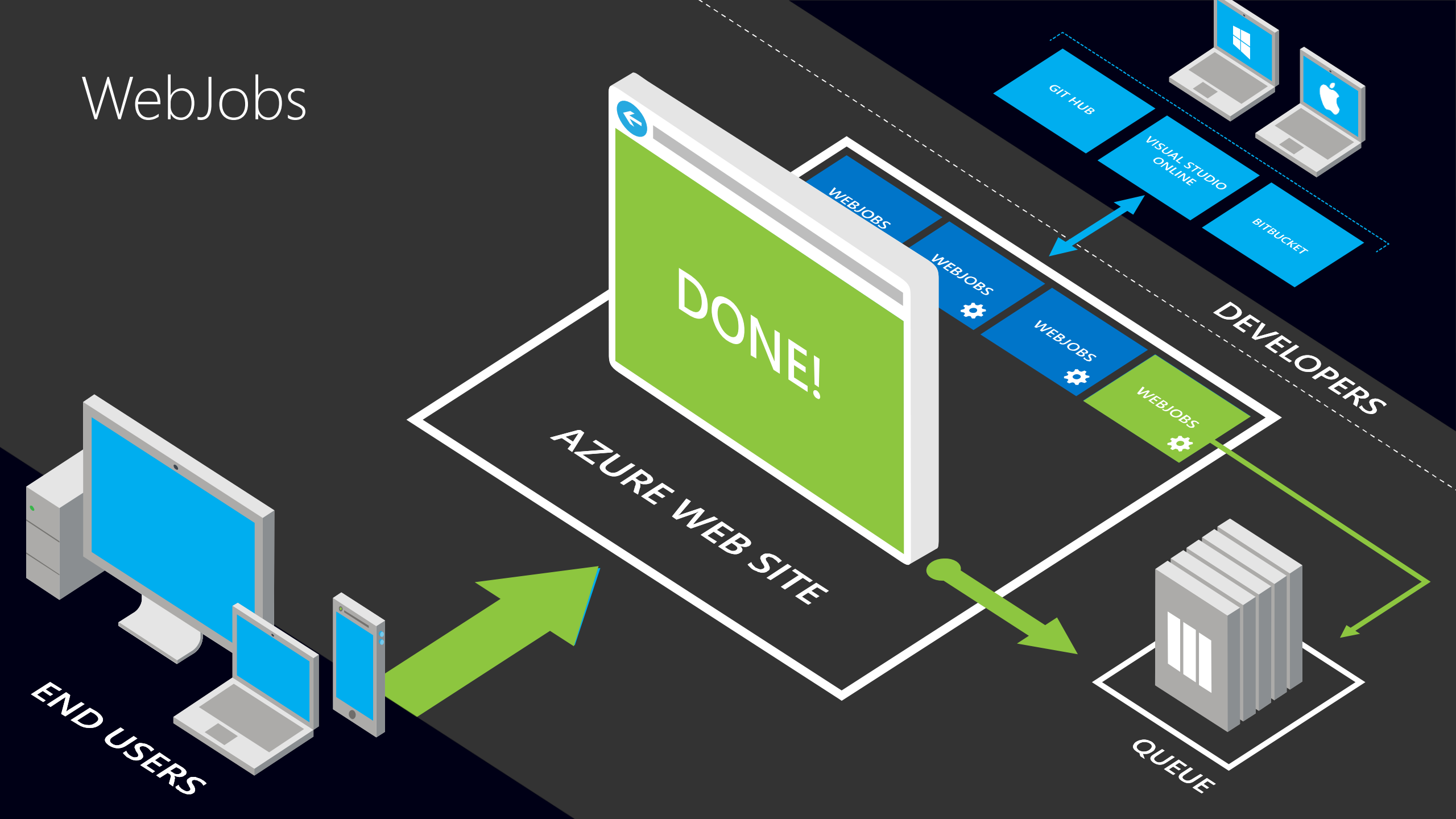
CI / Github, VSO, etc.



WebJobs


GIT HUB
VISUAL STUDIO ONLINE
BITBUCKET
DEVELOPERS
WEBJOBS
WEBJOBS
WEBJOBS
WEBJOBS
AZURE WEB SITE
END USERS
QUEUE

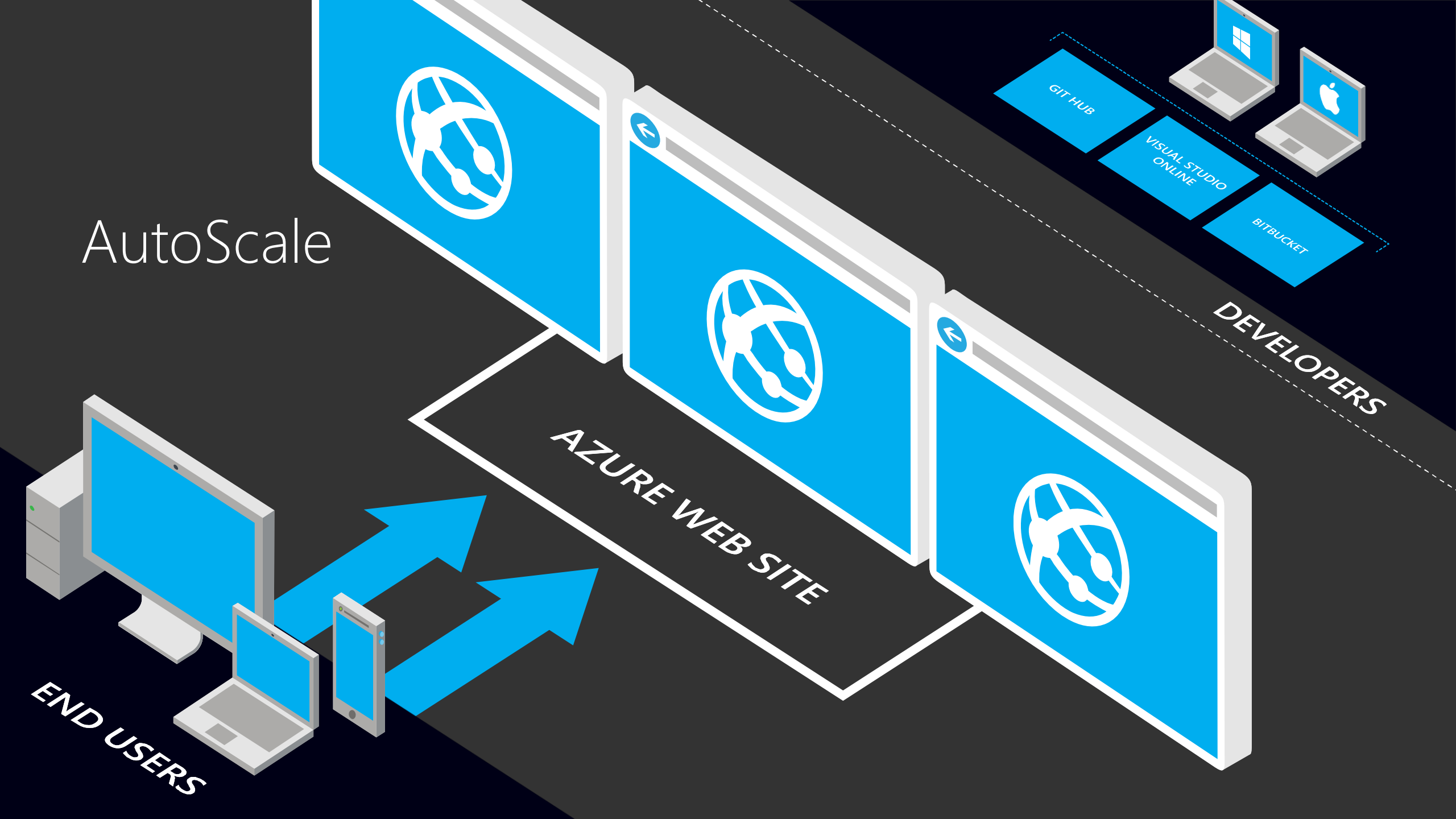
WebJobs


GIT HUB
VISUAL STUDIO ONLINE
BITBUCKET
DEVELOPERS
WEBJOBS
WEBJOBS
WEBJOBS
WEBJOBS
DONE!
AZURE WEB SITE
END USERS
QUEUE

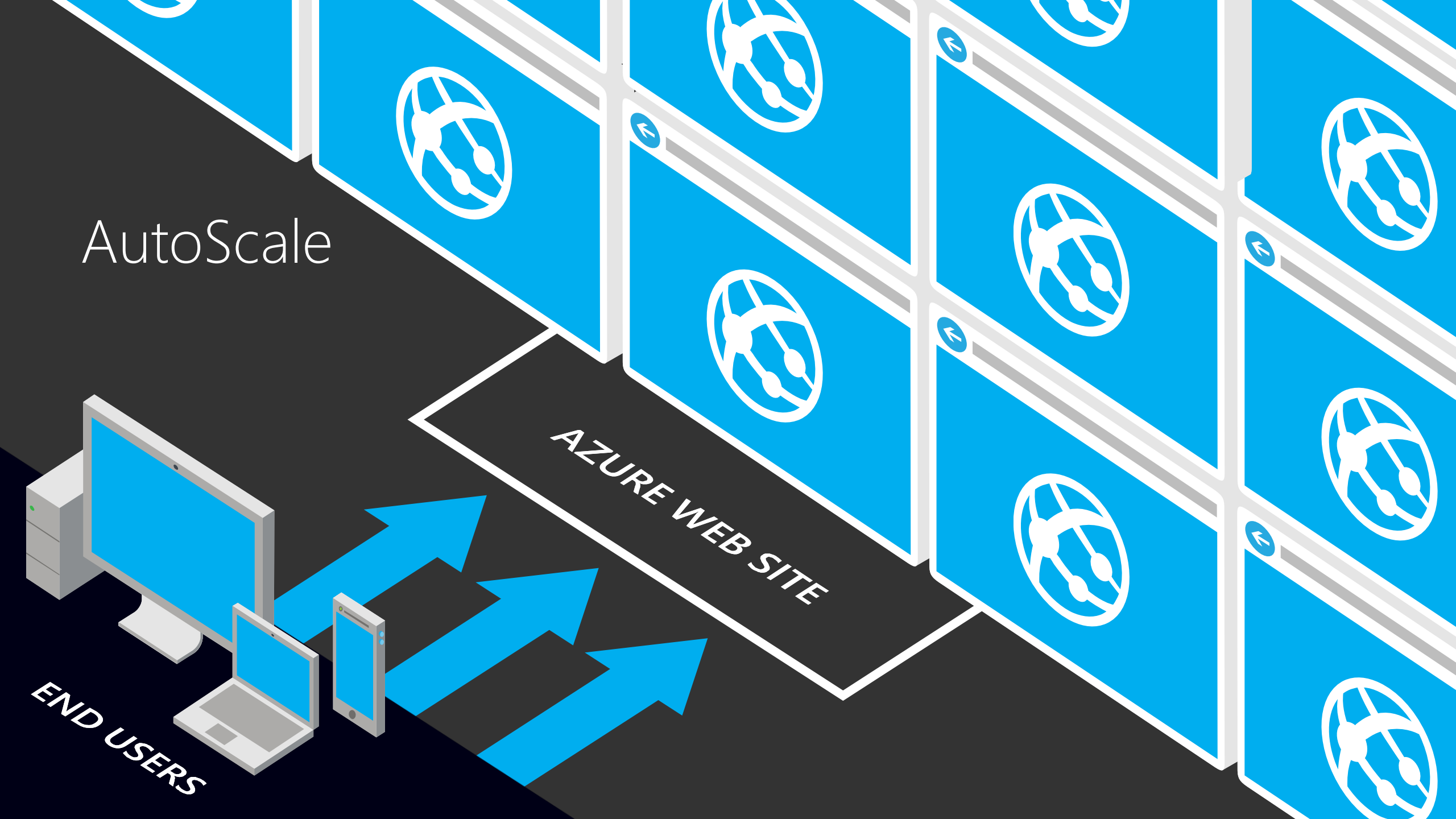
AutoScale


GIT HUB
VISUAL STUDIO ONLINE
BITBUCKET
DEVELOPERS
AZURE WEB SITE
END USERS

AutoScale


GIT HUB
VISUAL STUDIO ONLINE
BITBUCKET
DEVELOPERS
AZURE WEB SITE
END USERS

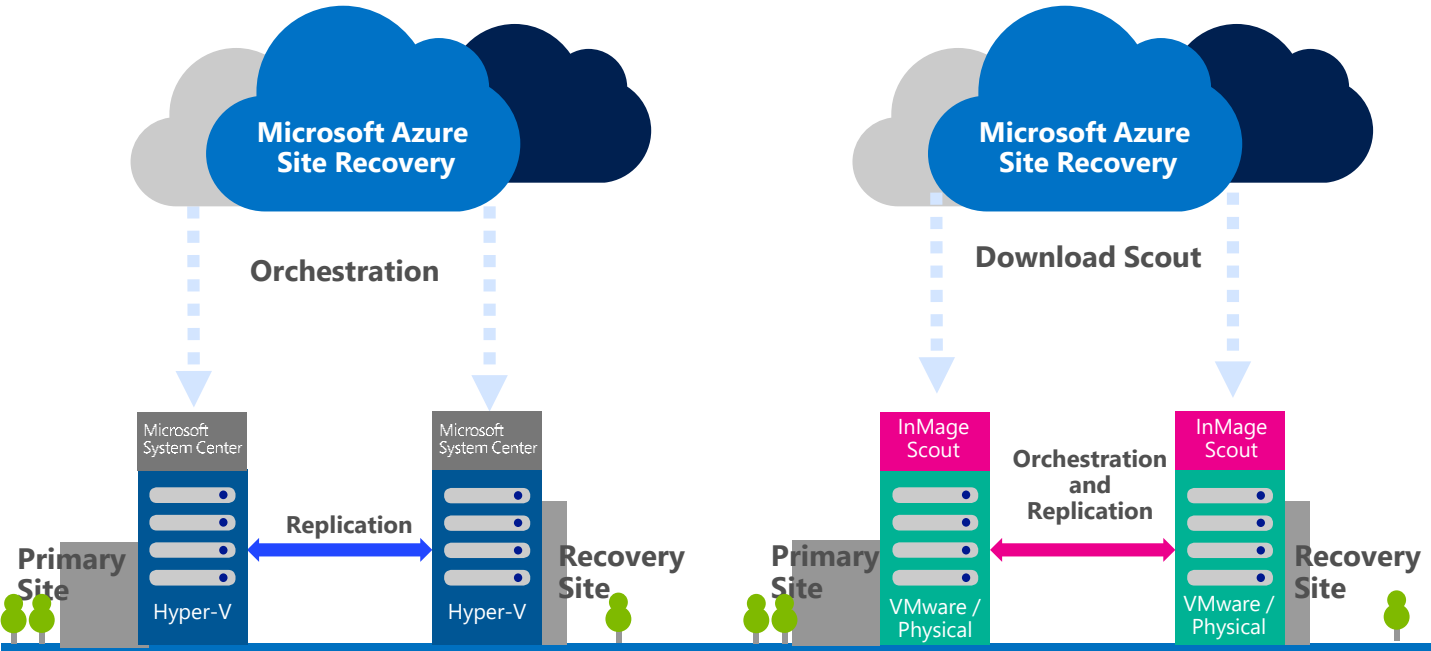
AutoScale



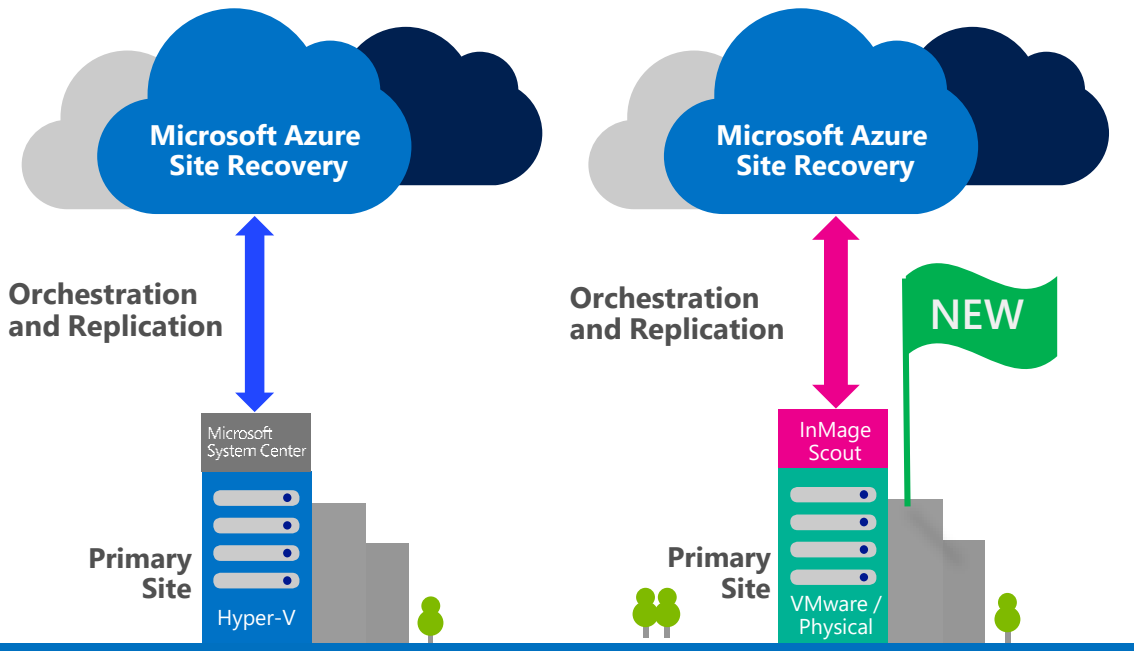
Azure Site Recovery

One solution for multiple infrastructures

On-premises to On-premises protection (Site-to-Site)



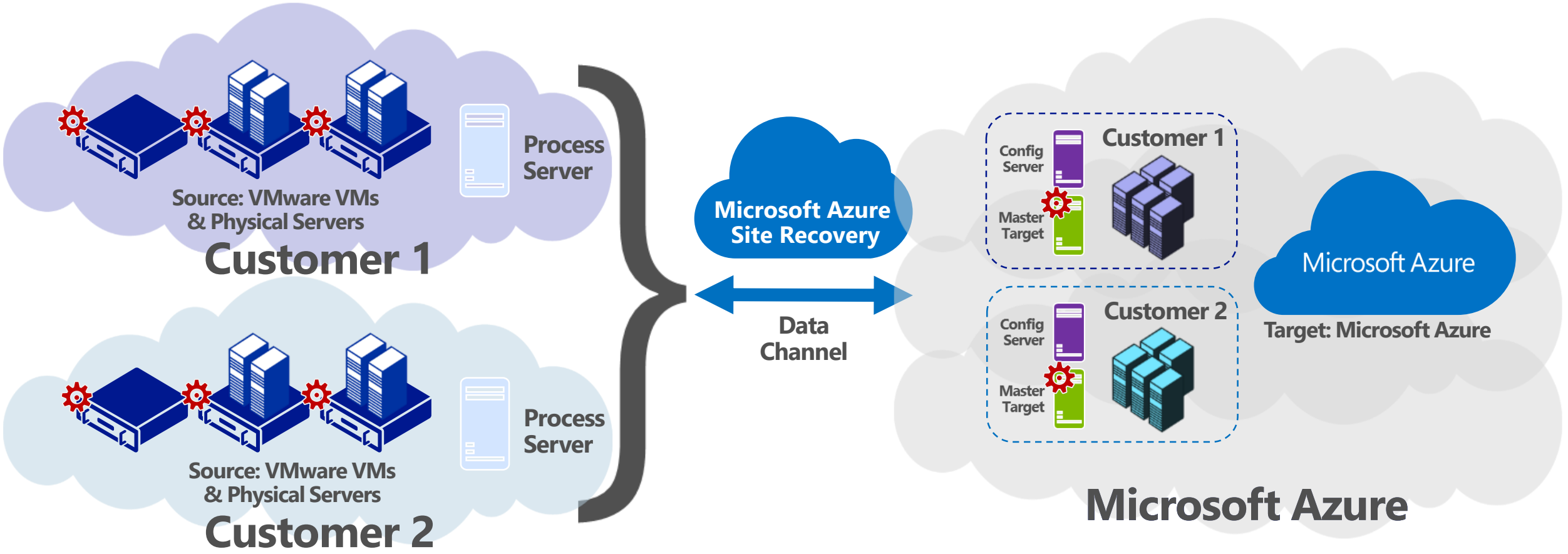
On-premises to Azure protection (Site-to-Azure)



Key features include:

- Automated VM protection and replication
- Remote health monitoring
- Near zero RPO
- No-impact recovery plan testing
- Customizable recovery plans
- Minimal RTO – few minutes to hours
- Orchestrated recovery when needed
- Replicate to – and recover in – Azure
- Heterogeneous physical and virtual support

Preview Deployment Architecture



Process Server – Used for Caching, Compression & Encryption

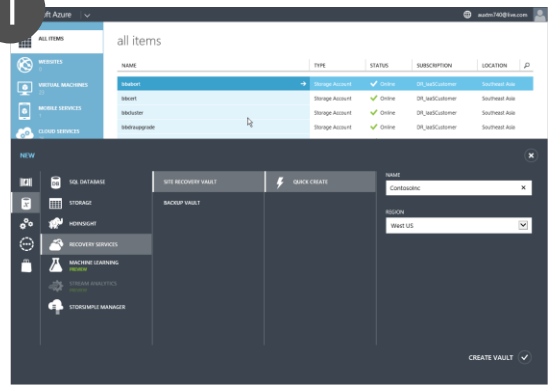
Config Server – Used for Centralized Management

Master Target – Used as a repository & for retention

Mobility Service – Captures all data writes from memory

Summary of Actions

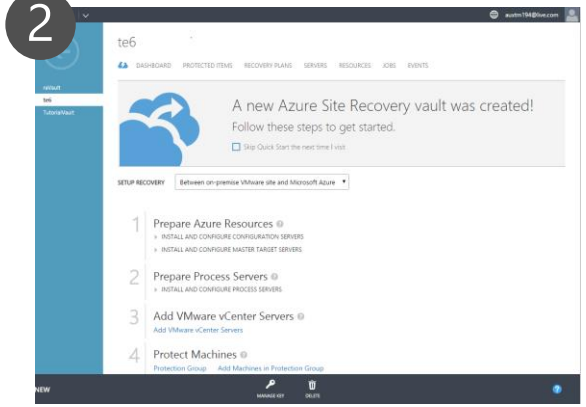
1



CREATE VAULT

Customer selects recovery region

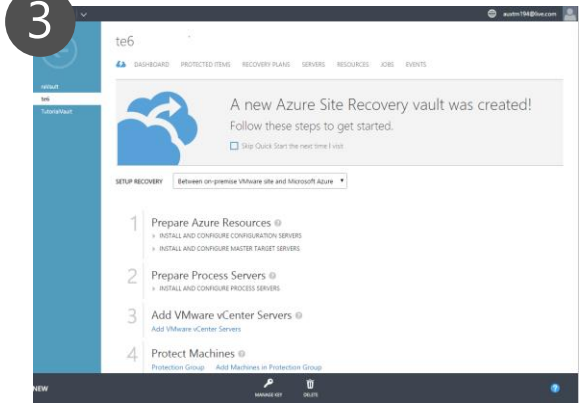
2



QUICK START

View step-by-step guidance

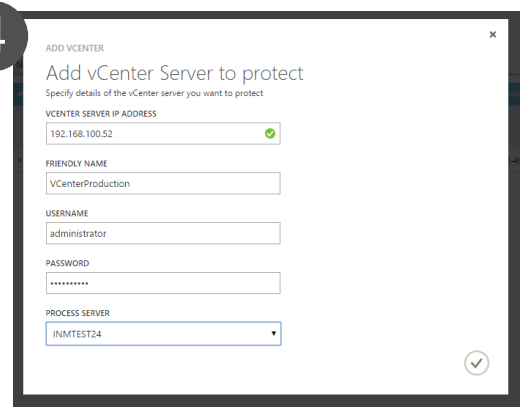
3



SETUP SERVERS (CS, MT, PS)

Infrastructure servers needed

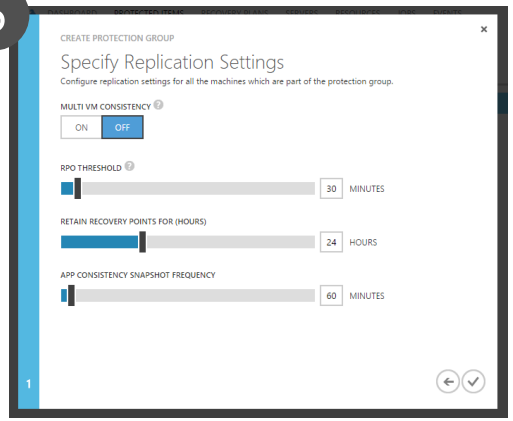
4



REGISTER

Register vCenter Server

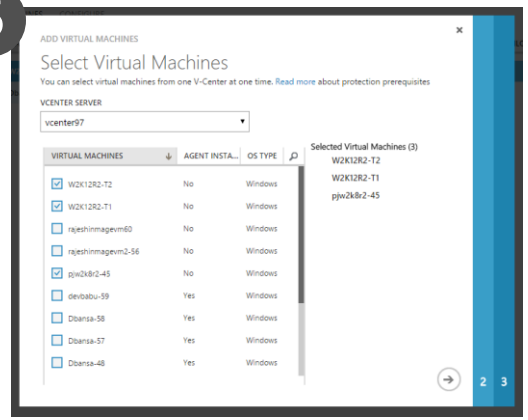
5



CONFIGURE PROTECTION

Define protection policy

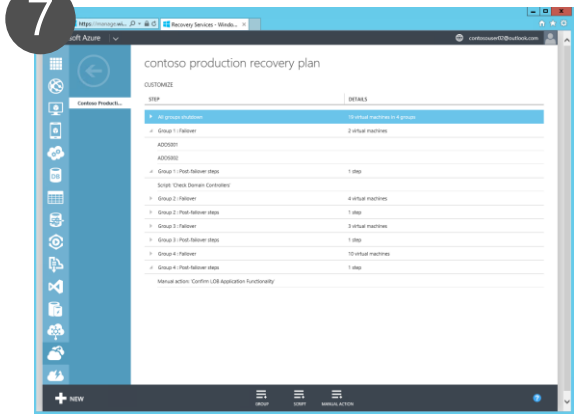
6



PROTECT VIRTUAL MACHINES

Replicate disks to Azure

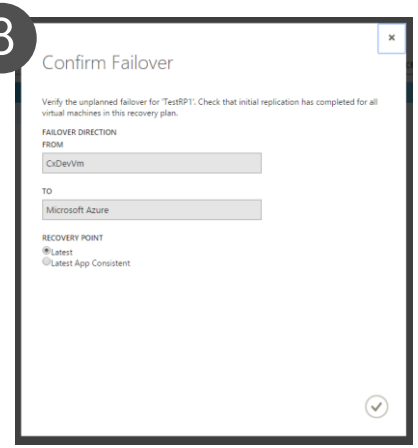
7



CREATE RECOVERY PLAN

Define DR plan

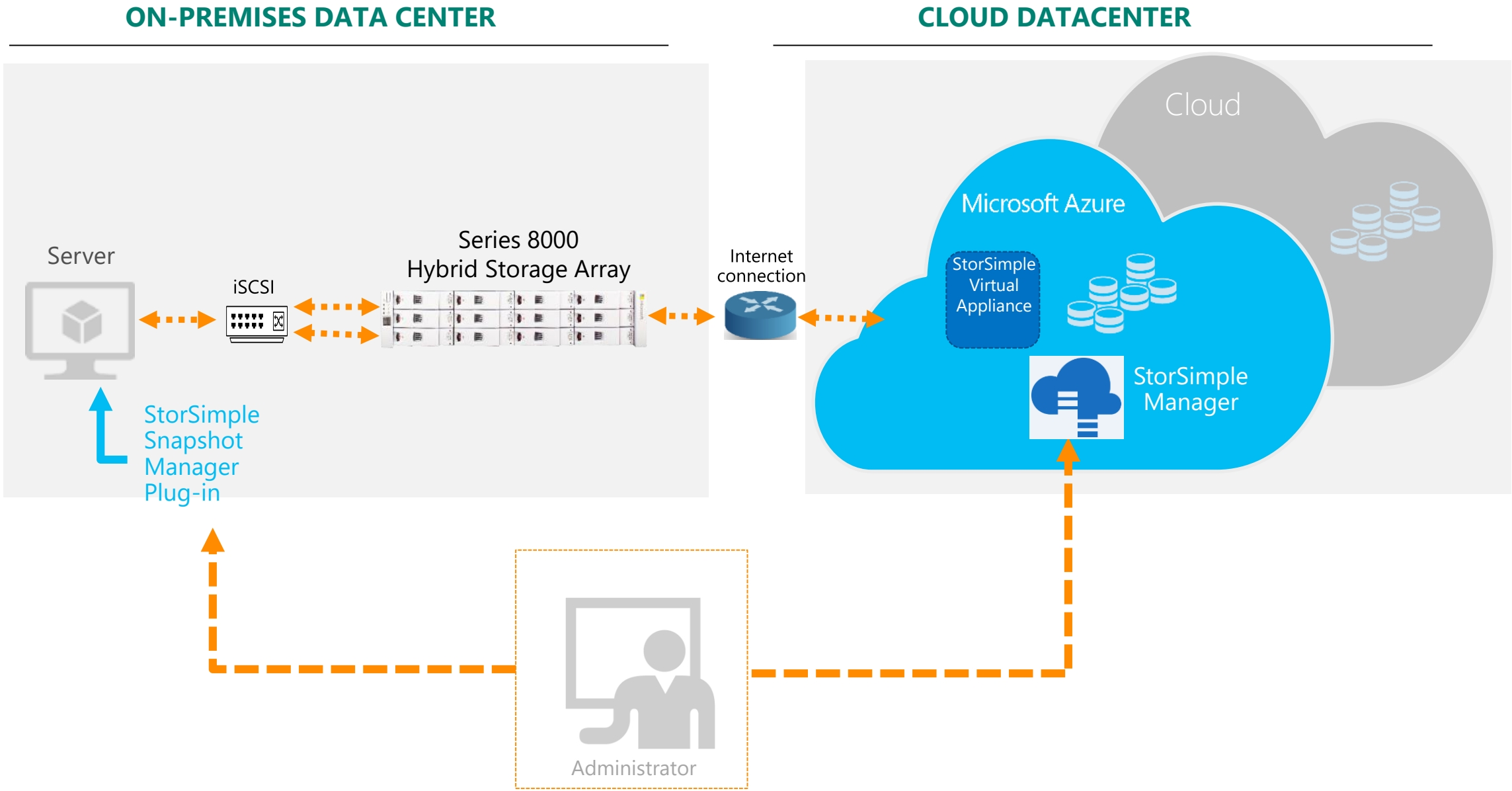
8



FAILOVER

Perform failover

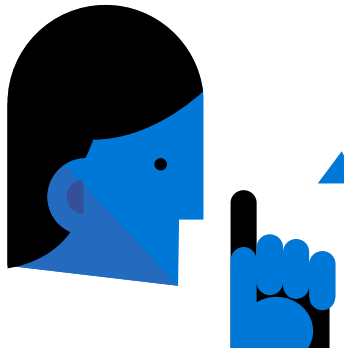
Microsoft Azure StorSimple Big Picture

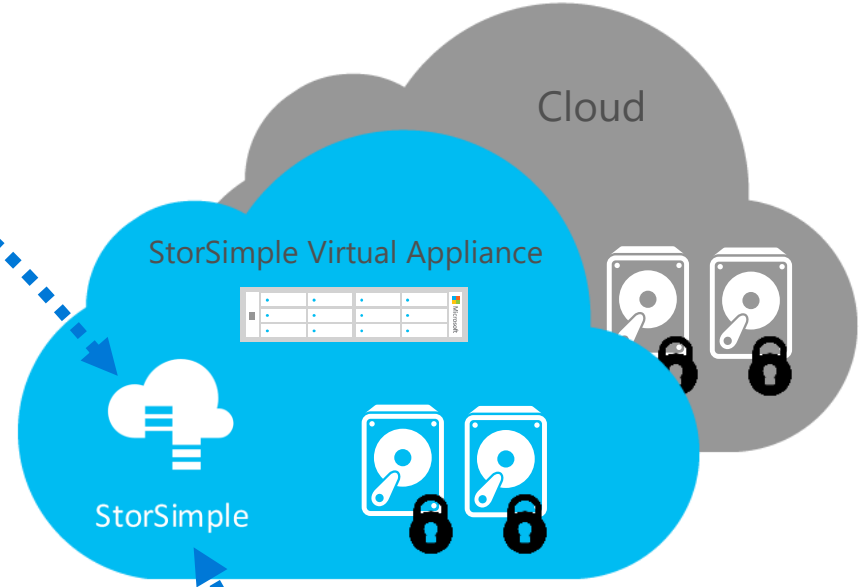


Secure data throughout the solution

Account Access

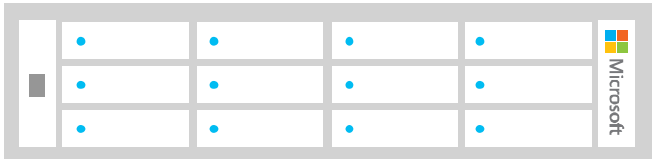
Account authentication with User ID, Password





Data At-rest

AES-256 bit encryption



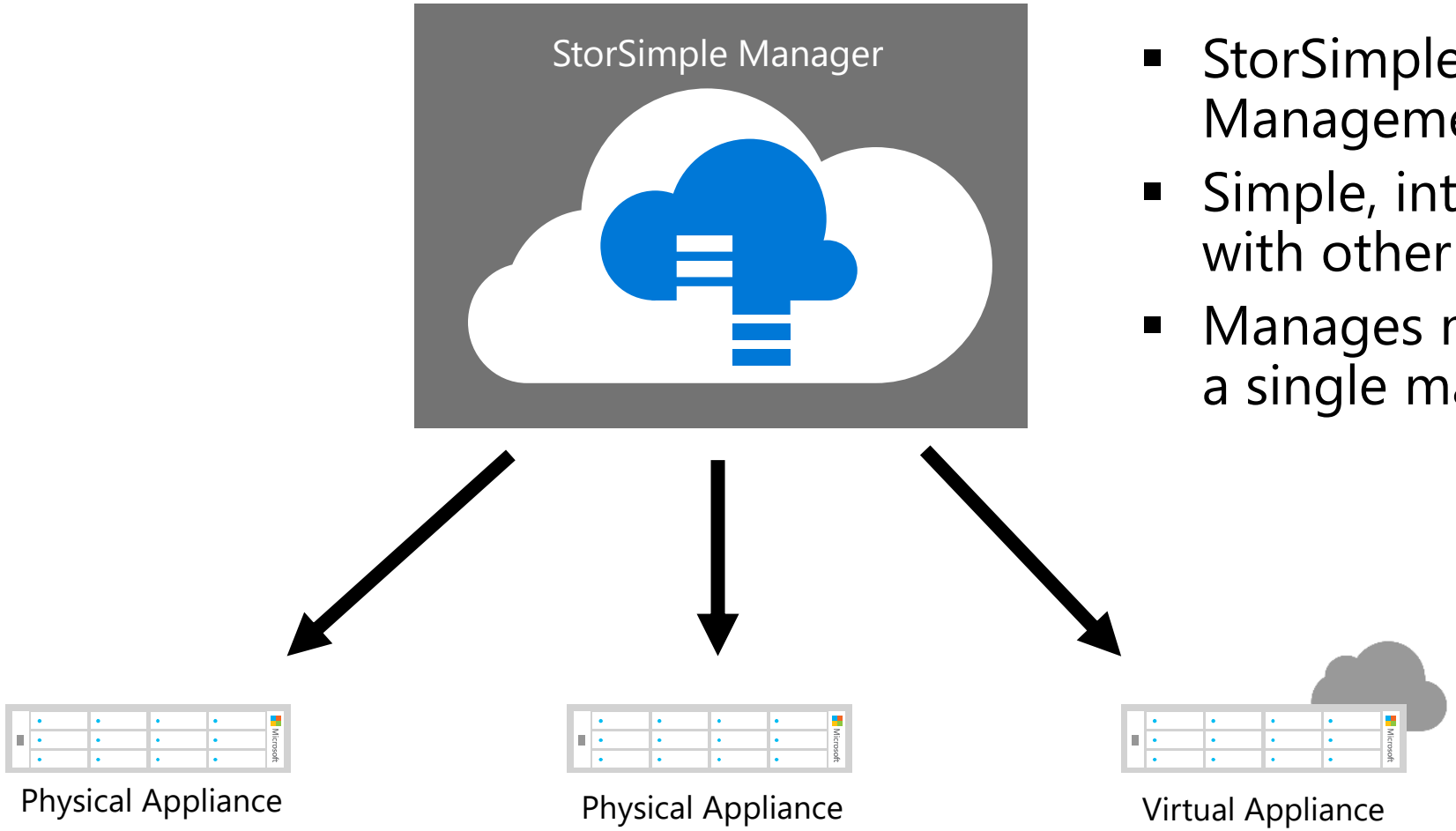
StorSimple

Customer defined encryption keys stored on device 2 x 512 bit keys

Data In-flight

AES-256 bit encryption

Consolidated management of appliances



- StorSimple Service in Azure Management Portal
- Simple, integrated workflows with other Azure entities
- Manages multiple devices from a single management interface

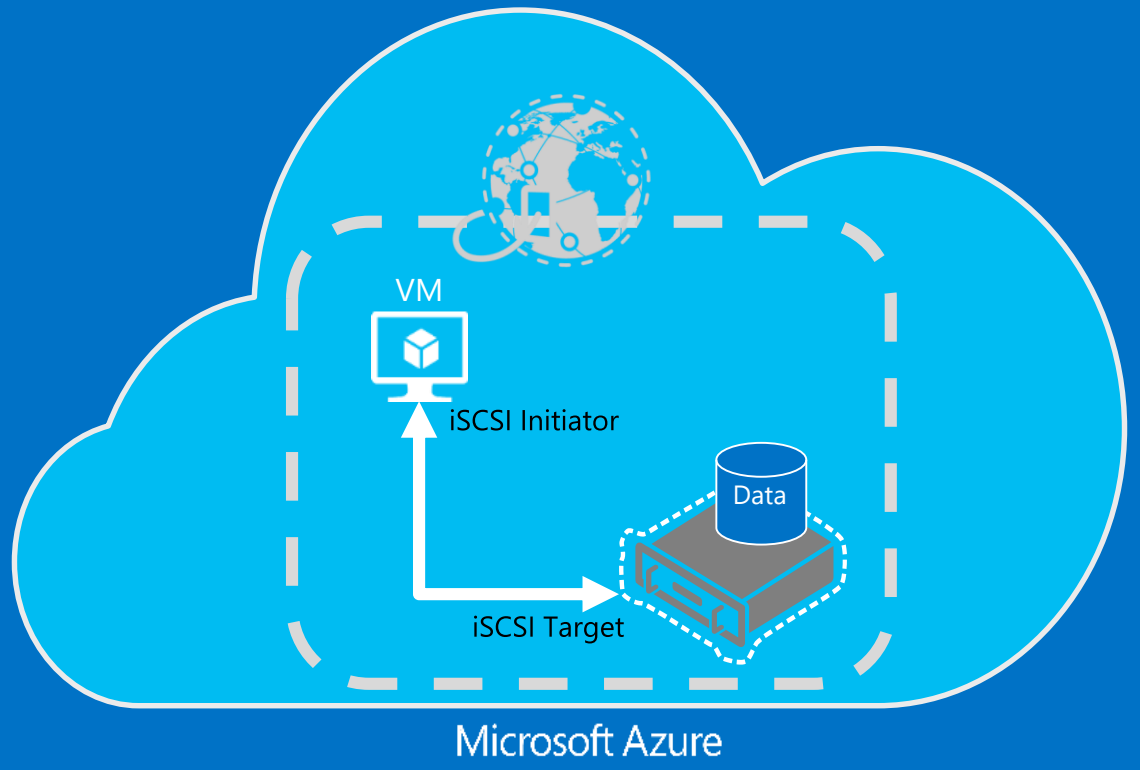
(Service Data Encryption Key is generated, on device console, when first device is registered)

StorSimple Virtual Appliance

The Virtual Appliance is a software version of the physical array that runs on a VM in Azure and can be provisioned and turned-on as needed.

The StorSimple Virtual Appliance is an iSCSI target for the VMs in Azure.

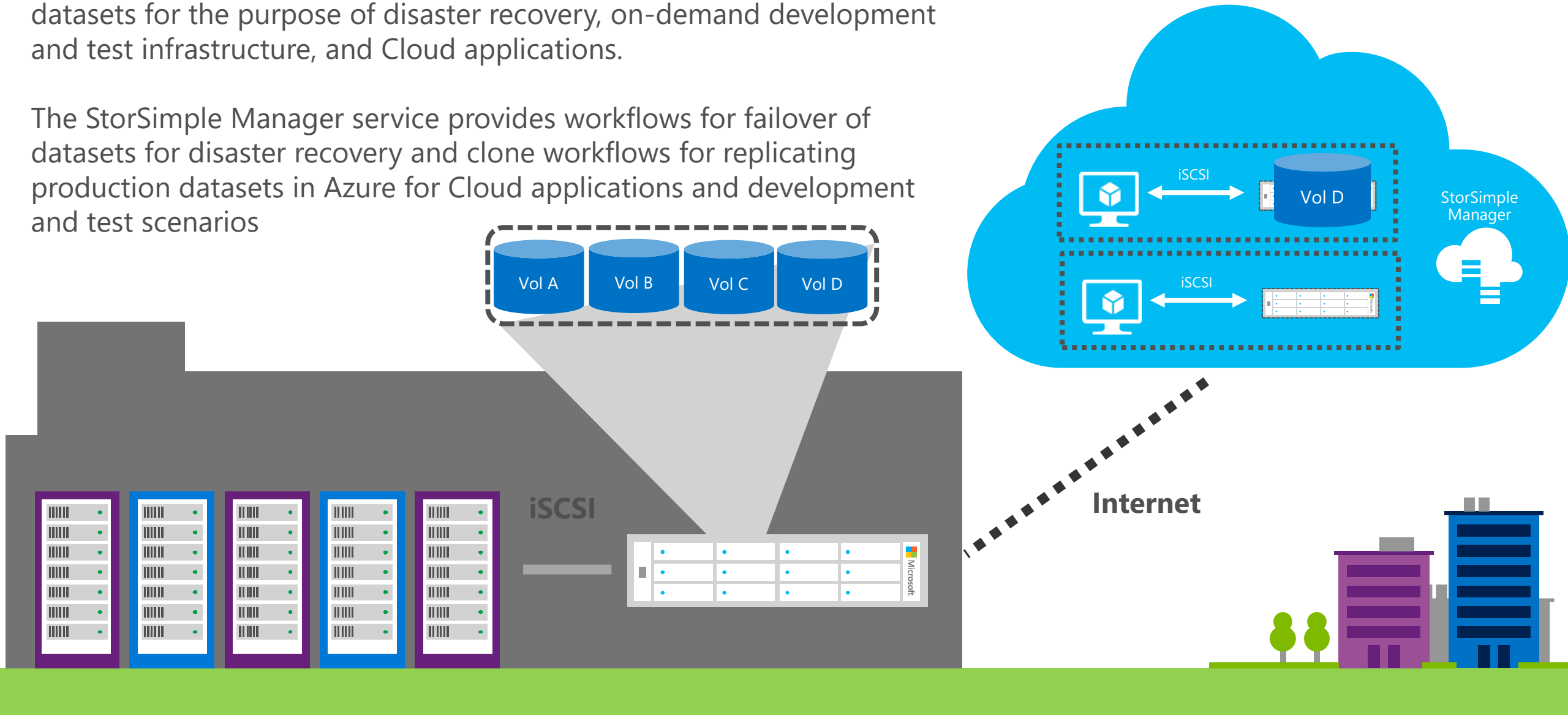
A virtual network joins VMs and the StorSimple Virtual Appliance.



IT agility in Azure with StorSimple Virtual Appliance

The StorSimple Virtual Appliance facilitates data mobility of production datasets for the purpose of disaster recovery, on-demand development and test infrastructure, and Cloud applications.

The StorSimple Manager service provides workflows for failover of datasets for disaster recovery and clone workflows for replicating production datasets in Azure for Cloud applications and development and test scenarios



DR to secondary datacenter or Virtual Appliance

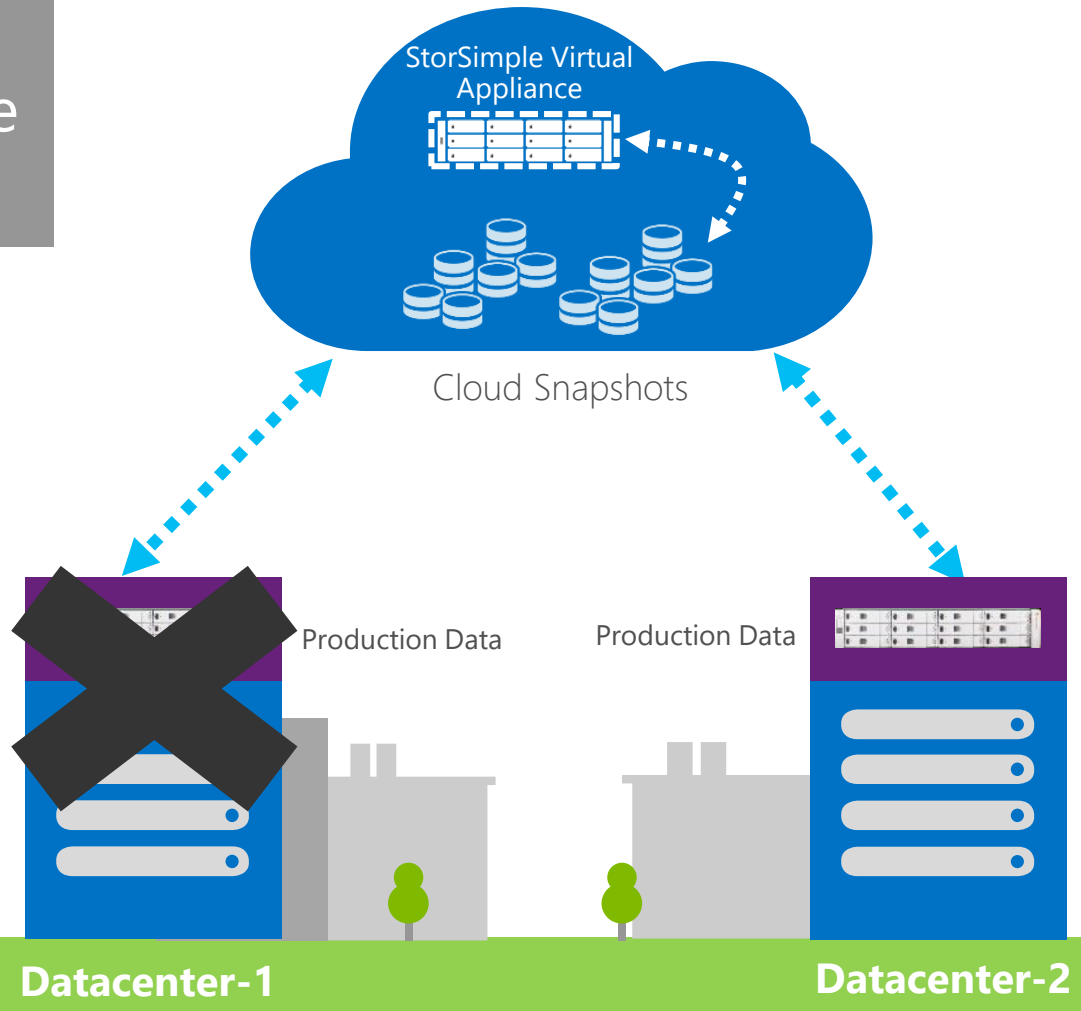
Thin

Instant

Predictable

Location independent recovery from cloud snapshot

Periodic VSS consistent cloud snapshots of production data



Big Compute evolution

HPC Pack On-premises

- On-premises Windows clusters
- Easy scaling to reduce runtimes
- Job scheduling and management
- Compute node provisioning

HPC Pack Hybrid

- Extend cluster to cloud to handle peak demand
- Leverages platform as a service virtual machines
- Secure packaging and distribution
- Automated deployment of Azure VMs

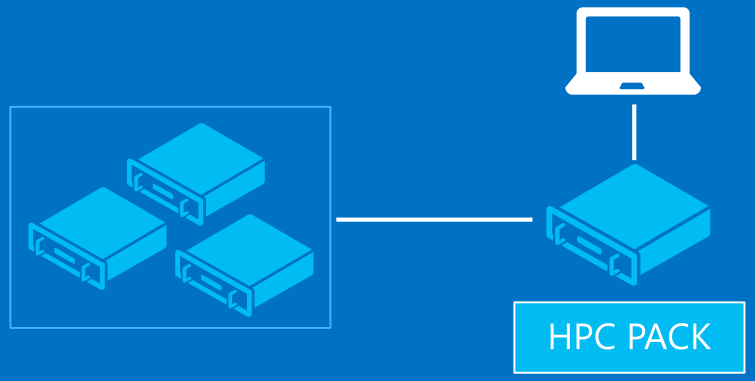
HPC Pack IaaS

- Deploy cluster all in cloud
- Move existing applications
- Support projects and testing
- Gallery images and scripts to deploy
- Flexible VM configuration

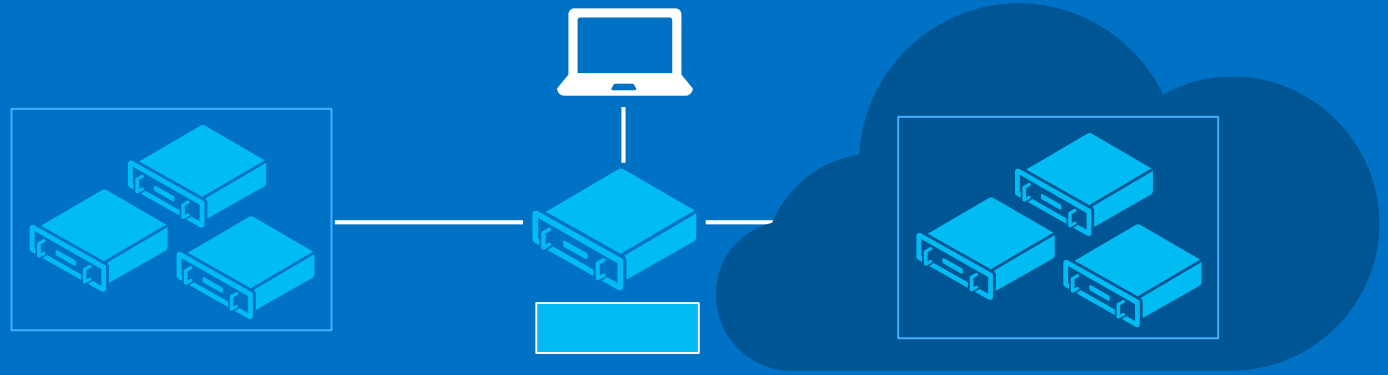
Azure Batch PaaS

- Native cloud scheduler
- Devops, not infrastructure management
- Small to very large deployments
- Elasticity with auto-scale
- Use within a service or to offer SaaS

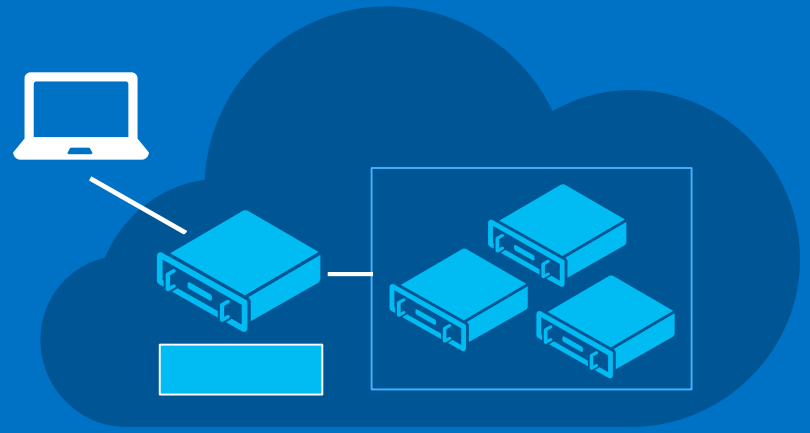
On-premises and Hybrid Big Compute with HPC Pack



On-premises head node and compute



On-premises head node and compute + extend to cloud



Head node + compute in Virtual Machines

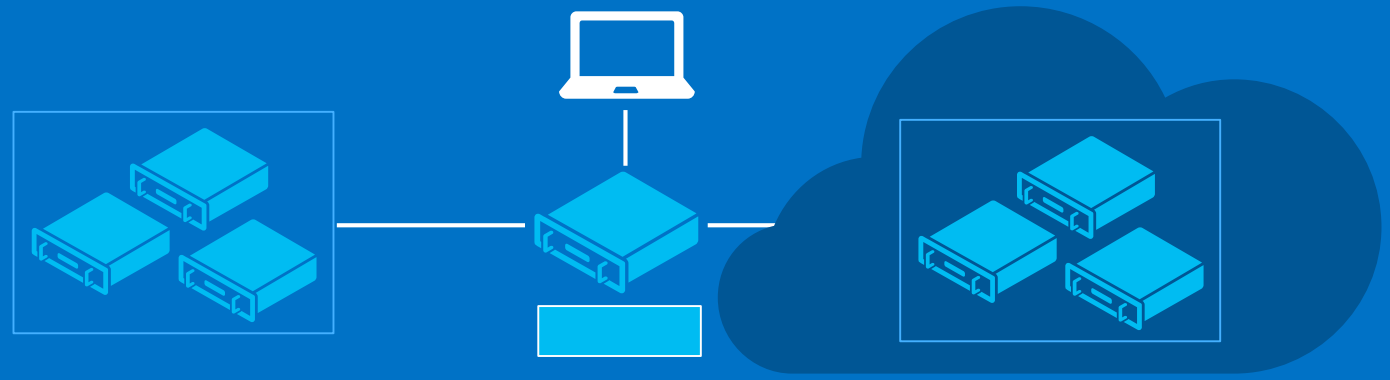
High Performance Computing on Azure

HPC clusters in Azure
Access to thousands of cores

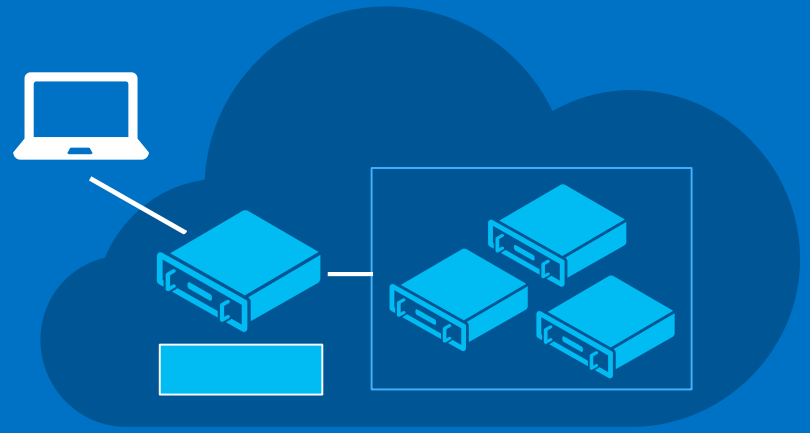
RDMA support with A8 and A9 Virtual Machines
Second low-latency network

Run MPI applications with close to bare metal performance

Burst to the cloud on demand



On-premises head node and clusters + cloud clusters



Head node in Virtual Machines + cloud clusters