Willkommen beim #GWAB 2014!

Einleitung in Windows Azure Infrastructure-as-a-Service (IaaS)

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Lokale Sponsoren:

Agenda

- Introduction to IaaS
- Windows Azure VMs
- Getting Started with VMs
- Managing VMs
- Virtual Networks

Evolving Hosting Options

The vast majority of existing applications live on on-premise or co-lo based infrastructure. As a result, any viable cloud offering must compliment and not compete with these existing investments.
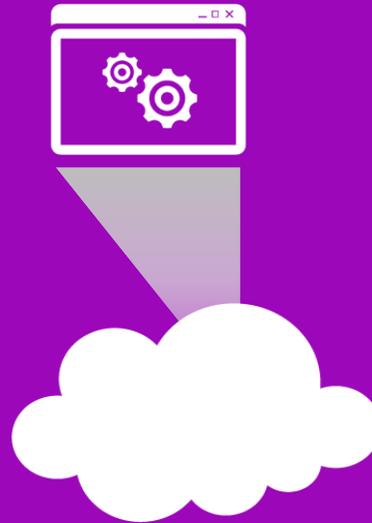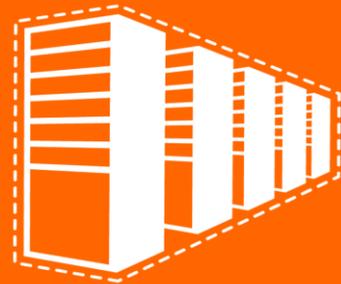
Legacy
Physical
- ❑ 47% of New Apps are on-prem
- ❑ 88% of Sockets in corp. datacenter

Past
Virtual
- ❑ 98% of large Orgs have some degree of virtualization

Present
IaaS
- ❑ 20% of Orgs have Private Clouds
- ❑ Majority of cloud growth is IaaS

Future
PaaS
- ❑ Majority of new cloud apps are PaaS
- ❑ Most efficient model for cloud development

SaaS
- ❑ ~16% of new Apps qualify as SaaS
- ❑ Business model, not hosting model. There are on-premise SaaS apps.

Hosting & Cloud Software Delivery

Hosting Models

On Premises

| Applications |
| Data |
| Runtime |
| Middleware |
| O/S |
| Virtualization |
| Servers |
| Storage |
| Networking |

You scale, make resilient and manage

Infrastructure
(as a Service)

| Applications |
| Data |
| Runtime |
| Middleware |
| O/S |

You scale, make resilient & manage

| Virtualization |
| Servers |
| Storage |
| Networking |

Managed by vendor

Platform
(as a Service)

| Applications |
| Data |

You manage

| Runtime |
| Middleware |
| O/S |
| Virtualization |
| Servers |
| Storage |
| Networking |

Scale, Resilience and management by vendor

Business Model

Software
(as a Service)

| Applications |
| Data |
| Runtime |
| Middleware |
| O/S |
| Virtualization |
| Servers |
| Storage |
| Networking |

Scale, Resilience and management by vendor
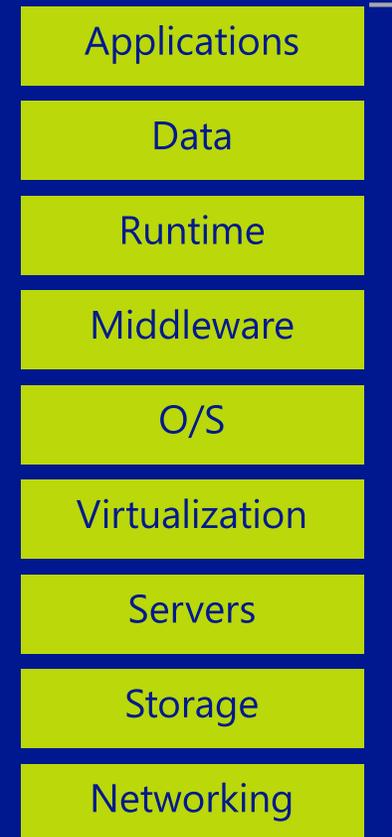
What is Microsoft Azure: Services

App services

- Cloud services
- Caching
- Identity
- Service bus
- Media
- Mobile services
- Web sites
- Integration
- HPC
- Analytics

Data services

- SQL database
- HDInsight
- Table
- Blob storage
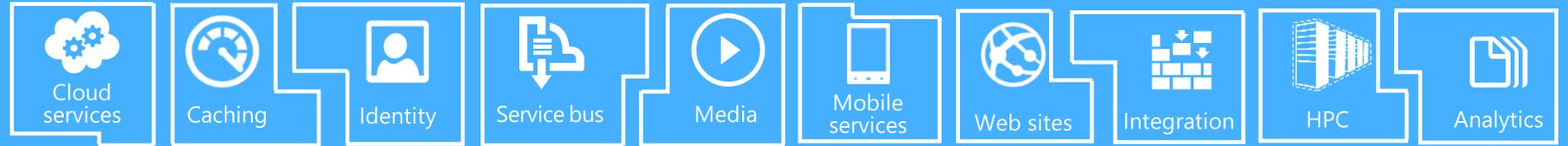
Infrastructure services

- Virtual machines
- Virtual network
- VPN
- Traffic manager
- CDN

Microsoft .NET | Java | PHP | nodeJS | python | ORACLE

Windows Azure VMs

A Continuous Offering From Private to Public Cloud

Physical | Virtual | IaaS | PaaS | SaaS
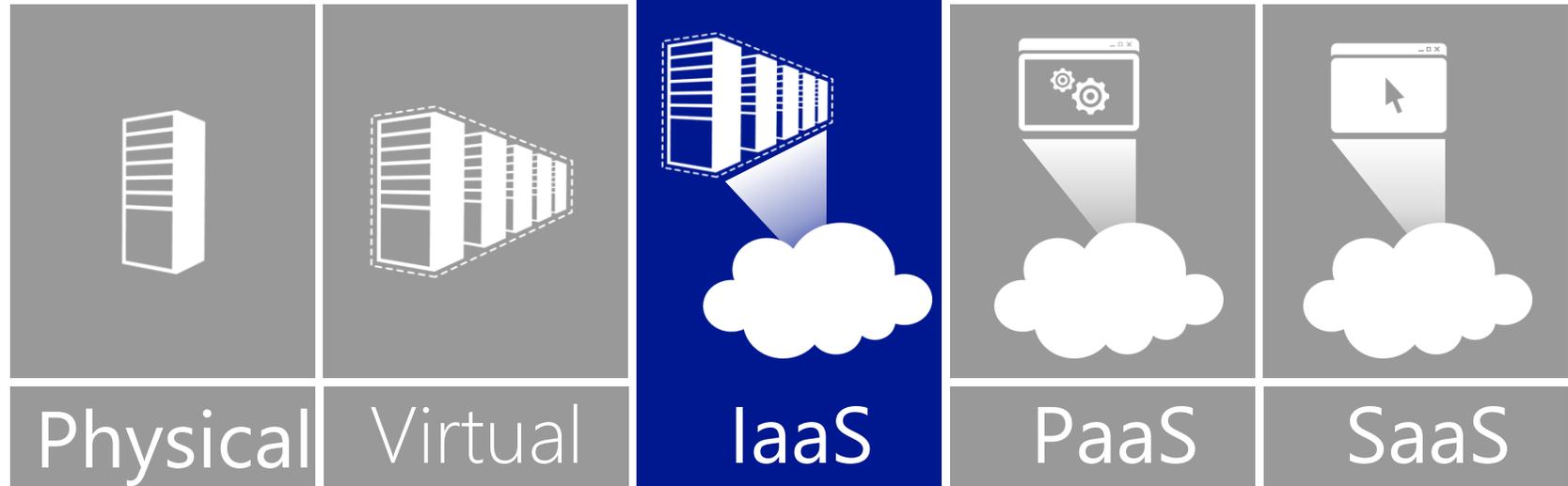
Windows Azure Virtual Machines

IT Pro experience

Support for key server applications

Easy storage manageability

High availability features

Advanced networking

Integration with compute PaaS

Cloud First Provisioning

Getting Started

Management Portal

Scripting
(Windows, Linux and Mac)

REST API

Select Image and VM Size
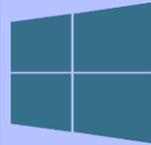
Windows Server

Linux

Extra Small

Small

Medium

Large

X-Large

New Disk Persisted in Storage

Boot VM from New Disk

Cloud

Supported Windows Server Applications
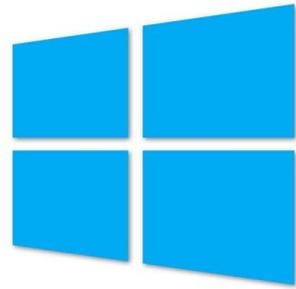
SQL Server 2008 SQL Server 2008 R2 SQL Server 2012	Windows Server 2008 R2 Windows Server 2012	SharePoint 2010 & 2013	BizTalk 2010 & 2013	System Center 2012

http://support.microsoft.com/kb/2721672

Linux on Windows Azure

We will support

SUSE SLES 11 sp2
Open SUSE 12.1
CentOS 6.2 by OpenLogic*
Ubuntu 12.04

Specific versions are endorsed

Integration Components
Testing and validation by partners
Bring other variants at your own risk**
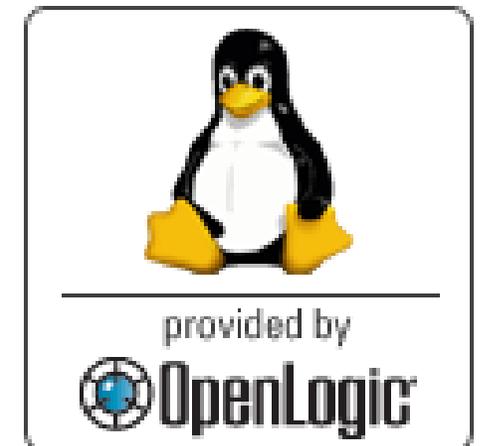
- *Image provided by OpenLogic based on CentOS 6.2
- **Integration Work will be needed

Gallery Images Available
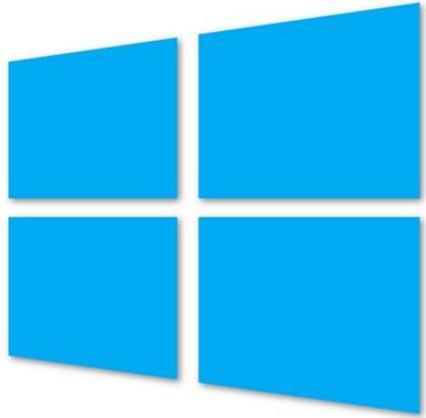
Microsoft

Windows Server 2008 R2

SQL Server Eval 2012

Windows Server 2012

Biztalk Server 2013 Beta
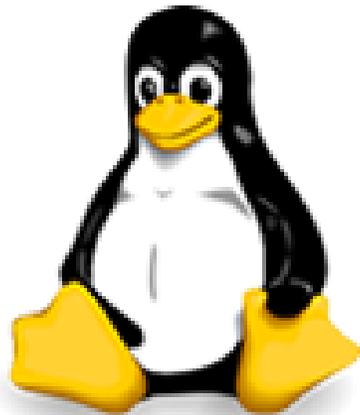
Open Source

OpenSUSE 12.2

CentOS 6.3

Ubuntu 12.04/12.10

SUSE Linux Enterprise Server 11 SP2

Demo

Provisioning Stand-alone Virtual Machine from Management Portal

Linux Offering

1ST

Open Source

First-Class Enterprise

Citizen Community

Support
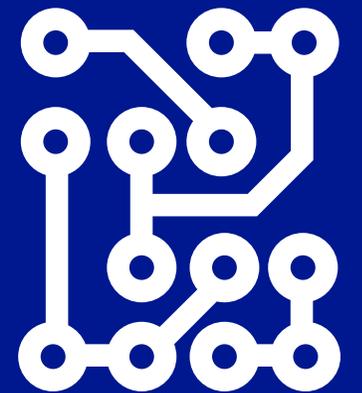
http://vmdepot.msopentech.com/
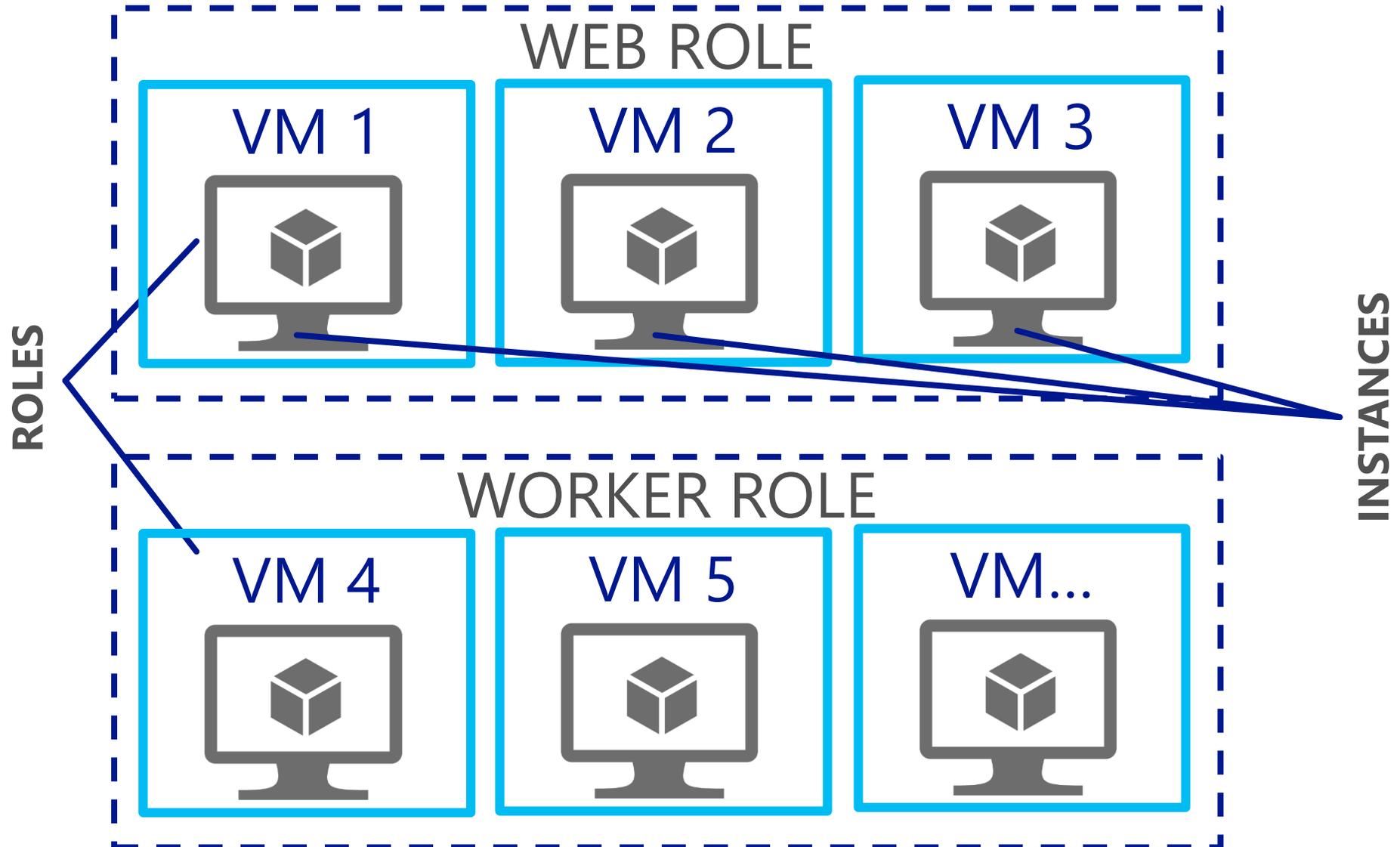
Demo

VM Depot for OSS Images

Virtual Machines and Cloud Services

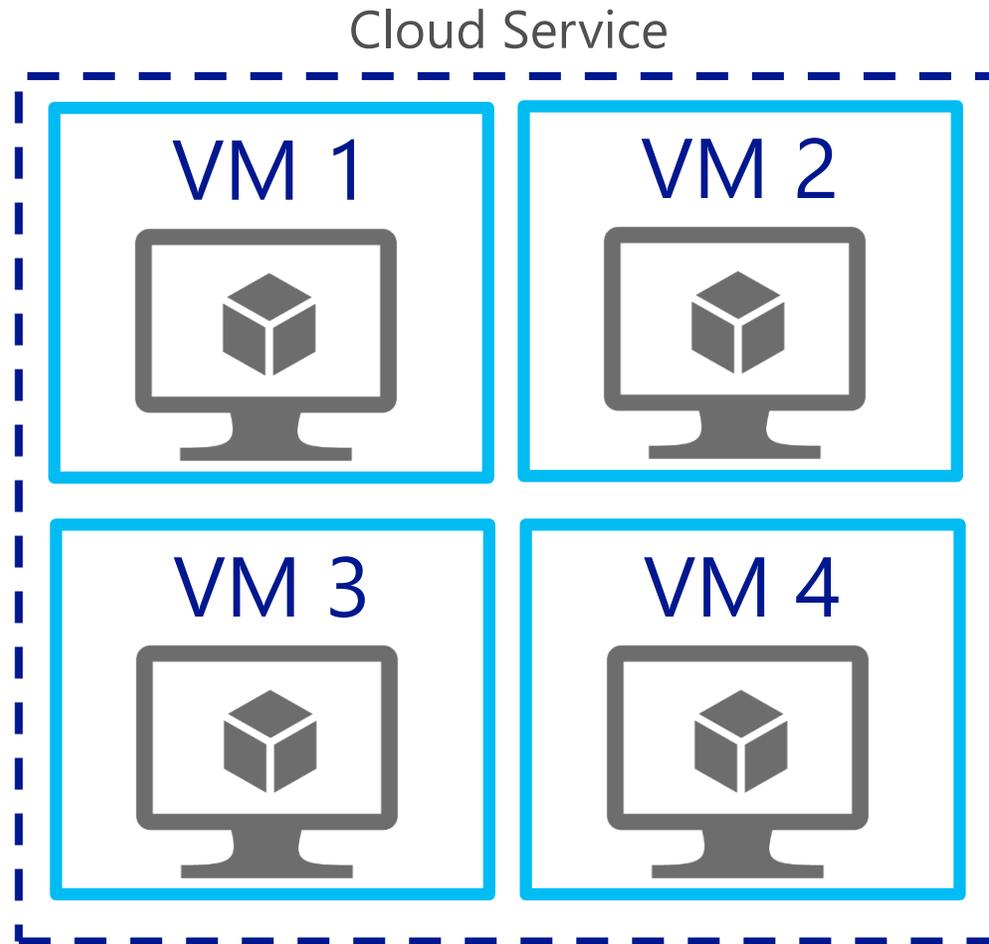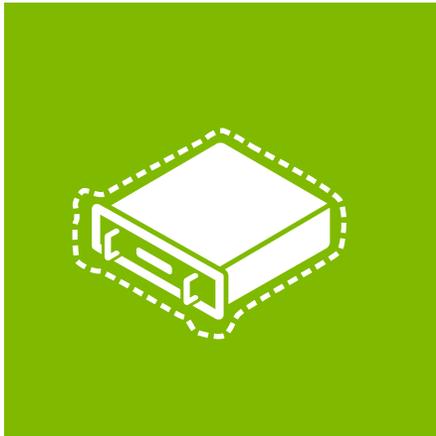# Cloud Services, Roles, and Instances

Cloud Service is a...

- Management
- Configuration
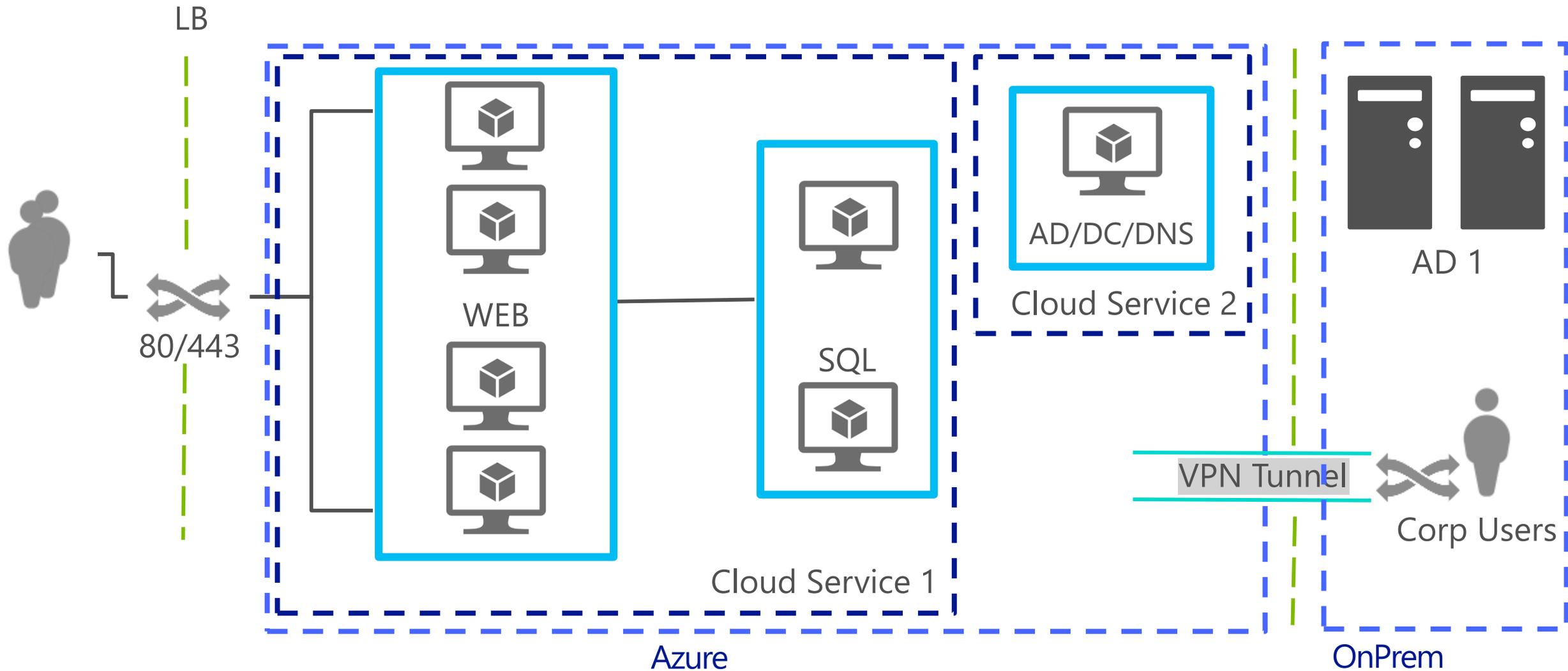- Security
- Networking
- Service Model

boundary

ROLES

INSTANCES

WEB ROLE

VM 1

VM 2

VM 3

WORKER ROLE

VM 4

VM 5

VM...

Cloud Services with Virtual Machines

Multiple Virtual Machines can be hosted within the same cloud service

Cloud Service

| VM 1 | VM 2 |
| VM 3 | VM 4 |

Multiple Cloud Services Configuration

LB

80/443

WEB

SQL

Cloud Service 1

AD/DC/DNS

Cloud Service 2

AD 1

VPN Tunnel

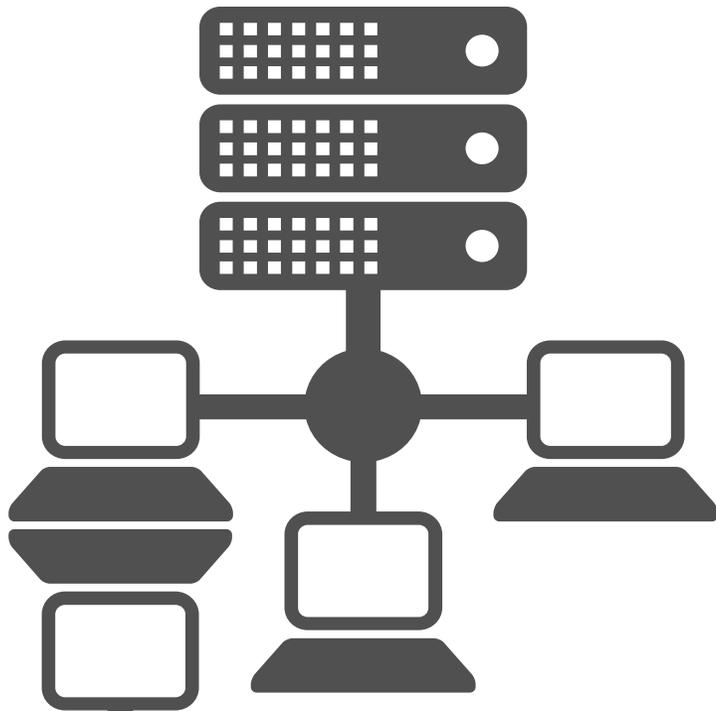Corp Users

Azure

OnPrem

Virtual Machine Availability

Service Level Agreements

99.9% for single role instances

8.75 hours of downtime per year

99.95% for multiple role instances

4.38 hours of downtime per year

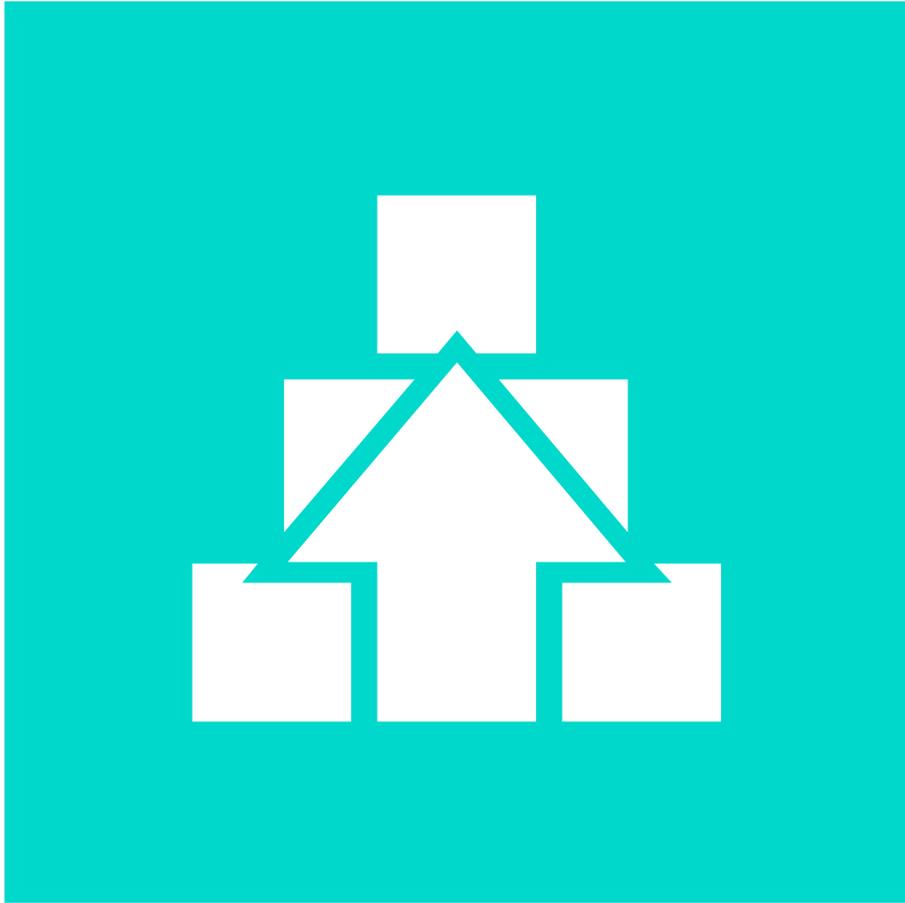What's included

Compute Hardware failure (disk, cpu, memory)
Datacenter failures - Network failure, power failure
Hardware upgrades, Software maintenance – Host OS Updates

What is not included

VM Container crashes, Guest OS Updates

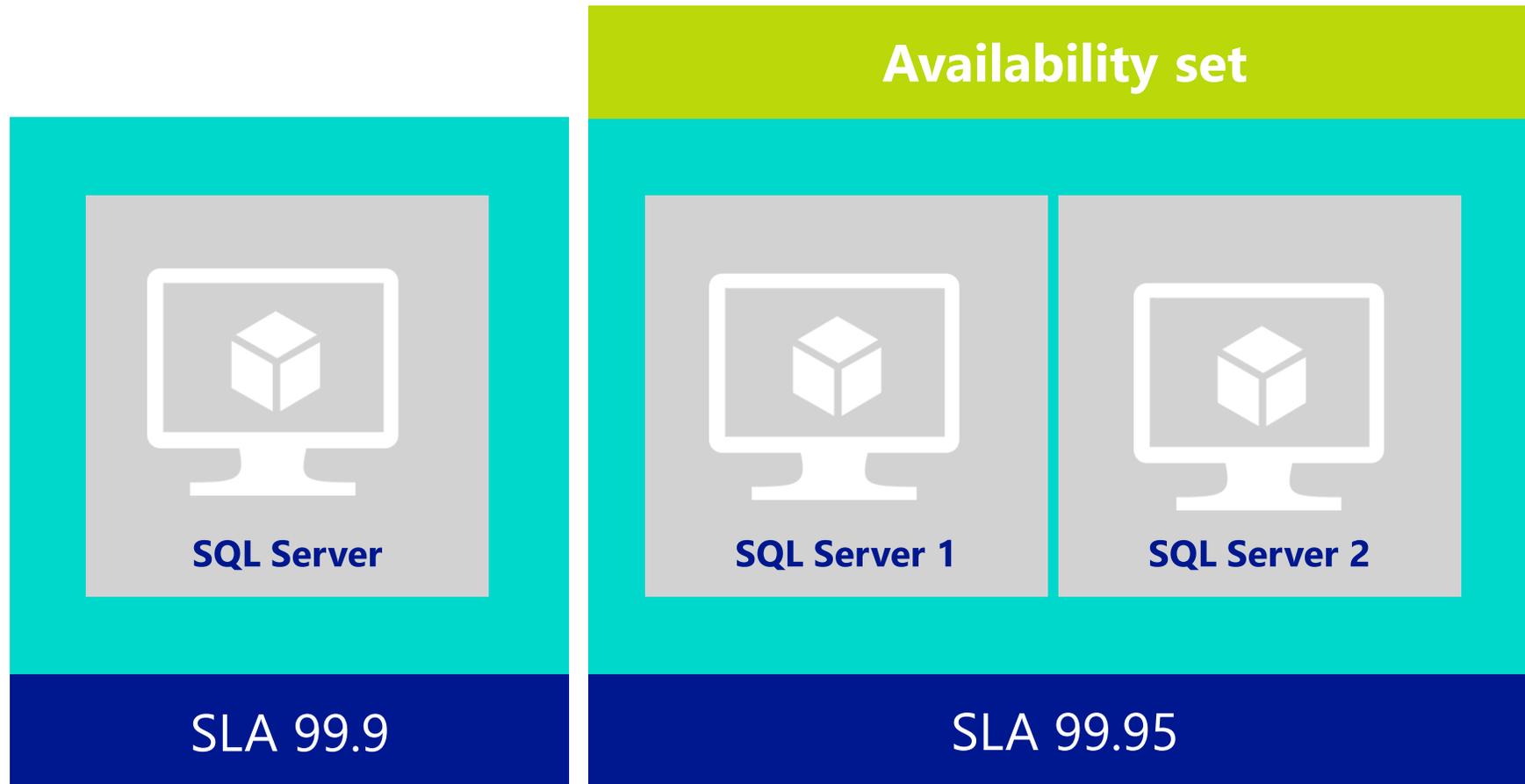# Fault and Update Domains

Fault Domains

- Represent groups of resources anticipated to fail together
- i.e. Same rack, same server
- Fabric spreads instances across fault at least 2 fault domains

Update Domains

- Represents groups of resources that will be updated together
- Host OS updates honour service update domains
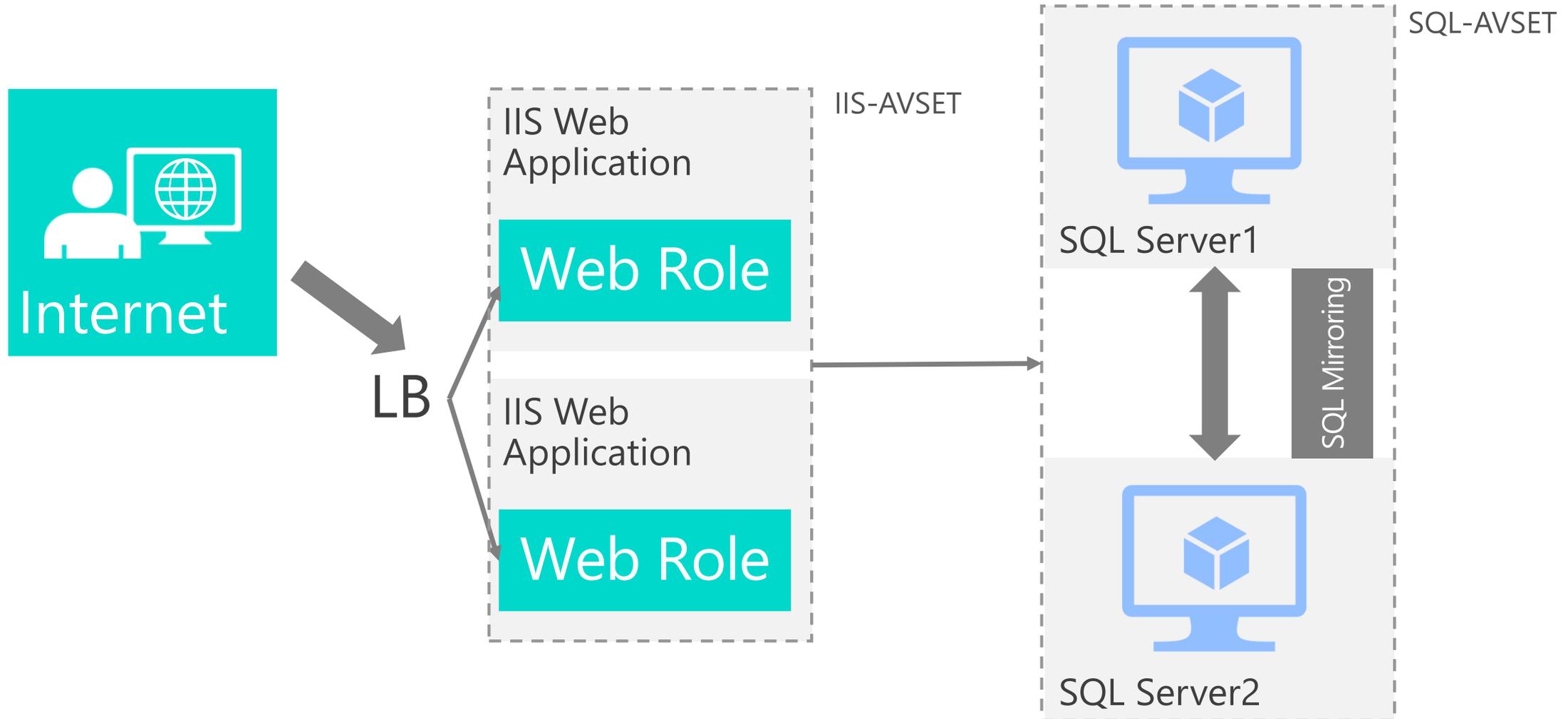- Specified in service definition
- Default of 5 (up to 20)

Fabric spreads role instances across Update Domains and Fault Domains

How Does this Relate to SLA?

Availability set

SQL Server

SLA 99.9

SQL Server 1

SQL Server 2

SLA 99.95

End to End Highly Available Solution
Redundancy at every level

Internet

LB

IIS-AVSET

IIS Web Application

Web Role

IIS Web Application

Web Role

SQL-AVSET

SQL Server1

SQL Mirroring

SQL Server2

Disks

VM disk layout

OS Disk
- Persistent
- SATA
- **Drive C:**

VM disk layout

Temporary Storage Disk
- Local (Not Persistent)
- SATA
- **Drive D:**

DISKS
All disks | 3 total

Filter

Disk ID	Virtual Disk	Status	Capacity	Unallocated	Partition	Clustered	Subsystem	Bus Type	Name

Drive Tools

Computer

File   Computer   View   Manage

Computer

Search Computer

Favorites
- Desktop
- Downloads
- Recent places

Libraries
- Documents
- Music
- Pictures
- Videos

Computer

⊿ Hard Disk Drives (3)

Local Disk (C:)
21.9 GB free of 29.9 GB

Temporary Storage (D:)
65.8 GB free of 69.9 GB

New Volume (F:)
799 GB free of 799 GB

⊿ Devices with Removable Storage (2)

Floppy Disk Drive (A:)

DVD Drive (E:)

VM disk layout

Persistent Disk Management

Capability	OS Disk	Data Disk
Host Cache Default	ReadWrite	None
Max Capacity	127 GB	1 TB
Imaging Capable	Yes	No
Hot Update	Cache Setting Requires Reboot	Change Cache Without Reboot, Add/Remove without Reboot.

- C:\ = OS Disk
- D:\ = Non-Persistent Cache Disk
- E:\, F:\. G:\ ... Data Disks

Disk Caching

Disk Type	Default	Supported
OS Disk	ReadWrite	Read-only and ReadWrite
Data Disk	None	None, Read-only and ReadWrite

Modify using Set-AzureOSDisk or Set-AzureDataDisk

Persistent Disks and Highly Durable

Windows Azure Storage
(Disaster Recovery)

Virtual Machine

Windows Azure Storage

Persistent Disks and Highly Durable

Windows Azure Storage
(Disaster Recovery)
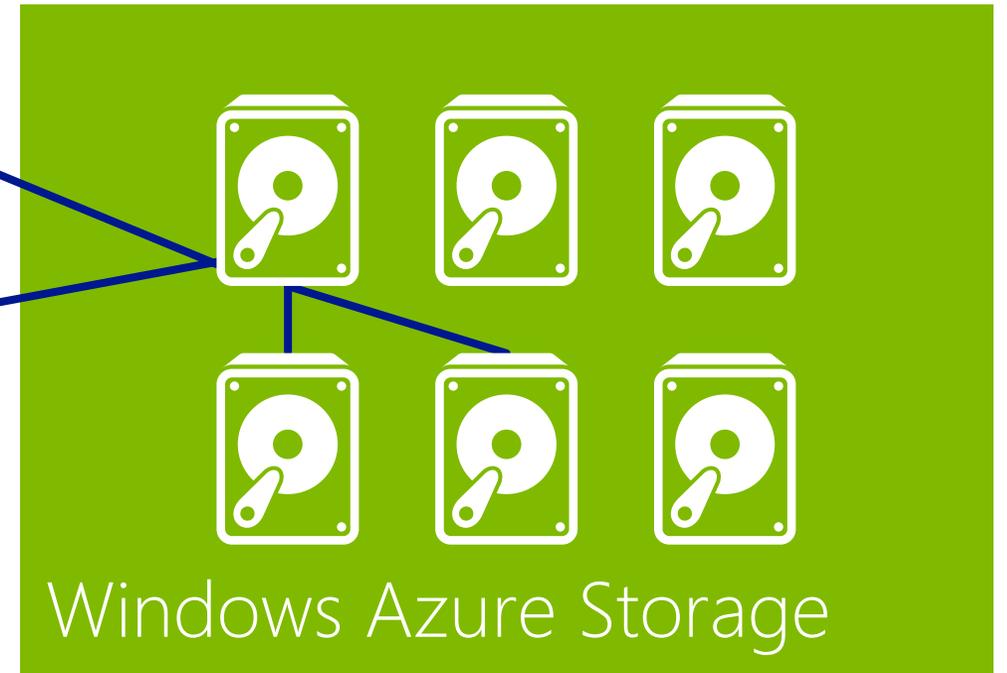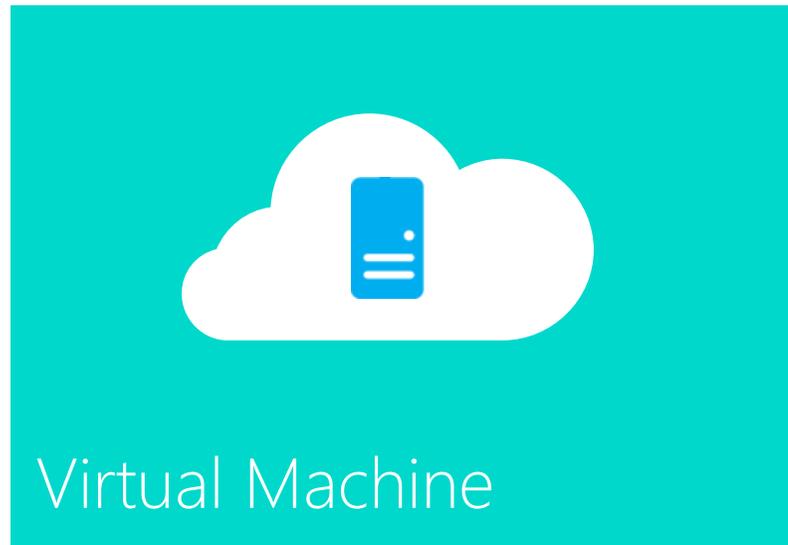
Virtual Machine

Virtual Machine

Windows Azure Storage
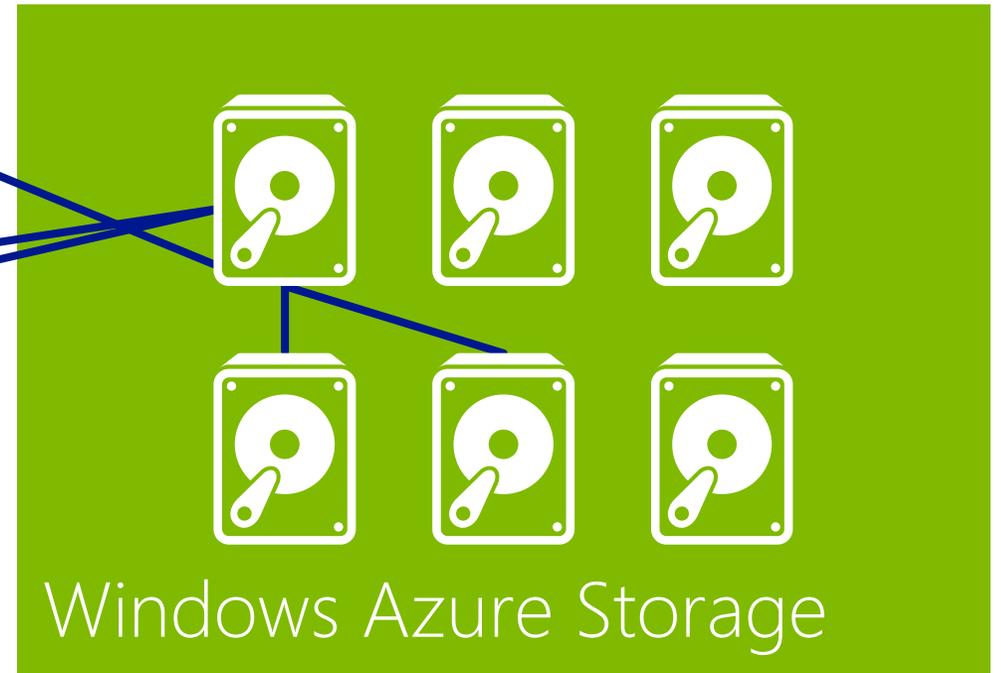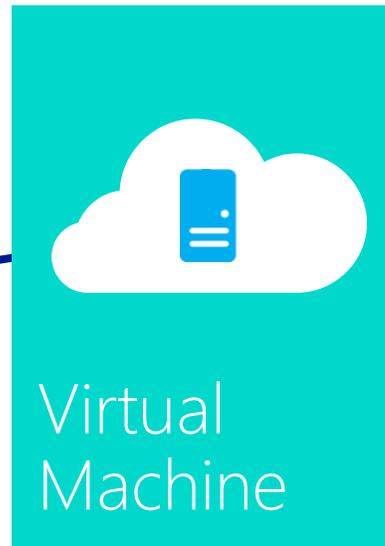
Images & Disks

Disks and Images

OS Images

- Microsoft
- Partner
- User

Base OS image for new Virtual Machines

Sys-Prepped/Generalized/Read Only

Created by uploading or by capture

Disks

- OS Disks
- Data Disks

Writable Disks for Virtual Machines

Created during VM creation or during upload of existing VHDs.

Image Mobility

Cloud

MyApp.vhd
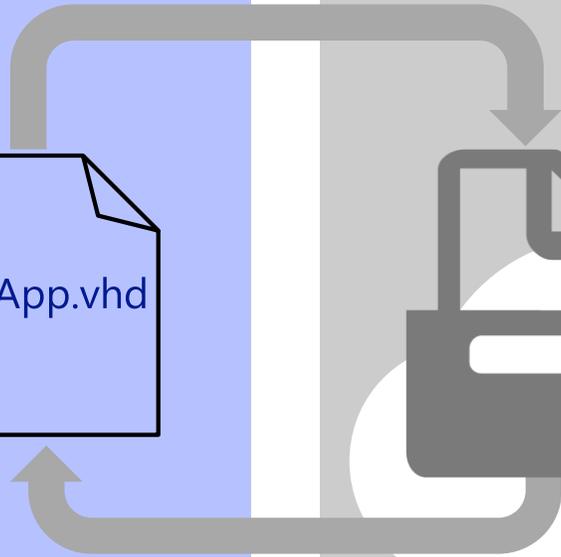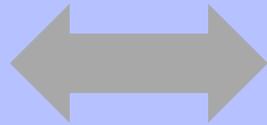
Bring Your Own Server/VHD

On-Premises

On Premises
Virtual Server

MyApp.vhd

Upload VHD

Use Case
- Forklift Migration of VMs
- Sys Prepped Images

VHD Must Be Fixed Disk

* CSUpload Can Convert on Upload

Cloud

Create Disk or Image

Provision VM from Image or Disk using portal, script or API
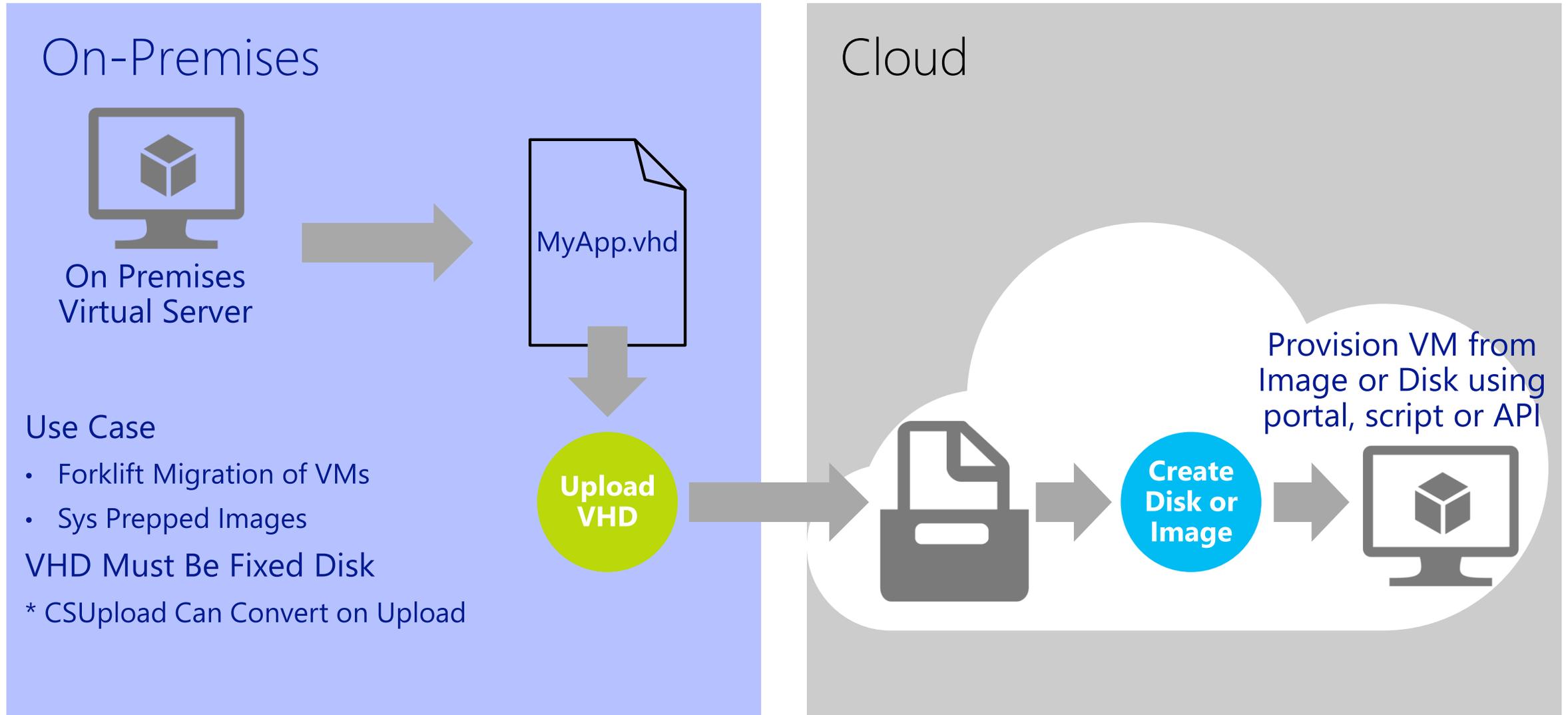
Imaging VMs in the Cloud

Cloud

Base.VHD

Boot VM

Customize VHD → **Generalize VHD** → **Capture VM**

Identical/similar deployment instances using common OS image as start

Capture VM Saves Customized Image to Your Image Library
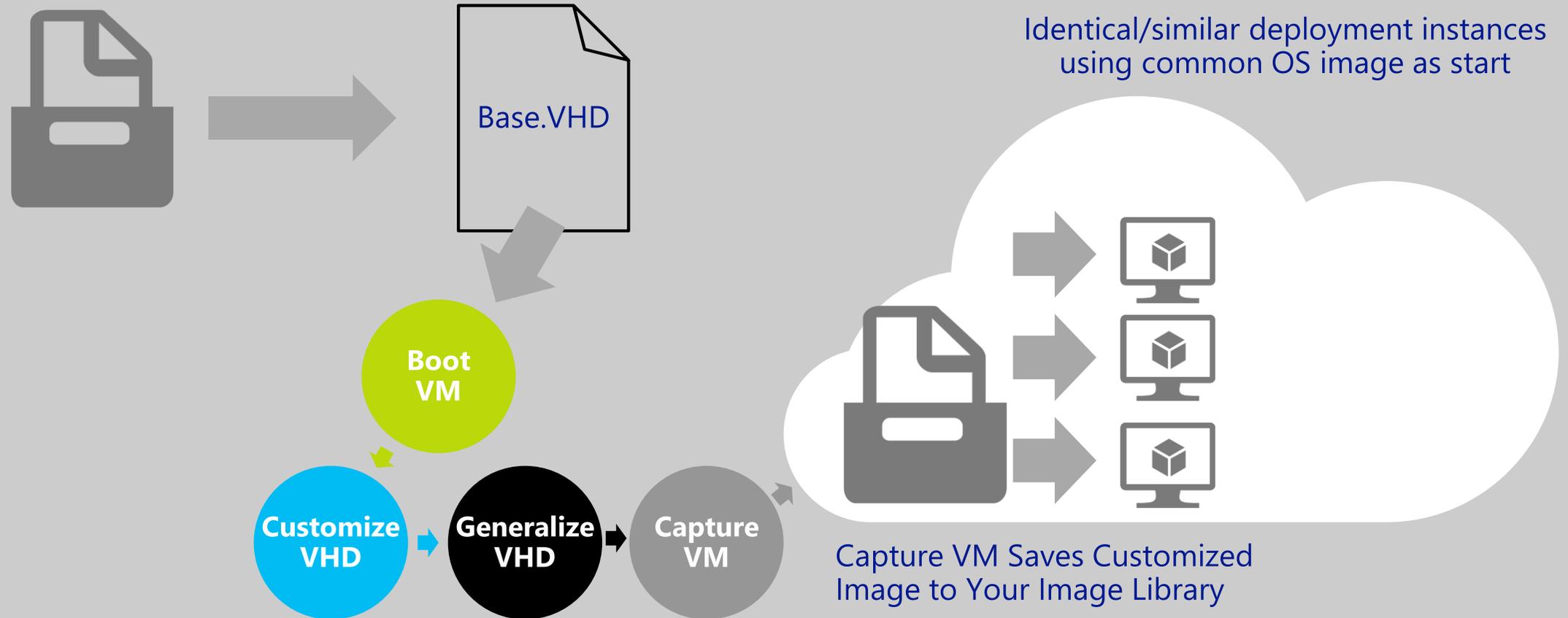
What will work on upload...

Images

Sysprep'd Windows Server VHD on Hyper-V

(Server 2008 R2 and Windows Server 2012)

Windows Azure Image

Disks

Windows Server VHD on Hyper-V

(Server 2008 R2 and Windows Server 2012)
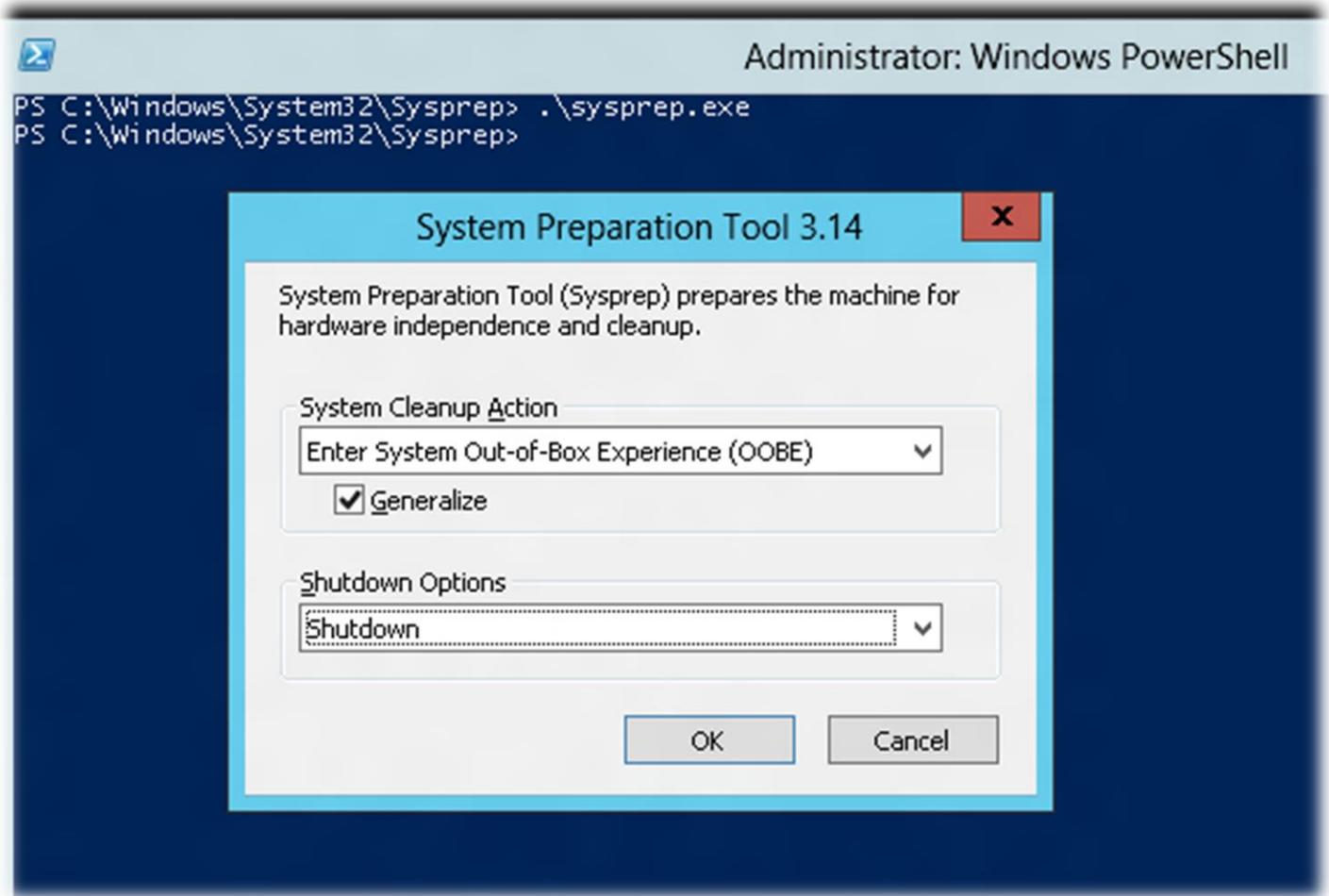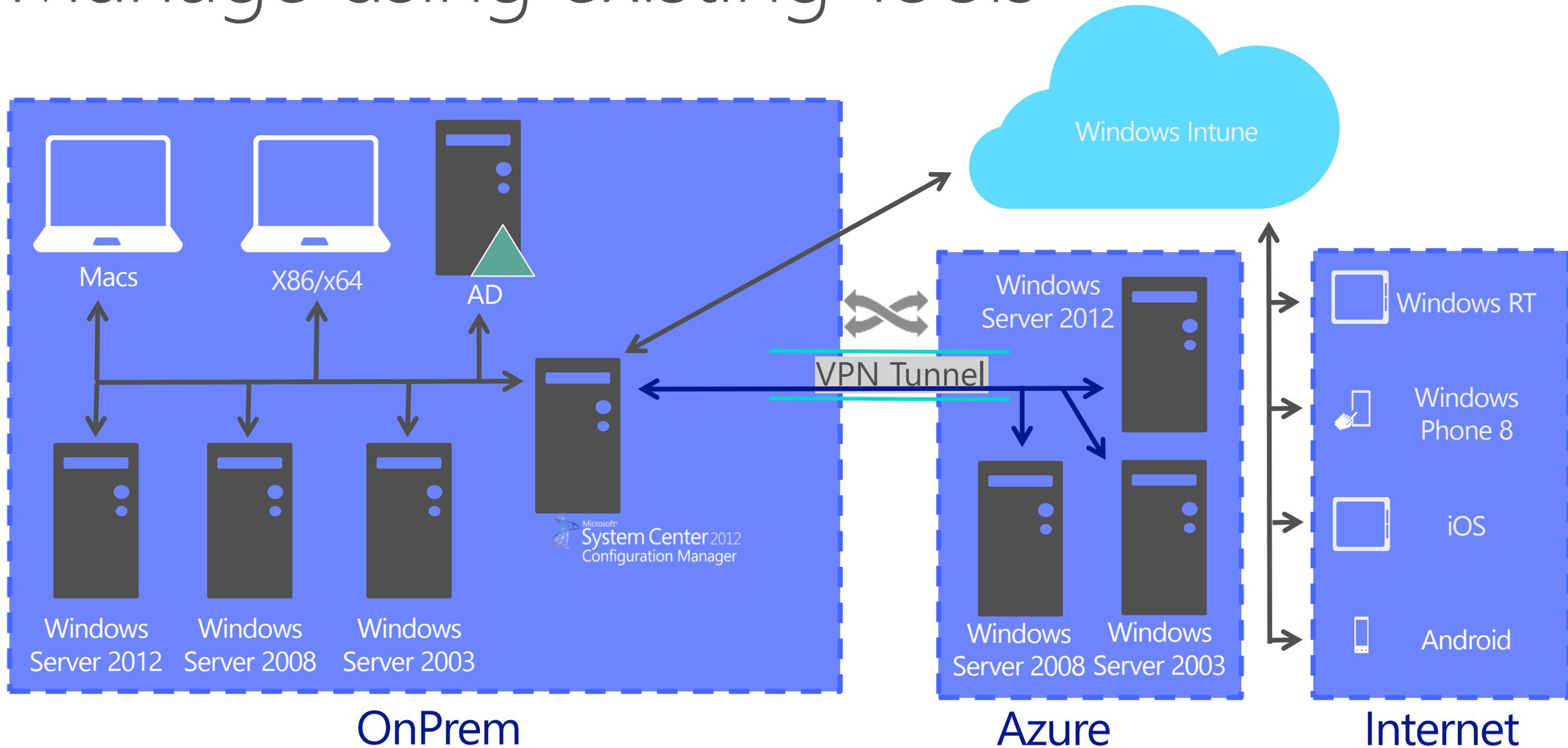
Windows Azure Disk

Tips on BYO Generalized Images

- Sysprep and "Generalize" is expected
- Do NOT put unattend.xml on the disk
- Do NOT install the Windows Azure Integration Components!!
- No WA Agent

Managing VMs

Manage using existing Tools

Macs

X86/x64

AD

Windows Intune

Windows Server 2012

VPN Tunnel

Microsoft® System Center 2012 Configuration Manager

Windows Server 2012

Windows Server 2008

Windows Server 2003

Windows Server 2008

Windows Server 2003

Windows RT

Windows Phone 8

iOS

Android

OnPrem

Azure

Internet

Scripting Capabilities

Full Support for IaaS

- Windows Azure PowerShell Cmdlets
- Cross Platform Scripting Built on node.js

Capabilities

- Provisioning, Removal
- Reboot, Start
- Import and Export VM settings
- Support for Windows and Linux VMs
- Domain Join at Provision for Windows
- Fully Customize VM with Data Disks and Endpoint Configuration
- Automate Virtual Network Settings
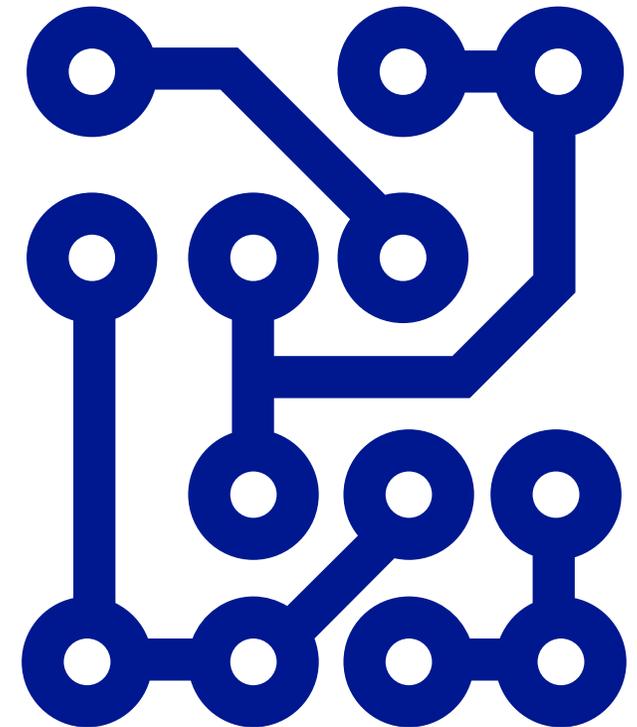
What can you do with PowerShell?

Automation
Query, Manage and Configure Virtual Machines across multiple subscriptions, cloud services and storage accounts.

Provision Fully Configured Virtual Machines
Domain Joined
Storage and Networking Configured

Virtual Networking
Completely Configure VNETs from a Script

Virtual Machine Management

Quick VM Provisioning Mode
Supports VM Creation in a Single Cmdlet

Advanced Provisioning Configuration Mode
Provision With: Endpoints, Data Disks
Configure: Cache Settings for OS/Data Disks and Subnet Names

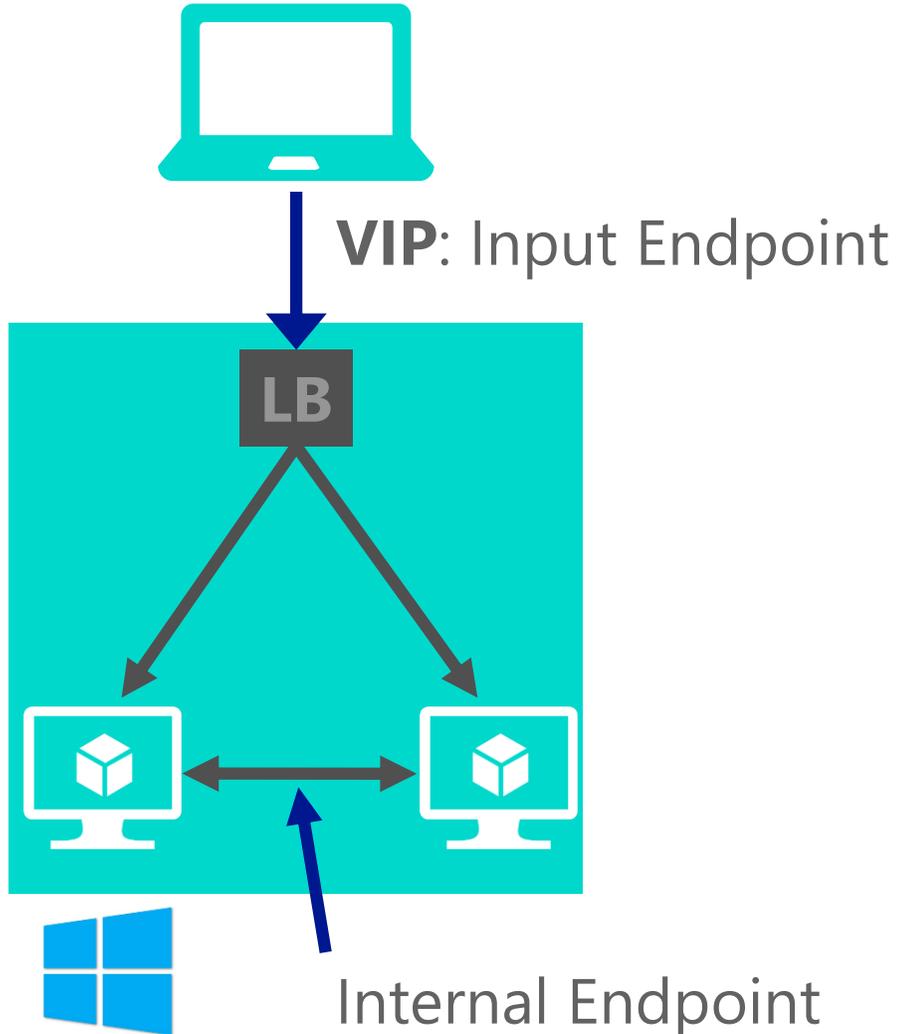## Create Multiple Pre-Defined VMs in a Batch
New-AzureVM -VMs $vm1, $vm2, $vm3

Demo

Azure Management with PowerShell

Virtual Networks

Overview: Connectivity in Azure

foo.cloudapp.net → **VIP**

VIP: Input Endpoint

LB

Internal Endpoint

Input Endpoint

Load balanced endpoint. Stable VIP per cloud service.

Single port per endpoint

Supported protocols: HTTP, HTTPS, TCP

Internal Endpoint

Instance-to-instance communication

Supported Protocols: TCP, UDP

Port ranges supported

Communication boundary = Deployment boundary

Overview: Connectivity in Azure

Single Input Endpoint

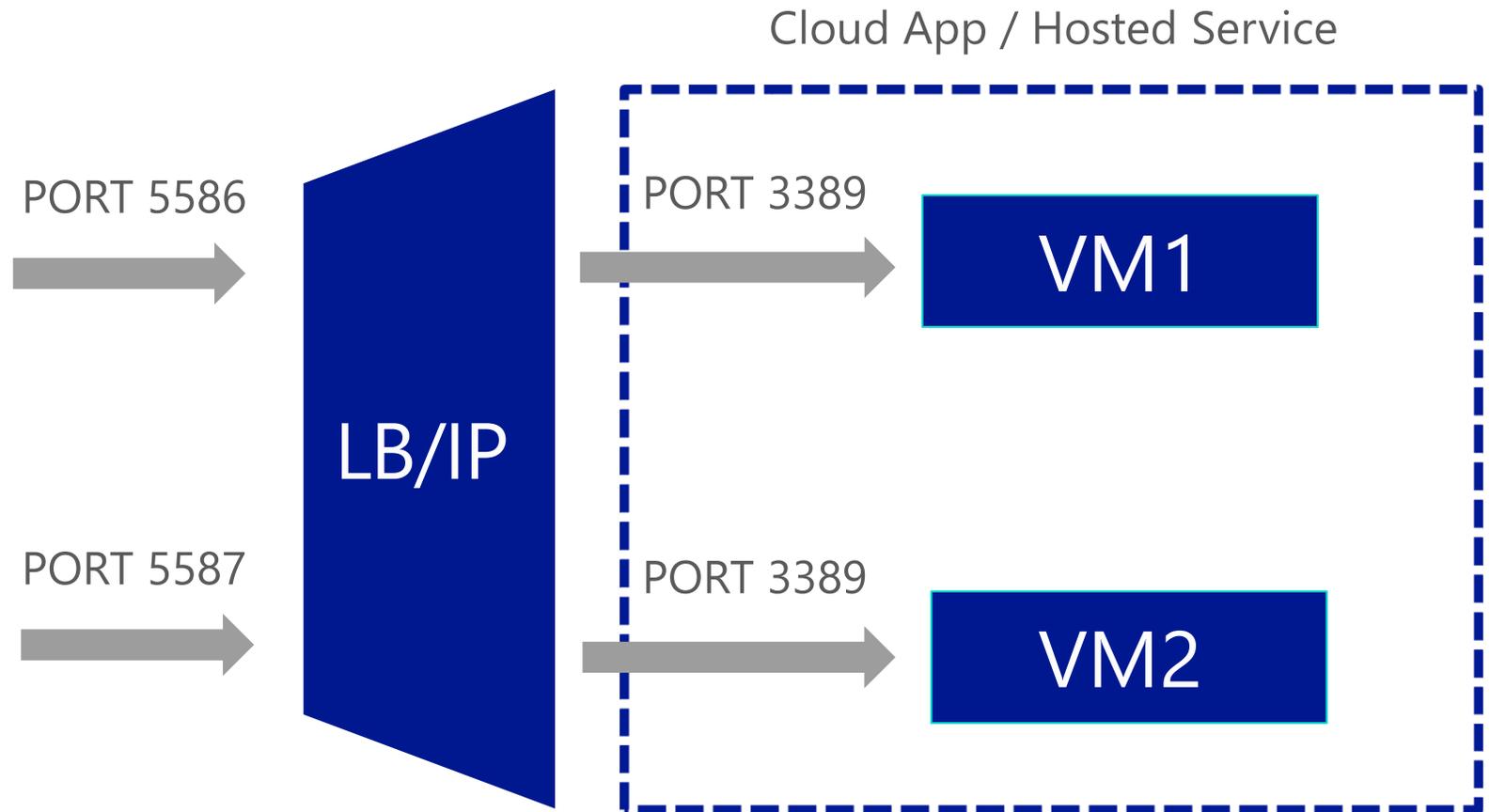Load balanced Input Endpoint

LB

Internal Endpoints
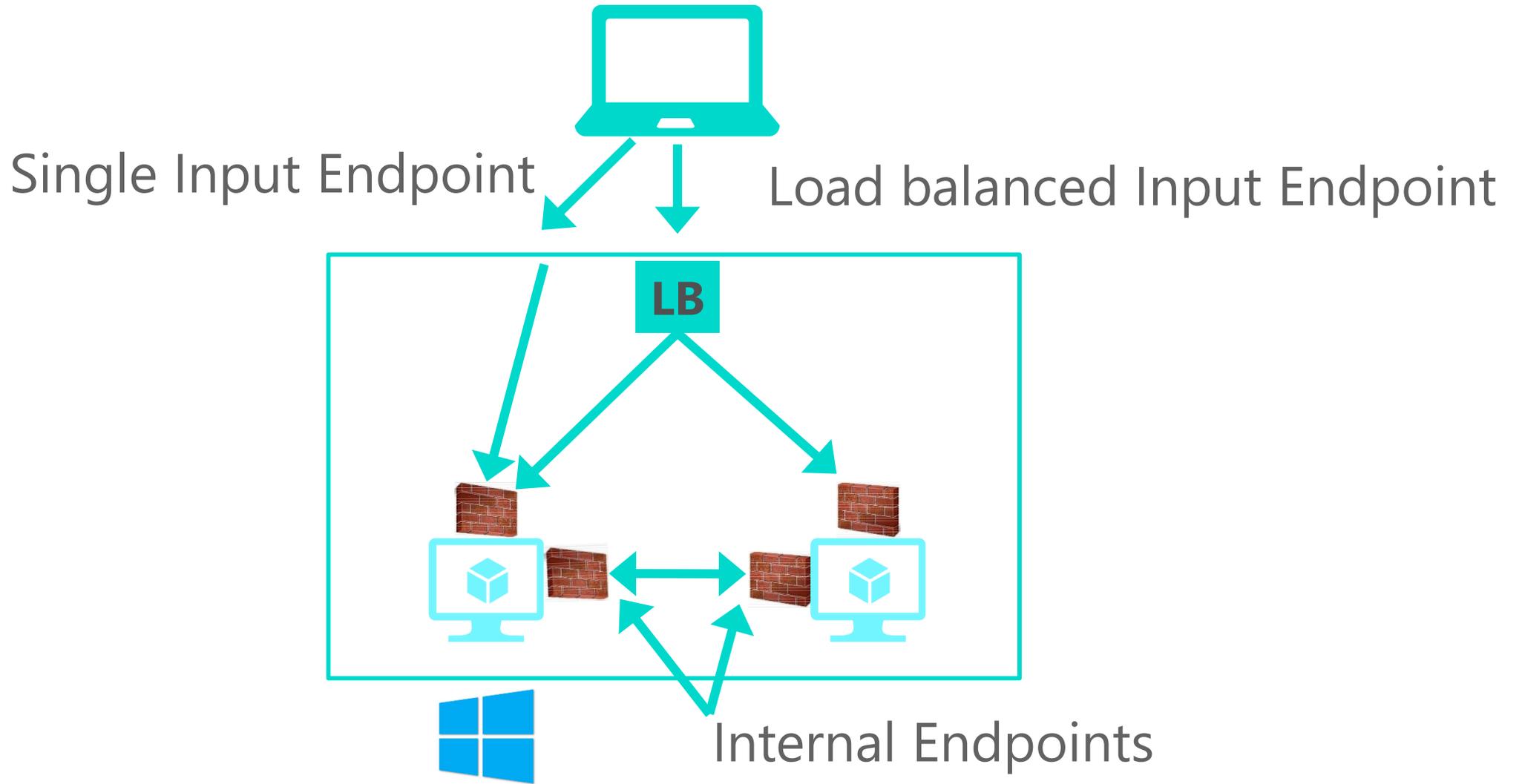
Port Forwarding Input Endpoints

Endpoint
Public Port
Local Port
Protocol (TCP/UDP)
Name

Cloud App / Hosted Service

PORT 5586

PORT 5587

LB/IP

PORT 3389 → VM1

PORT 3389 → VM2

Single Public IP Per Cloud Service

# Does Your App Need a Virtual Network?

IP Address Requirements

- Virtual Machines deployed into a virtual network have an infinite DHCP lease

Hybrid On-Premises Cloud Apps

- Requirement for connectivity between your data center and the public cloud

Connectivity between cloud services

- Deploying Active Directory in the Cloud or connecting a PaaS to IaaS Service
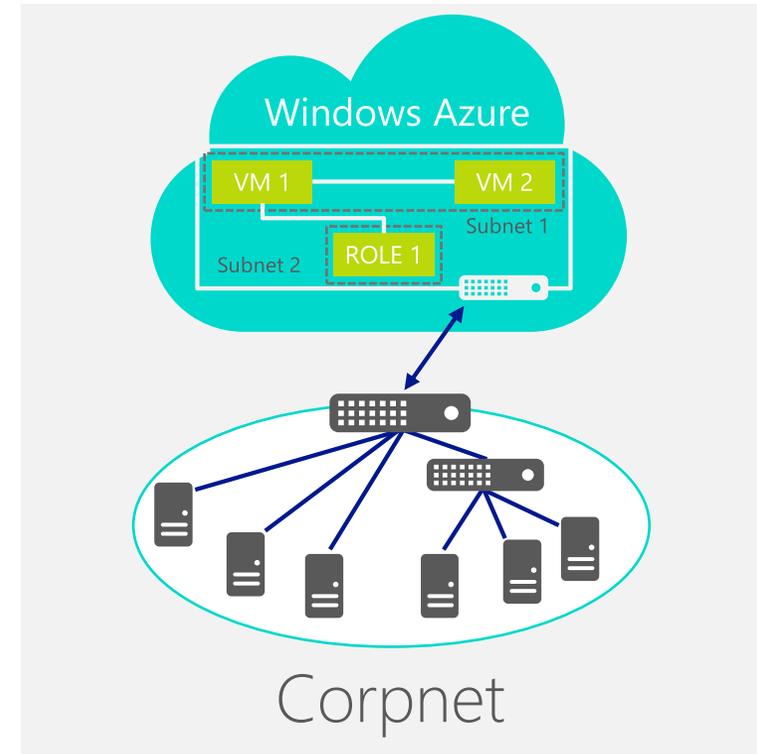
Demo

Creating a Virtual Network

Summary

IT Pro experience

Support for key workloads

Create Disks and Images

Manage VMs easily

Microsoft®