



CLOUDTRANSFORMERS
MASTERS IN CLOUDSOLUTIONS

The next generation
of software defined datacenter

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#LouisJ



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Gold
Microsoft Partner



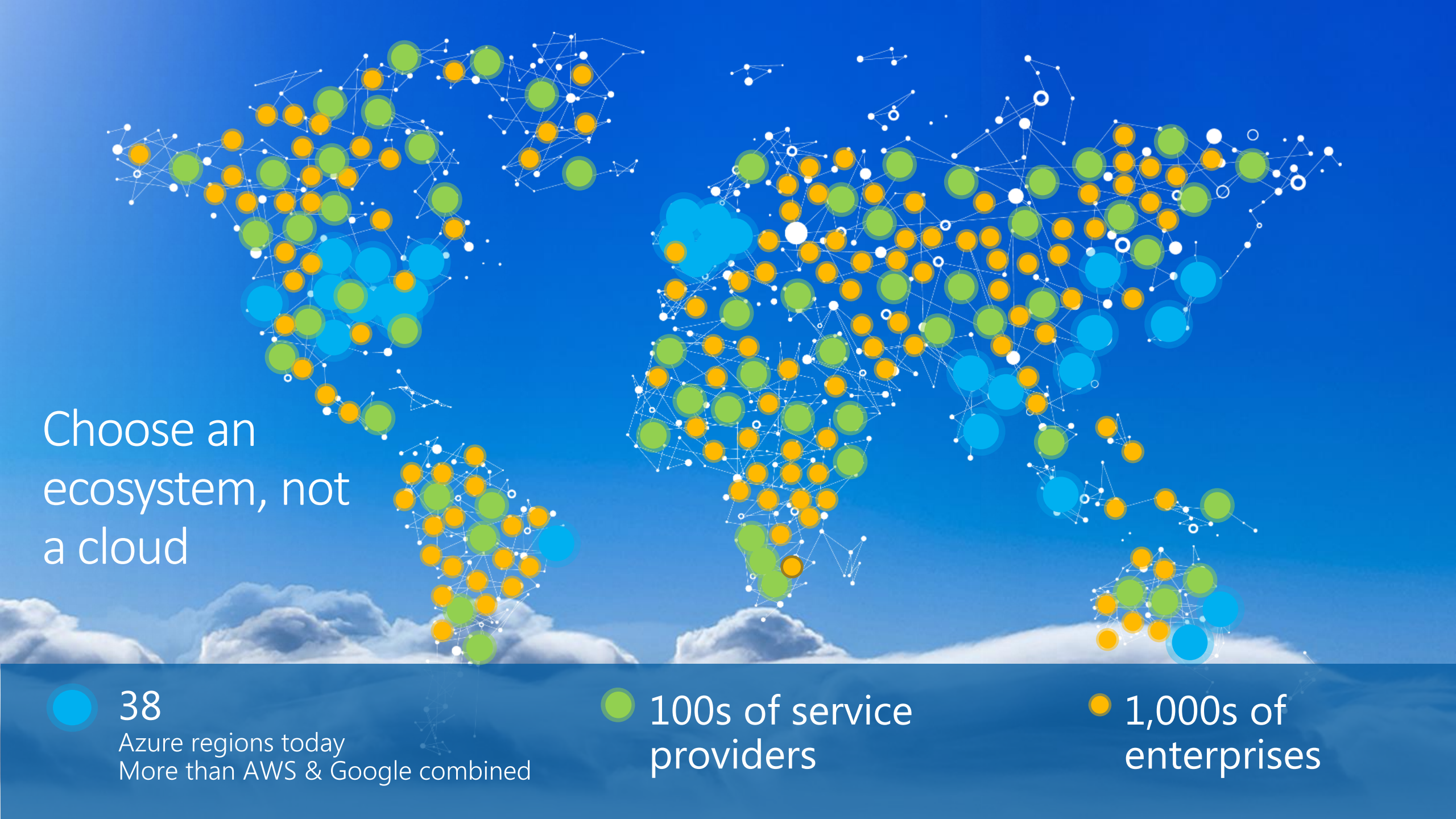
Windows
MASTERS

Cloud Architect
MCT

Agenda

- Intro – the next SDD
- Azure stack – What is it.
- Architecture
- Subscriptions
- Marketplace
- Devops

Azure Stack: What is it?



Choose an
ecosystem, not
a cloud



38

Azure regions today
More than AWS & Google combined



100s of service
providers



1,000s of
enterprises

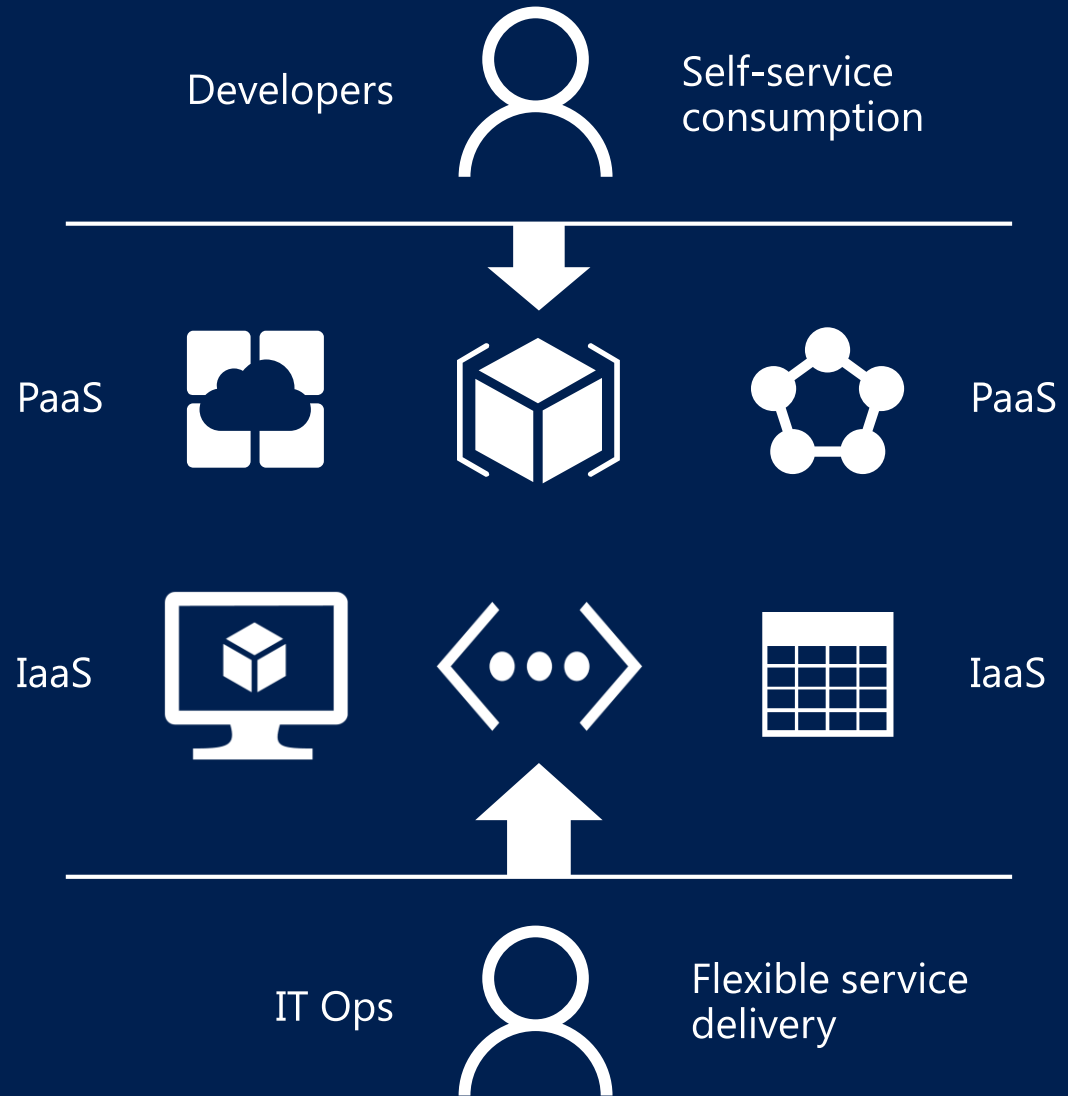
Azure services in your datacenter

Transform datacenter resources into cloud services

Self-service IaaS—Virtual Machines, Virtual Network, Storage, Docker-enabled containers

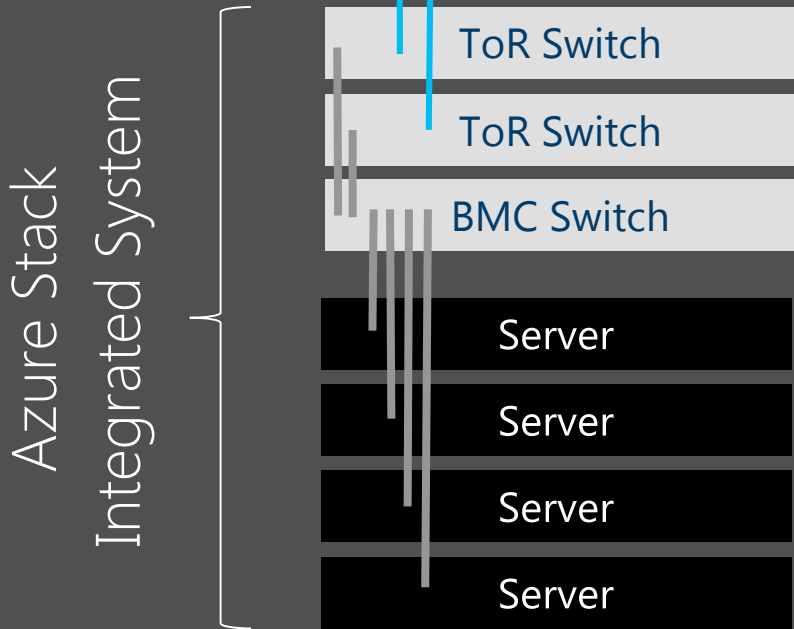
Self-service PaaS— App Service, Service Fabric*

Flexible service delivery with Azure-based management and automation tools



* - some components will be in Preview at Azure Stack GA

Azure Stack Integrated System



Azure Stack Integrated System (Life Cycle)



DELL EMC

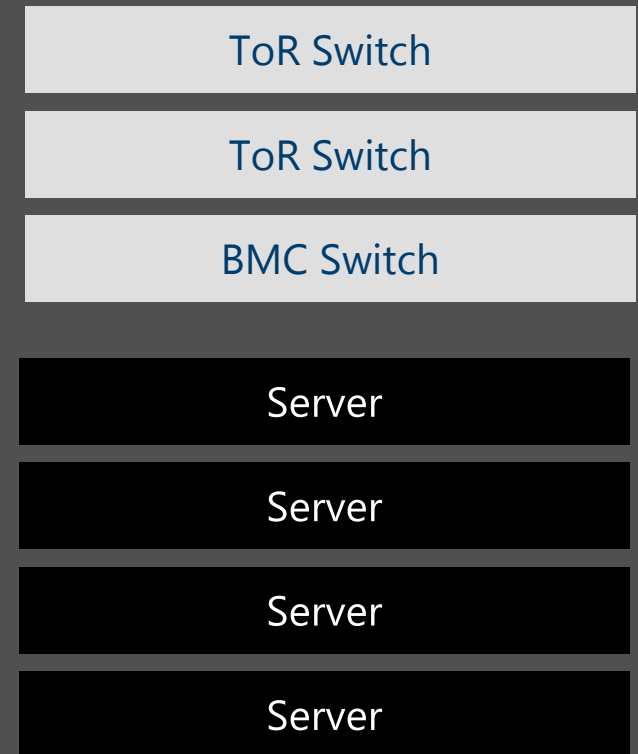
**Hewlett Packard
Enterprise**

Lenovo™



Peek into a Scale Unit

- 4 x servers + network switches
- Min spec for server
 - 2 x 10 Gb ports with RDMA
 - 256 GB Memory
 - 1 x boot media, 2 x SSD (cache) + 4 x HDD
 - 8 x cores per CPU, min 2 x CPU's
- Each server runs Windows Server 2016
- Failover cluster with hyperconverged storage spaces direct
- Resilient deployment of Azure Stack software in VM's
- Appropriate resiliency for each layer



Scale Unit

DEMO Azure Stack

Azure Stack Architecture

Azure Stack Scale Unit

Tenant Capacity

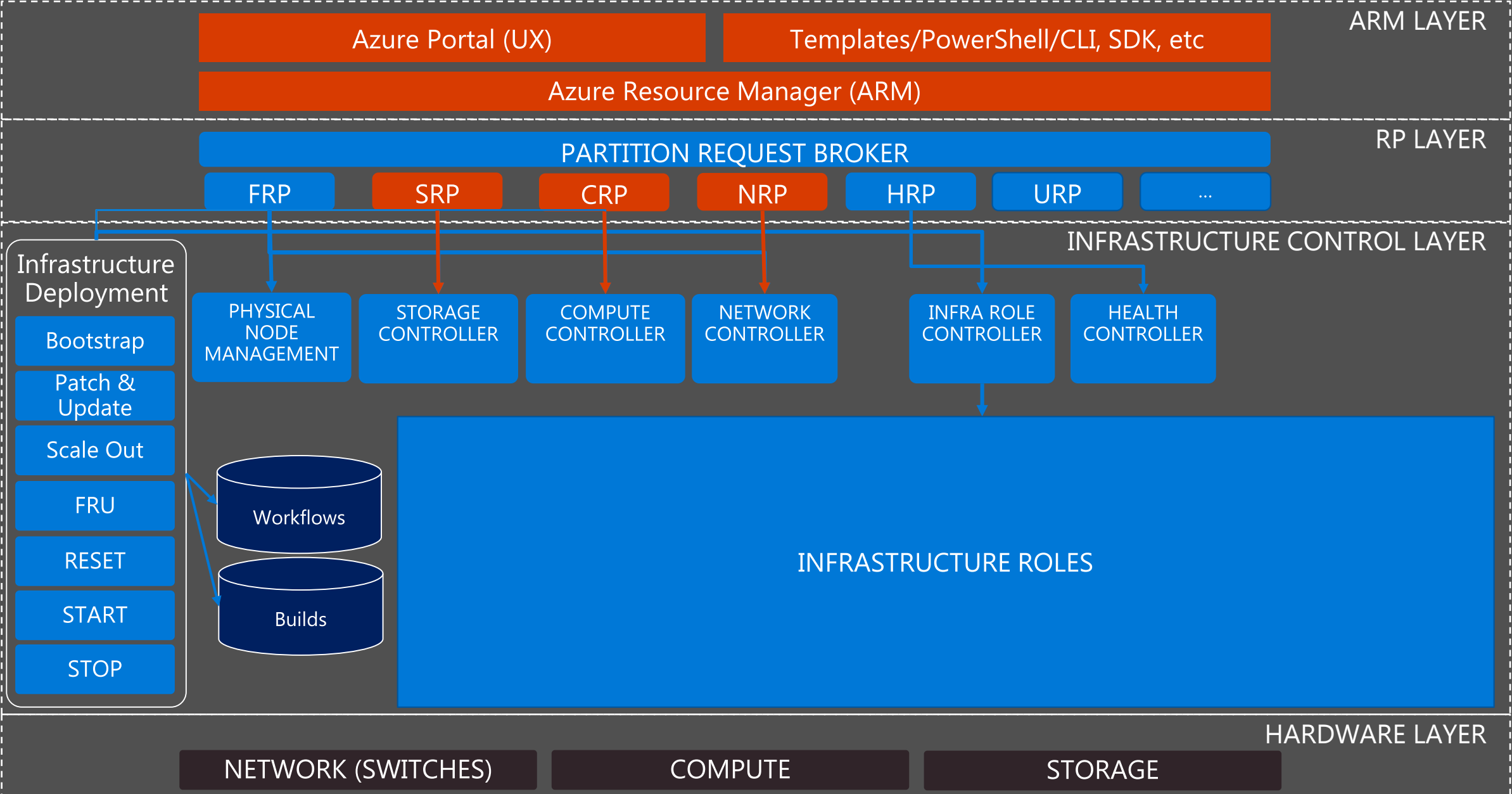
Patch and Update Reserve

Infrastructure Services

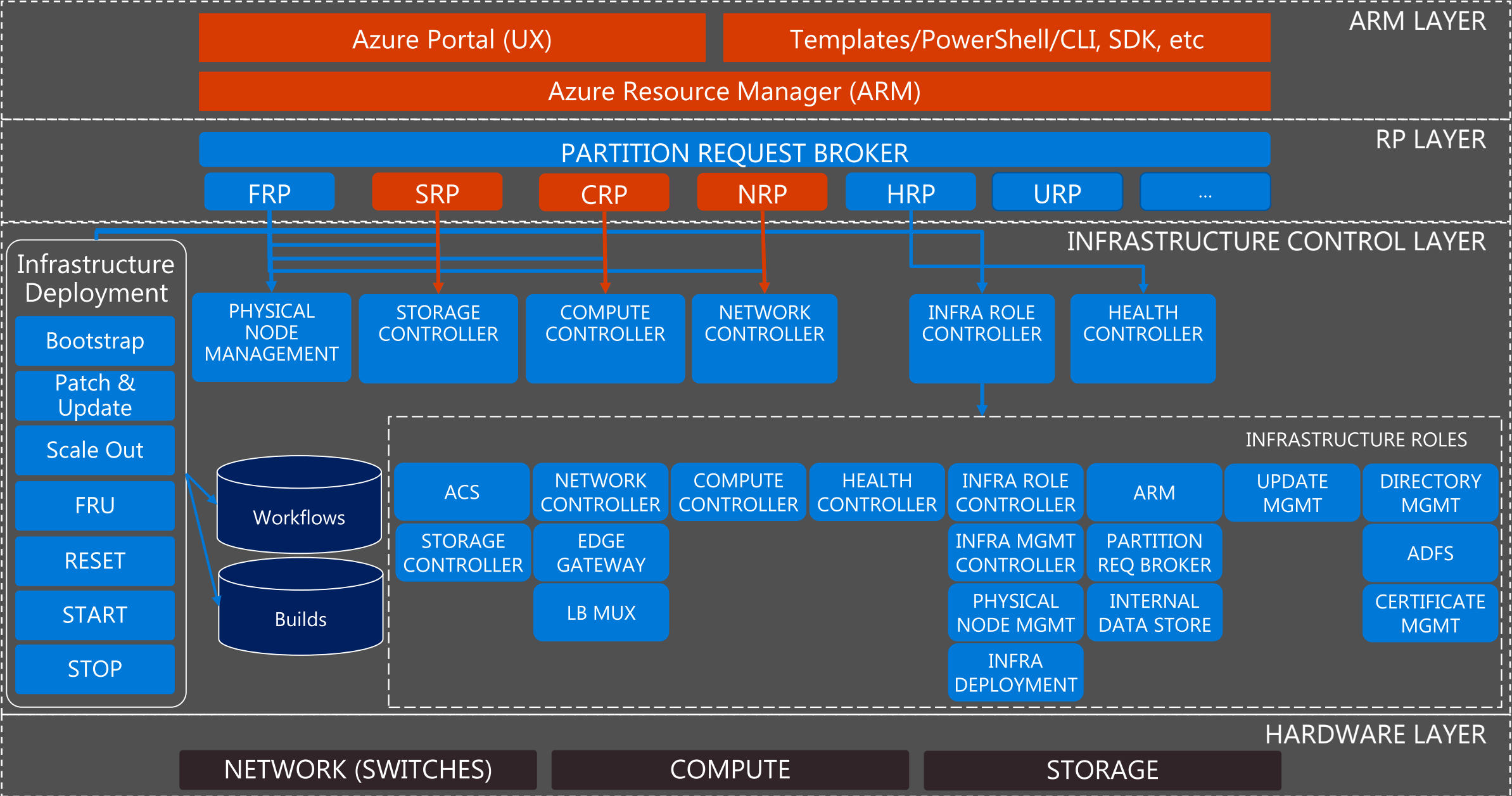


Network Switches

Azure Stack Architecture Overview



Azure Stack Architecture Overview



What is an Installation or Instance of Azure Stack?

Single instance of Azure Resource Manager (ARM)

1 or more Regions under management of ARM

1 or more Scale Units within a Region

4 or more servers within a Scale Unit

Azure Stack Region

Set of Scale Units that share same “physical location”

Under one physical and logical “administrator”

Networking requirements

- High-bandwidth / Low Latency

- e.g. Flat, Layer-3 Network

Other attributes of a region are *implied* by customer choices

Azure Stack Scale Unit

Associated with a single Region

1 or more Scale Units within a Region

Unit of Capacity Expansion

Fault Domain (Azure Consistency)

Alignment of Hardware SKU (Homogenous within Scale-Unit)

Azure Stack Scale Unit – Implementation Details

Windows Server 2016

Hyper-Converged Configuration

Windows Server Failover Cluster (1 to 1 correspondence with Scale Unit)

Storage Spaces Direct storage

Servers must share same top-of-rack (ToR) switch (ToR “pair”)

More than one Failover Cluster per ToR “pair” is possible

Addressing smaller entry points for Azure Stack solutions

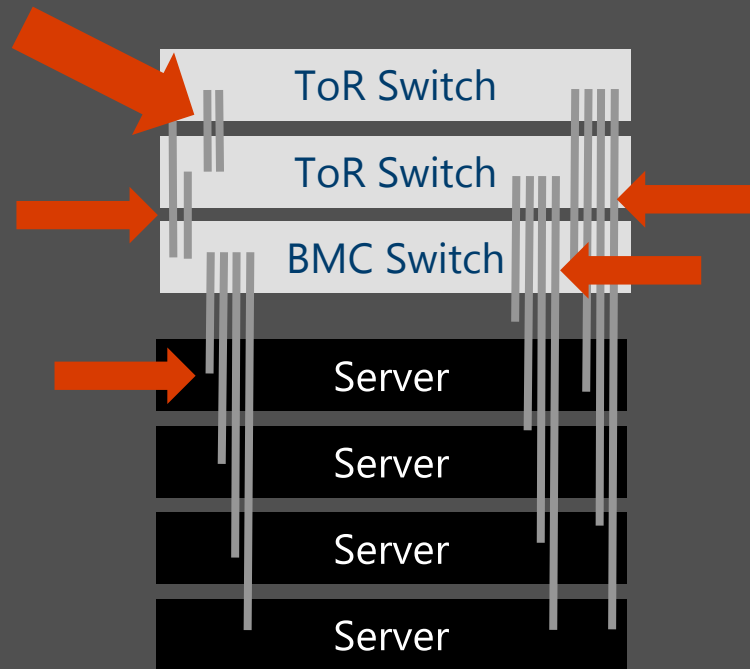
Eases capacity expansion

Multiple Scale Units used for scalability and fault separation

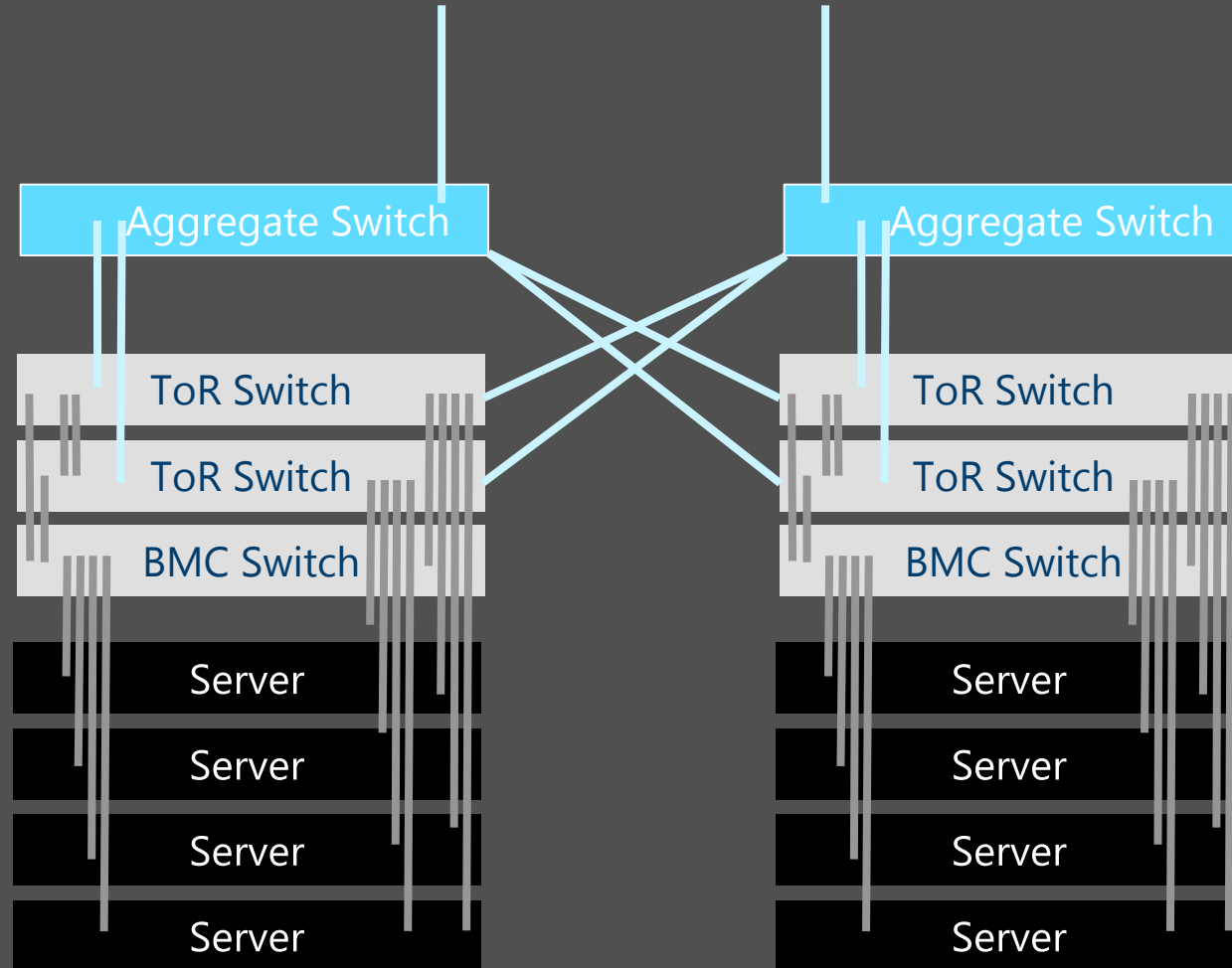
All servers within a single cluster must be homogenously configured

For example: CPU, Memory, NIC, Storage Devices

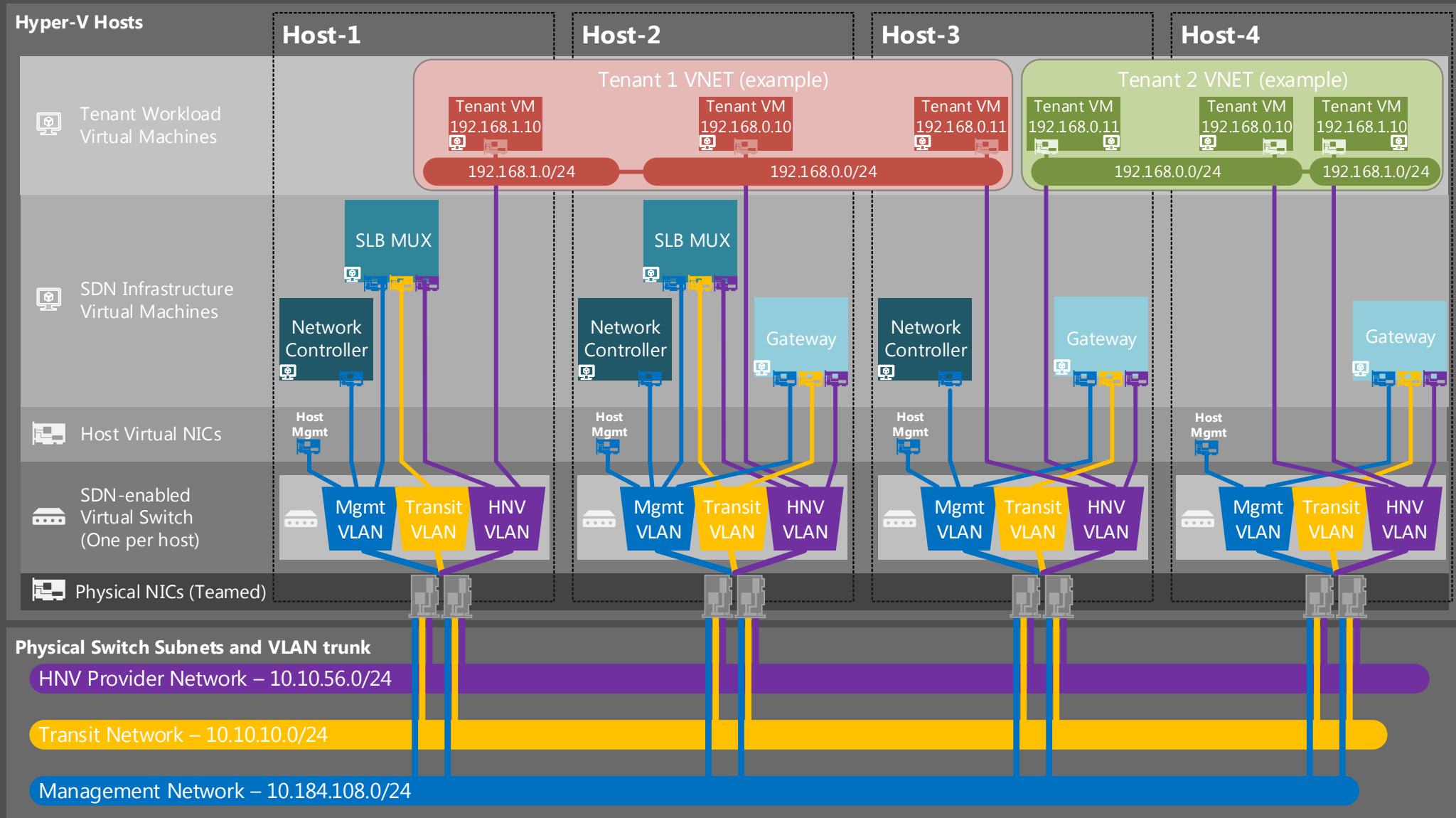
Network Switch Connectivity



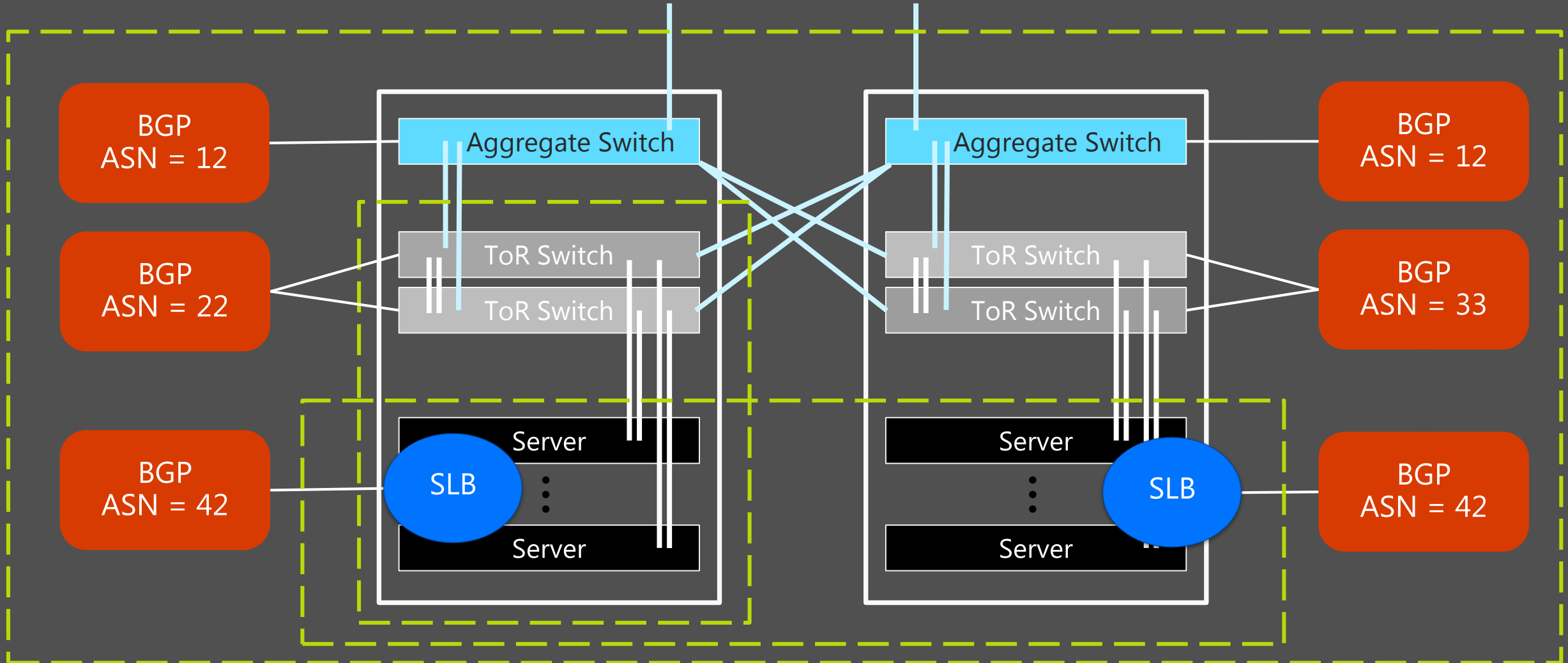
Network Switch Connectivity



Windows Server 2016 – HNV Networking



Physical to Logical Switch Transition



Storage Stack

Deployment Choice

Hyper-Converged

File System (CSVFS with ReFS)

Cluster-wide data access

Fast VHD(X) creation, expansion and checkpoints

Storage Spaces

Single scalable pool with all disk devices (except boot)

Multiple virtual disks per pool (Mirrored or Parity)

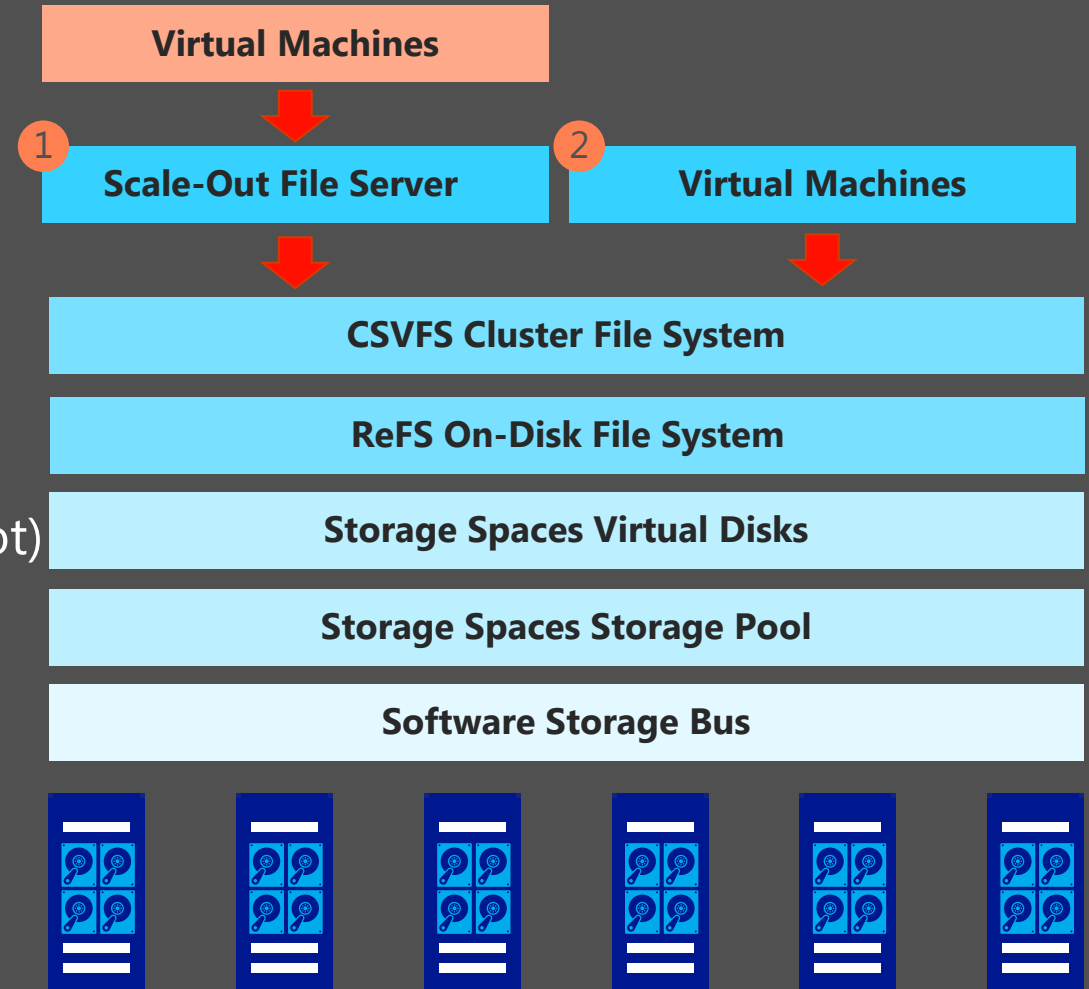
Software Storage Bus

Storage Bus Cache

Leverages SMB3 and SMB Direct

Servers with local disks

SATA, SAS and NVMe



Azure Stack Storage

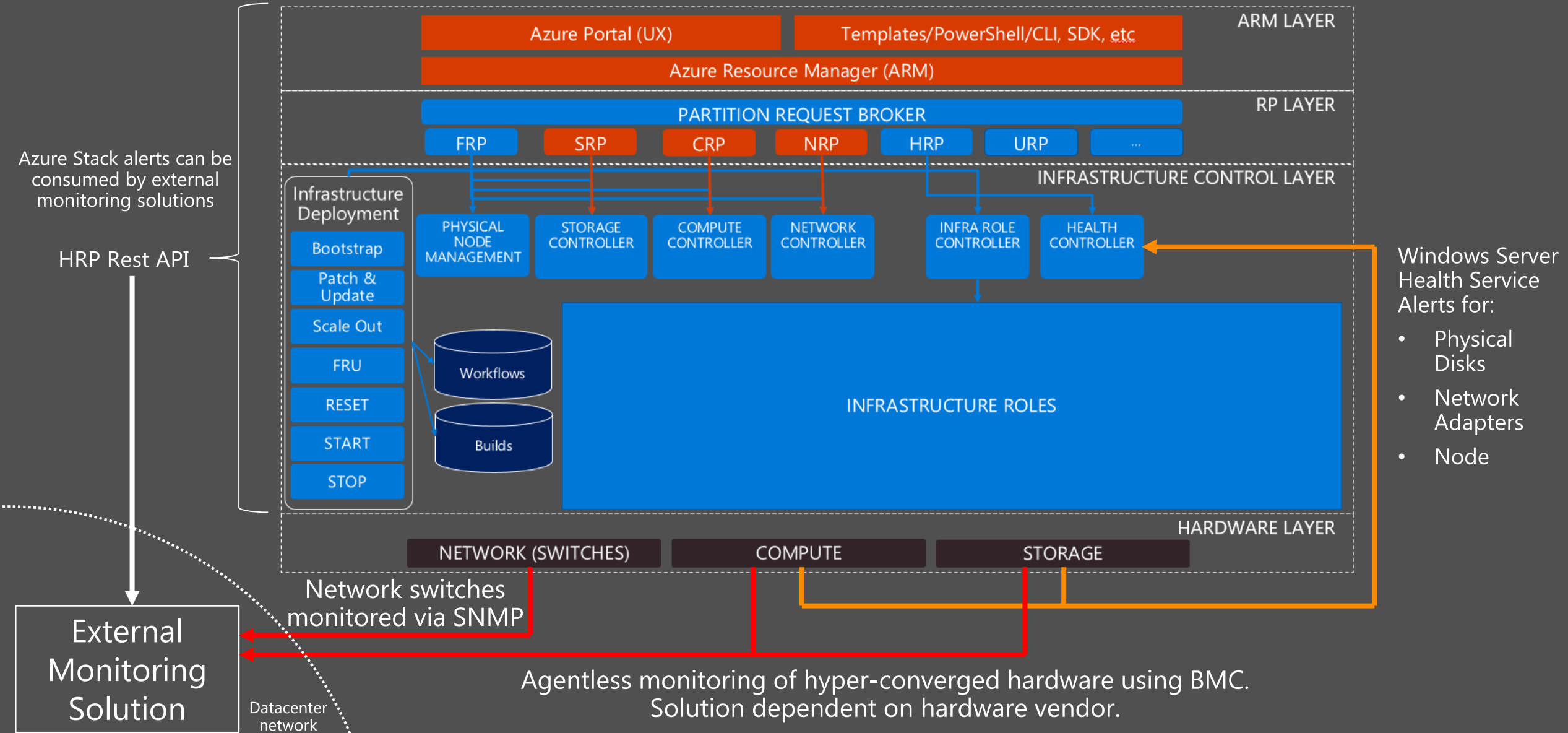
ReFS Configuration

- Single storage spaces pool per cluster
- One ReFS file system "per server"
- Accommodates add / remove resources
- Mirrored or Multi-resilient Virtual Disks

Hardware Requirements

- Minimum 2 Cache Devices
- Minimum 4 Capacity Devices (likely will be 8-12)

Hardware Monitoring Overview



Patching and Update

Pre-validated updates for software and firmware

Designed to not disrupt tenant workloads

Designed to be reliable, single-sourced and easy to use

Designed to allow focus on other aspects of the business


OPERATIONS

Updates

Current Version: 1512

Last checked: 2015-12-24

Update in progress



UPDATES

Update Rollup for Jan 2016 in progress: 5 out of 42 completed. See details →

Available updates

NAME	STATE	VERSION	PACKAGE SIZE
Update Rollup for Apr 2016	1602 required	1604.2	4.2 MB
Update Rollup for Apr 2016	1602 required	1604	2.3 MB
Update Rollup for Mar 2016	1602 required	1603	5.6 MB
Update Rollup for Feb 2016	Available	1602	2.8 MB
Update Rollup for Jan 2016	In progress	1601	5.2 MB

Update Details

Update rollup for Jan 2016

Update Now

View Log

View KB Article

VERSION

1601

DATE AVAILABLE

2016-01-02

DATE STARTED

2016-01-11

STARTED BY

MAS_ADMIN

DURATION (HH:MM)

01:03 (in progress)

PACKAGE SIZE

5.2 MB

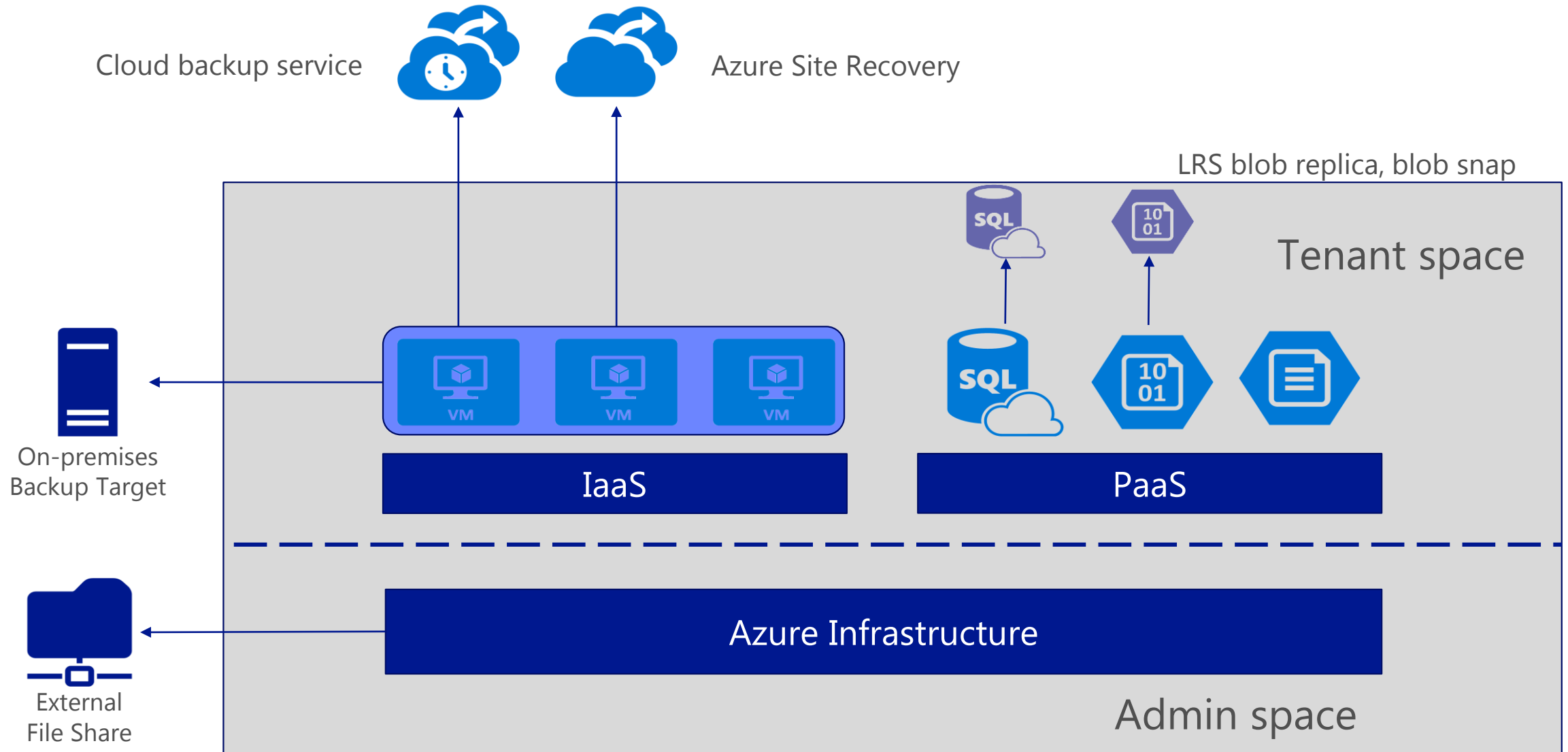
DETAILS

For more info see [HTTP://support.MAS.com/KB/3014412](http://support.MAS.com/KB/3014412)

NAME	PROGRESS	STATUS	DURATION
NC	58% completed	In progress	00:43
SLB	12% completed	In progress	00:12
Gateway	5% completed	In progress	00:08
Console	Not started	-	-
WOSS	Not started	-	-
WSUS	Not started	-	-

Update History			
NAME	STATE	VERSION	DATE STARTED
Update Rollup for Dec 2015	Finished	1512	2015-12-24
Update Rollup for Nov 2015	Finished	1511	2015-11-26
Update Rollup for Oct 2015	Finished	1510	2015-10-21
Update Rollup for Sept 2015	Finished	1509	2015-09-27
Update Rollup for Aug 2015	Finished	1508	2015-09-05

Azure Stack: Backup and Disaster Recovery



Azure Stack: Security Principles for Azure Stack

Assume Breach

- Constrained admin

 - Least privilege, RBAC

 - Just Enough Administration

- Application whitelisting

- Network whitelisting

- Customized auditing

Hardened by default

- Data at rest encryption

- Security OS baseline

- Disabled legacy protocols (e.g. NTLM)

- Customized AV configurations



Subscriptions

Mapping offers to usage to \$\$

- 1. User Subscribes to an Offer
- 2. Gets a Subscription ID
- 3. Provisions Resources with Subscription ID
- 4. All Meters are emitted with Subscription ID
- 5. Your Commerce System applies \$\$ to meter
- 6. You send your Customer a Bill

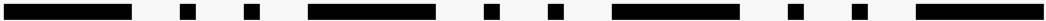


2AFD8568-8192-4EE6-8883-04A31650D016



Bill	
_____	\$
_____	\$
_____	\$
_____	\$
_____	\$

2AFD8568-8192-4EE6-8883-04A31650D016



Devops

Hybrid

Experiences

One Azure Ecosystem

Tools

Azure SDK

Application Content

(Templates, Images, Extensions, ...)

Azure Cloud Architecture

Azure Resource Manager

Core Services

Regions

Additional Services

Foundational Services

Cloud Infrastructure

Instances Of

Public

National

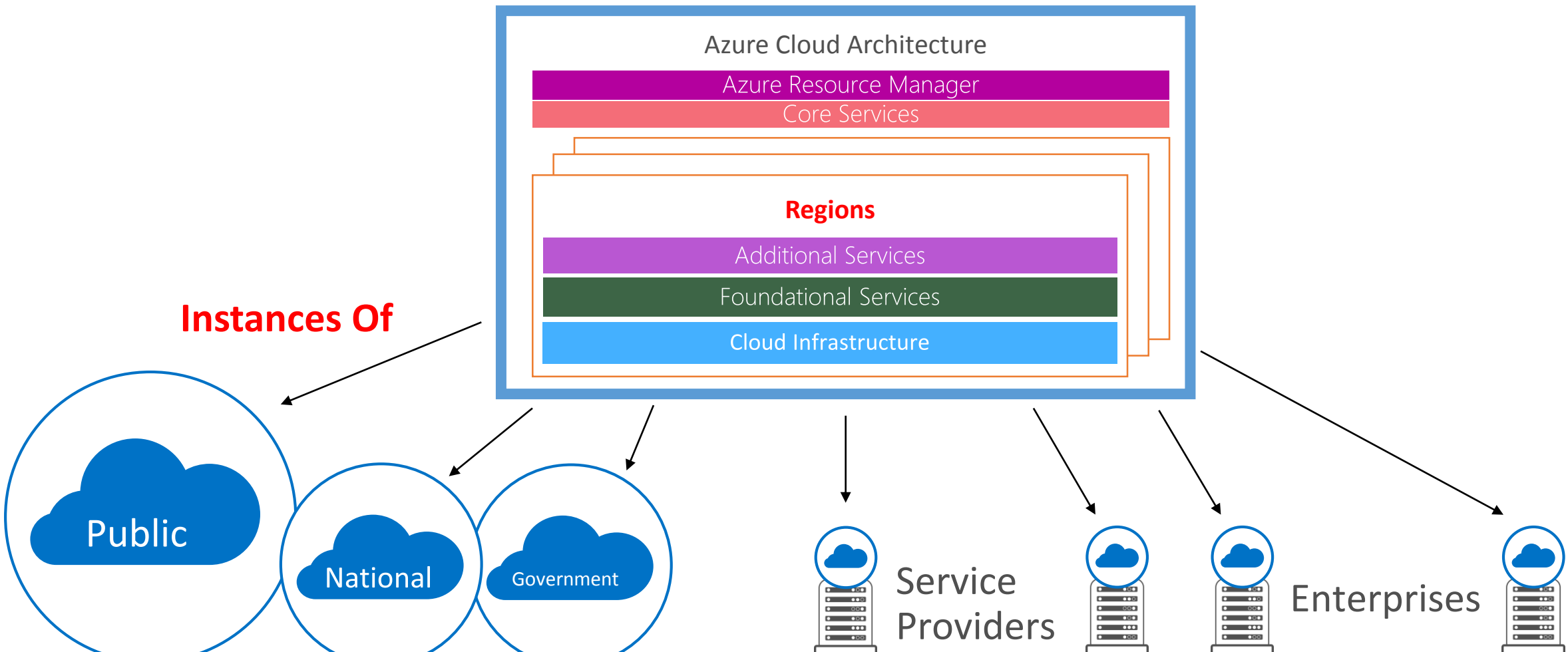
Government

Microsoft Azure

Service
Providers

Enterprises

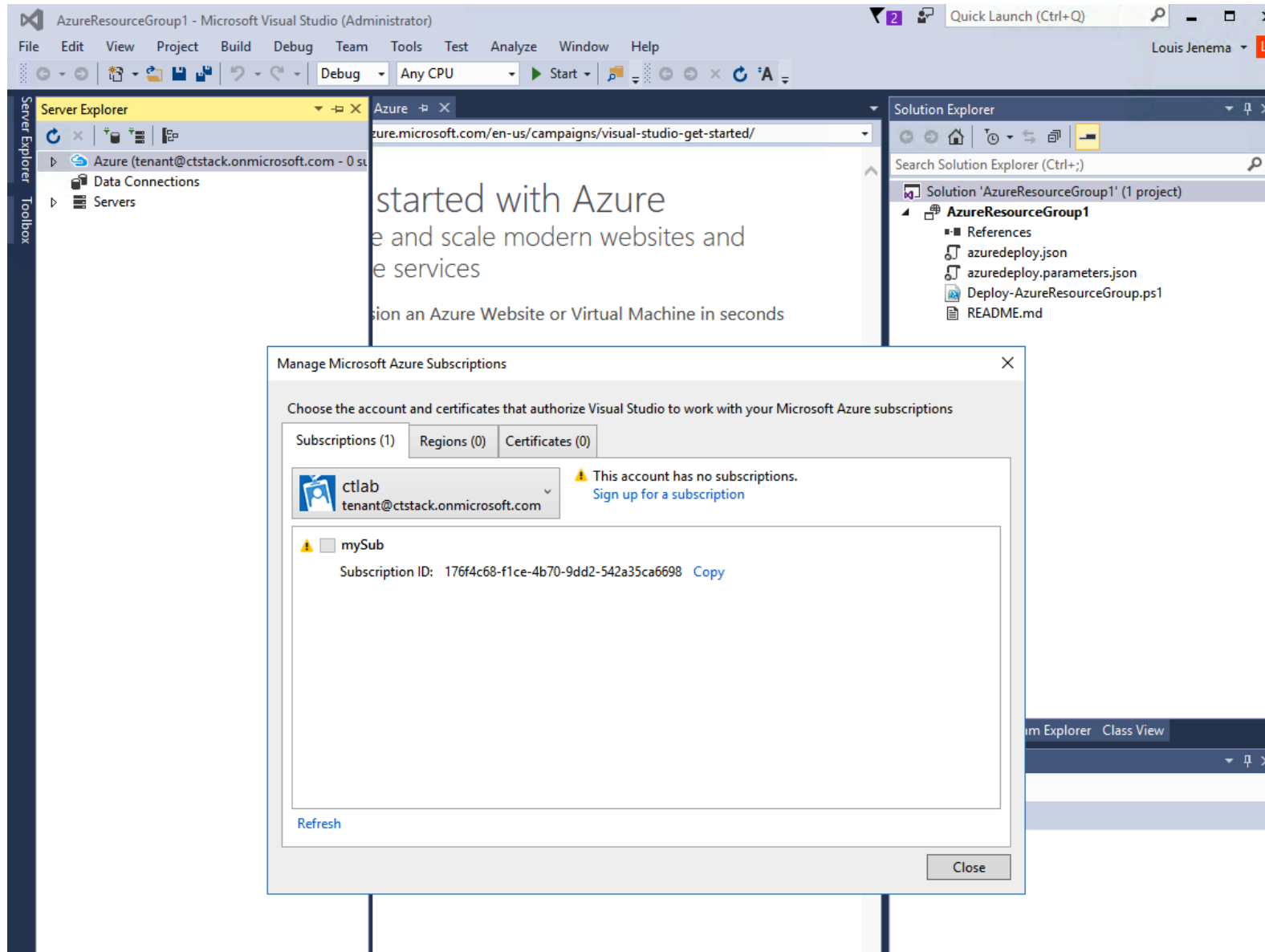
Microsoft Azure Stack



Software defined

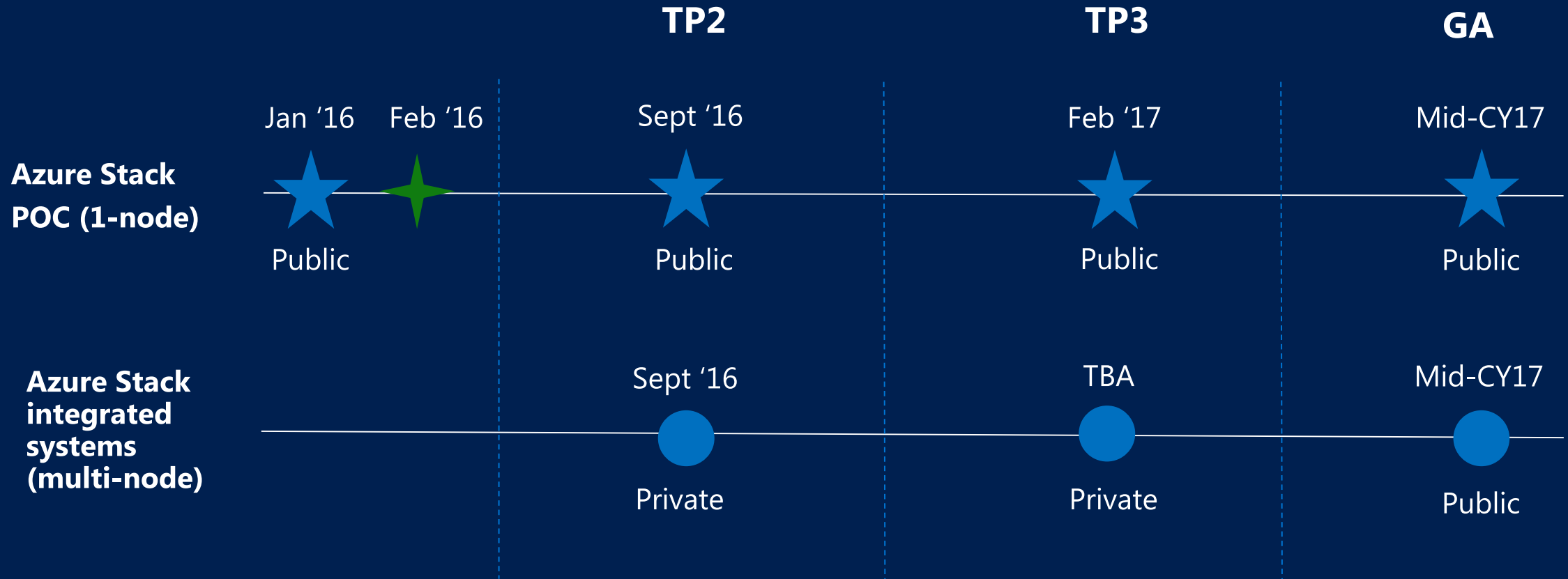
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      }
    }
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```

Visual Studio



Demo

Timelines



Legend



Each Technical Preview (TP) will include "foundational" Azure services such as Compute, Networking, Storage. In between TPs, we will release incremental updates with new customer scenarios.



Following each TP, we will release updates for "additional" Azure services, such as Web Apps.



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Thanks!!
Q & A



Windows
MASTERS

<http://windowsmasters.nl>