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The next generation

of software defined datacenter

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#LouisJ

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Cloud Architect
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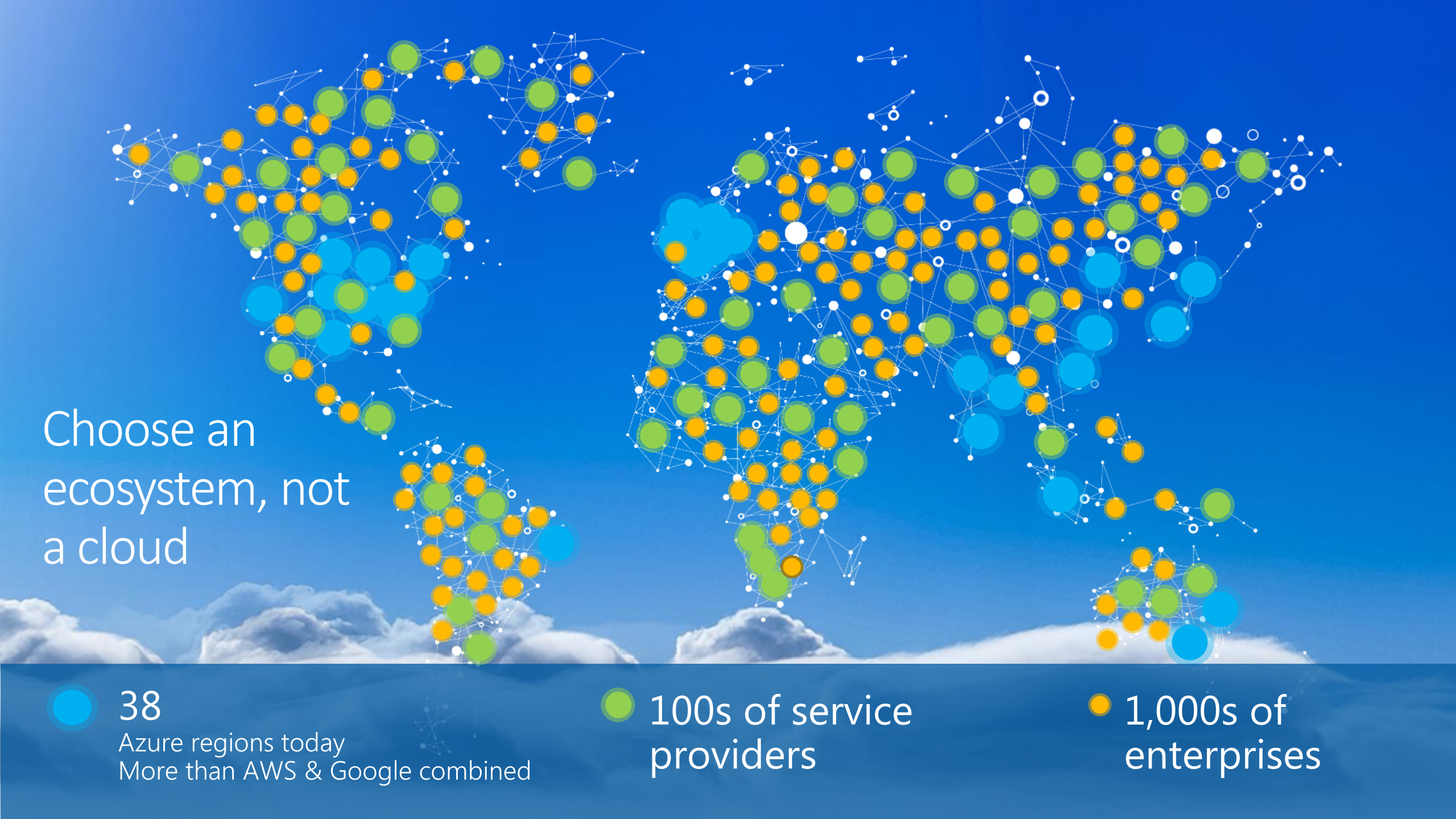
Agenda

- 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

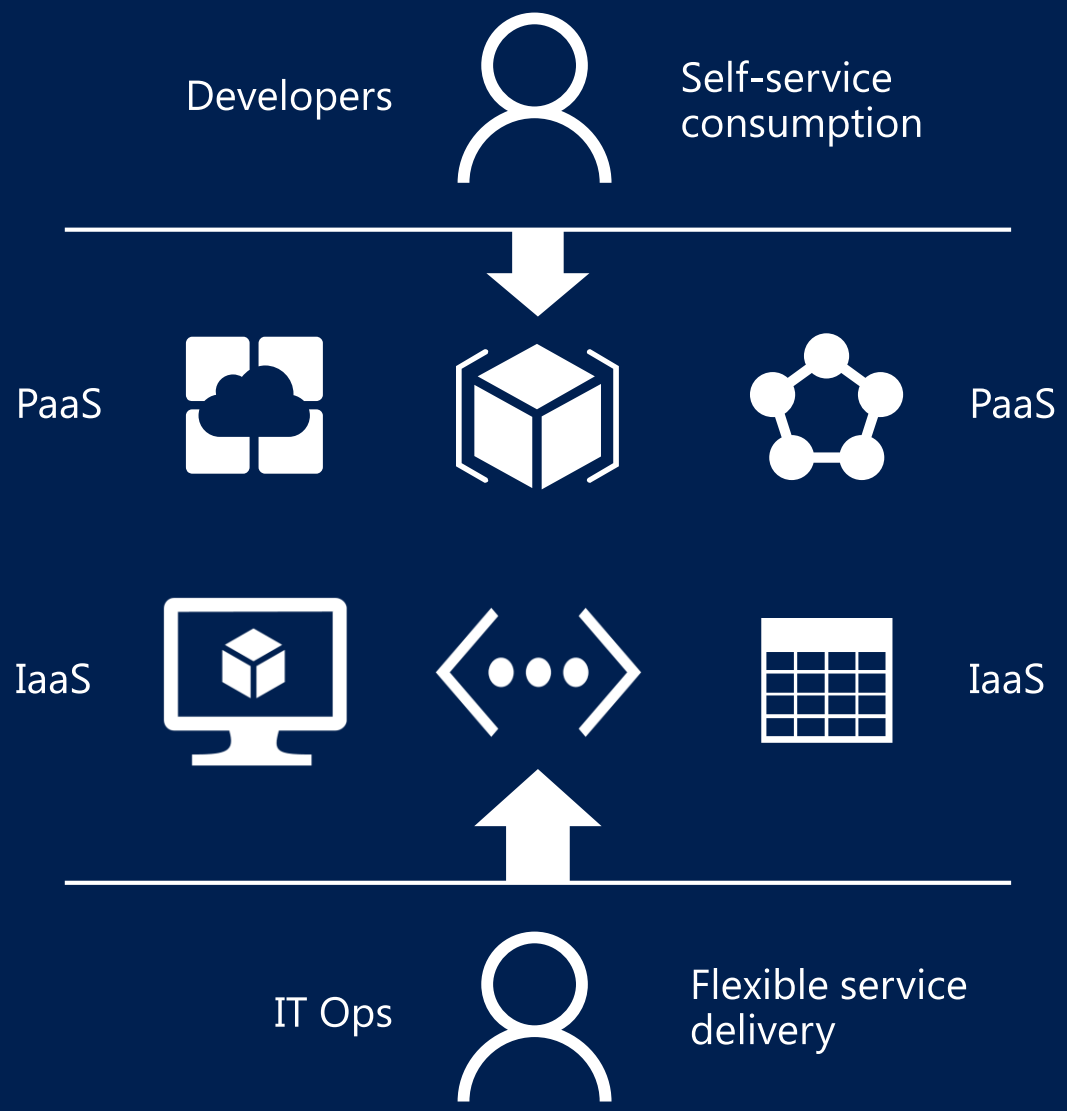
Azure services in your datacenter

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

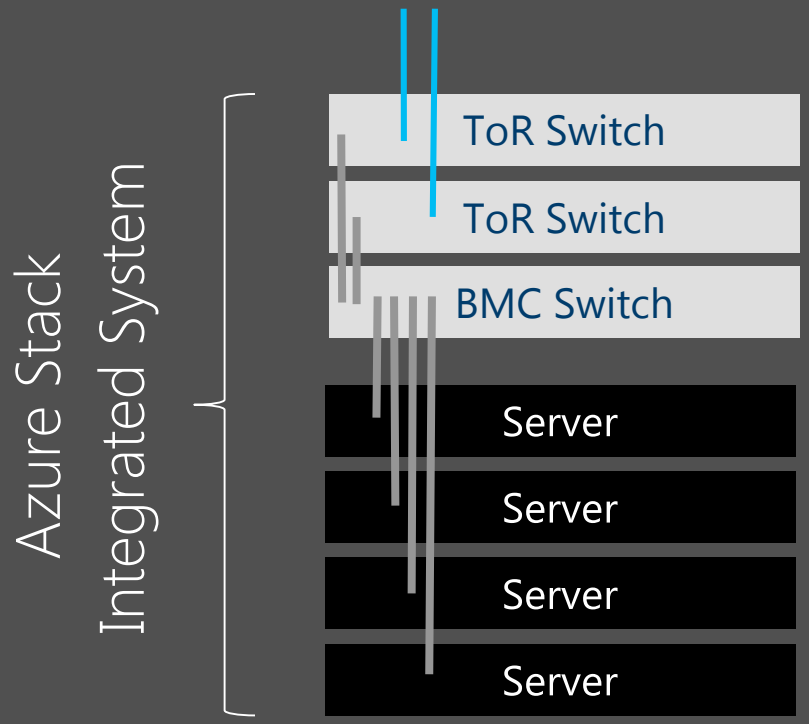
Azure Stack Integrated System

Software

Hardware

Support

Services



Azure Stack Integrated System (Life Cycle)

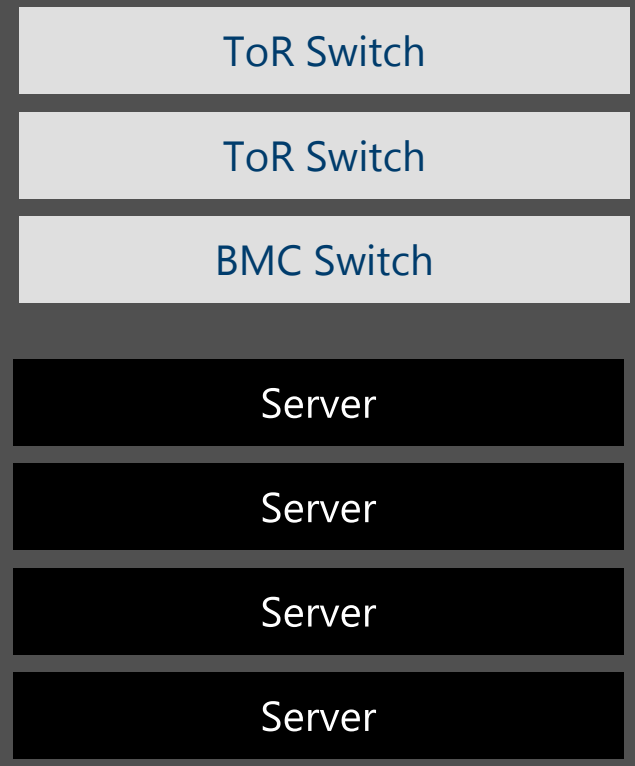
DELL EMC

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

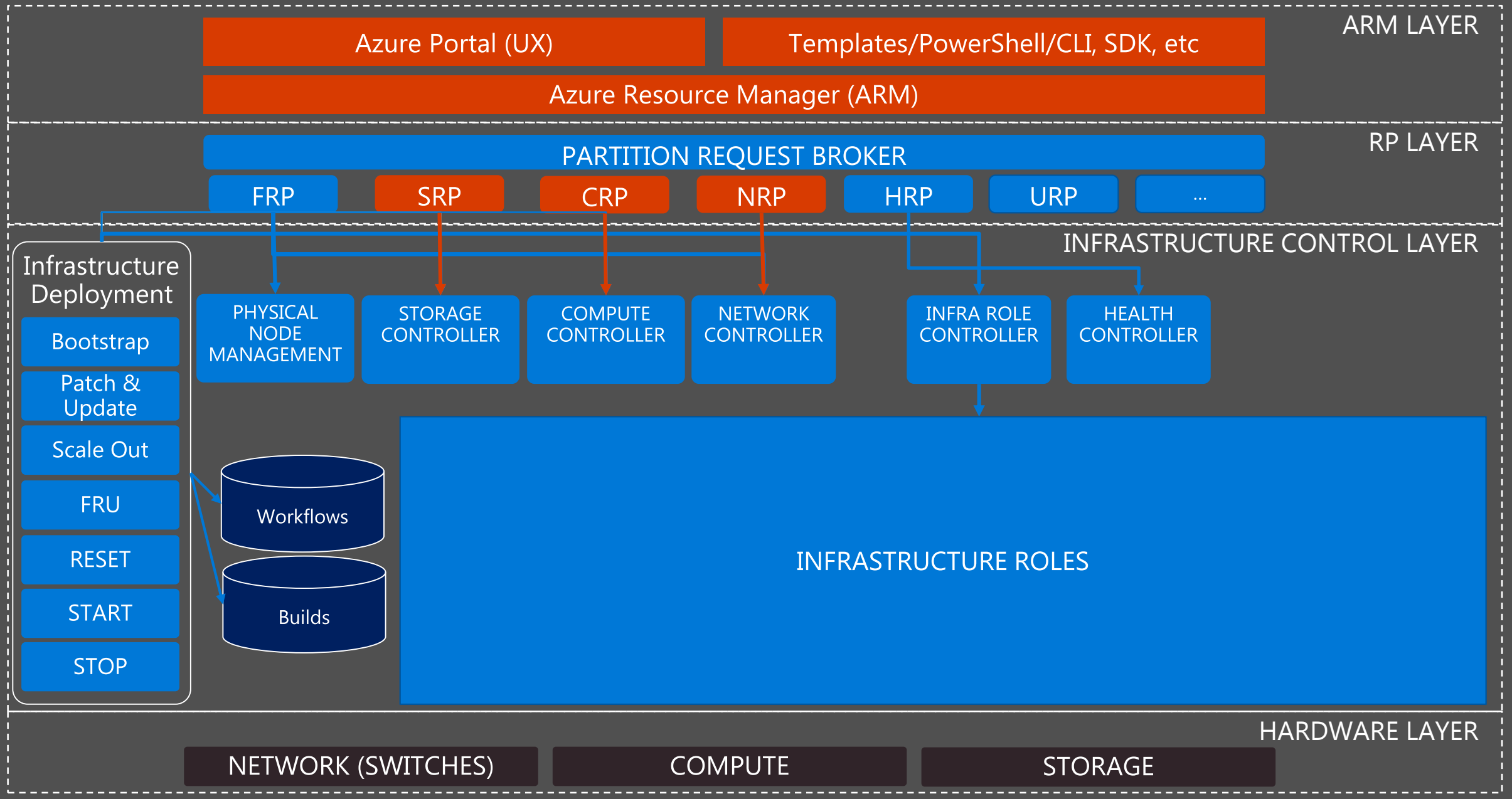
Tenant Capacity

Patch and Update Reserve

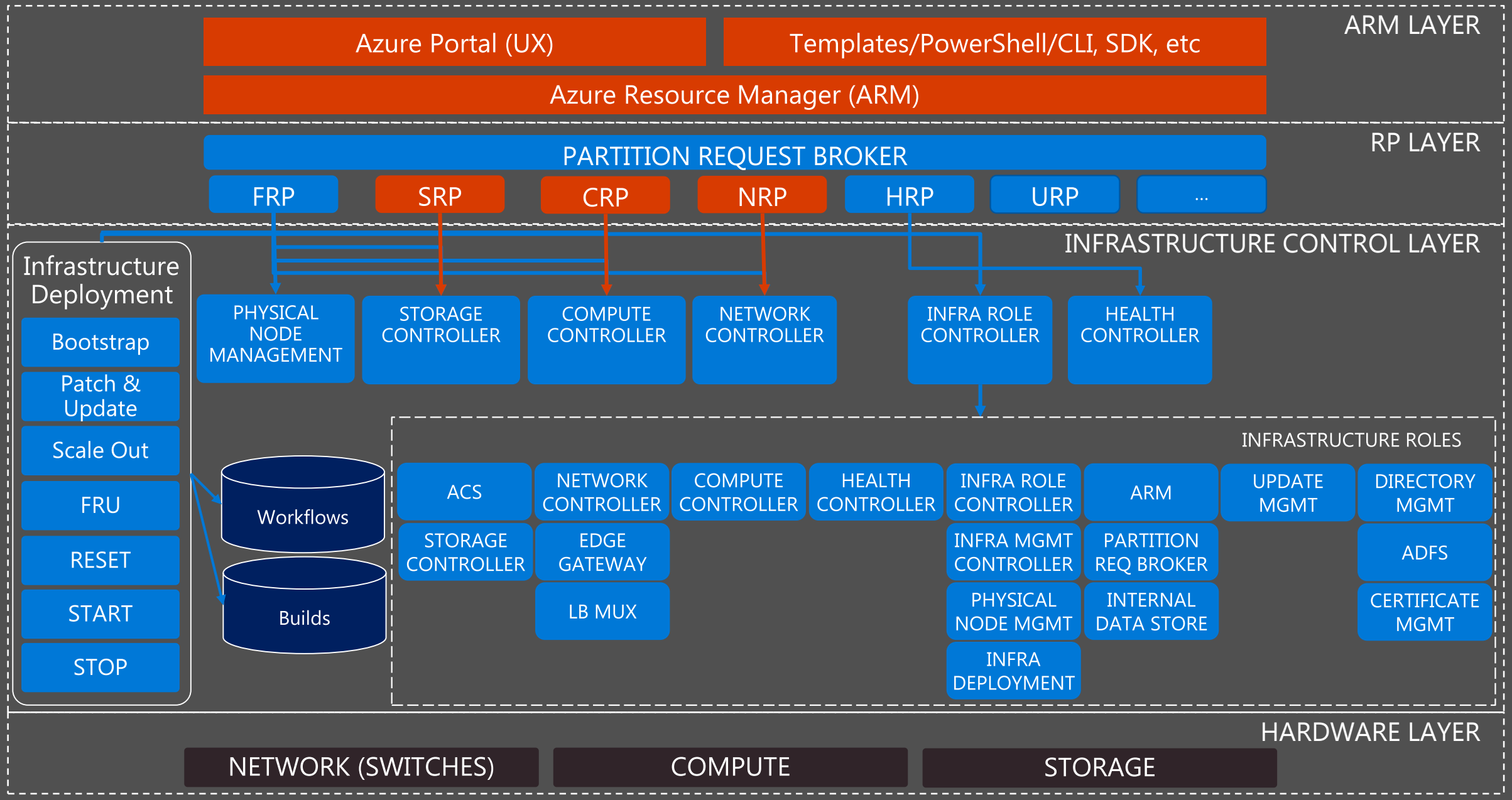
Infrastructure Services

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

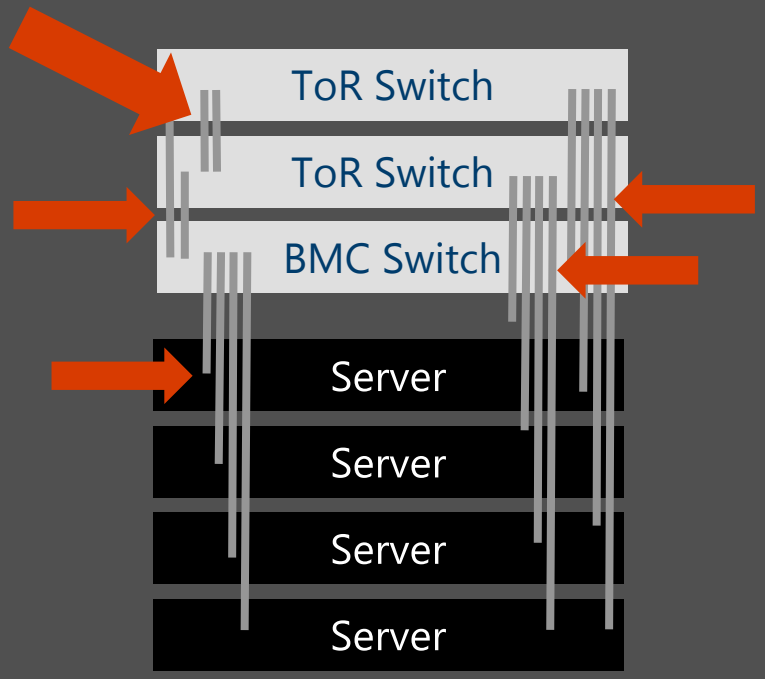
Unit of Capacity Expansion
Fault Domain (Azure Consistency)
Alignment of Hardware SKU (Homogenous within Scale-Unit)

Azure Stack Scale Unit – Implementation Details

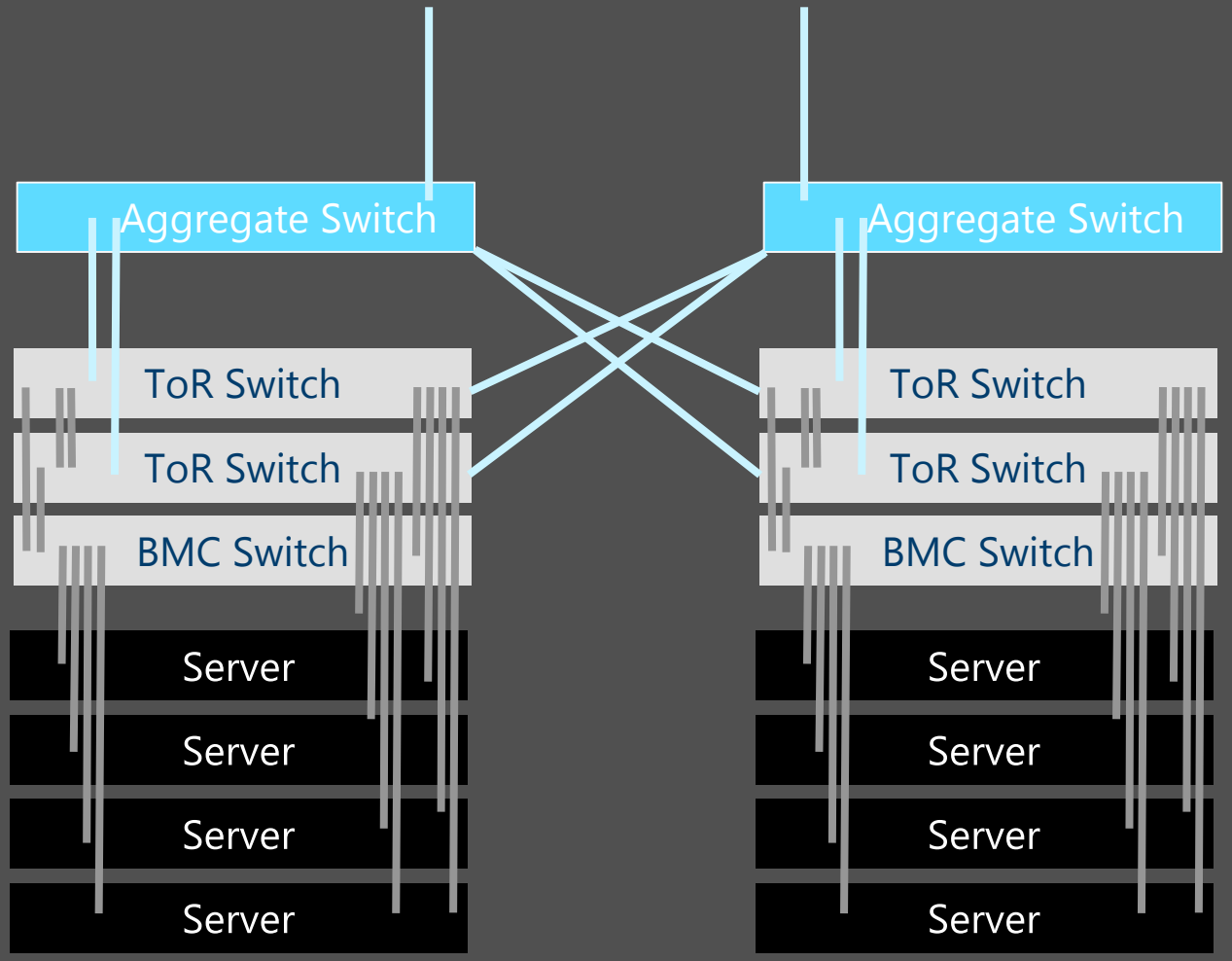
Windows Server 2016
Hyper-Converged Configuration
Windows Server Failover Cluster (1 to 1 correspondence with Scale Unit)
Storage Spaces Direct storage
Servers must share same top-of-rack (ToR) switch (ToR "pair")
More than one Failover Cluster per ToR "pair" is possible

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

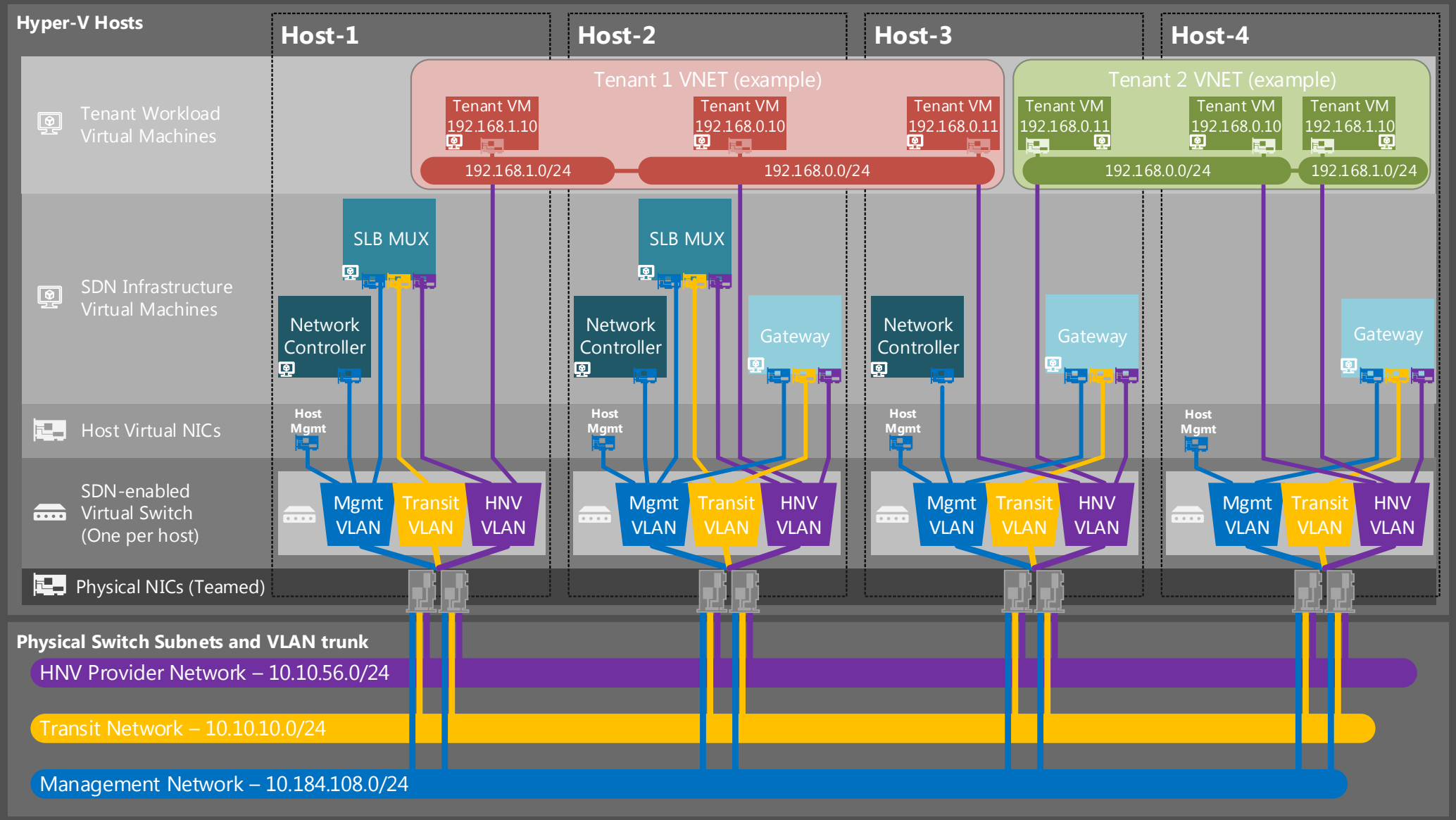
Network Switch Connectivity



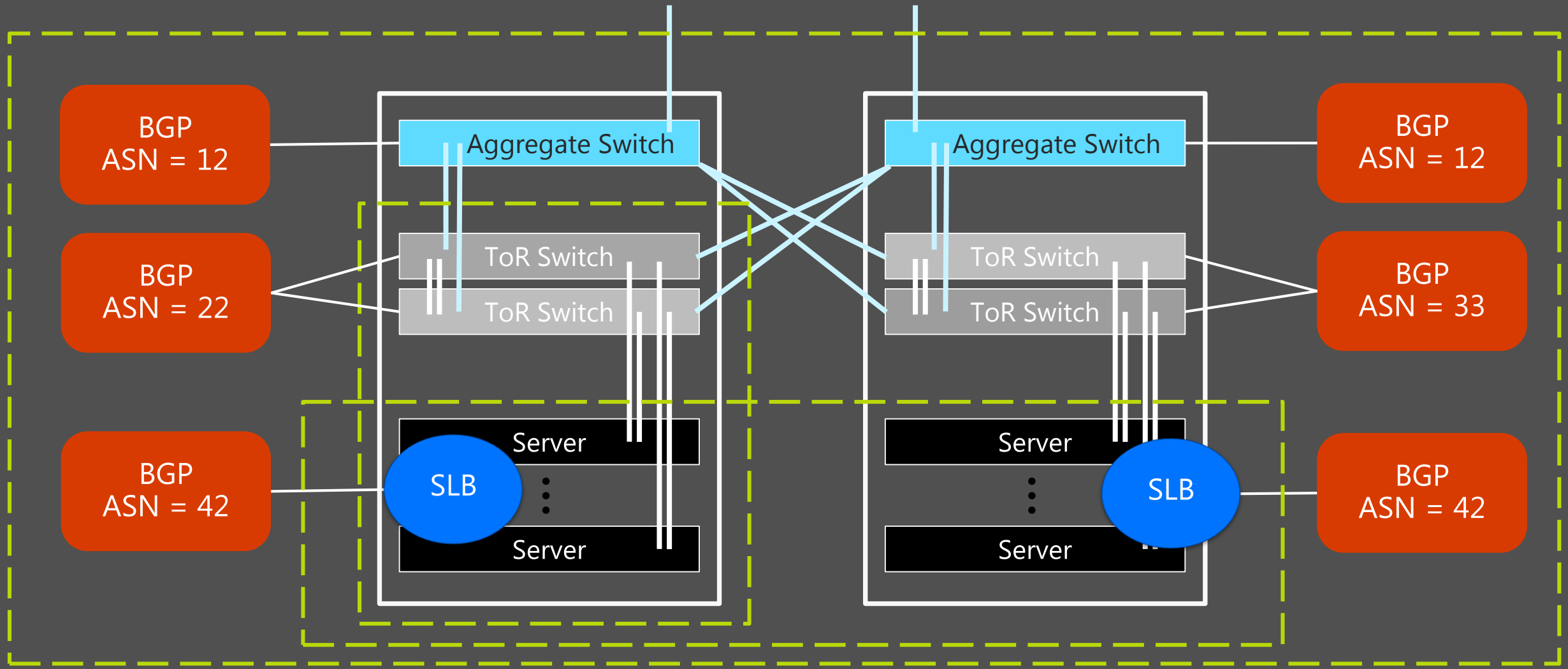
Network Switch Connectivity



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

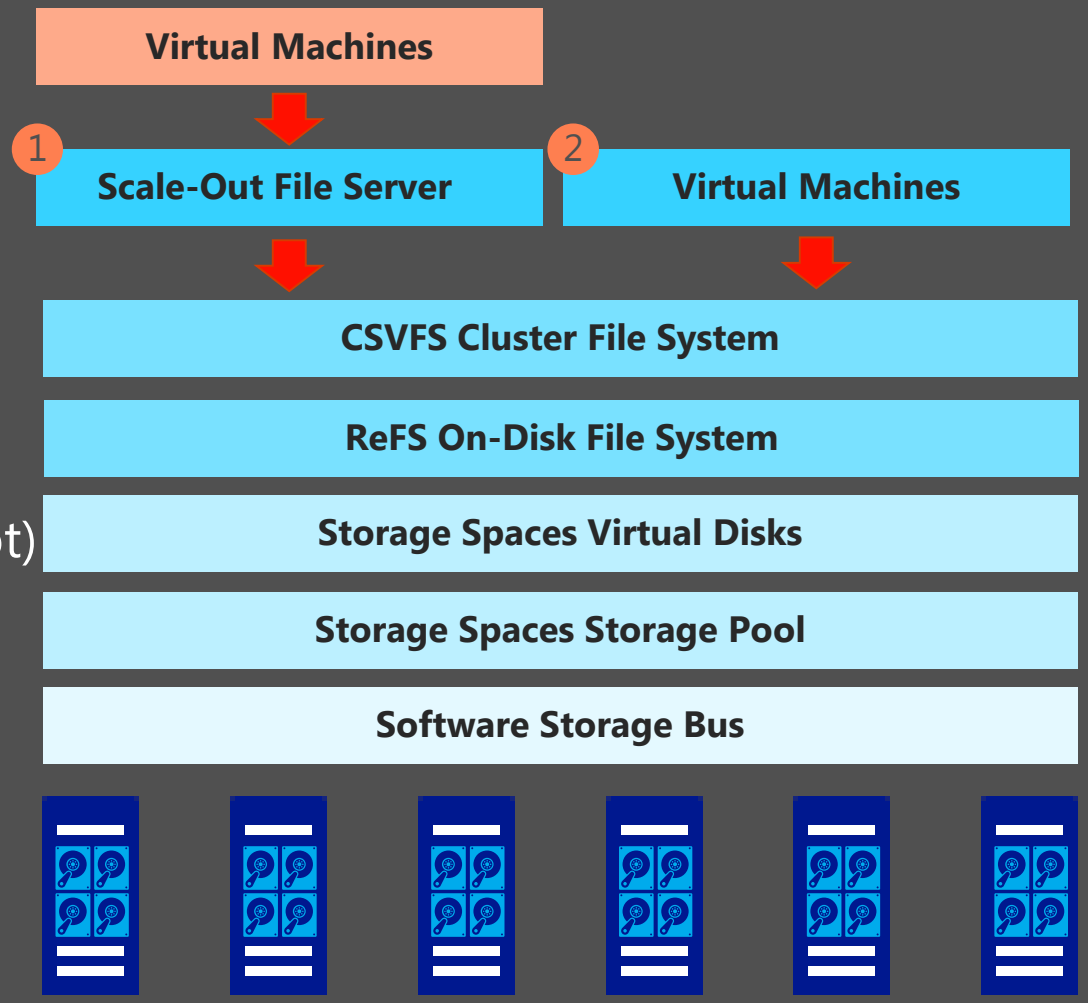
- Single scalable pool with all disk devices (except boot)
- Multiple virtual disks per pool (Mirrored or Partity)

Software Storage Bus

- Storage Bus Cache
- Leverages SMB3 and SMB Direct

Servers with local disks

- SATA, SAS and NVMe



Azure Stack Storage

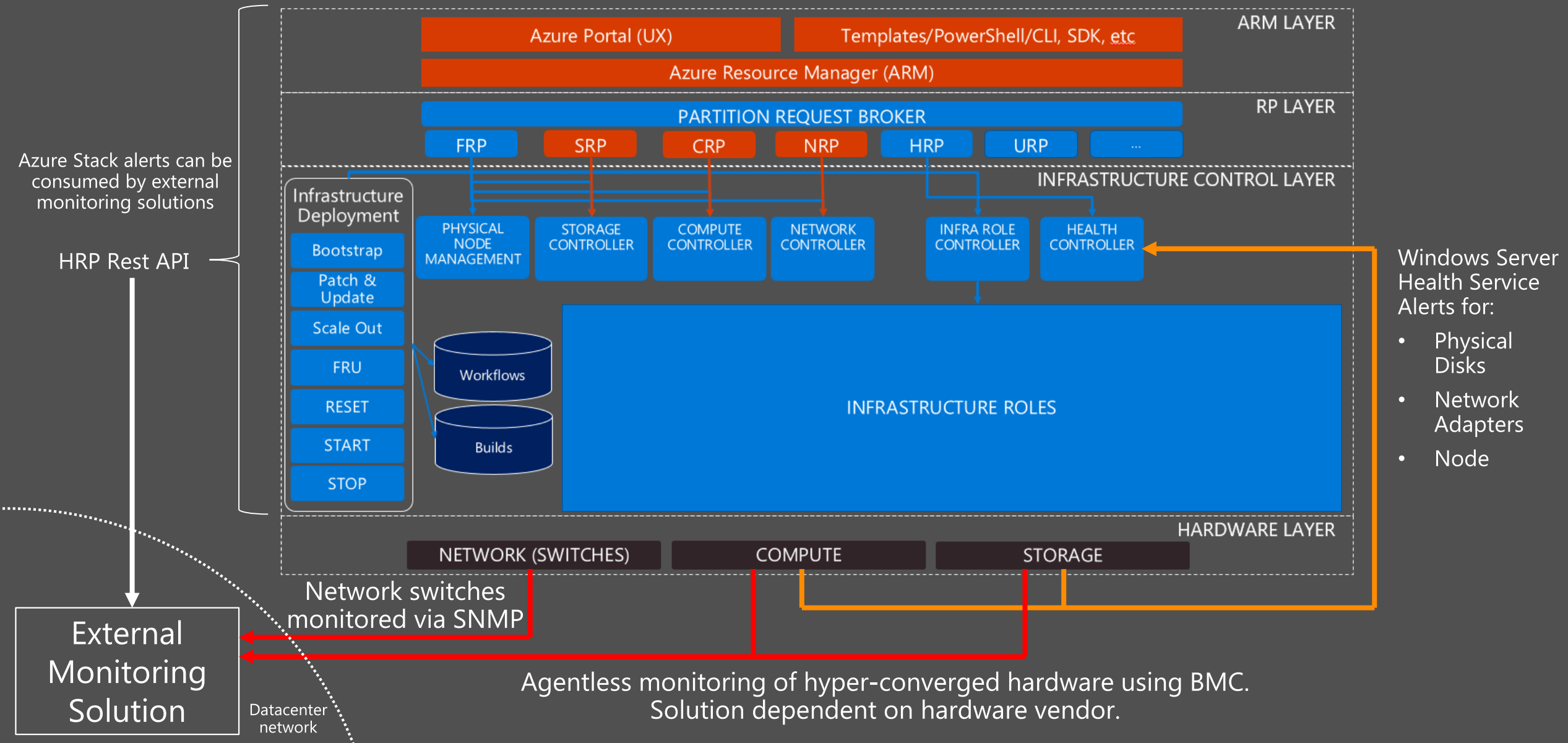
ReFS Configuration

- 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



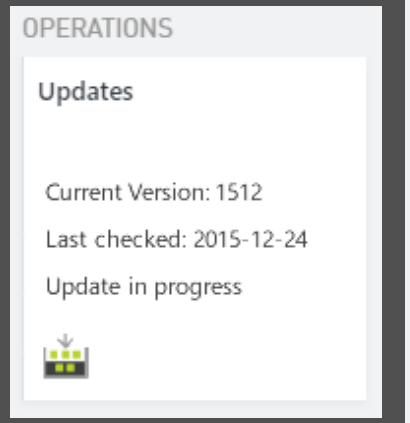
Patching and Update

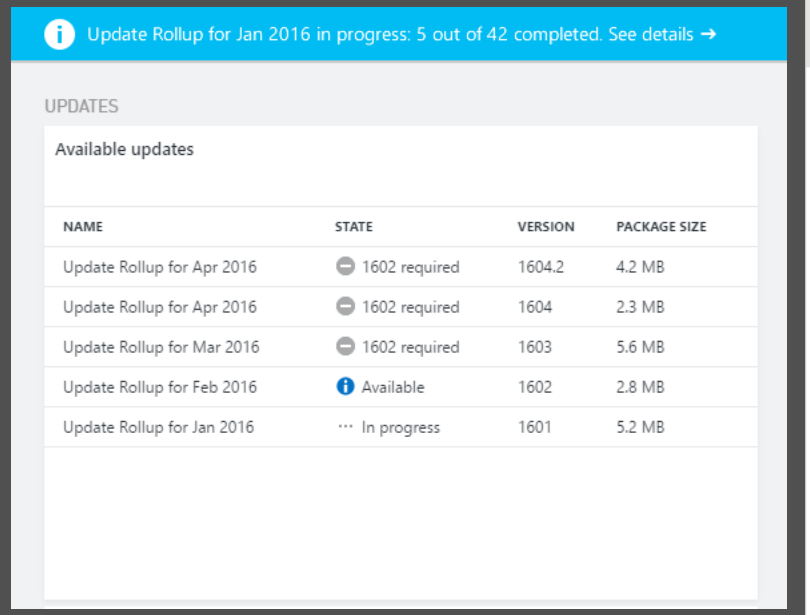
Pre-validated updates for software and firmware

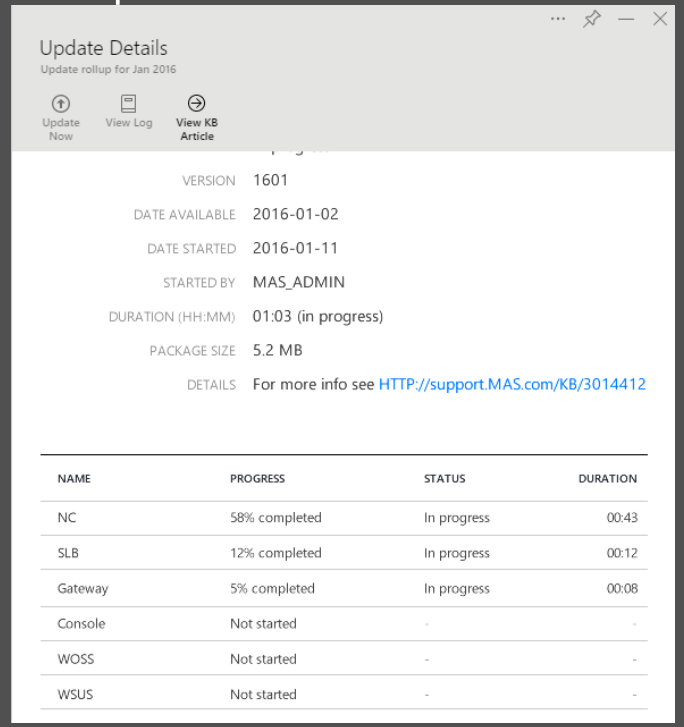
Designed to not disrupt tenant workloads

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

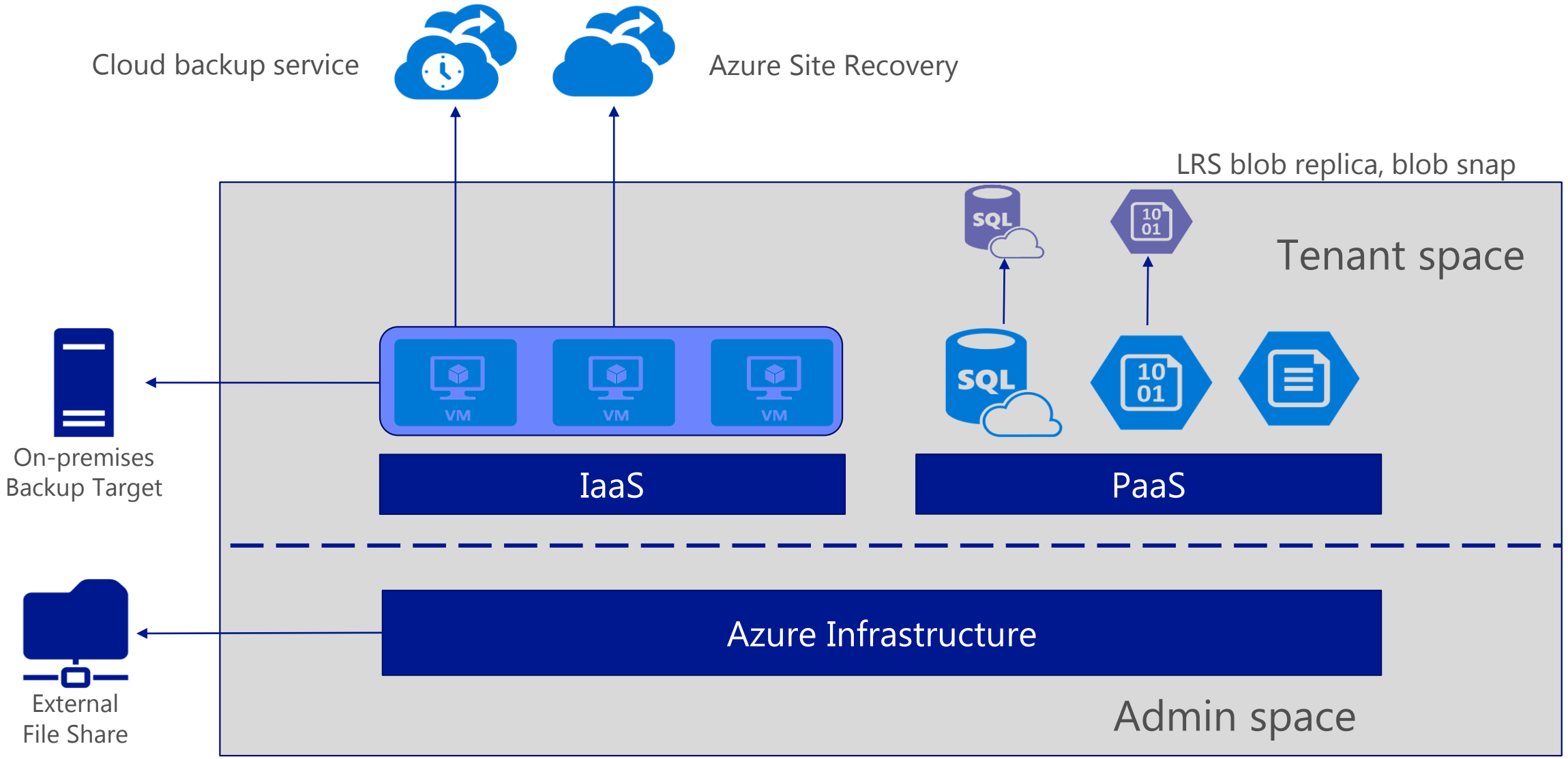
Designed to allow focus on other aspects of the business







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

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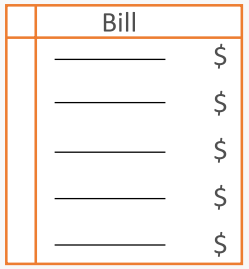

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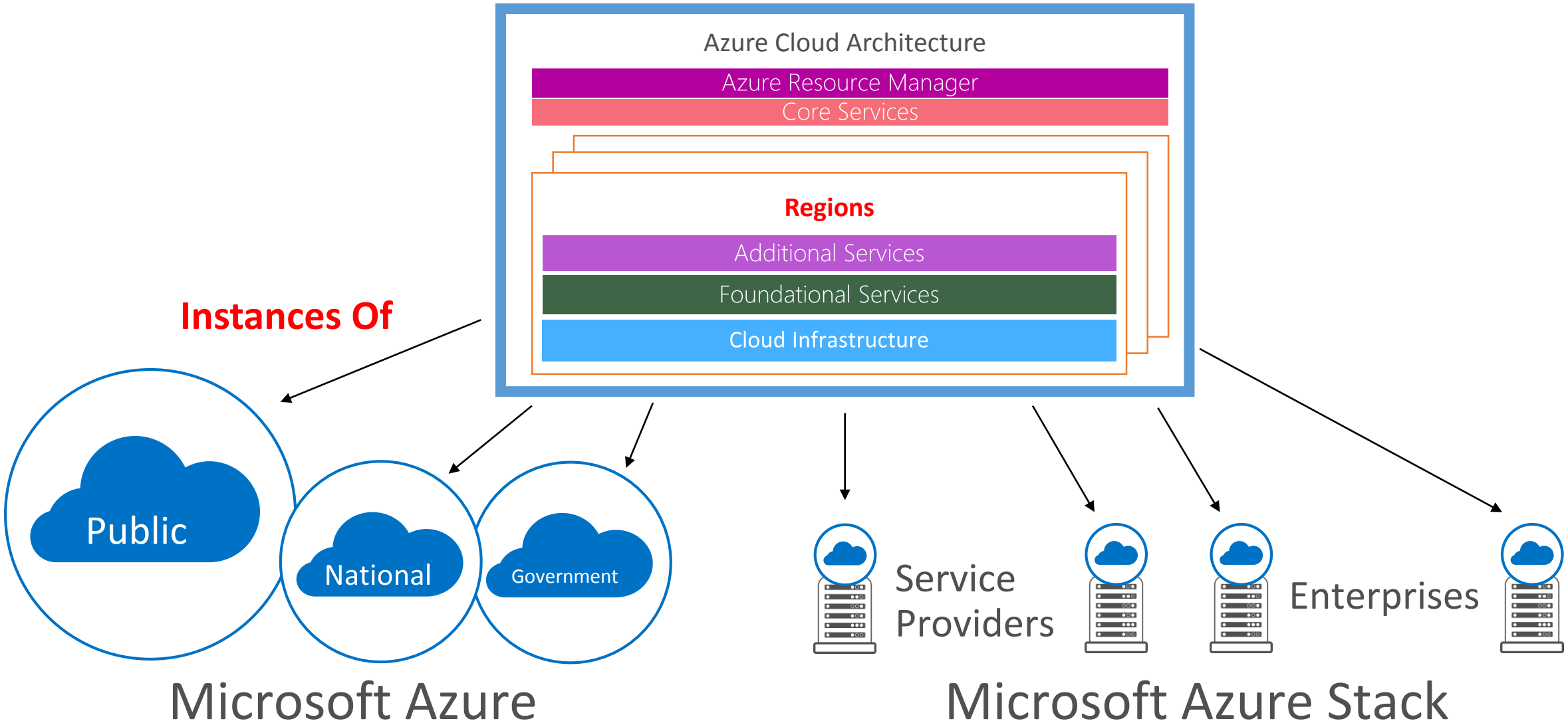
Devops

Hybrid

Experiences — One Azure Ecosystem

Tools — Azure SDK — Application Content (Templates, Images, Extensions, …)



Software defined

```
"windowsOSVersion": {
    "type": "string",
    "defaultValue": "2012-R2-Datacenter",
    "allowedValues": [
        "2008-R2-SP1",
        "2012-Datacenter",
        "2012-R2-Datacenter"
    ],
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        "description": "The Windows version for the VM. This will pick a fully pa
    }
}
```

```
"storageProfile": {
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        "version": "latest"
    },
```
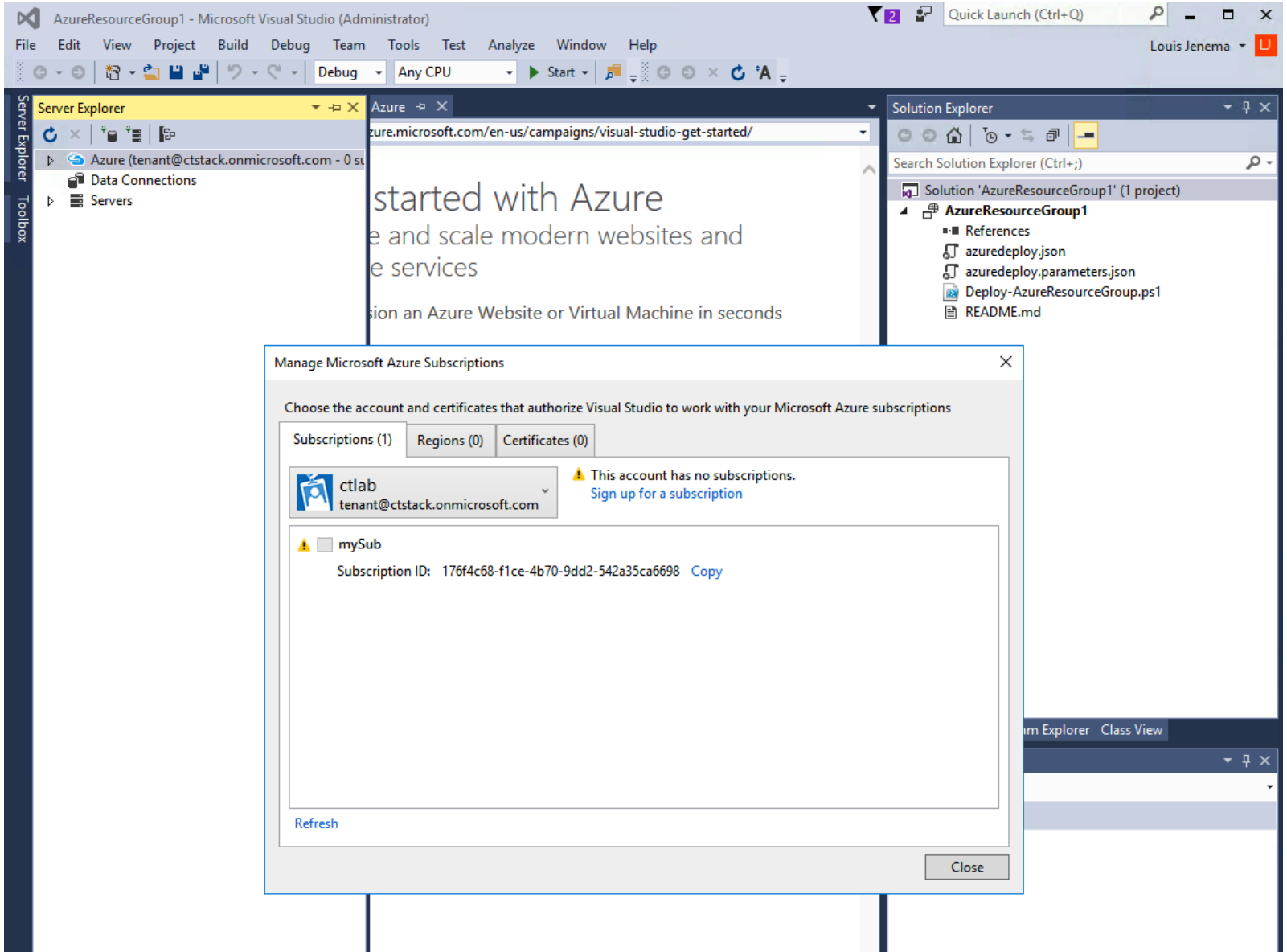
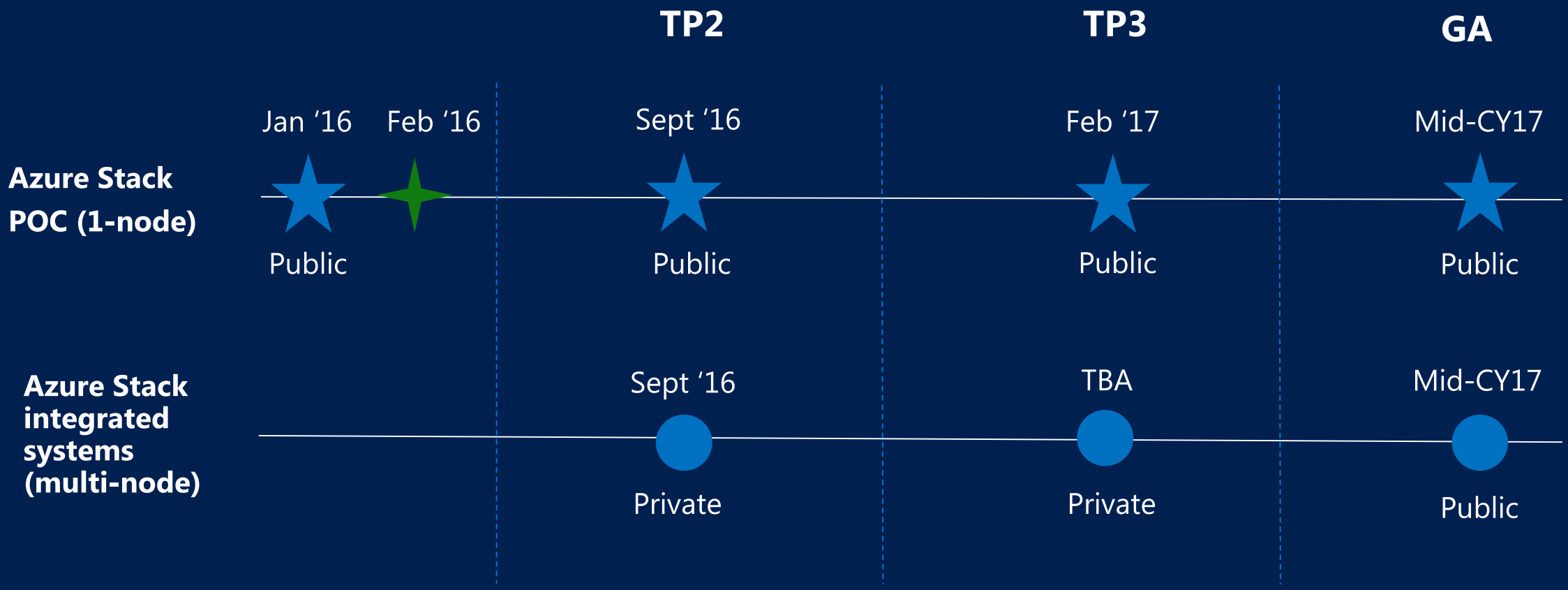

Visual Studio



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

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