Designing Azure Infrastructure for Data Platform Projects

Joey D’Antoni and Denny Cherry

Data Grillen

21 June 2019


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Session Feedback Day 2 (not optional!)

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Denny Cherry

- Denny Cherry & Associates Consulting
- 6 books
- Dozens of articles
- Microsoft MVP
- Microsoft Certified Master
- VMware vExpert

Microsoft CERTIFIED Master | SQL Server 2008

vmware vEXPERT

MVP Microsoft® Most Valuable Professional

Joey D'Antoni

Joey has over 20 years of experience with a wide variety of data platforms, in both Fortune 50 companies as well as smaller organizations

He is a frequent speaker on database administration, big data, and career management

MVP, MCSE BI and Data Platform

VMWare vExpert

He is the co-president of the Philadelphia SQL Server User's Group

He wants you to make sure you can **restore your data**

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Agenda

- Authentication
- Resource Groups
- Networking
- Storage
- VMs

Questions and Topics

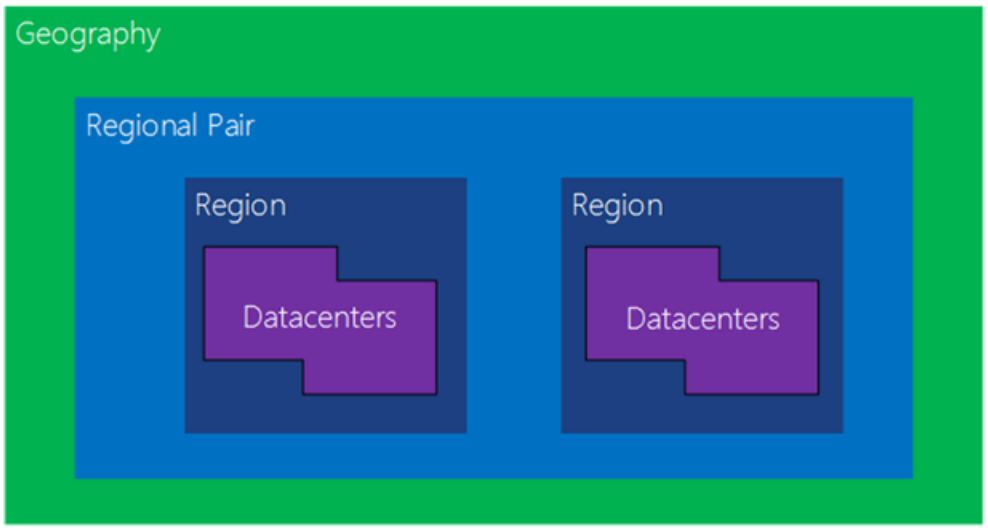
Hyper scale Infrastructure is the enabler

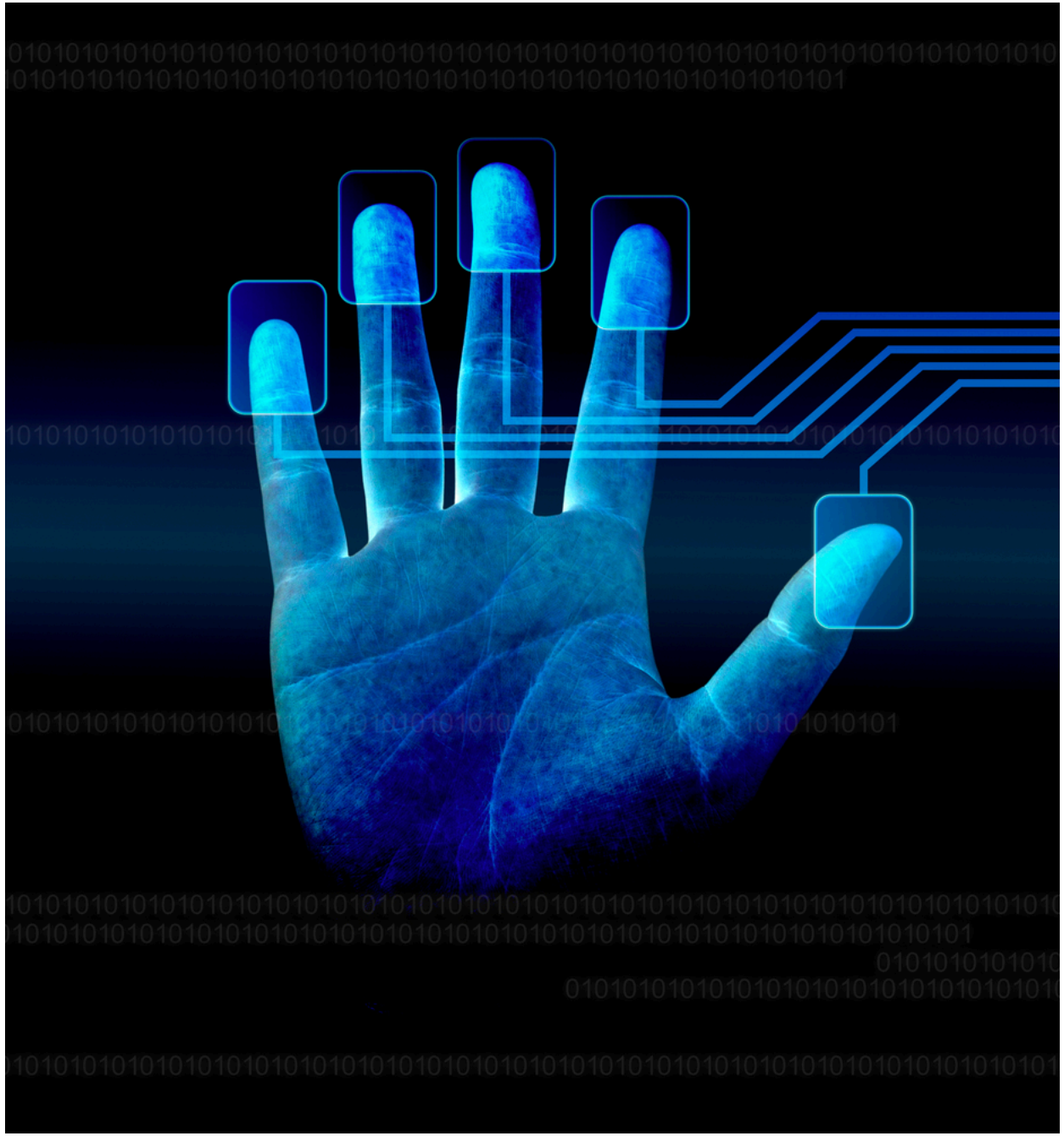
54 Regions Worldwide, 34 Generally Available…

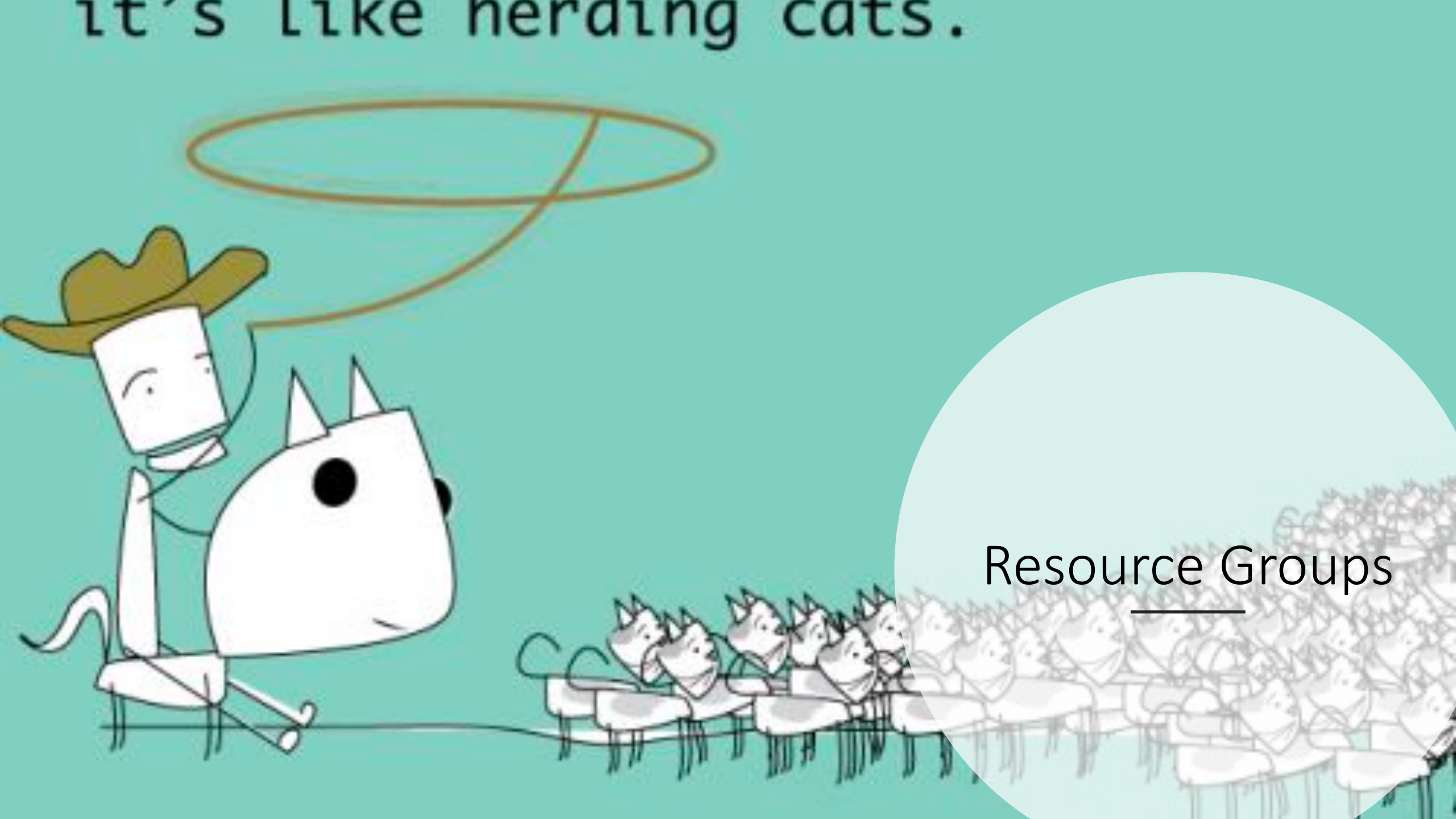
- 100+ datacenters
- Top 3 networks in the world
- 2.5x AWS, 7x Google DC Regions

Regional Pairing

- Each Region has a "Sister" Region
  - Physical isolation
  - Platform-provided replication
  - Region recovery order
  - Sequential updates
  - Data residency



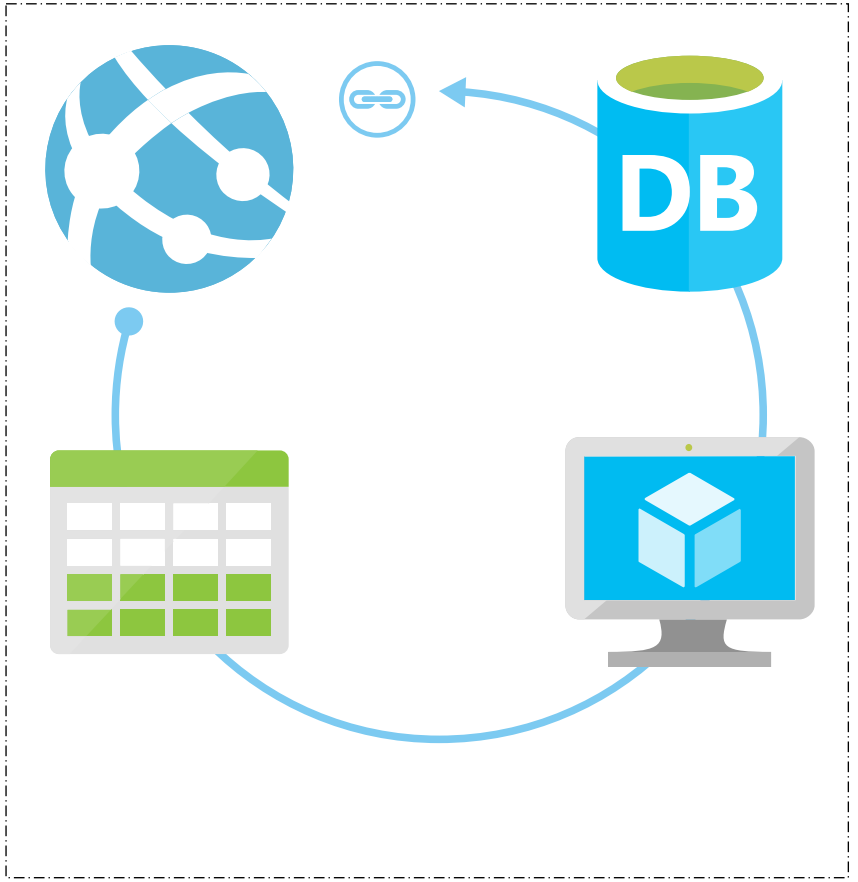




Resource Groups

What’s a Resource Group?

- Container for multiple resources
- Resources exist in one and only one resource group
- Resource groups can span regions
- Resource groups can span services




Networking

Load Balancer

Layer 4, per flow

- All TCP & UDP applications
- Inbound & outbound
- Flow-based Load Balancing with Health Probing
- Inbound NAT rules (port forwarding)
- Availability Zones support
- HA Ports load balancing
- 2 SKUs: Standard & Basic

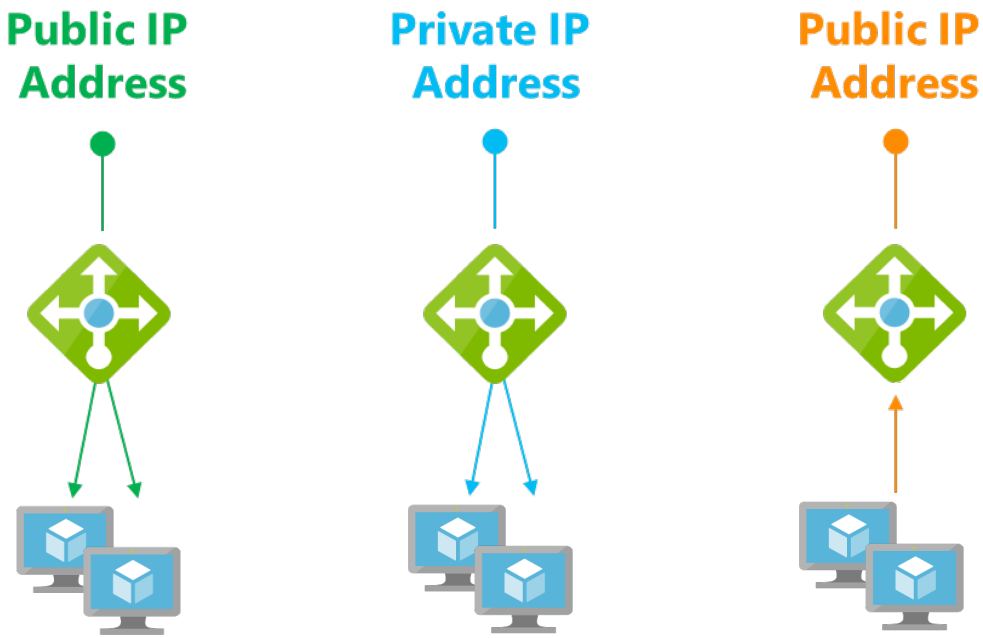
High performance

- Part of the Azure SDN stack, not a VM
- Low latency
- High throughput
- Outbound bandwidth only limited by VM in pool

Diagnostics and Probes

- Multi-dimensional metrics and alerts in Azure Monitor
- TCP & HTTP health probes, Data path health

3 key scenarios



Traffic Manager

DNS request routing

- Easy Onboarding
- Multiple Routing Methods
- Endpoint monitoring
- High resiliency
- Real User Measurement & Traffic View

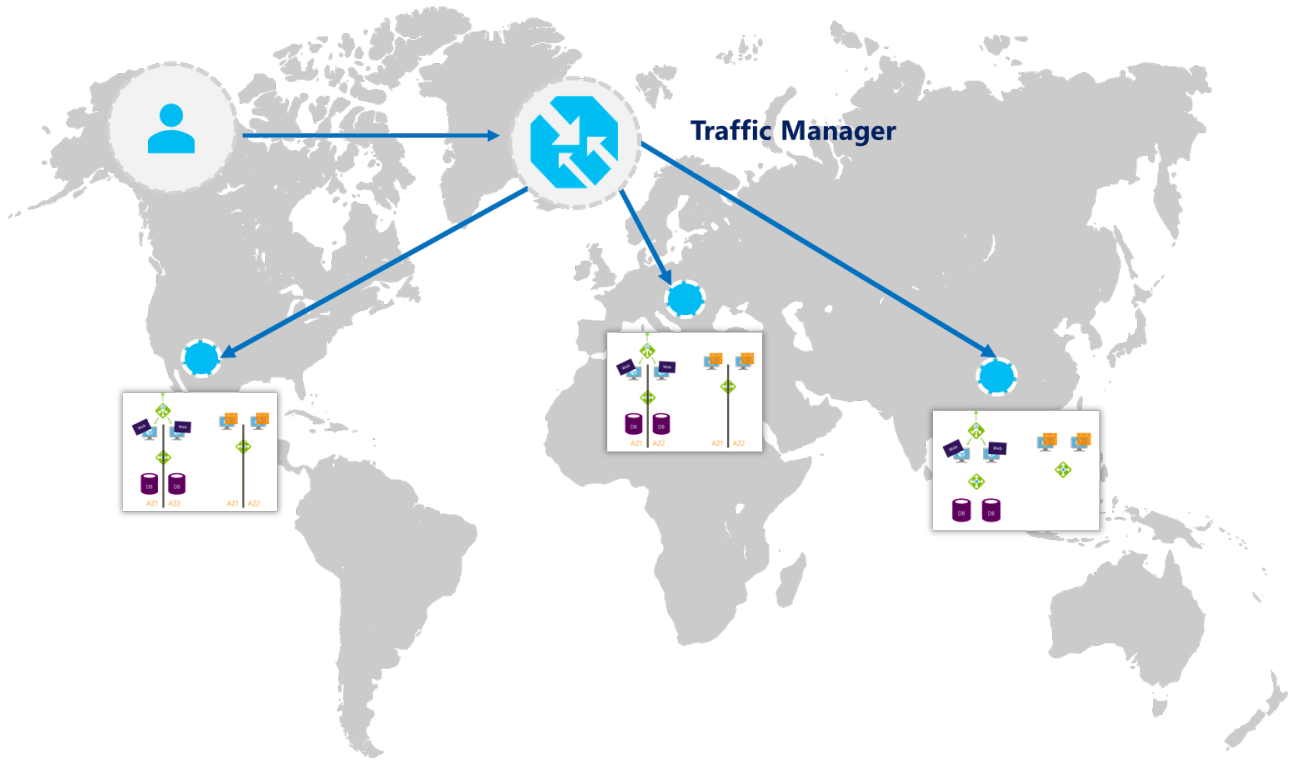
Routing based on profiles

- Priority
- Weighted Round Robin
- Geographic
- Performance

Diagnostics and Probes

- Traffic View visualization

  Understand the volume of traffic generated by your users and the latency experienced by them, at a per region level
- TCP & HTTP health probes



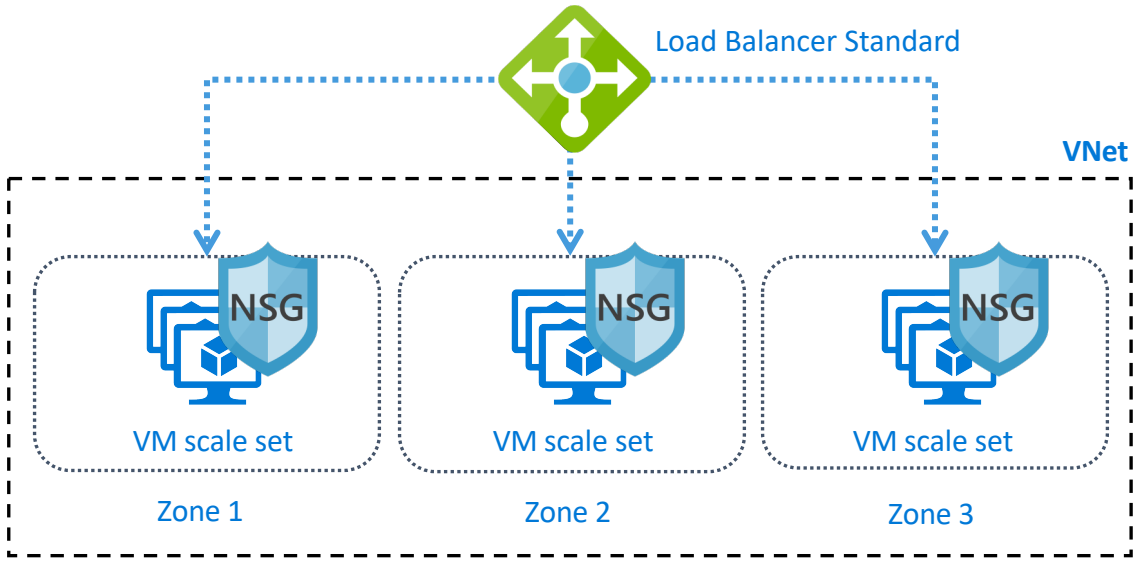
Standard LB for entire VNet

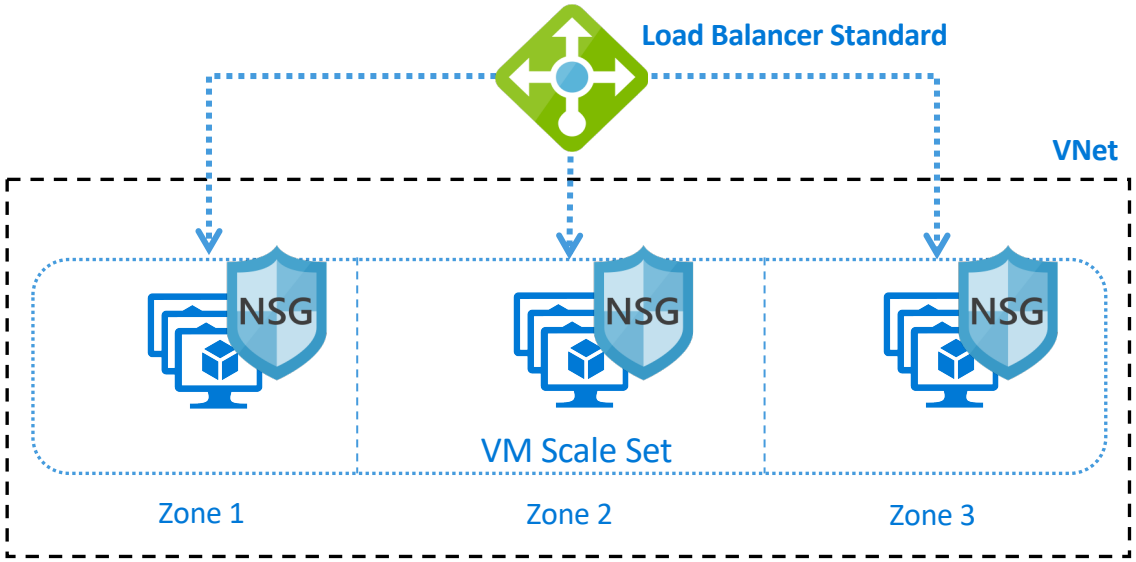
Any VM in a VNet in a backend pool
(no Availability Set boundary)

- Standalone VMs without Availability Sets
- Standalone VMs with Availability Sets
- Virtual machine scale sets with up to 1000 instances
- Zonal and Cross-zone VMSS
- Multiple standalone VM, Availability Sets, VMSS
- Blending VMs and virtual machine scale sets

Secure by default

- Use NSG to explicit whitelist traffic you want to permit

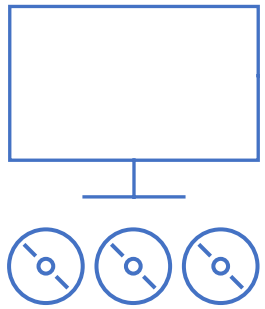




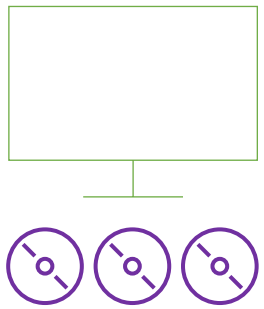
Storage

Azure Disks

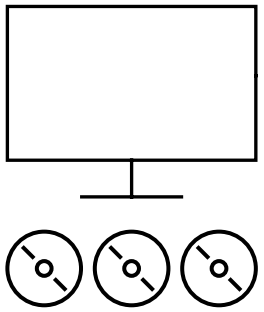
Performance Tiers



Premium SSD Disks
Provisioned performance for Enterprise Prod



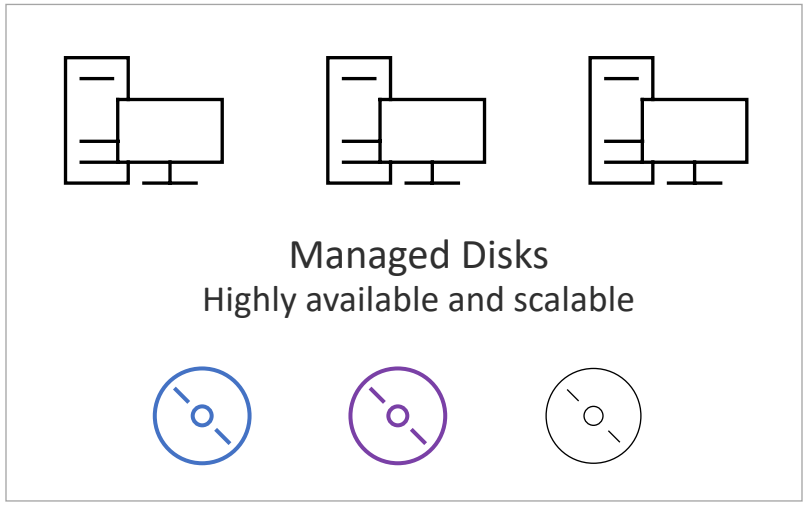
Standard SSD Disks
Cost effective performance for entry-level workloads



Standard HDD Disks
HDD based, cost effective for dev-test workloads

Simplified Management

Resource Group



Industry leading ZERO % Annual Failure Rate

Enterprise grade durability with 3 replicas

Best in class VMs with High IOPS/BW

80,000 IOPS & 2,000 MB/s Disk throughput per VM

< 1ms latency for cached operations

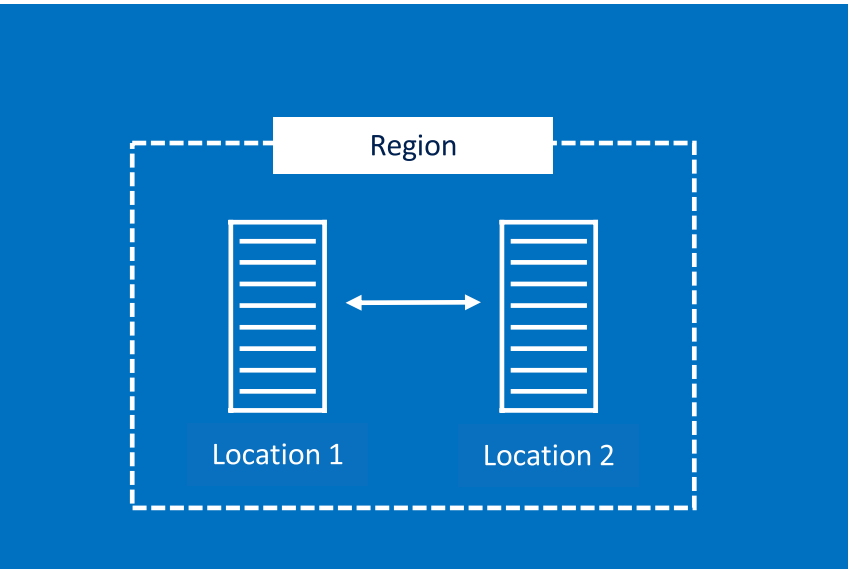
Blob Cache technology
Up to 160,000 IOPS

Developer Support

REST API Support
Easy Migration / DR / Backup
Rich partner ecosystem

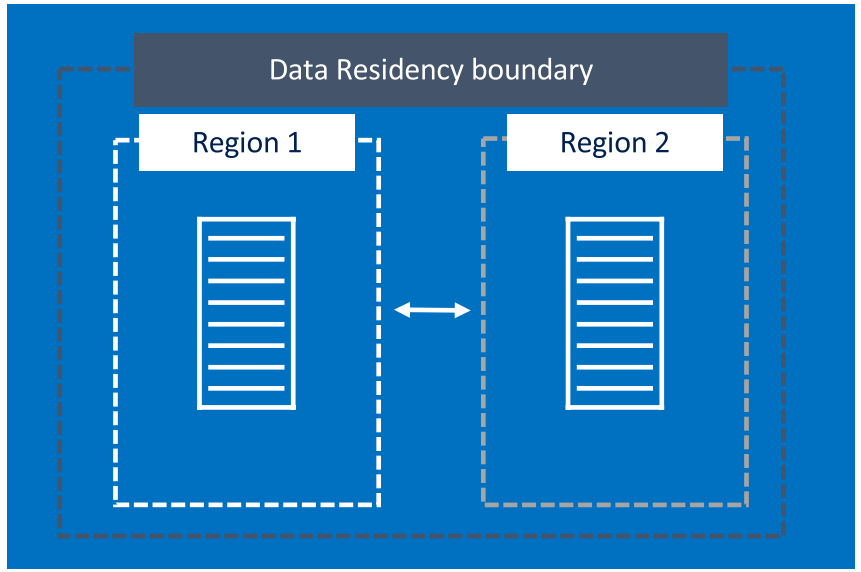
Azure business continuity

From mission critical applications to backup



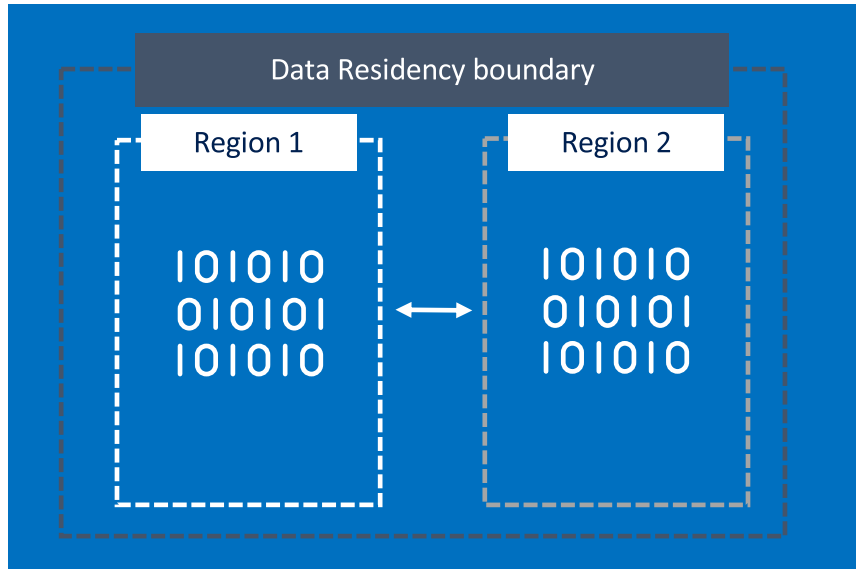
High Availability

Data is replicated to a minimum of one additional location at low latency so data and application uptime is preserved.



Disaster Recovery

Asynchronous replication from one region to another, with standby VMs in the other region. Azure offers protection between regions within data residency boundaries.

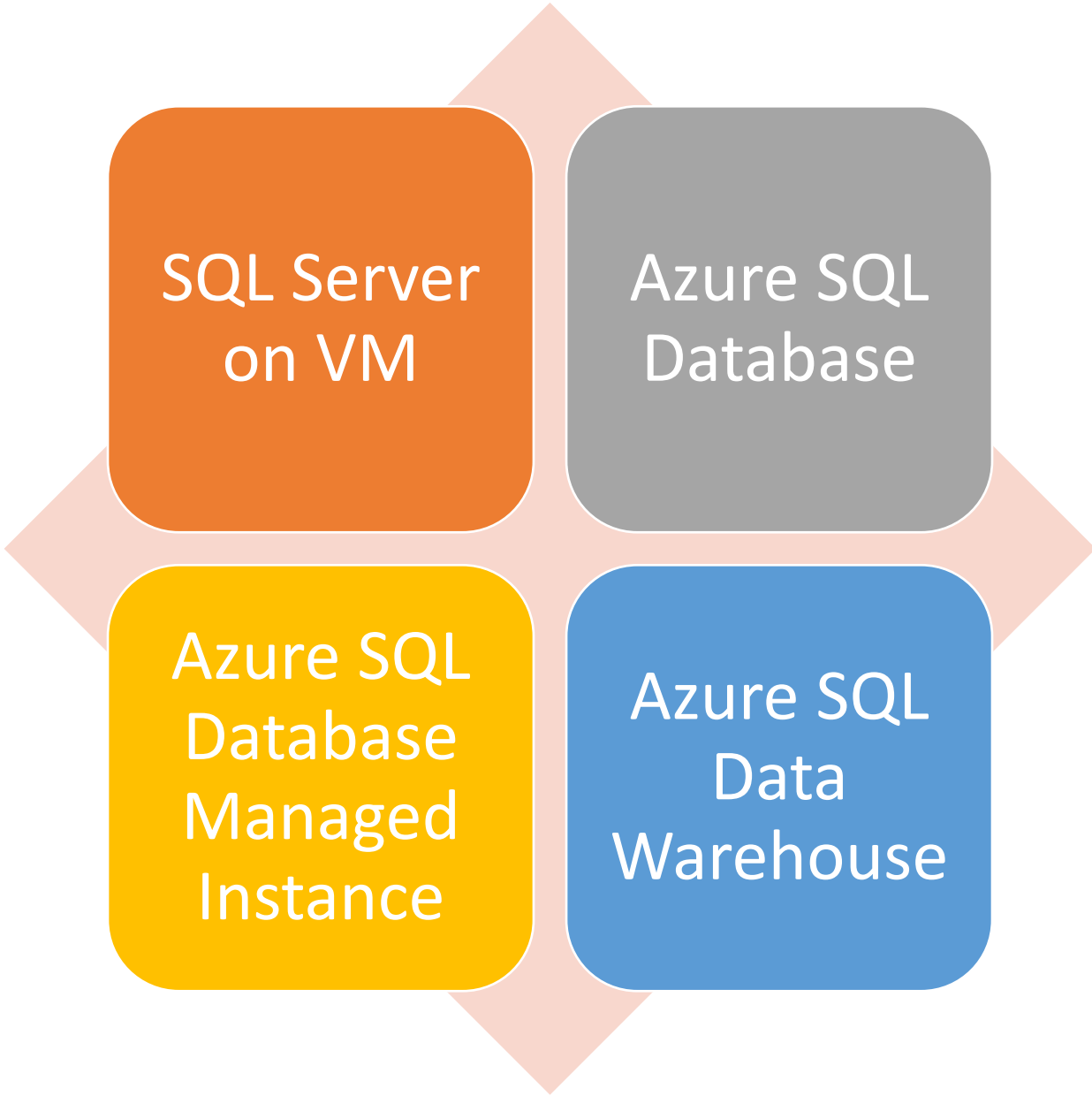


Backup

Data is asynchronously replicated and stored for redundancy purposes with data residency options.

Virtual Machines

SQL on Azure


SQL Server on VM
Azure SQL Database
Azure SQL Database Managed Instance
Azure SQL Data Warehouse

Summary

- Azure is Awesome
- Networking and Authentication are important
- Storage is different
- Virtual Machines are Virtual Machines
- PaaS is mostly always cheaper