Microsoft

SQL Server 2014 Platform for Hybrid Cloud

(Level 300 Deck)

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SQL Server 2014

Platform for hybrid cloud

Level 300

Microsoft

SQL Server 2014 and the data platform

Mission-critical performance

Faster insights from any data

Platform for hybrid cloud

Platform for hybrid cloud

Hybrid cloud solutions

Enable new hybrid scenarios like cloud backup and cloud disaster recovery (DR) to reduce costs and improve on-premises DR

Easy on-ramp to cloud

Easily migrate and run SQL Server in the cloud to gain benefits of cloud computing

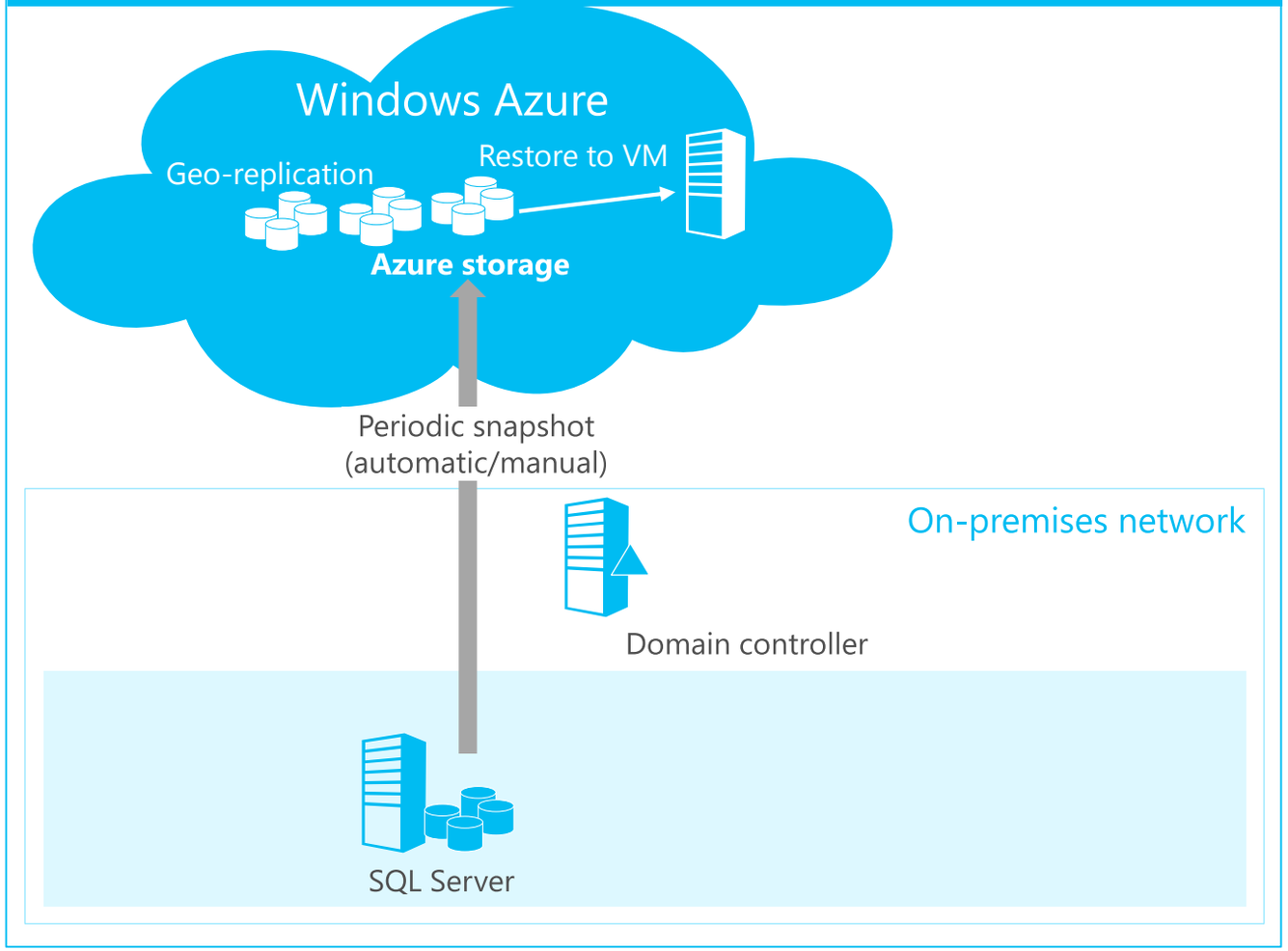
Complete and consistent

Deploy a complete and consistent data platform from on-premises to cloud

Hybrid cloud solutions

Simplified cloud backup	Manual or managed At an instance level with point-in-time restore Measures database usage patterns to set backup frequency
Cloud disaster recovery	Fast disaster recovery (low RTO) Easy to deploy and manage
Extend on-premises apps	Cloud bursting Greater global reach Better isolation of internal assets

Reduce CAPEX and OPEX with cloud backup



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Backup to Cloud

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Backup to Cloud

Backup to Windows Azure

What's being delivered

- SQL Server supports backups to and restores from the Windows Azure Blob storage service (UI, T-SQL, PowerShell commandlets)

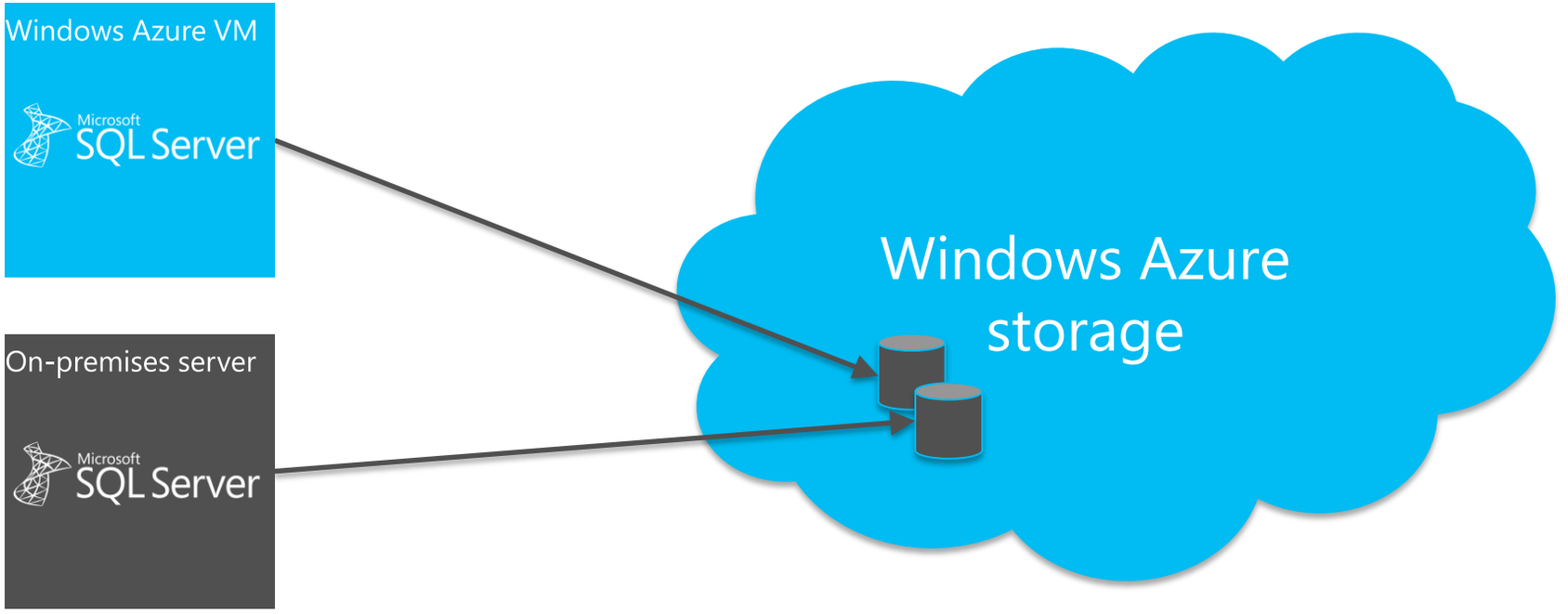
Main benefit: Take advantage of Windows Azure Blob storage

- Flexible, reliable (3-copies geo-DR), and limitless off-site storage
- No need of backup media management
- No overhead of hardware management

```
CREATE CREDENTIAL mystoragecred
WITH IDENTITY = 'mystorage',
SECRET = '<your storage access key>

BACKUP DATABASE mydb TO URL ='https://mystorage.blob.core.windows.net/backup-
container/mydb-20130411.bak'
WITH CREDENTIAL = 'mystoragecred',
FORMAT, COMPRESSION, STATS = 5,
MEDIANAME = 'mydb backup 20130411', MEDIADESCRIPTION = 'Backup of mydb'
```

Backup to Windows Azure



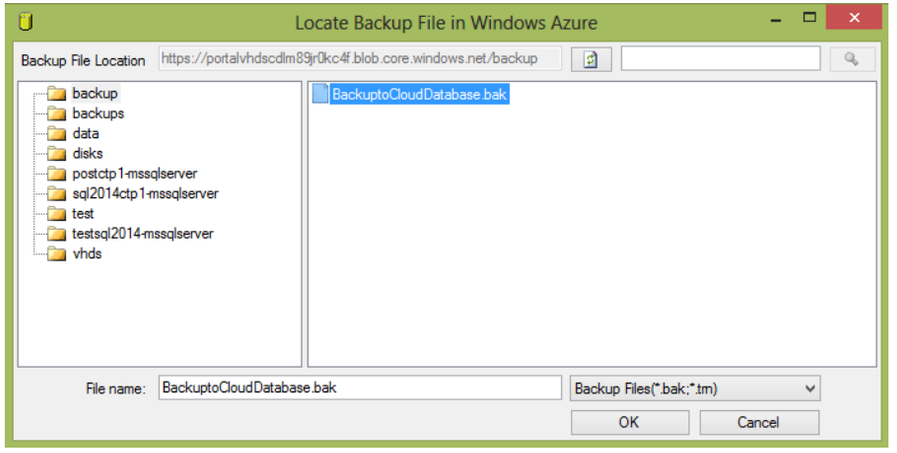
- On-site/off-site storage costs
- Device management costs

- XDrives limited to 1 terabyte
- Max 16 drives
- Manage drives and policy

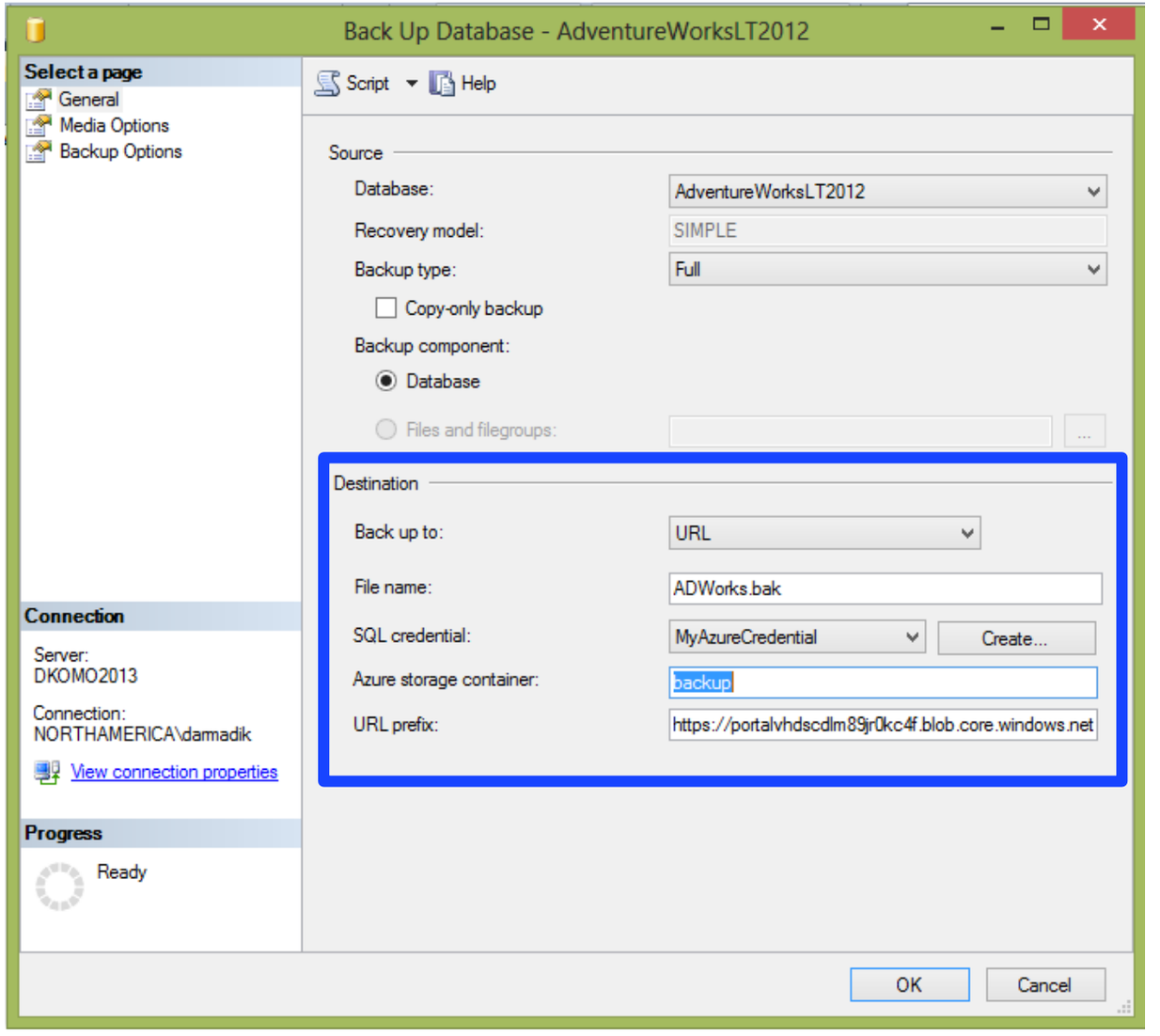
- Near “bottomless” storage
- Off-site, geo-redundant
- No provisioning
- No device management
- Media safety (decay-free)
- Remote accessibility

Backup to Windows Azure

- Simple configuration UI
- Easy creation of Azure credential
- No overhead



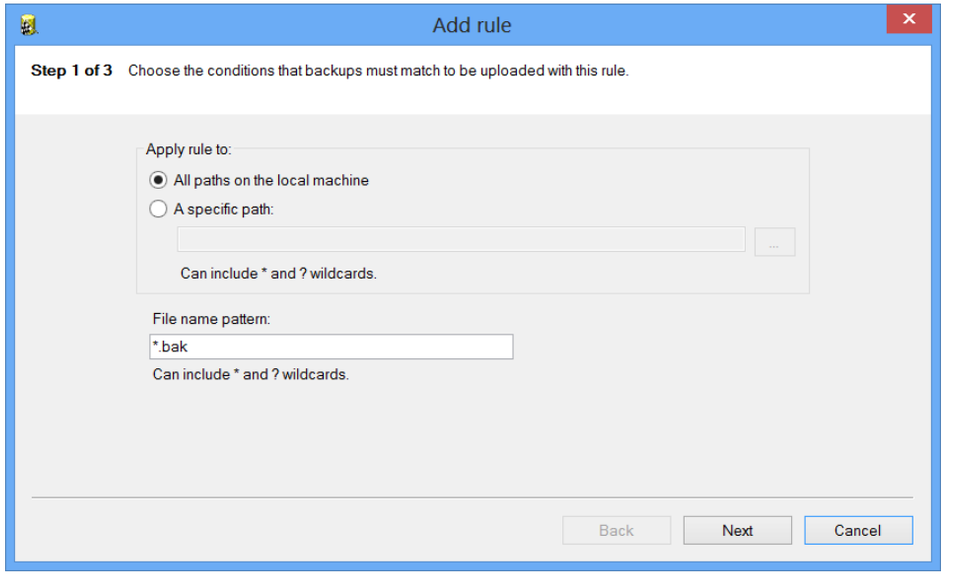
Restore GUI



Backup GUI

Backup to Windows Azure Tool

- What is it?
  - Stand-alone Tool that adds backup to Windows Azure capabilities and backup encryption to prior versions of SQL Server
- Benefits
  - One Cloud Backup strategy across **prior versions of SQL Server including 2005, 2008, and 2008 R2**
  - Adds backup encryption to prior versions, locally or in the cloud
  - Takes advantage of backup to Azure
  - Easy configuration



Managed Backup to Azure

What's being delivered

- Agent that manages and automates SQL Server backup policy

Main benefit

- Large-scale management and no need to manage backup policy
  - Context-aware – for example, workload/throttling
  - Minimal knobs – control retention period
  - Manage whole instance or particular databases
- Take advantage of backup to Azure
  - Inherently off-site
  - Geo-redundant
  - Minimal storage costs
  - Zero hardware management

Example:

```
EXEC smart_admin.sp_set_db_backup
        @database_name='TestDB',
        @storage_url=<storage url>,
        @retention_days=30,
        @credential_name='MyCredential',
        @enable_backup=1
```

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Cloud DR

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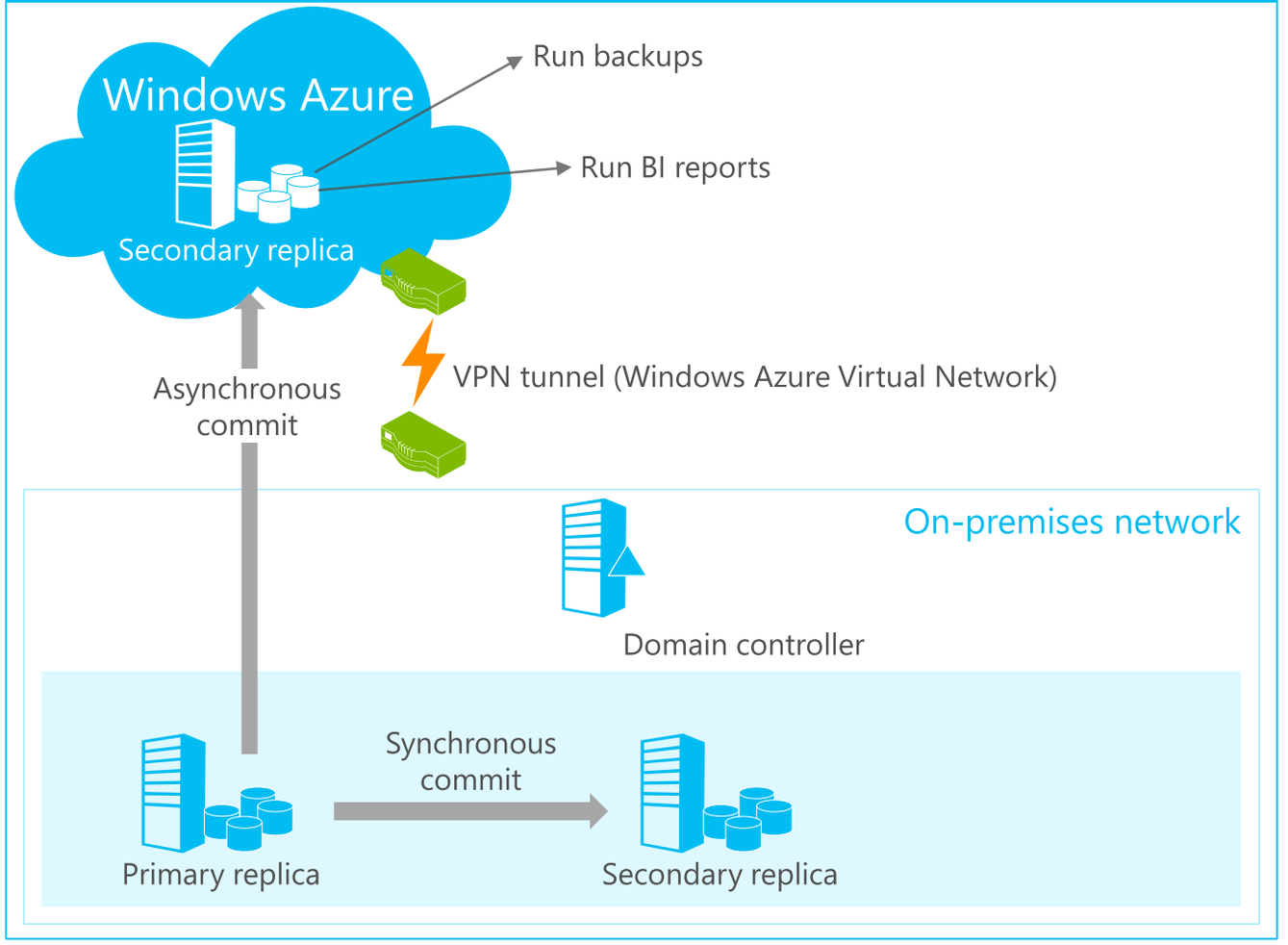
Cloud DR

Hybrid cloud solutions

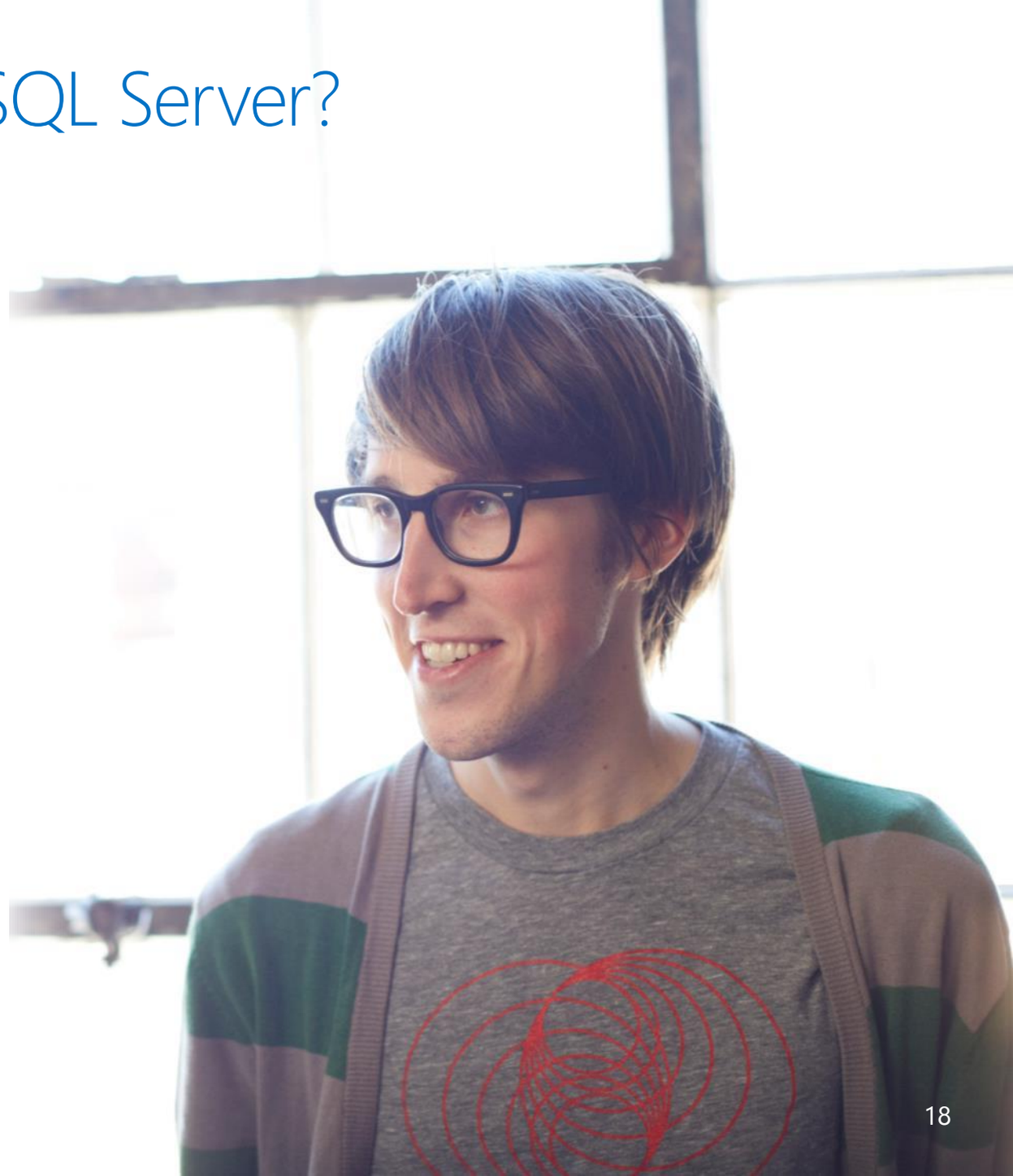
Simplified cloud backup	Manual or automatic At an instance level with point-in-time restore Measures database usage patterns to set backup frequency
Cloud disaster recovery	Fast disaster recovery (low RTO) Easy to deploy and manage
Extend on-premises apps	Cloud bursting Greater global reach Better isolation of internal assets

Reduce CAPEX and OPEX with cloud DR

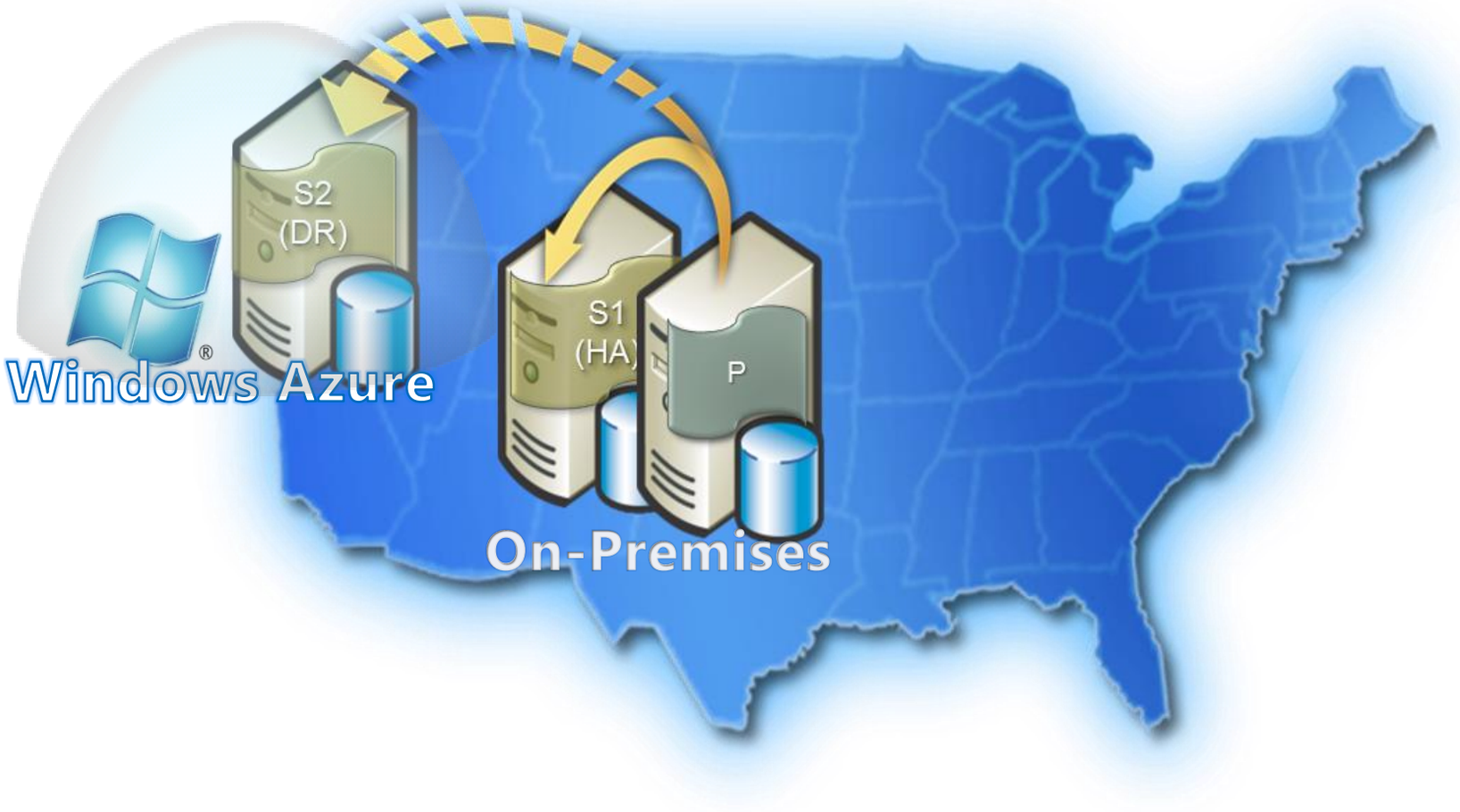


Why Do We Need Cloud DR for SQL Server?

- An event can cause on-premises SQL Server to become unavailable
  - Temporarily (e.g. gateway failure)
  - Permanently (e.g. flooding)
- A disaster recovery site is expensive
  - Site rent + maintenance
  - Hardware
  - Ops



Typical Configuration



Characteristic of Cloud DR for SQL Server

- Deploy one or more secondary replicas for on-premises SQL Server
  - Replicas continuously synchronize
- At best region: West US, East US, East Asia, Southeast Asia, North Europe, West Europe
  - Political considerations
  - Latency
- Low TCO
  - VM and storage

Inverse Deployment Configuration Supported

Technologies Supported

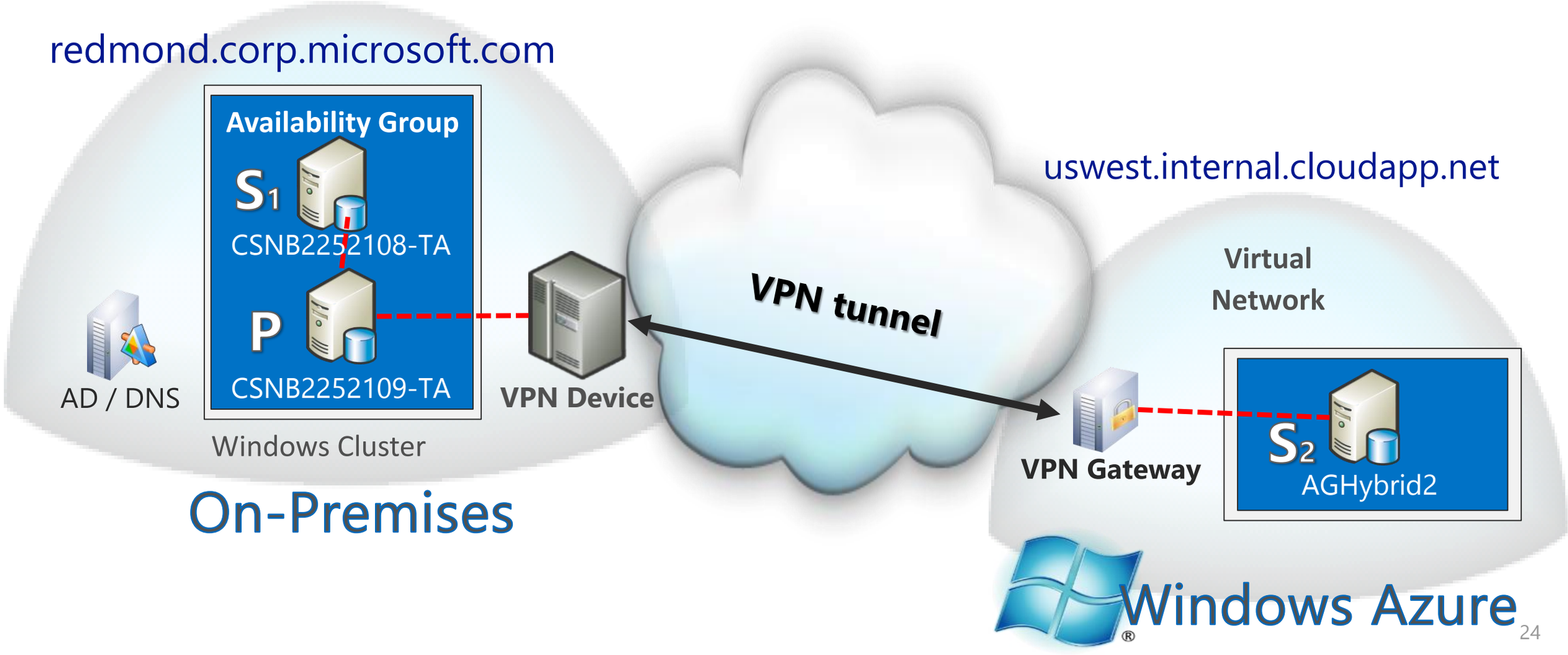
Technology	SQL Server Version	Zero Data Loss	Scope	# Secondaries	Automatic Failover	Readable Secondaries
Availability Groups	SQL Server 2012	**Yes* (Sync Mode)**	**DB(s)**	**4**	**Yes (w/ additional cluster member)****	**Yes**
Database Mirroring	SQL Server 2008 R2 SQL Server 2012	**Yes* (High Safety Mode)**	**DB**	**1**	**Yes (w/ Witness)****	Limited (database snapshots)
Log Shipping	SQL Server 2008 R2 SQL Server 2012	No	DB	N	No	Limited (standby state)

* Most customers use *Async Mode (High Performance)* to avoid impacting primary performance
***Async Mode* only supports *Force Failover* to make DR (and potential data loss) a conscious decision

Availability Groups in Cloud DR

- Provide additional benefits:
  - Integrated HA/DR
  - Offload Read workloads to Windows Azure
    - Connect reporting/BI apps
    - Migrate apps and run against local secondaries
  - Offload Backups to Windows Azure
    - A solution for policy compliance
- Requires:
  - Same Windows Domain
  - Needs an Active Directory Domain Controller

Example of Availability Group Spanning On-premises and Windows Azure



Customer deployment examples

Online travel firm

Container shipping company

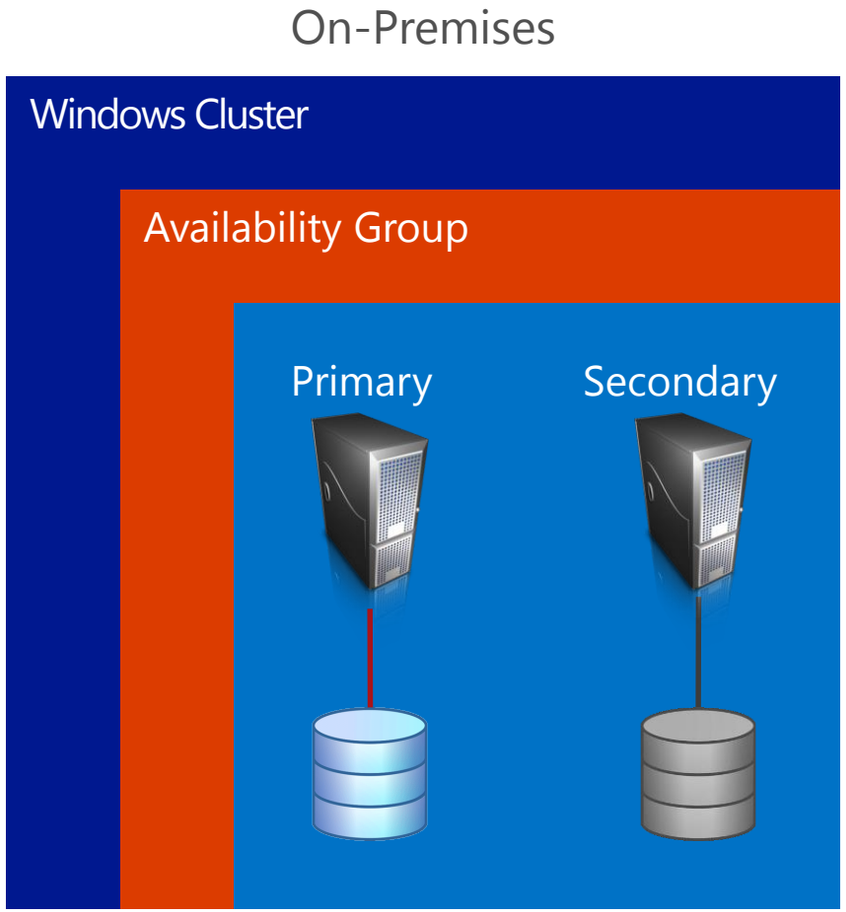
Online video streaming company

Healthcare company

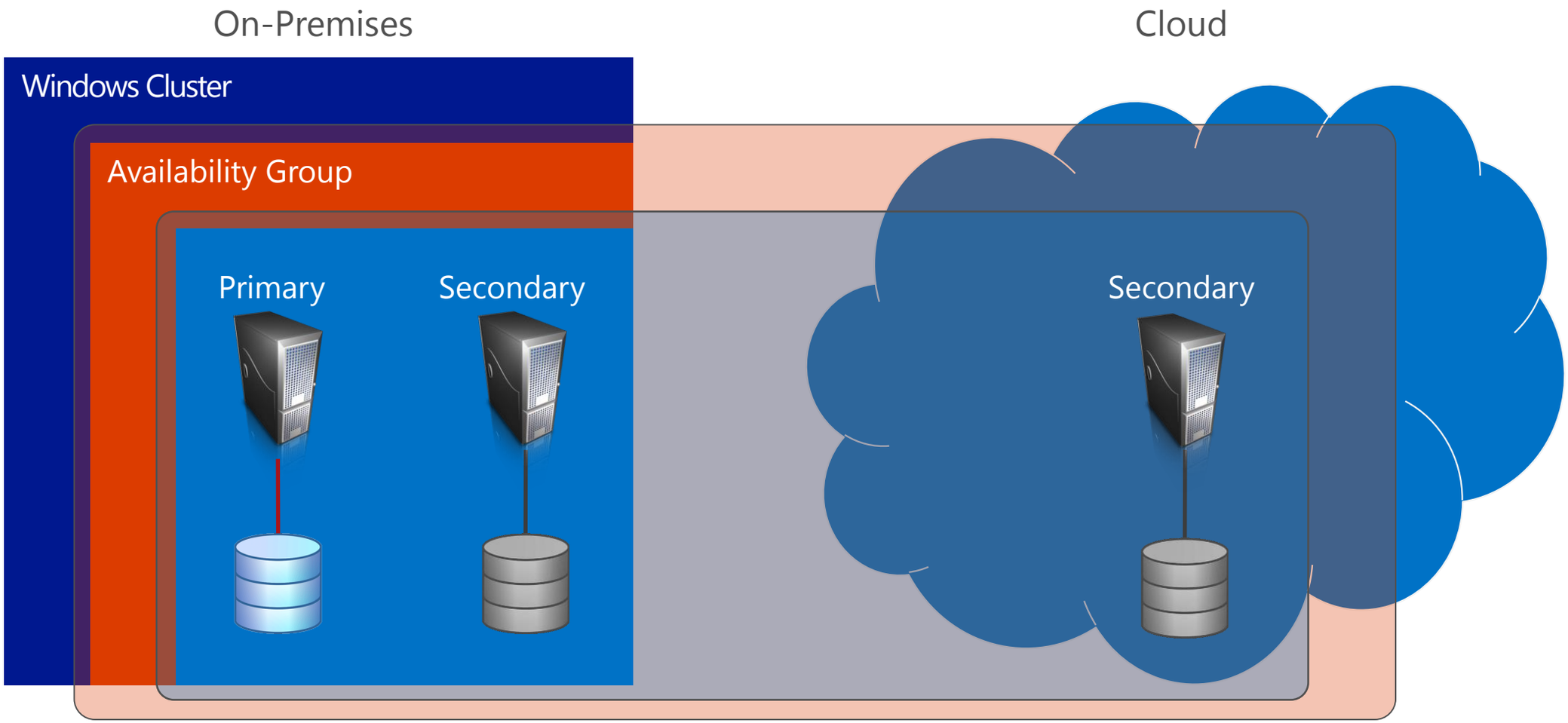
Online Travel Firm

- Business
  - Leading tour operator in Europe.
  - Sells trips to holiday destinations throughout Europe.
  - 10 brands, 9 countries
  - Over 700K passengers in 2011
- Application
  - Online travel reservation system
- Infrastructure
  - 1 data center (on-premises)
  - Use AlwaysOn Availability Groups on-premises today
  - No DR site
  - Leverage Windows Azure as DR data center

Architecture Diagram



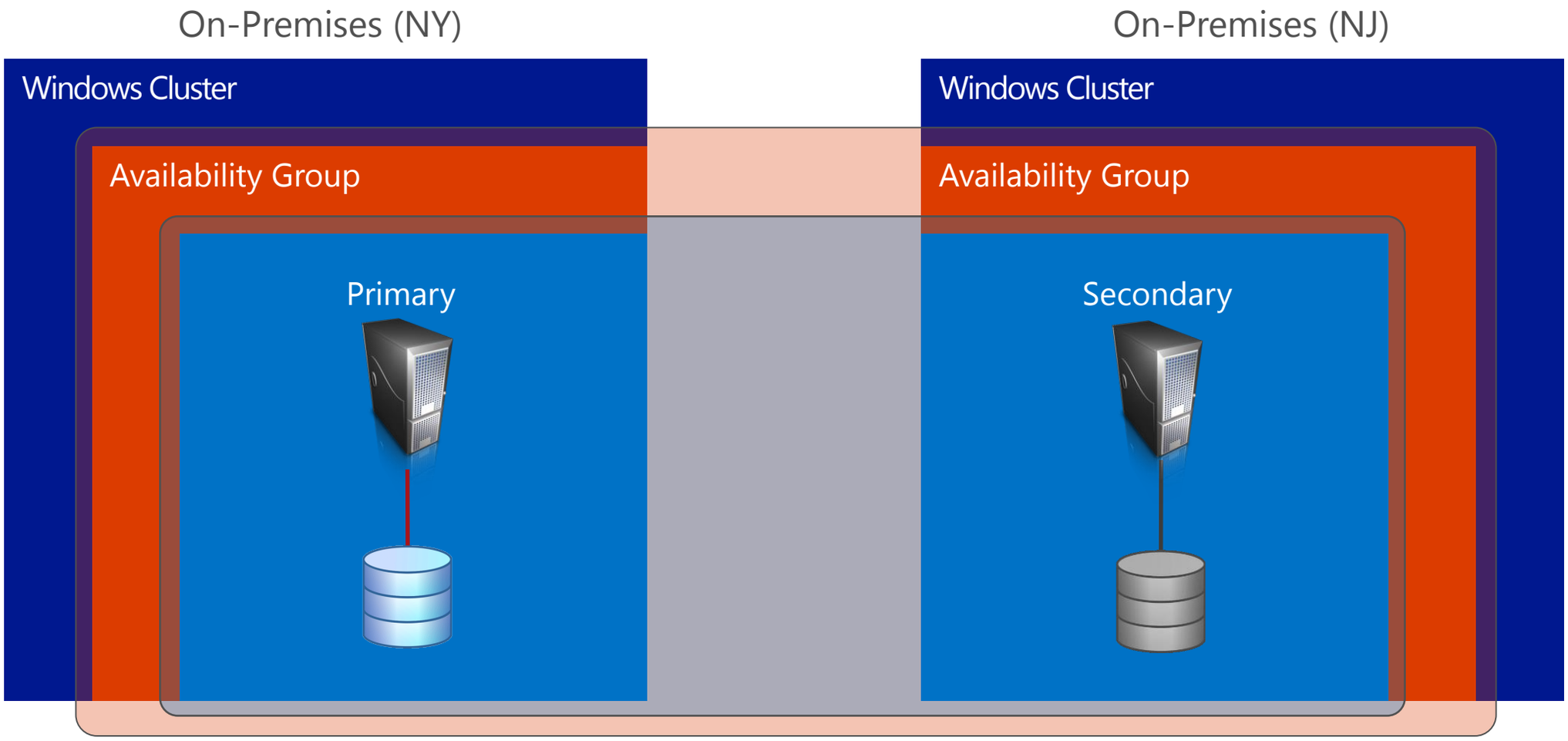
Architecture Diagram



Container Shipping Company

- Business
  - One of the largest container shipping company in the World
- Application
  - Secured electronic data interchange (EDI) messages
- Infrastructure
  - Primary data center in NJ
  - DR data center in Manhattan, NY
  - Use Availability Groups for DR
  - Both data centers got affected by Hurricane Sandy
  - Would like to leverage Windows Azure as DR data center

Architecture Diagram



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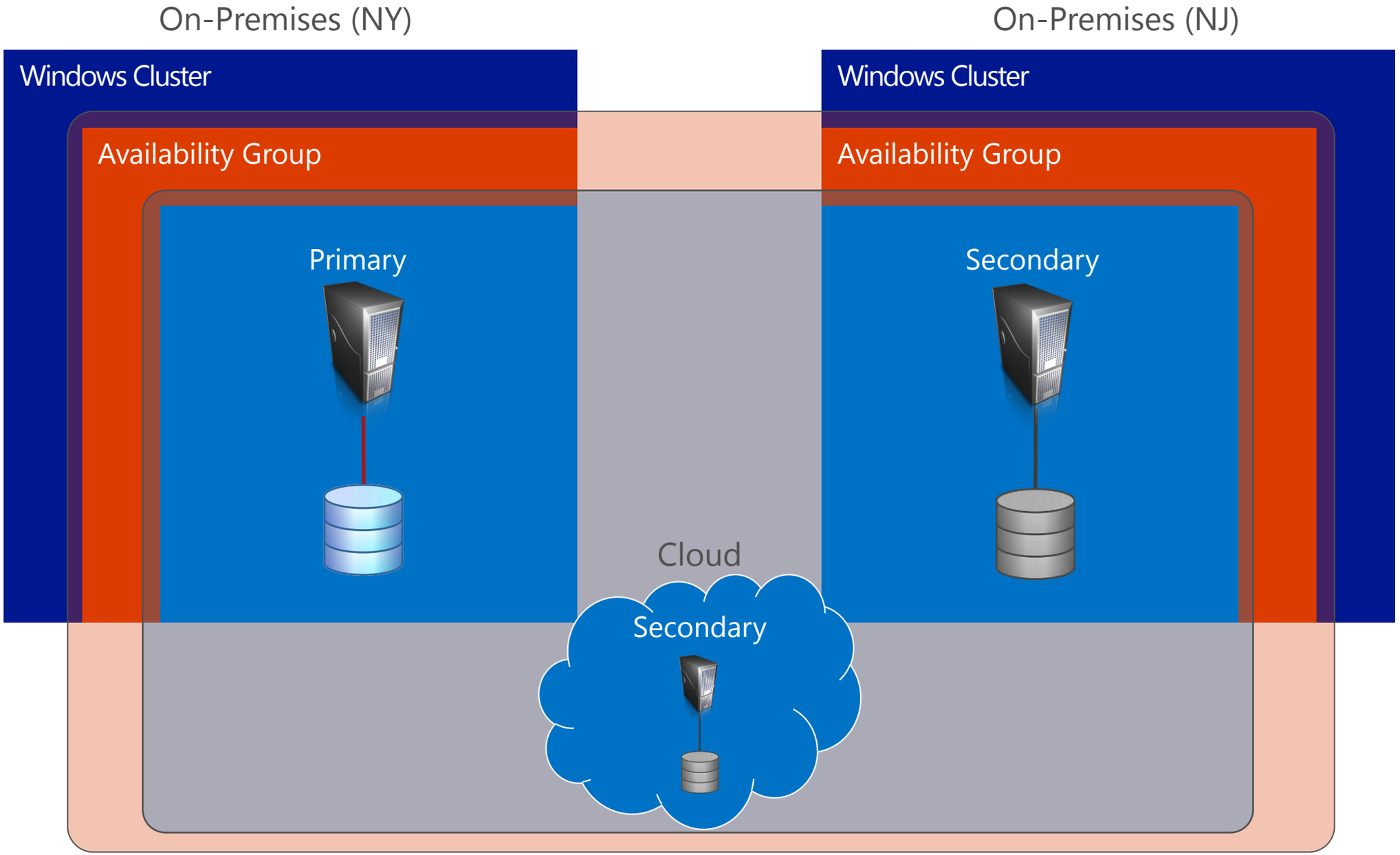
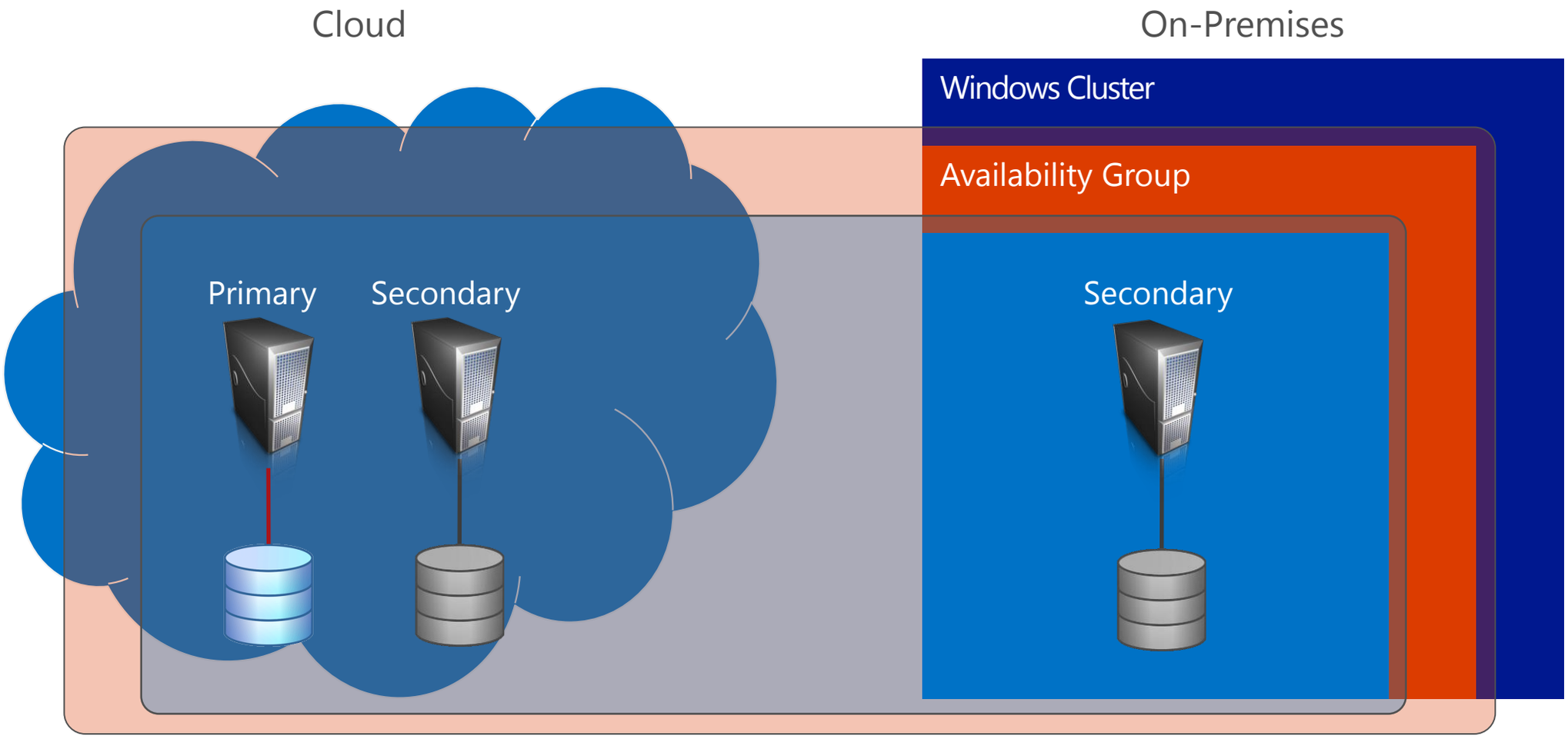


Online Video Streaming Company

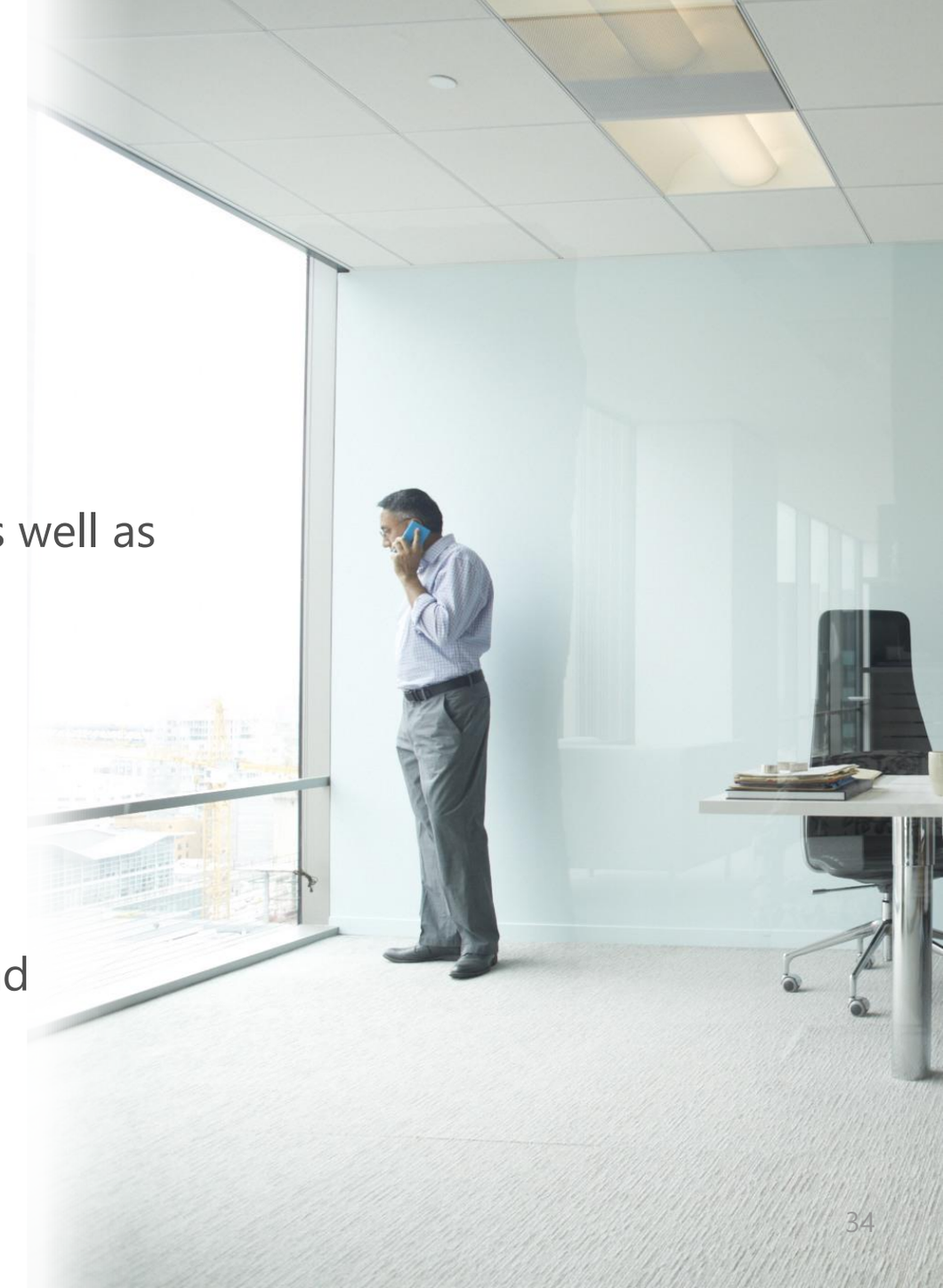
- Characteristics:
  - Organizational strategy to move to Windows Azure
  - HA / DR important need
  - Windows Azure will be used as primary
  - One secondary in Windows Azure for local HA
  - Another secondary replica on-premises for DR

Architecture Diagram

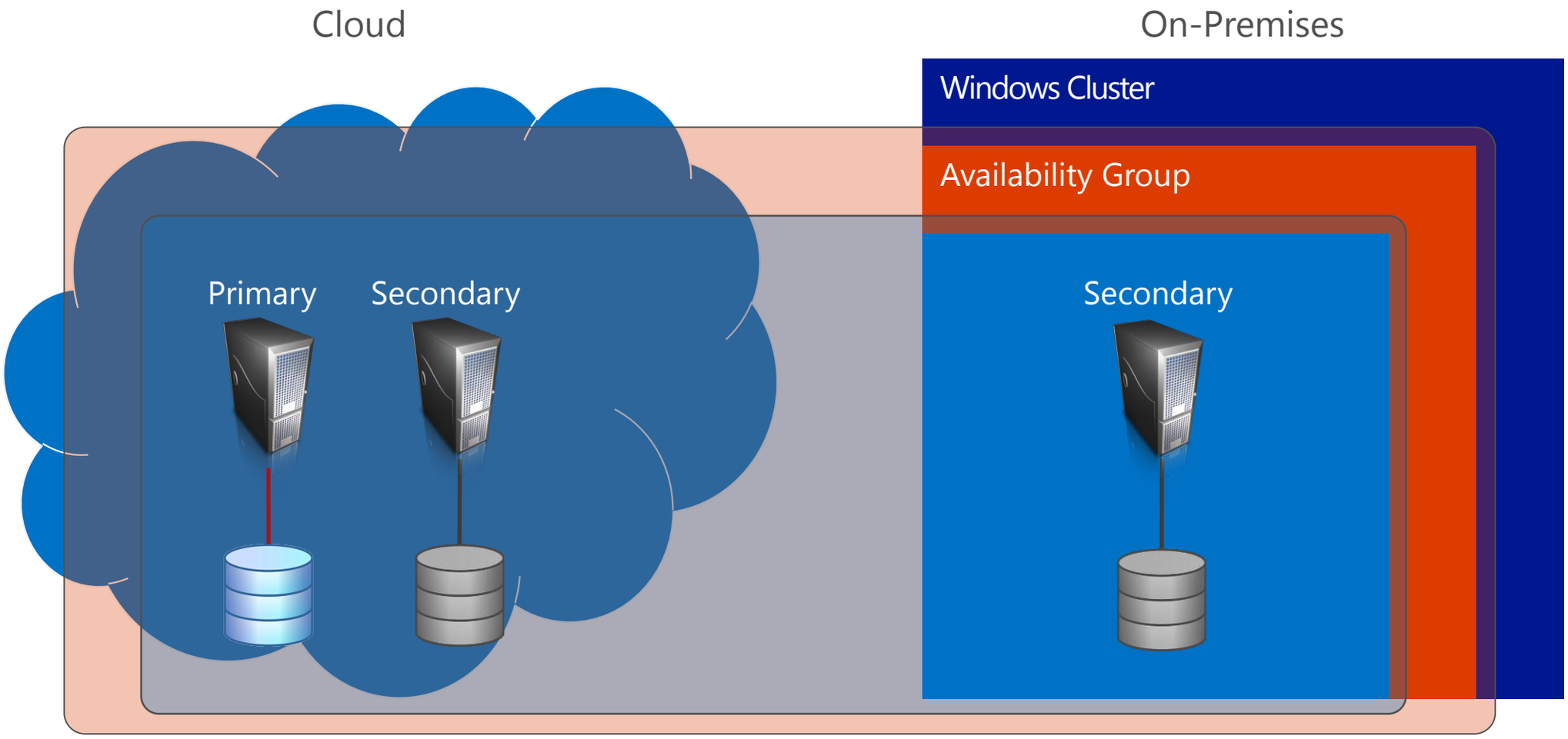


Healthcare Company

- Characteristics:
  - Healthcare software company providing on premises as well as hosted software
  - Use Windows Azure as hosting infrastructure
  - HA / DR needs are important
  - HIPAA compliance is important
  - Primary: Windows Azure
  - Secondary: a copy of data on premises for reporting and regulatory purposes

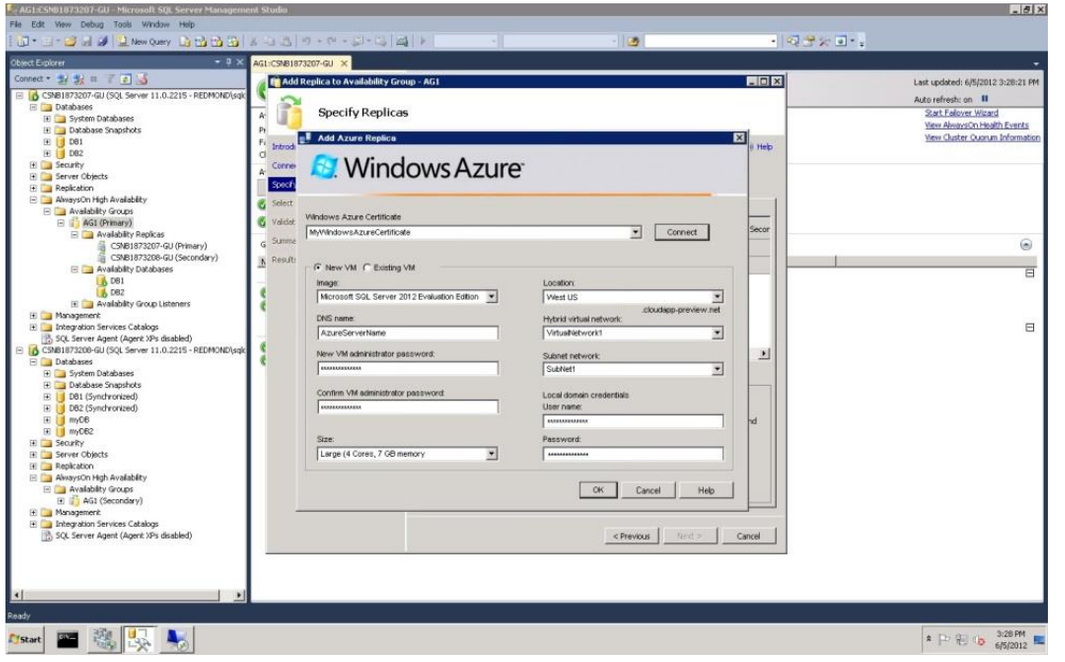


Architecture Diagram



AlwaysOn Replica in Windows Azure

- What's being delivered
  - Wizard to add a replica in a Windows Azure VM
- Main benefits
  - Easily deploy one or more replicas of your databases to Windows Azure
    - No need for a DR site (hardware, rent, ops)
  - Use these replicas for
    - Disaster Recovery
    - Workloads (reads/backups)



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Deploy dB to Windows Azure Wizard

Microsoft
Deploy dB to
Windows Azure Wizard

Easy on-ramp to cloud

New migration wizard

Easily migrate on-premises SQL Server to a Windows Azure VM

Designed for users unfamiliar with Windows Azure

SQL Server in a Windows Azure VM

Ideal for existing apps and dev/test new apps

Full SQL Server functionality

Full VM control

Windows Azure SQL Database Service

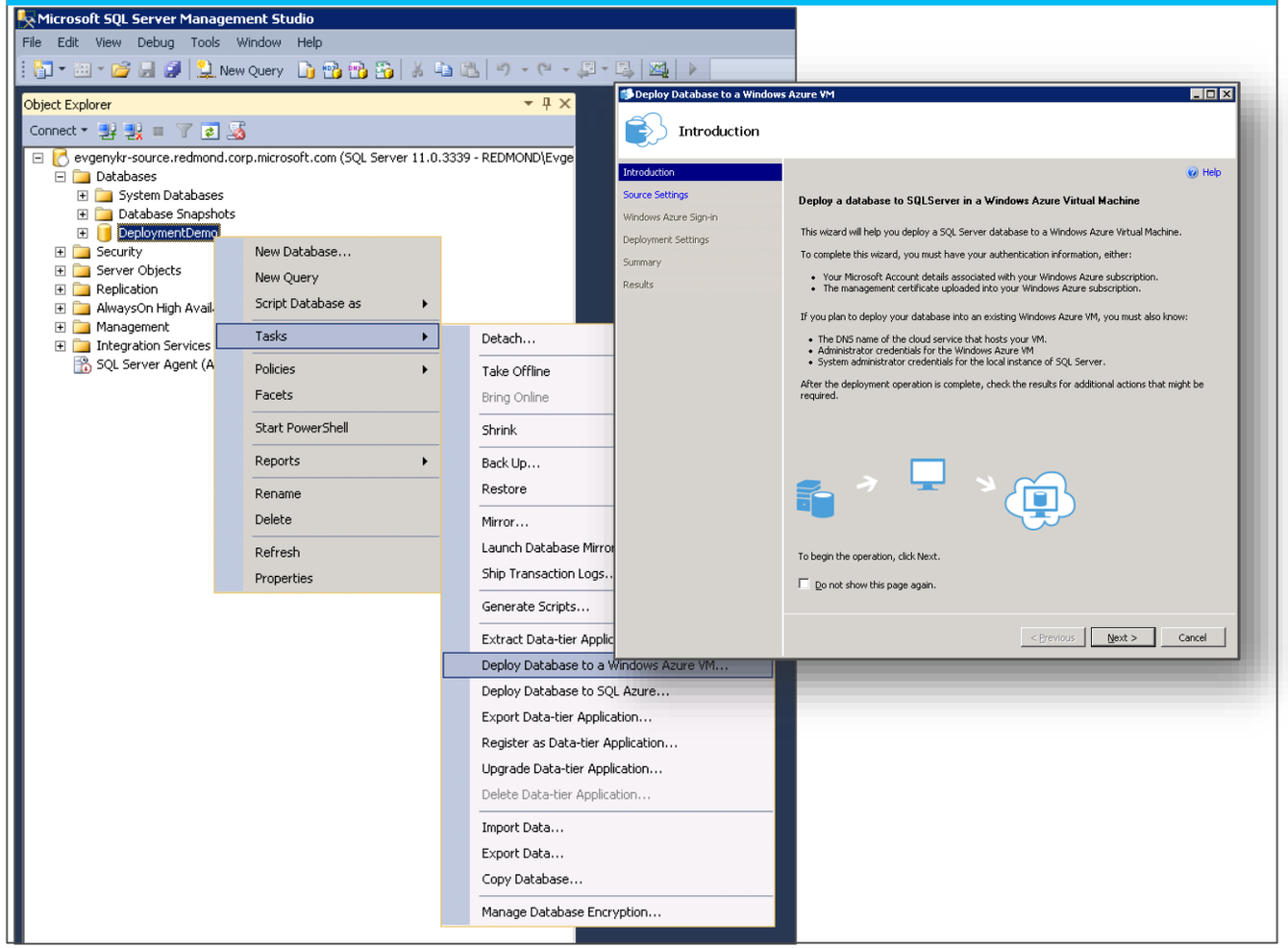
Ideal for new variable-demand apps

Dynamic scale-out of database

No patching of OS or DB

Built-in HA with 99.9-percent SLA

Cloud migration wizard



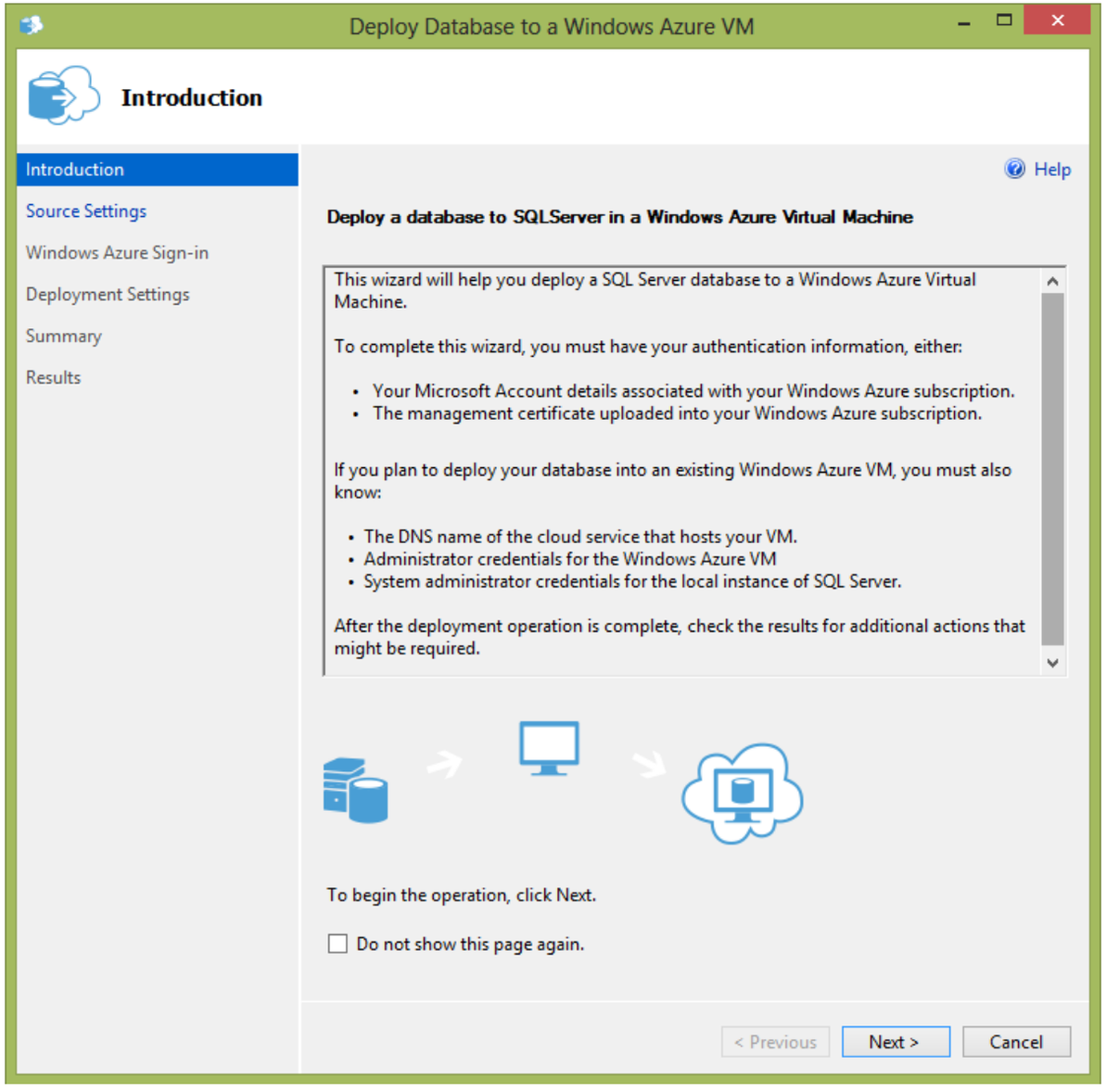
Deploy databases to Windows Azure VM

What's being delivered

- New wizard to deploy databases to SQL Server in Windows Azure VM
- Can also create a new Windows Azure VM if needed

Main benefits

- Easy to use
  - Perfect for database administrators new to Azure and for ad hoc scenarios
- Complexity hidden
  - Detailed Azure knowledge not needed
  - Almost no overhead: defining factor for time-to-transfer is database size



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SQL Server Data & Log Files in Windows Azure Storage

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SQL Server Data & Log Files in Windows Azure Storage

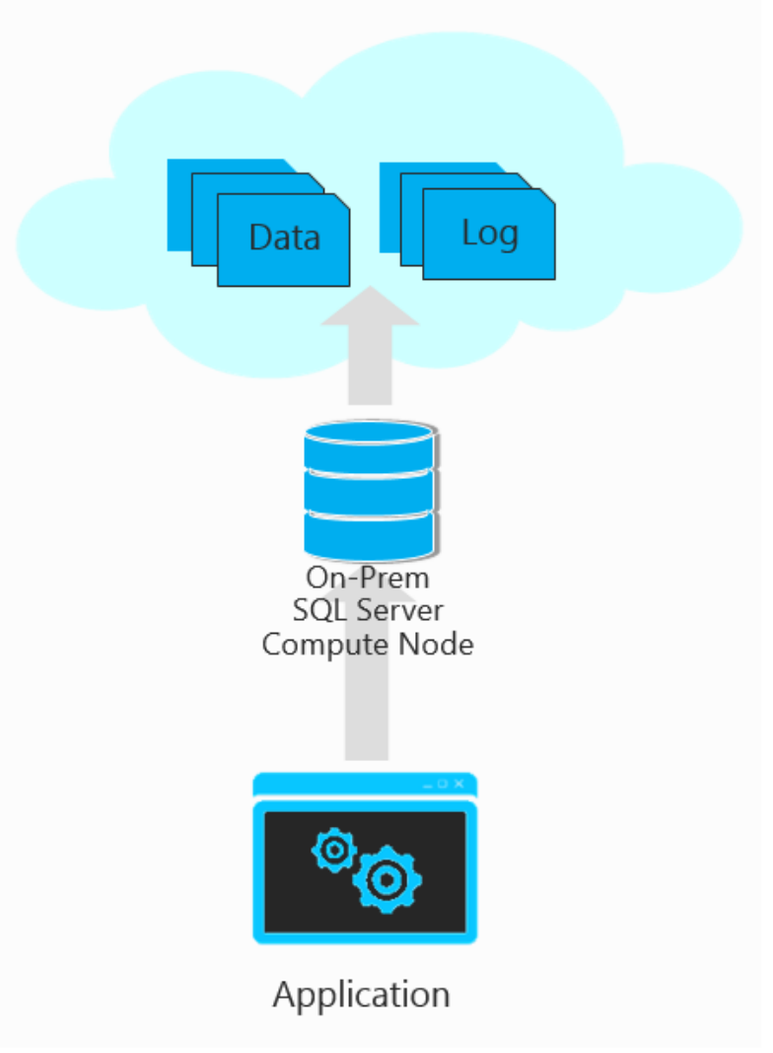
SQL Server Data & Log Files in Windows Azure Storage

What's being delivered

- Ability to move data & log files in Windows Azure Storage, while keeping the compute node of SQL Server on-premise
- Transparent Data Encryption (TDE) is supported

Main benefits

- No application changes required
- Centralized copy of data and log files
- Enjoy unlimited storage capacity in Azure Storage (built in HA, SLA, geo-DR)
- Secure because TDE encryption key can be stored on-premise
- Restore database is simply an attach operation



SQL Server Data & Log Files in Windows Azure Storage

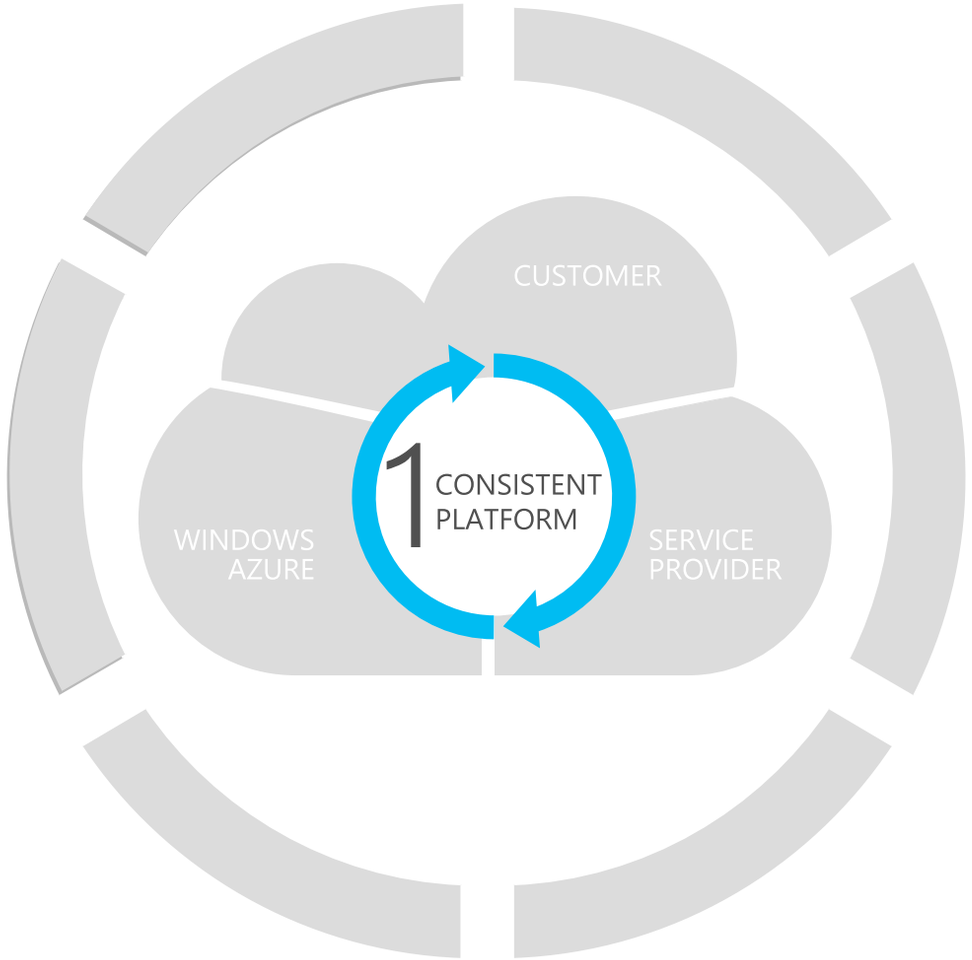
Create database syntax does not change:

```
-- Now create a database which uses this container
CREATE DATABASE foo
ON
( NAME = foo_dat,
    FILENAME = 'https://<Your Azure storage with folder location>/foo.mdf' )
LOG ON
( NAME = foo_log,
    FILENAME = 'https://<Your Azure storage with folder location>/foolog.ldf')
GO
```

Restore is simply an attach operation:

```
USE master
Go
CREATE DATABASE foo
ON
( NAME = foo_dat,
    FILENAME = 'https://<Your Azure storage with folder location>/foo.mdf' )
LOG ON
( NAME = foo_log,
    FILENAME = 'https://<Your Azure storage with folder location>/foolog.ldf')
FOR ATTACH
GO
```

Complete and consistent data platform



SQL Server 2014

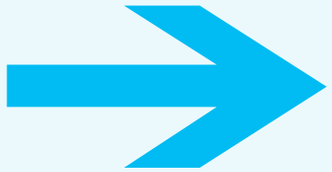
Mission-critical performance

Faster insights from any data

Platform for hybrid cloud

Development | Management | Data | Identity | Virtualization

Call to action



Download SQL Server 2014 CTP2

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