



TUGA IT

SUMMER EDITION

LISBON, JULY 19-21, 2018

WIFI: MSFTGUEST
CODE: msevent000ej

THANK YOU TO OUR SPONSORS



Microsoft

GOLD SPONSOR

bi4all

CREATING BUSINESS INTELLIGENCE

SILVER SPONSOR

|create|**it**|

INNOVATING LIFE

TUGA BEER SPONSOR

FARFETCH

SWAG SPONSOR



Azure SQL Database Managed Instance

Built to easily modernize application data layer

Borko Novakovic (bonova@microsoft.com)

Senior Program Manager, Microsoft Azure Data

Agenda

- Hour 1 (Overview)
 - Cloud modernization opportunity
 - The “four pillars” of Managed Instance
 - Recent updates
 - 1st demo: meet managed instance
- Hour 2 (Focus on details)
 - The AHB model
 - Developer perspective
 - Network architecture
 - 2nd demo: migrate workloads to Managed Instance

Session objectives

At the end of this session, you should be able to understand:

- ...how Managed Instance minimizes migration friction and increases customer's productivity

- ...whether your app is ready for migration to SQL MI

- ..value props and technical details of Managed Instance

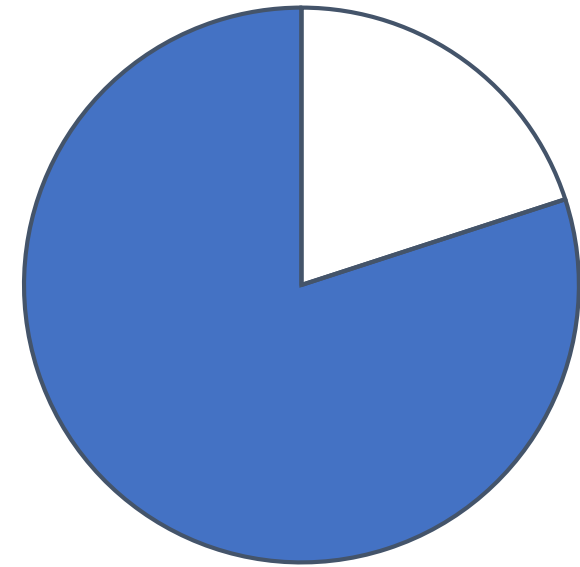
Cloud Migration Opportunity

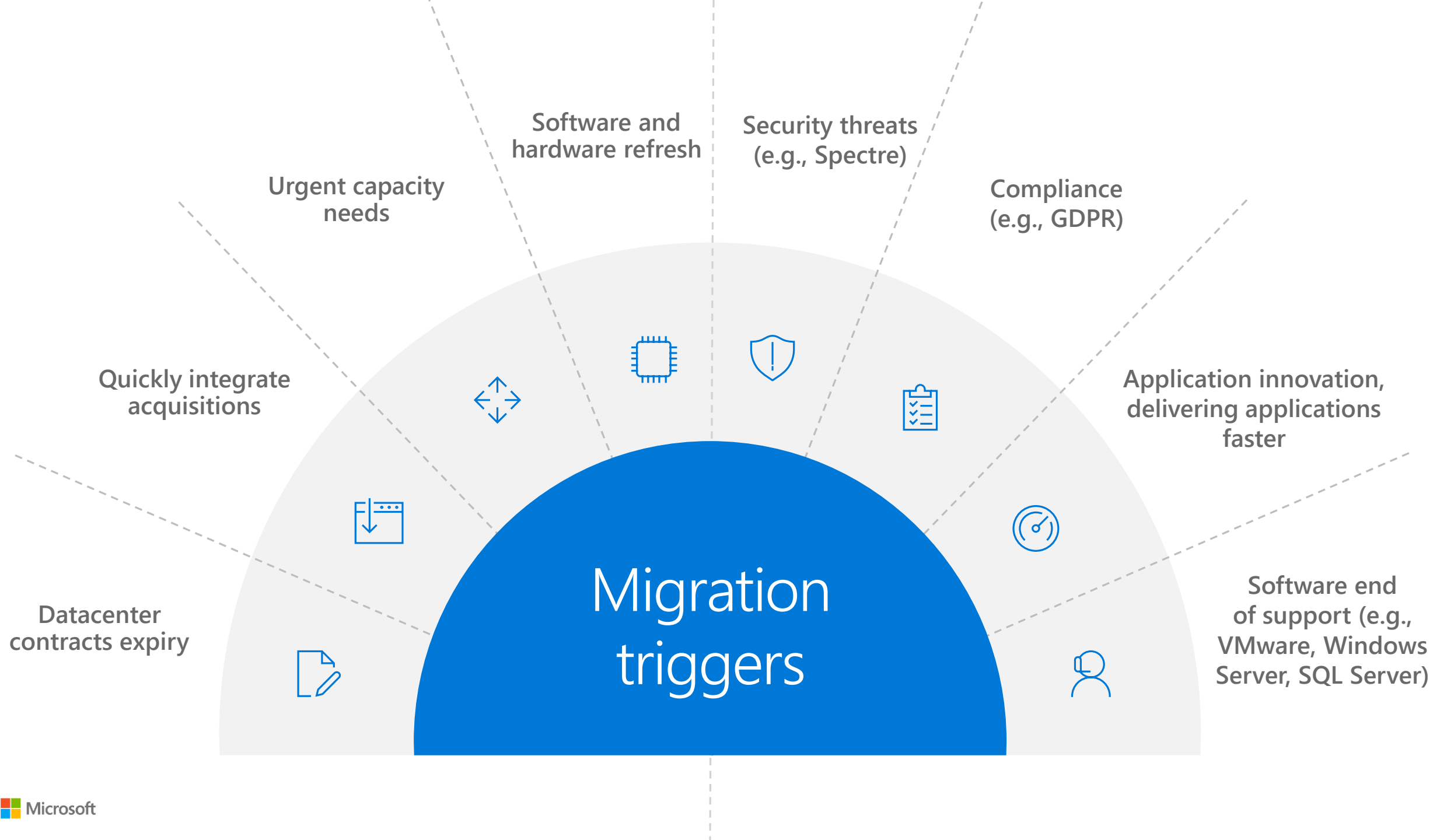
GETTING AHEAD MEANS GETTING TO THE CLOUD

Companies that embrace the cloud
grow **19.6% faster**



More than **80% of organizations**
now adopt cloud-first strategies



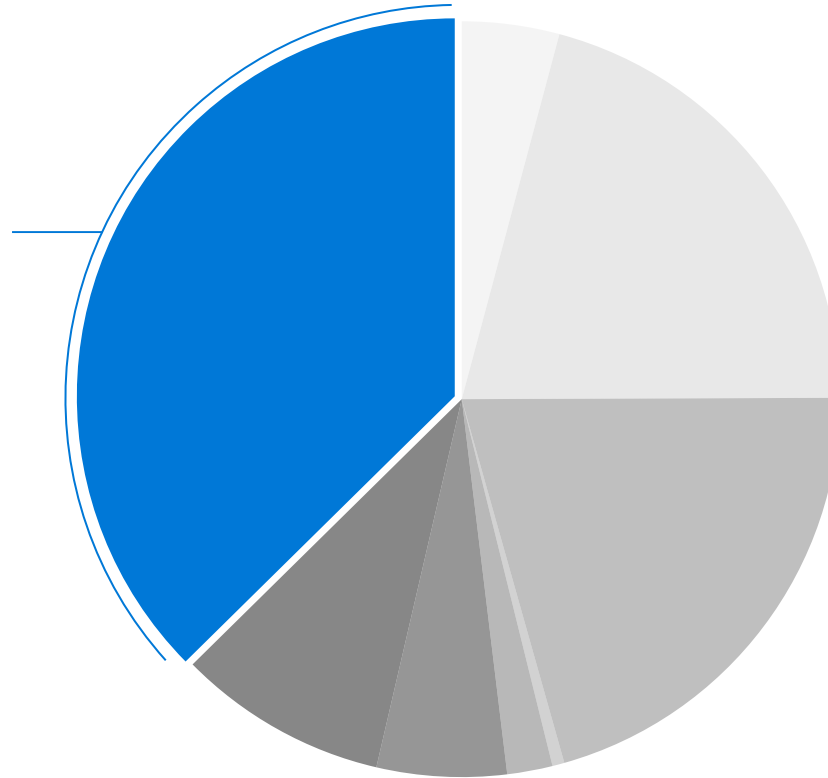


IT OPTIMIZATION IS KEY TO DIGITAL TRANSFORMATION

IDC Worldwide Database Server Forecast

SQL Server

37% of all units run Microsoft,
>50% of units run 2008/R2 or older²



Priorities

- Eliminate time spent managing “long tail” of applications—lift and shift to managed cloud
- Free up limited IT resources to drive transformation
- Migrate business critical apps to cloud—extend and innovate

¹ Pie Chart *IDC Worldwide DB Forecast Dec 2016

² Microsoft Internal Sources

AZURE SQL DATABASE

THE BEST AND MOST ECONOMICAL CLOUD
DESTINATION FOR YOUR SQL SERVER APPS

Built-in intelligence



Breakthrough productivity
and performance



Seamless and compatible

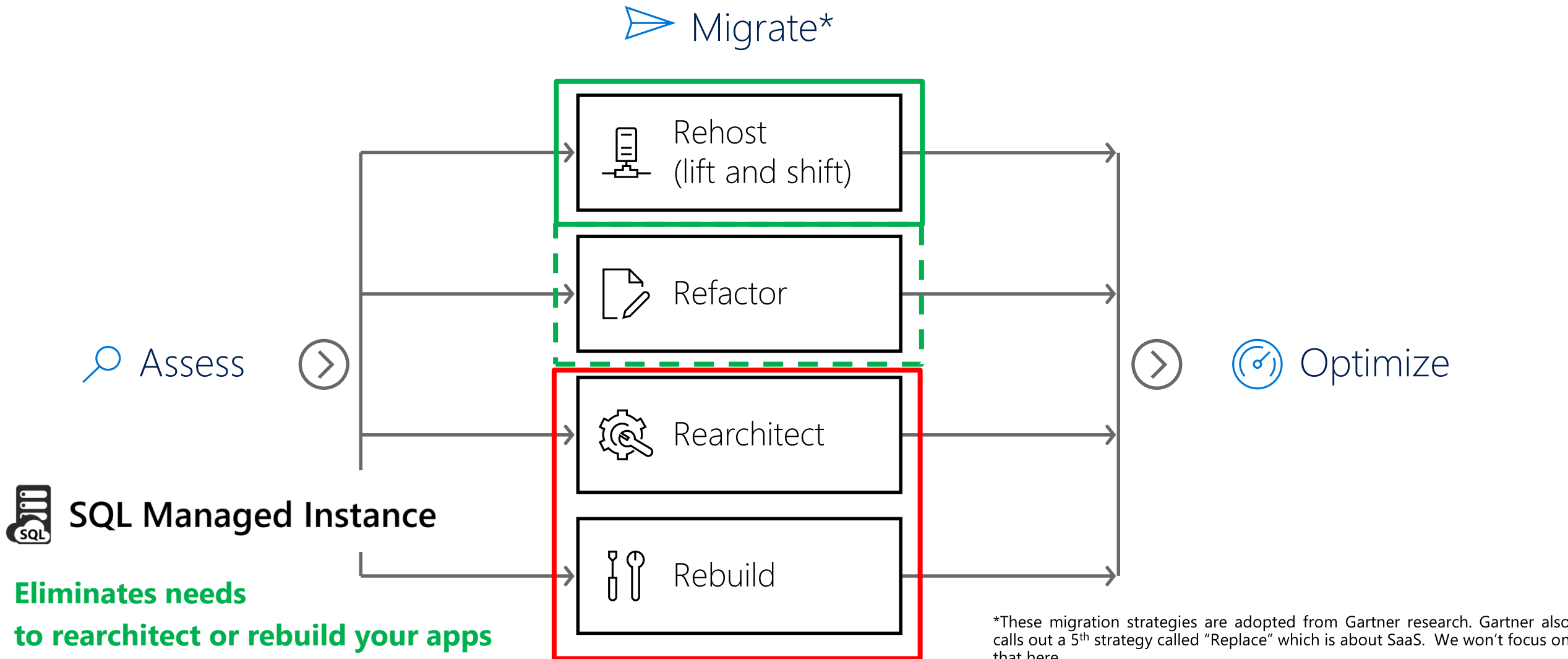


Competitive TCO



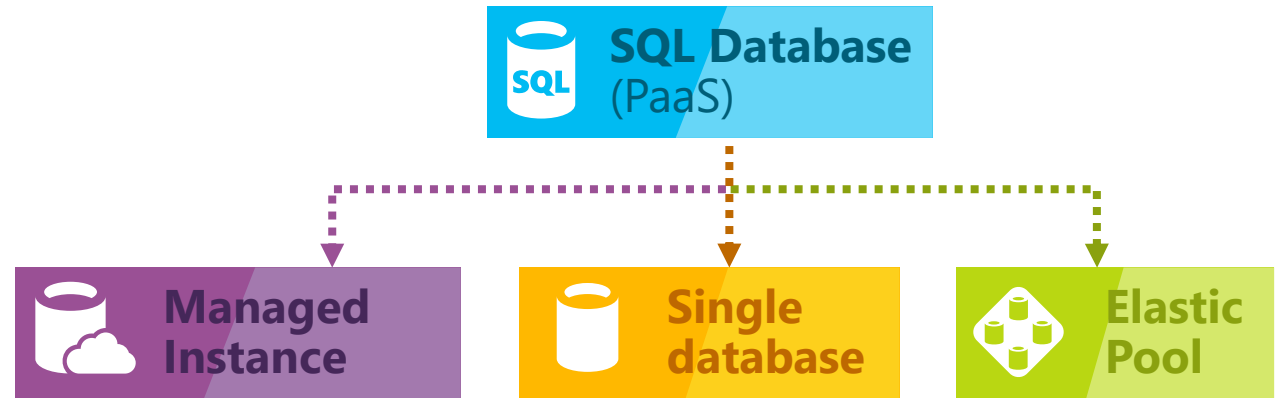
Realize up to a 406% ROI over on-premises and hosted solutions

Breaking down the Azure migration journey



What is SQL Database Managed Instance?

New deployment option that enables friction-free migration for SQL workloads and modernization in a fully managed service



SQL Server compatibility

- Fully-fledged SQL instance with nearly 100% compat with on-prem

Fully managed DBaaS

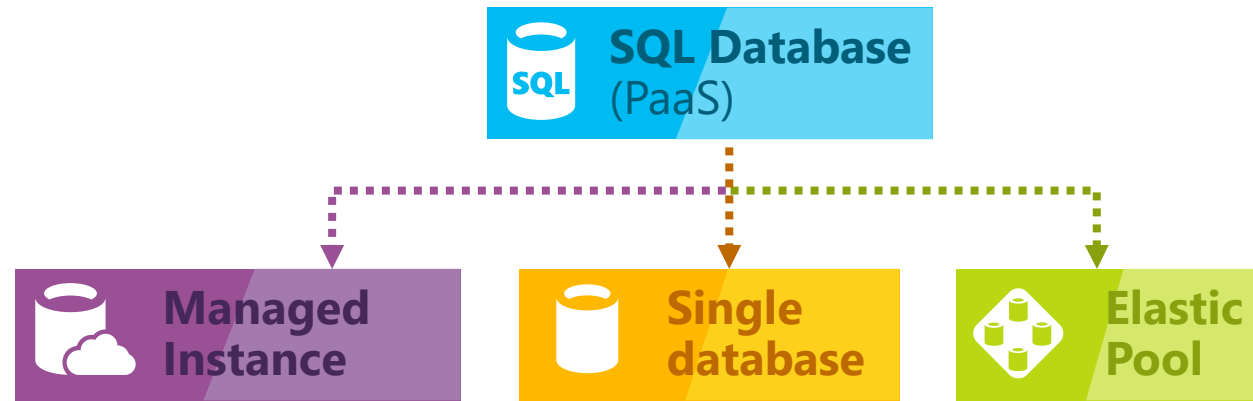
- Built on the same infrastructure as SQL DB
- All DBaaS features

Full isolation and security

- Contained within your VNet
- Private IP addresses
- Express Route / VPN connectivity

New business model

- Transparent
- Frictionless
- Competitive



SQL Server compatibility

- Fully-fledged SQL instance with nearly 100% compat with on-prem

Fully managed DBaaS

- Built on the same infrastructure as SQL DB
- All DBaaS features

Full isolation and security

- Contained within your VNet
- Private IP addresses
- Express Route / VPN connectivity

New business model

- Transparent
- Frictionless
- Competitive

Easy migration: nearly 100% like SQL Server

Data migration

- Native backup/restore
- Configurable DB file Layout
- Log Reply *
- DMS (migrations at scale)

Security

- Integrated Auth (AAD)
- Encryption (TDE, AE)
- Row Level Security
- SQL Audit
- Vulnerability Assessment*
- Dynamic Data Masking

Programmability

- Cross-database queries and transactions
- .NET, R*
- Linked servers
- Global temp tables

Operational

- DMVs & XEvents
- Query Store
- SQL Agent
- DB Mail (external SMTP)

Scenario enablers

- Service Broker
- Change Data Capture
- Transactional Replication*

* - some features will be added until General Availability of Managed Instance

BUSINESS INTELLIGENCE SERVICES

Not installed side-by-side with
Managed Instance

Migrate your SSIS packages to new SSIS
on Azure Data Factory (PaaS service)

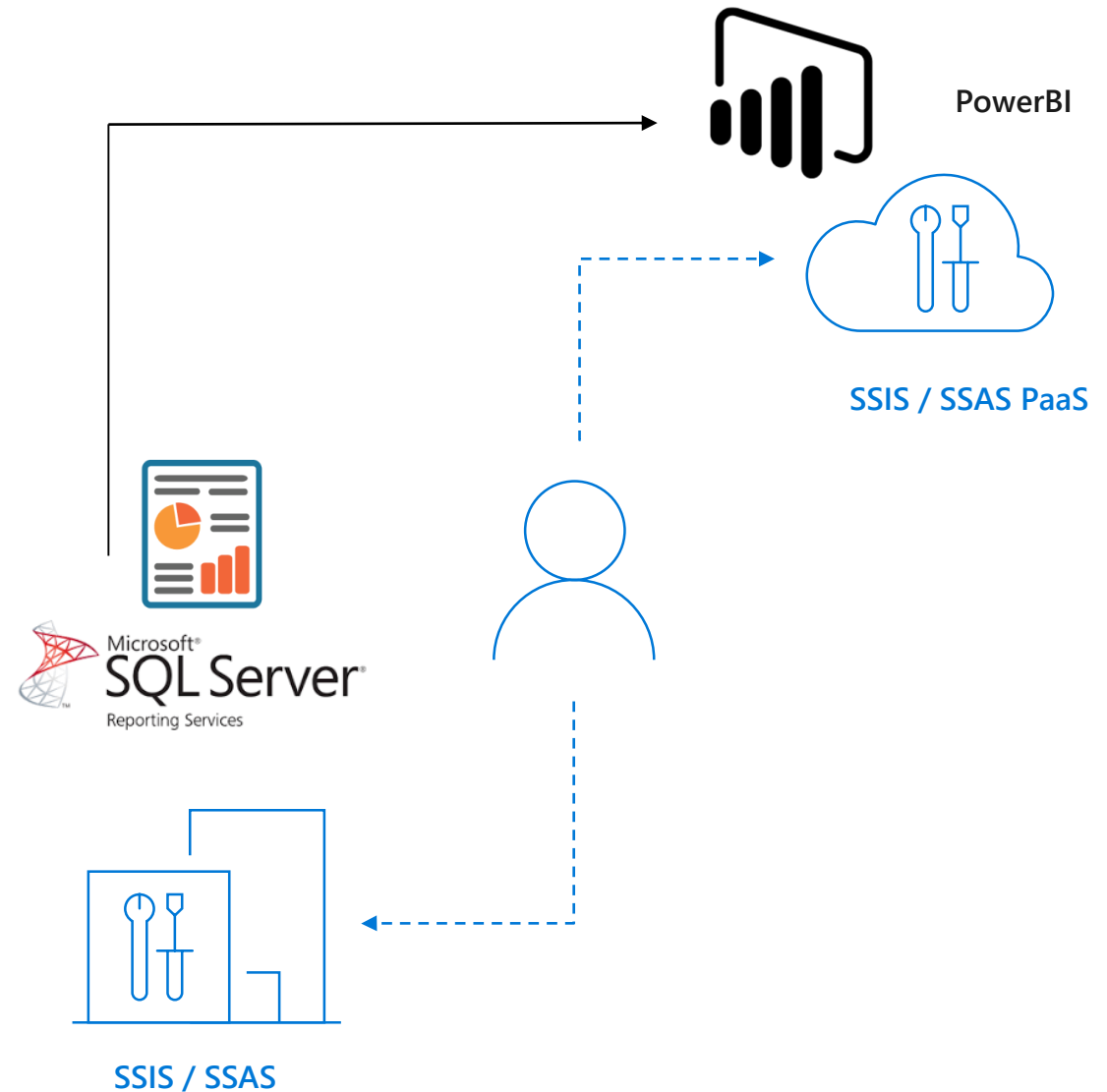
Migrate your OLAP models to Azure
Analysis Services

... or run these services in Azure virtual
machines

For SSRS: run in a virtual machine, or
switch to Power BI



Recommendation - move BI solutions to PaaS model



LIFT YOUR SQL SERVER INTEGRATION SERVICES (SSIS) PACKAGES TO AZURE

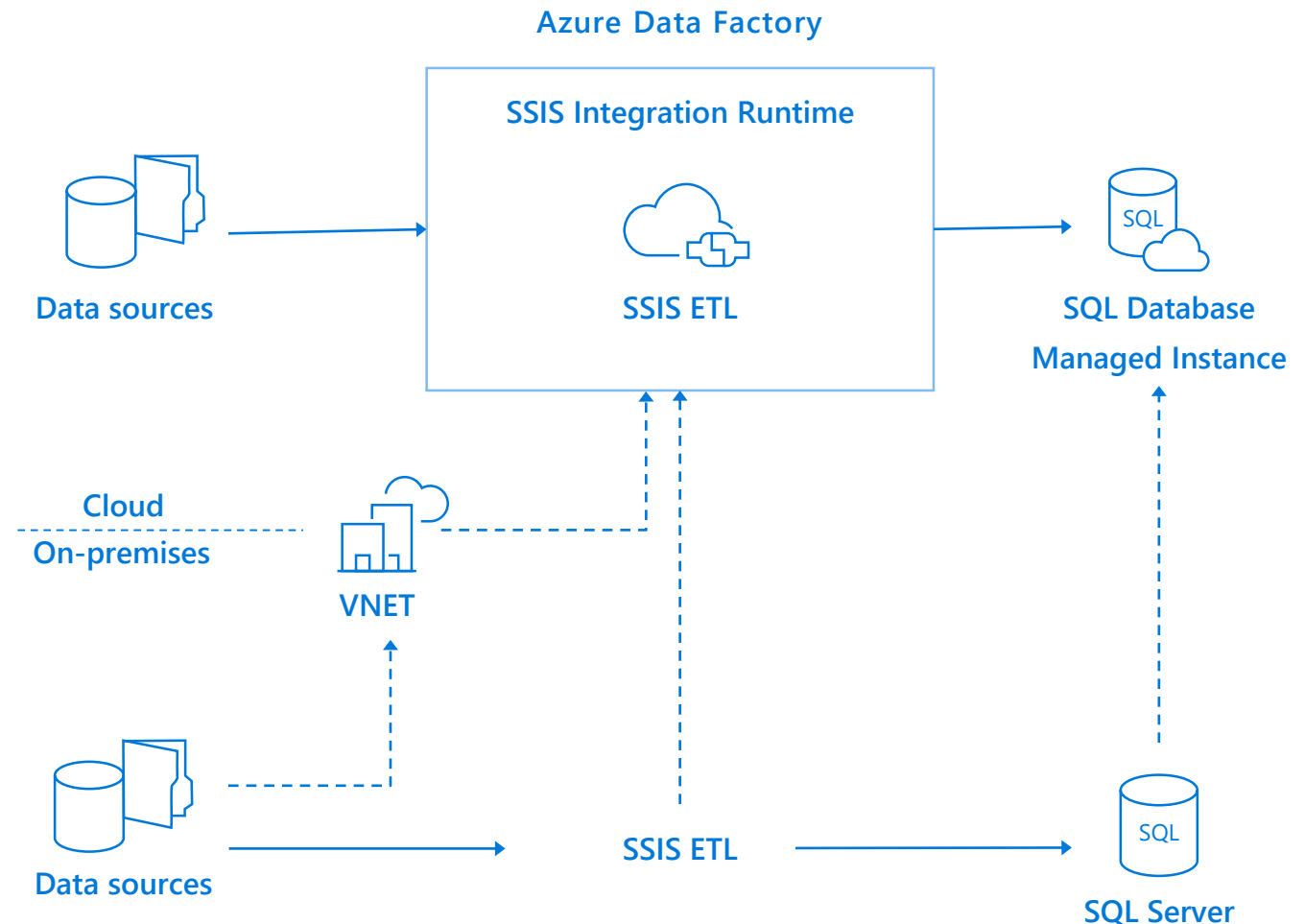
Easily execute and schedule your SQL Server Integration Services (SSIS) packages in managed execution environment for SSIS in Azure Data Factory version 2 (ADF v2)

Gain high availability, scalability and lower TCO by lifting your SSIS packages to Azure

Continue to build, monitor and manage packages with existing tools like SQL Server Management Studio (SSMS) & SQL Server Data Tools (SSDT)

You can install both free or unlicensed components, and paid or licensed components!

[Learn more](#)



**Next session: EMBRACE AND EXTEND: FIRST-CLASS ACTIVITY
AND 3RD PARTY ECOSYSTEM FOR SSIS IN ADF**

Tillmann Eitelberg Sandy Winarko
BI Cloud Data Platform

ACCELERATING YOUR JOURNEY TO THE CLOUD

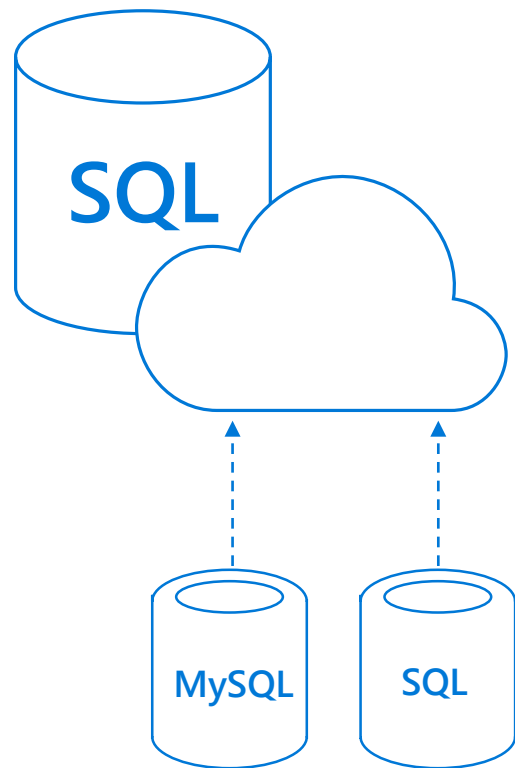
Fully managed database migration service for both operational databases and data warehouses

Enables reliable and seamless migrations to the cloud *at scale and minimal downtime*

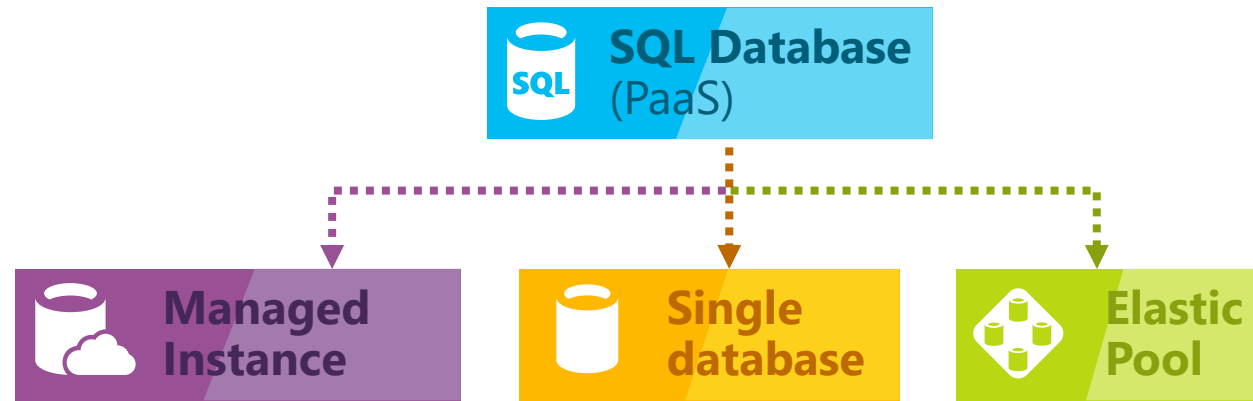
Migrate SQL Server & 3rd party databases to Azure SQL Database



Azure Database Migration Service



SQL Server	Azure SQL Database single, elastic pools and Managed Instance
MySQL	Azure Database for MySQL
PostgreSQL	Azure Database for PostgreSQL
Oracle, ...	Azure SQL Database & Managed Instance
Netezza, ...	Azure SQL Data Warehouse



SQL Server compatibility

- Fully-fledged SQL instance with nearly 100% compat with on-prem

Fully managed DBaaS

- Built on the same infrastructure as SQL DB
- All DBaaS features

Full isolation and security

- Contained within your VNet
- Private IP addresses
- Express Route / VPN connectivity

New business model

- Transparent
- Frictionless
- Competitive

COMPETITIVE TOTAL COST OF OWNERSHIP

Managed Instance will incrementally deliver following capabilities:

Automatic and easy instance provisioning

Automatic patching and upgrades

Protecting data with automated backups

Built-in high availability (99.99%)

Easy to configure disaster recovery

Securing your data from malicious users and mistakes

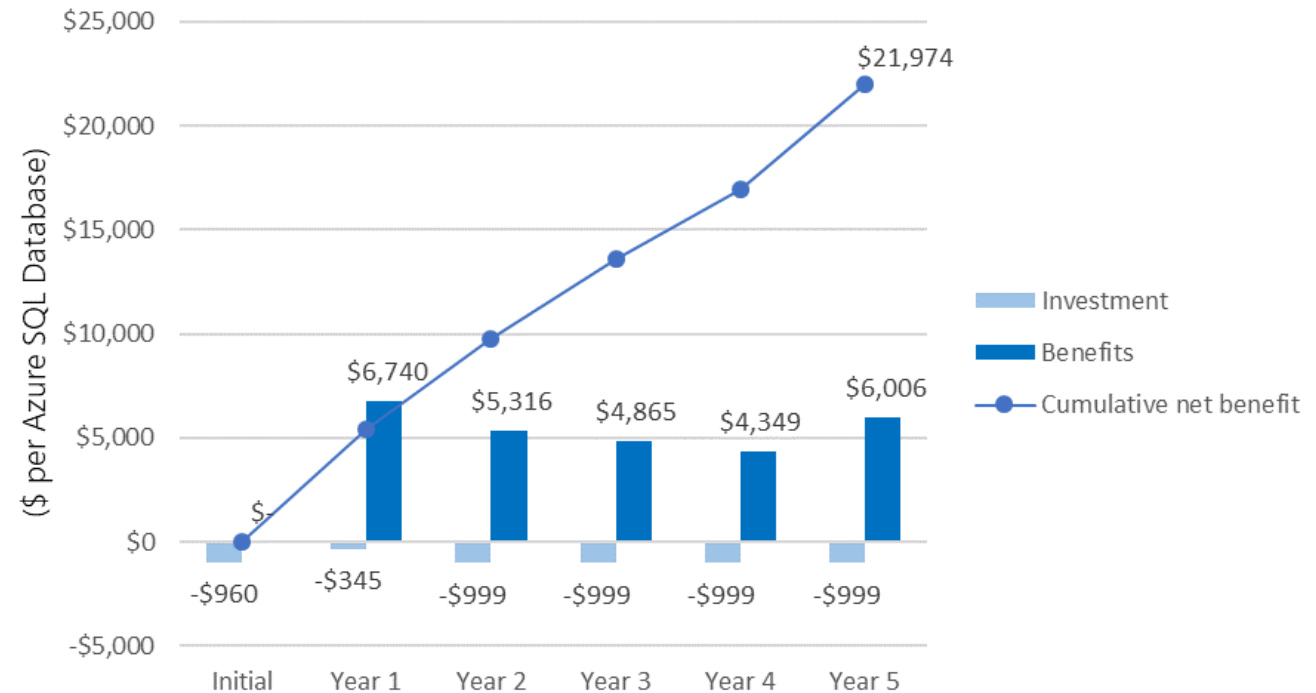
Compliance with security standards

Monitor, troubleshoot and tune for predictable performance



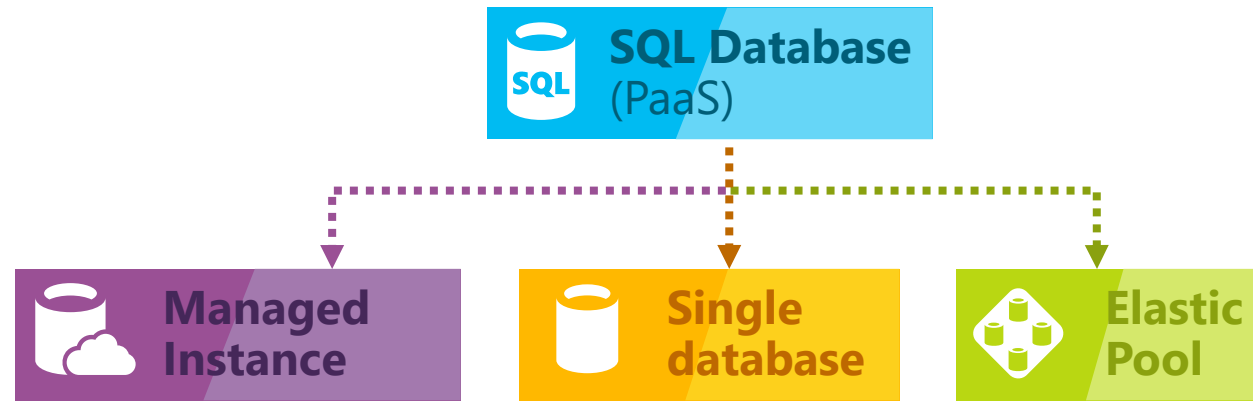
Up to 406% ROI with Azure SQL Database

Cost-Benefit Analysis per Azure SQL Database



Adapted from [The Business Value of Microsoft Azure SQL Database Services](#), IDC, March 2015.

Focus on your business and let platform manage your databases



SQL Server compatibility

- Fully-fledged SQL instance with nearly 100% compat with on-prem

Fully managed DBaaS

- Built on the same infrastructure as SQL DB
- All DBaaS features

Full isolation and security

- Contained within your VNet
- Private IP addresses
- Express Route / VPN connectivity

New business model

- Transparent
- Frictionless
- Competitive

DEDICATED RESOURCES THROUGH CUSTOMER ISOLATION

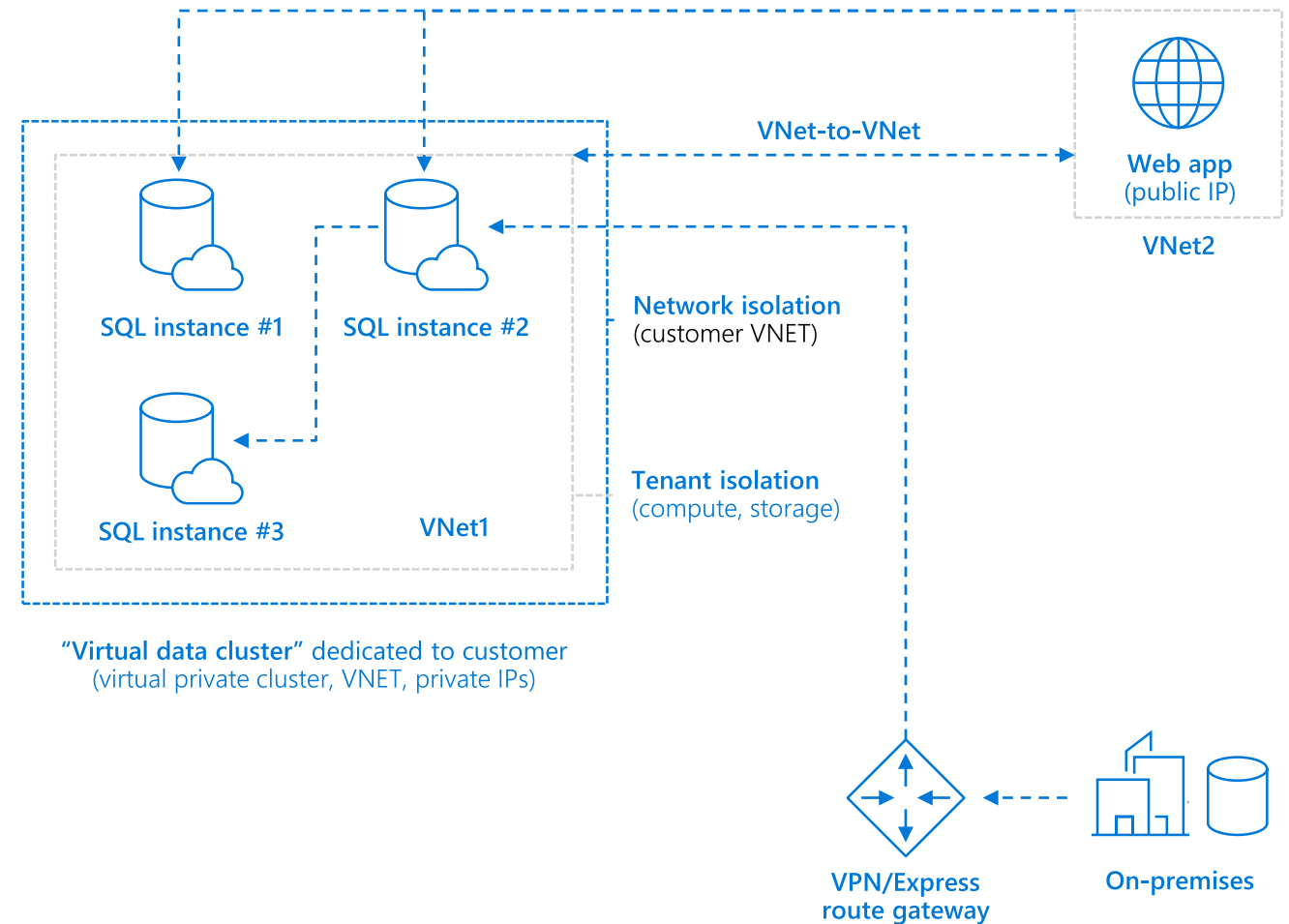
Enable full isolation from other tenants without resource sharing

Promote secure communication over **private IP addresses** with native VNet integration

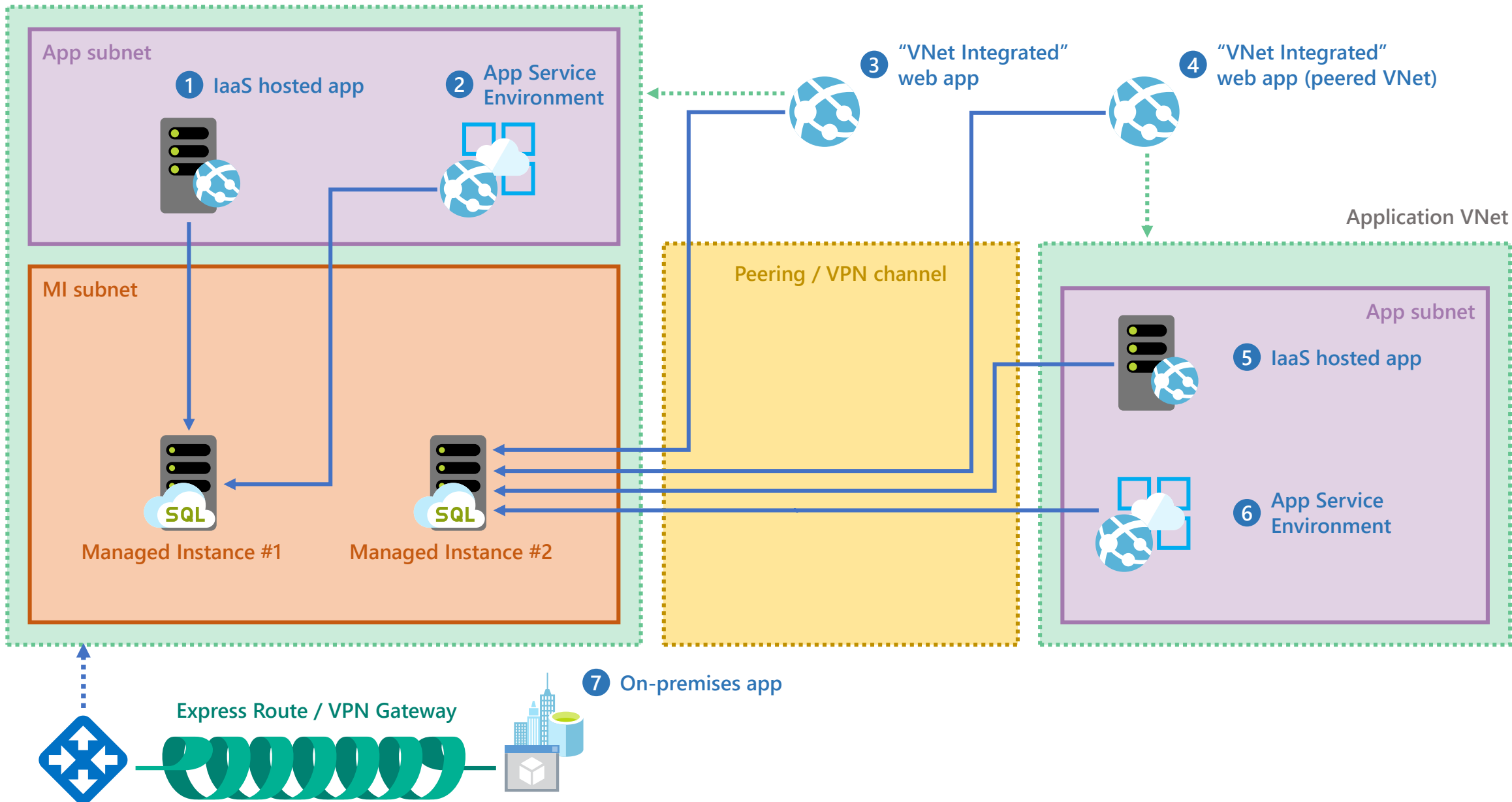
Enable your on-premise identities on cloud instances, through integration with **Azure Active Directory** and **AD Connect**

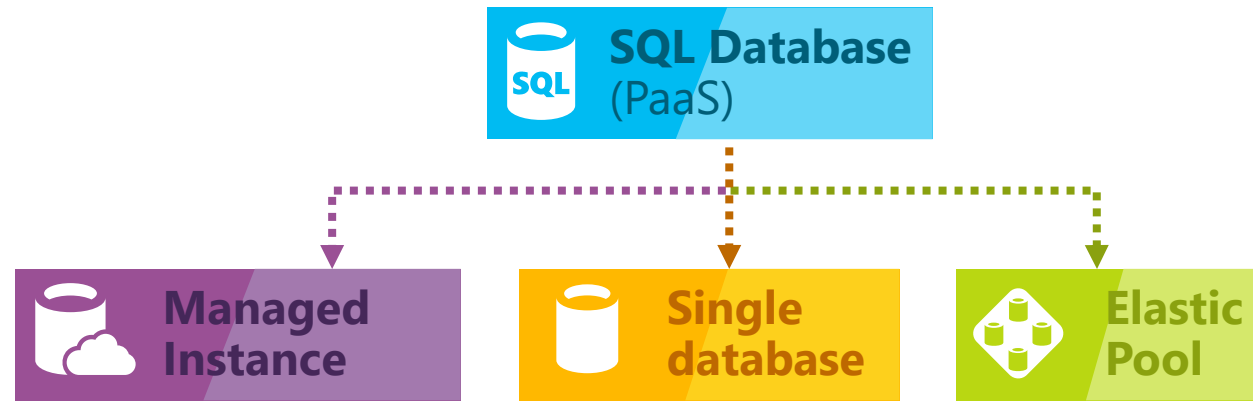


VNET support in SQL Database Managed Instance



App integration and network security





SQL Server compatibility

- Fully-fledged SQL instance with nearly 100% compat with on-prem

Fully managed DBaaS

- Built on the same infrastructure as SQL DB
- All DBaaS features

Full isolation and security

- Contained within your VNet
- Private IP addresses
- Express Route / VPN connectivity

New business model

- Transparent
- Frictionless
- Competitive

RIGHT-SIZE YOUR WORKLOADS FOR THE CLOUD

Easier to right-size the destination environment by removing the guesswork of DTUs

You pay only for what you use

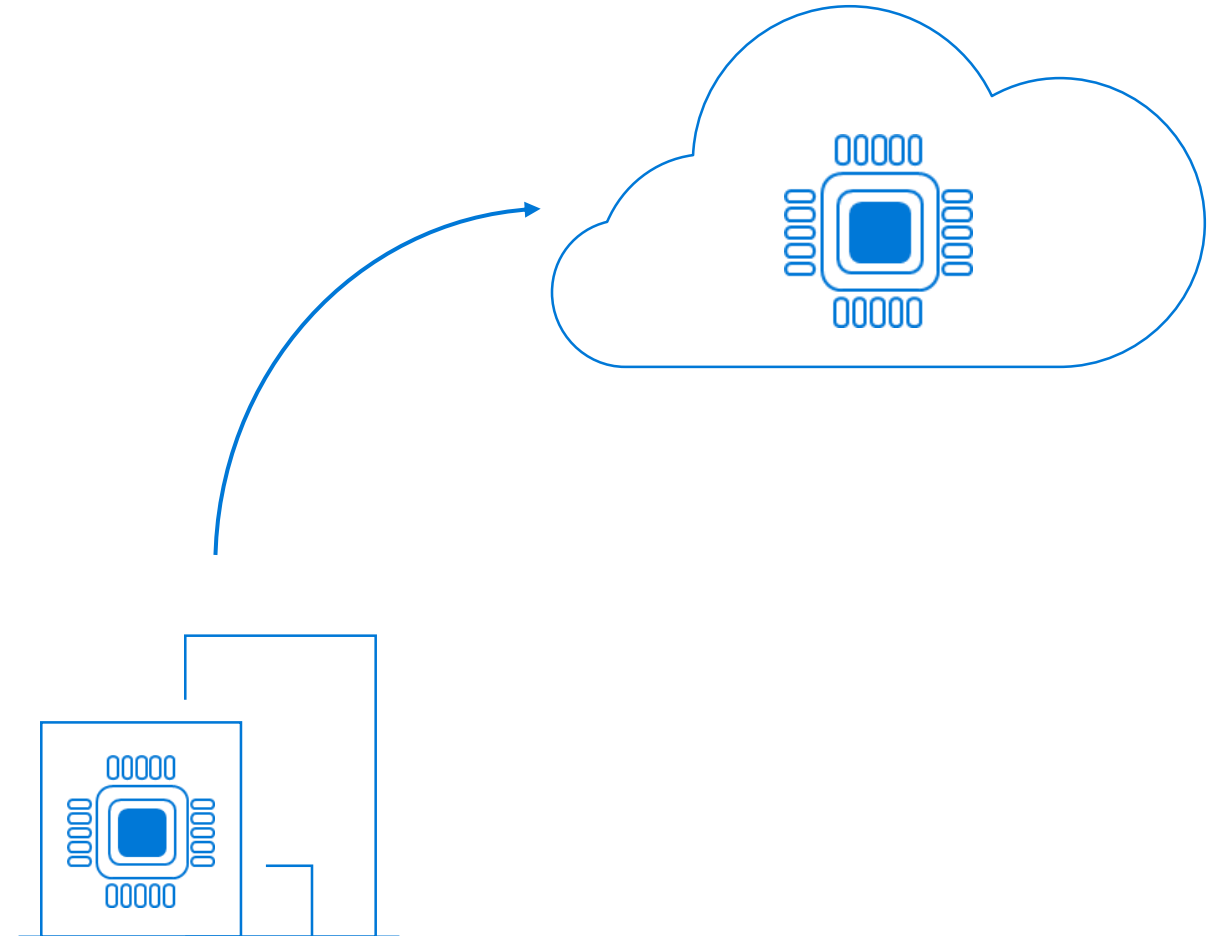
A virtual core represents the logical CPU offered with an option to choose between generations of hardware

Gen 4 Logical CPUs are based on Intel E5-2673 v3 (Haswell) 2.4 GHz processors.

Gen 5 Logical CPUs are based on Intel E5-2673 v4 (Broadwell) 2.3 GHz processors.



Introducing vCores





CHOOSE THE BEST OPTION FOR YOUR WORKLOADS

- Choose compute resources and storage independently
- Balance SLA requirements and price with two service tiers
- Customers pay for:
- Compute (vCores)
 - Type and amount of storage
 - Number of IO (in GA)
 - Back-ups (in GA)

[Learn more](#)



Two Managed Instance options

	 GENERAL PURPOSE	 BUSINESS CRITICAL*
Best for	Data applications with common IO and availability requirements	Business critical data applications with fast IO and high availability requirements
Compute tiers	8, 16, 24, 32, 40, 64*, 80* vCores	8, 16, 24, 32, 40, 64*, 80* vCores
Storage	Fast remote storage 32GB – 8TB per instance	Super-fast local SSD storage 32GB – 4TB per instance
Availability	1 replica, no read-scale	3 replicas, 1 read-scale
Surface area	Full (except In-memory OLTP)	Full

**NEW: Available in public preview since July 16th!*

Positioning SQL offerings in Azure

**SQL
IaaS**



YES

NO

Prefer full control /
customization
over the lowest
TCO?

YES

On-premises
lift-shift
migration?

NO

SQL PaaS



July updates

More choices for enterprise apps

- Business critical public preview
- 64 and 80 vCores in both tiers

Improved provisioning experience

- From 24+ to less than 6 hours
- Explicit networking dependencies

TDE with automatic key management

- Migration and new database scenario

General availability

- Planned for early Q4 this year

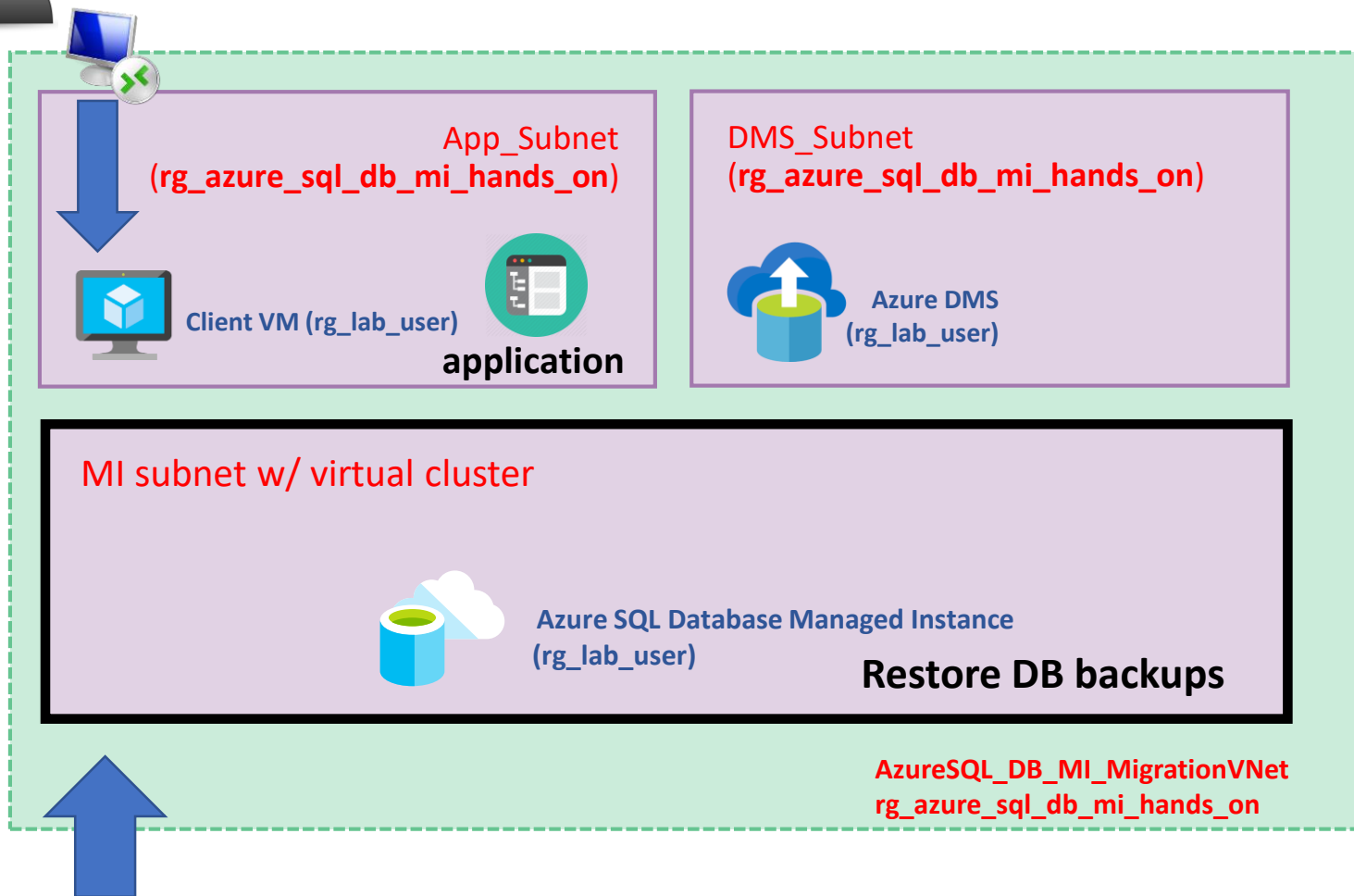
Demo

Environment setup



Lab user: an owner of rg_lab_user resource group

Lab organization – environment setup

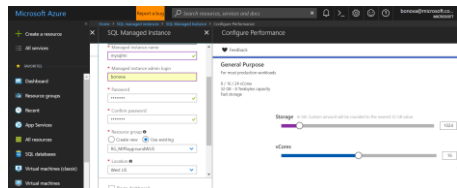


Shared Lab Resources

Non-shared Lab resources
(sandbox resources)



Azure Storage Account
(rg_lab_user)

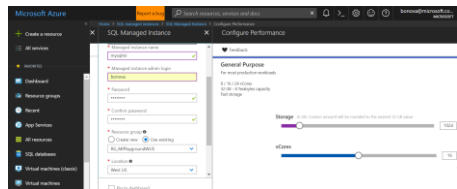
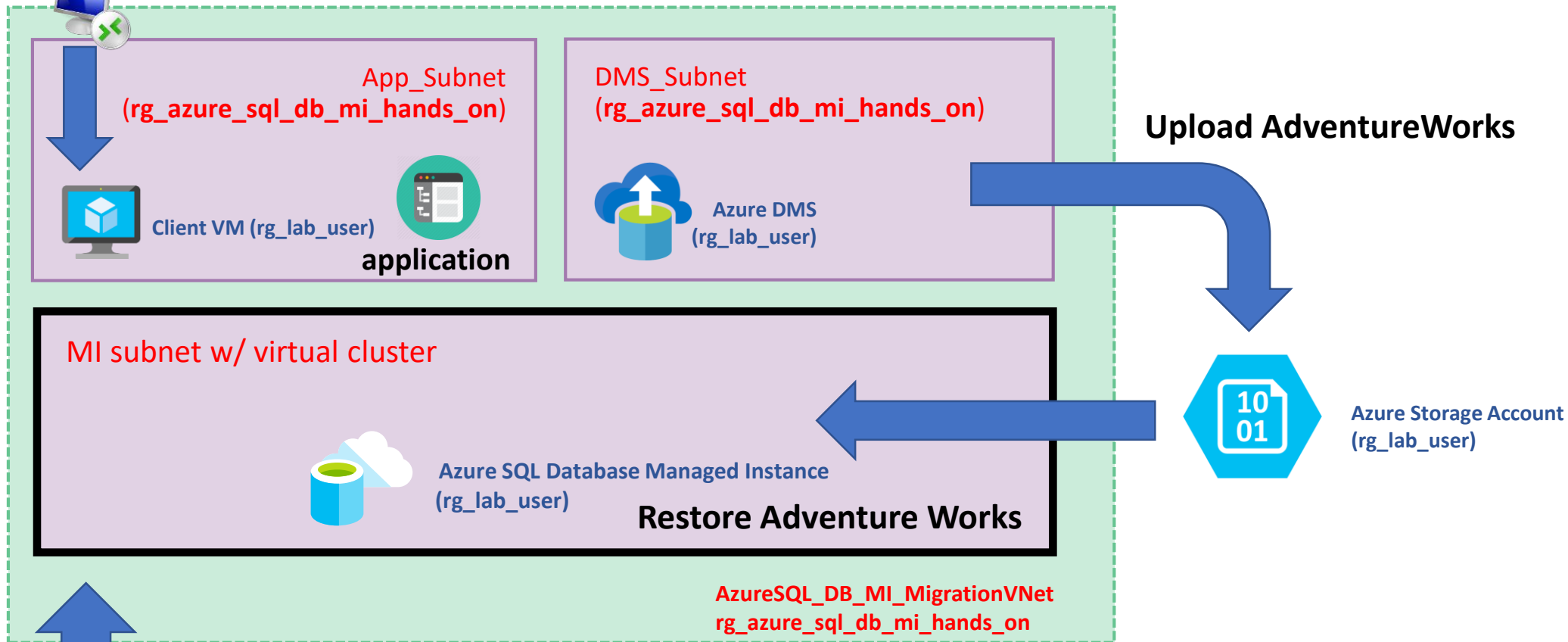


Lab user: an owner of rg_lab_user resource group



RDP
Connect to SQL MI through SSMS

Part 1

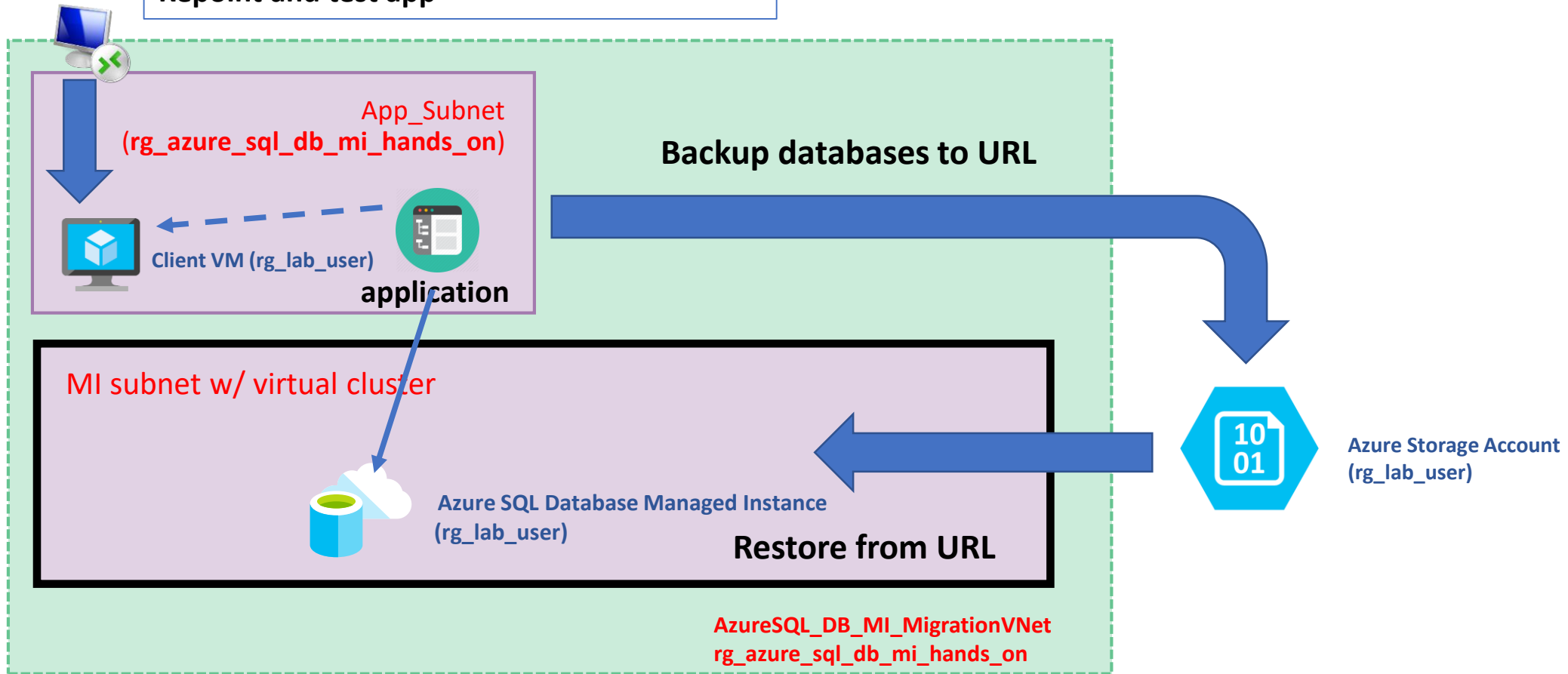


Inspect VNet
Create MI
Resize, reset password
Setup DMS migration
Point-in-time-restore



Configure access to storage account
Perform DB backups
Restore to MI
Repoint and test app

Part 2



Part 2

Focus on details

AZURE IS THE MOST ECONOMICAL DESTINATION FOR SQL WORKLOADS*

What is Hybrid Benefit for SQL Server?

An Azure benefit that allows you to use your on-premises SQL Server licenses to save on SQL Database Managed Instance. You can save up to 30% on Managed Instance

How do you qualify?

You must have on-premises SQL Server licenses with active Software Assurance

How do you activate this benefit?

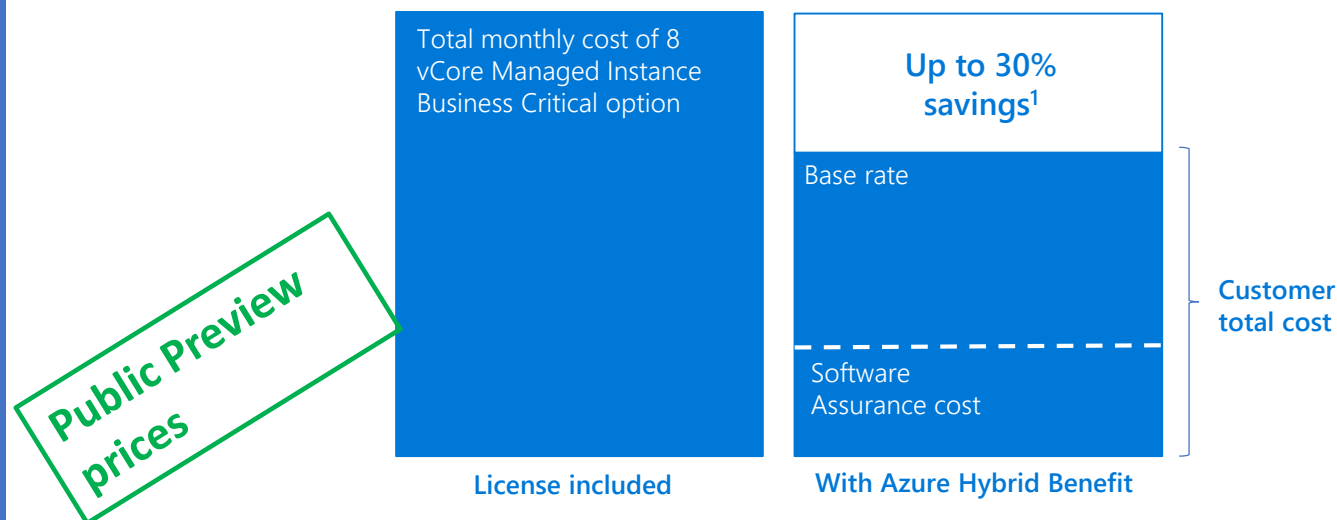
Deploy a SQL DB Managed Instance and select Azure Hybrid Benefit as an option in the portal.

[Learn more](#)



*Based upon comparison of on-demand pricing on Azure for Managed Instance versus running SQL on AWS RDS.

Save up to 30% with Azure Hybrid Benefit for SQL Server



Pricing (monthly)	General Purpose (GA)		Business Critical (GA)	
	License Included	AHB for SQL Server	License Included	AHB for SQL Server
8 vCores	\$736.29	\$444.39	\$1,983.78	\$888.78
16 vCores	\$1,472.58	\$888.7	\$3,967.56	\$1,777.56
24 vCores	\$2,208.87	\$1,333.17	\$5,951.34	\$2,666.34

Type of Storage/IO	Included with Compute (per SKU)	Additional price
General Purpose	32 GB	\$0.0575/GB-Month
Business critical	32 GB	\$0.125/GB-Month
IO rate	NA	\$0.1 per 1 million requests

¹ Savings based on 8 vCore Business Critical Managed Instance in East US Region running 730 hours per month. Savings are calculated from full price (license included) against reduced price (leveraging Azure Hybrid Benefit for SQL Server), which includes the Software Assurance cost for SQL Server Enterprise Edition. Actual savings may vary based on region, instance size and performance tier and Software Assurance tier. Prices as of December 2017. Prices subject to change.

EXCLUSIVE TO AZURE: GET MORE FOR YOUR VIRTUALIZED WORKLOADS

Take an inventory of on-premises licenses to determine potential for conversion

Convert on-premises cores to vCores to maximize value of investments

1 Standard license core = 1 General Purpose core

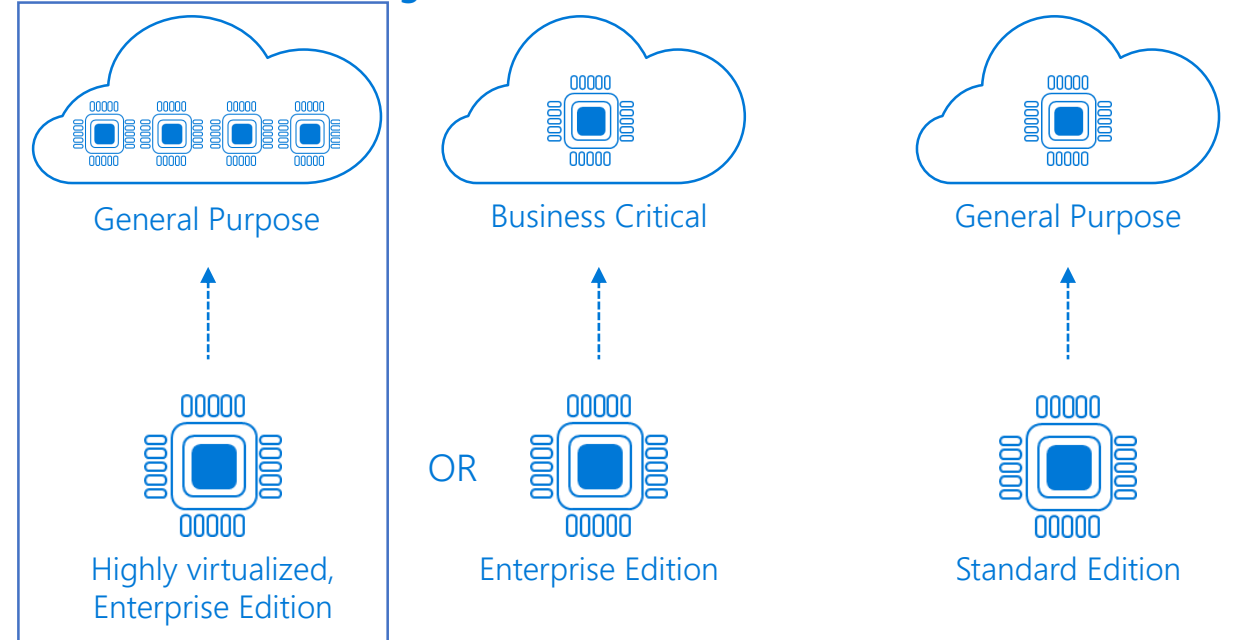
1 Enterprise license core = 1 Business Critical core

1 Enterprise license core = 4 General Purpose cores (virtualization benefit)



SQL Server license trade-in values

SQL Database Managed Instance



SQL Server with Software Assurance

APPLYING AZURE HYBRID BENEFIT

The number of instances eligible for Azure Hybrid Benefit is calculated based upon

- number and type of licenses you are exchanging
- Managed Instance vCore selection, rounding down to the nearest whole value.



How to calculate instances eligible for the hybrid benefit

Example 1:

Customer A has:

10 Standard Edition licenses
10 Enterprise Edition licenses

Wants a:

8 vCores Managed Instances

Calculation = (10 Standard licenses * 1 core)
+ (10 Enterprise licenses * 4 cores) = **50 vCores**

Eligible number of instances:

(50 vCores / 8 vCore instance) = **6 eligible instances**

Example 2:

Customer B has:

5 Standard Edition licenses
20 Enterprise Edition licenses

Wants a:

16 vCores Managed Instances

Calculation = (5 Standard licenses * 1 core) +
(20 Enterprise licenses * 4 cores) = **85 vCores**

Eligible number of instances:

(85 vCores / 16 vCore instance) = **5 eligible instances**

1 Standard license core = 1 General Purpose core

1 Enterprise license core = 4 General Purpose cores (virtualization benefit)

Developer perspective

Programmability perspective

- Latest driver versions provides best connectivity experience
- MI is PaaS - build [connectivity resilience](#) into your code to protect from transient faults
- Well-known SSMS tools supported – install **latest version**
- MI is always on latest and greatest SQL engine version but supports db compat levels from 100 and above
- Code can be MI aware, if necessary: **SERVERPROPERTY ('EngineEdition') = 8**
- Current limitations (will be removed later this year)
 - Time is **UTC** . Use [AT TIME ZONE](#) to add local time zone experience
 - Instance collation is **fixed** (affects tempdb and system databases)
- You can use read-only replicas to [load balance read-only queries](#)
 - Local and Geo-DR

Tool version supporting SQL MI

Tool	Minimal version
ODBC driver	v17
PHP driver	5.2.0
JDBC driver	6.4.0.
Node.js driver	2.1.1
OLEDB driver	18.0.2.0
SSMS	17.6
DacFx	15.8* (future release)
SCOM MP for MI	1.0.0.0

Database Compatibility Based Certification

Microsoft Database Compatibility Level Protection

- Full Functional protection once assessment tool runs clean.
- Maintaining backward compatibility is very important to SQL Server team.
- Query Plan shape protection.

Overall process

- Use *Database Migration Assistant (DMA)* and Database Experimentation Assistant (DEA) for assessment.
- Migrate database and keep/set source Database Compatibility Level on target.
- Perform minimal testing or as determined by your organization.

Contact Microsoft – Explore jointly on how to use Database Compatibility based certification.

Features: what's is missing?

- Features with a better alternative in Azure

Always-On Availability Groups: local HA, active geo-replication

Windows Authentication: Azure Active Directory is the alternative.

Management Data Warehouse : [OMS](#) integration is the alternative.

- Retired features

Database Mirroring: built-in HA / geo-replication

Extended stored procedures: customers should use CLR

- Features considered post-GA

Filestream, Filetable

Cross-instance distributed transactions (MS DTC)

Stretch Database

PolyBase

Networking Architecture

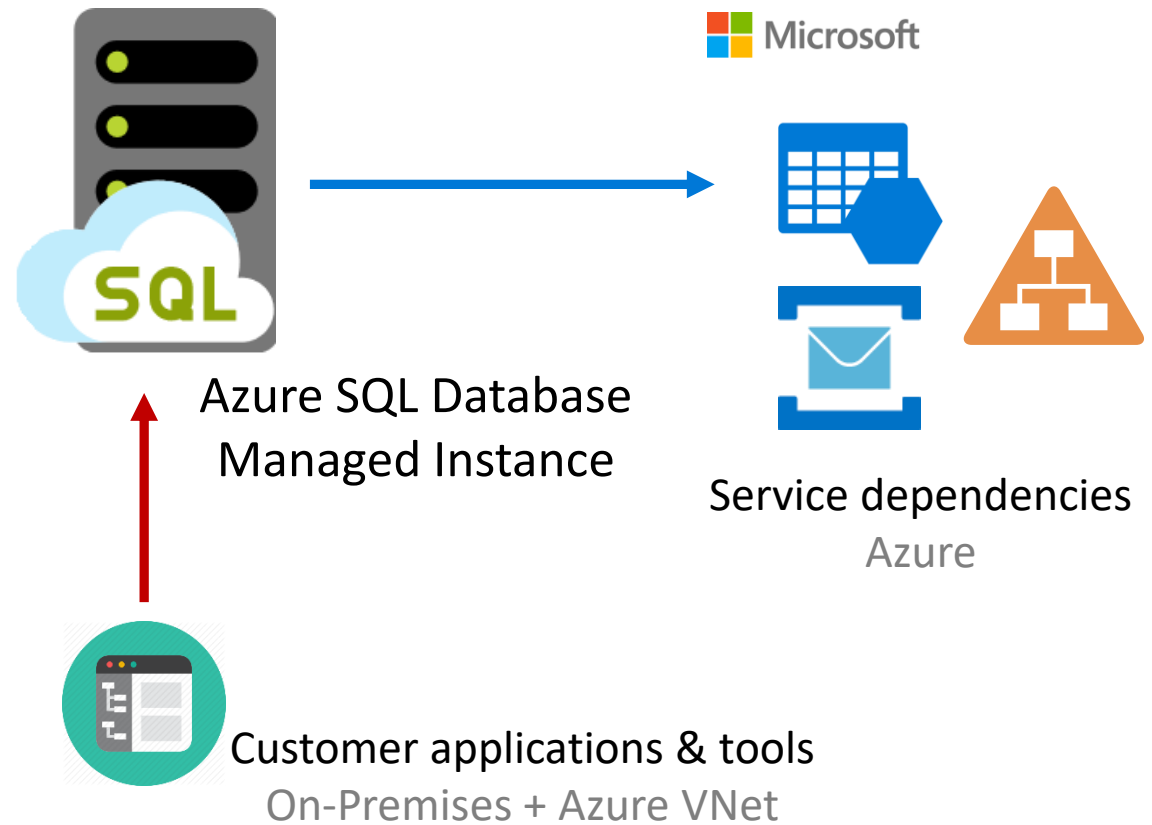
Communication dependencies of Managed Instance

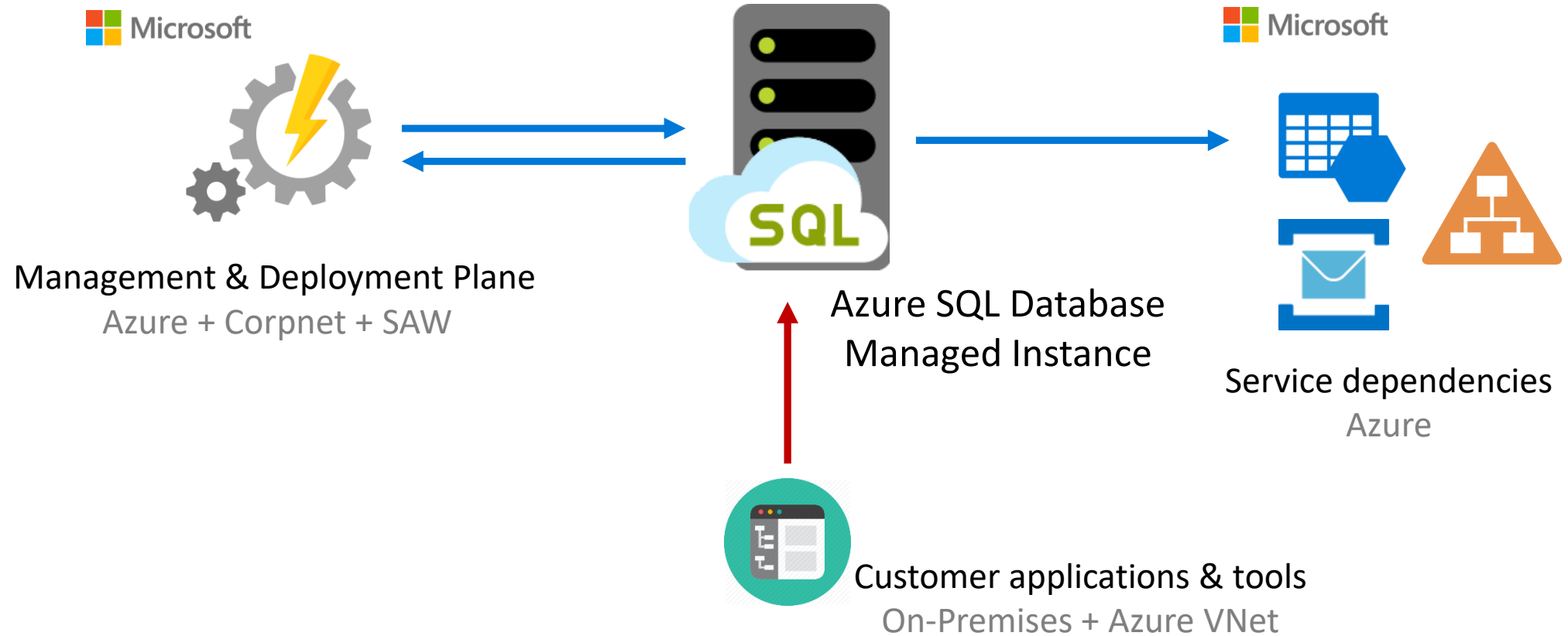


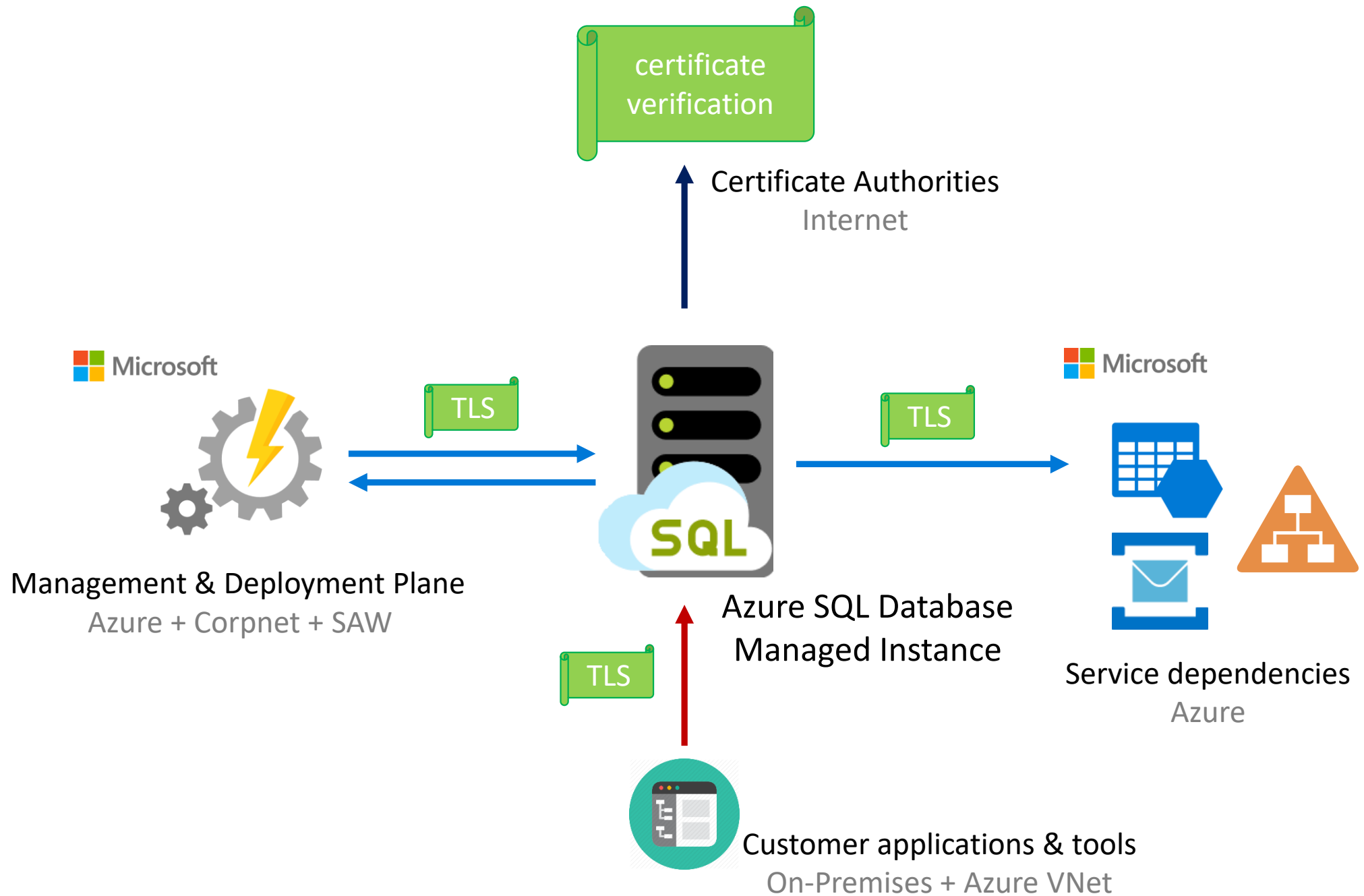
Azure SQL Database
Managed Instance



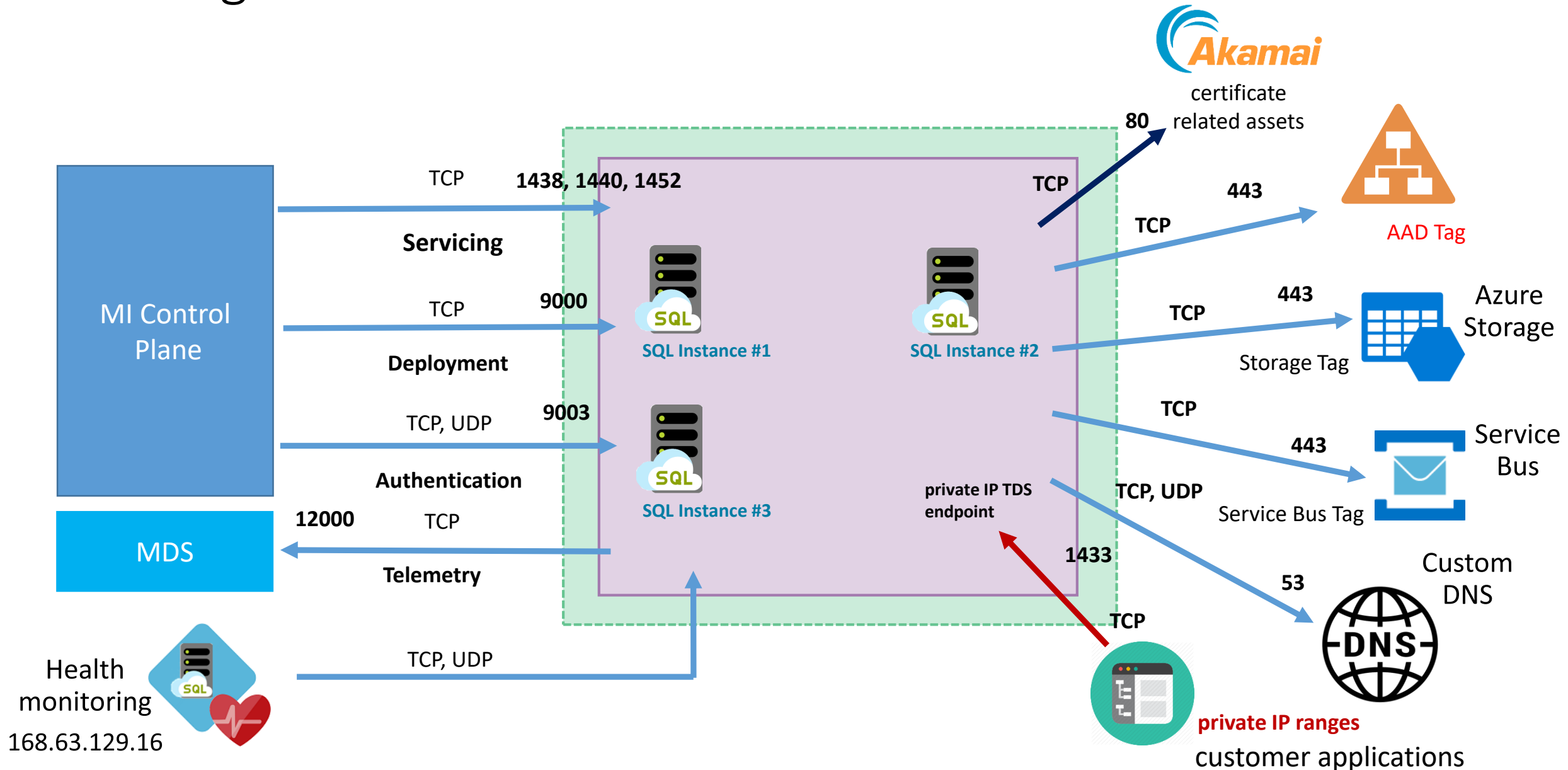
Customer applications & tools
On-Premises + Azure VNet

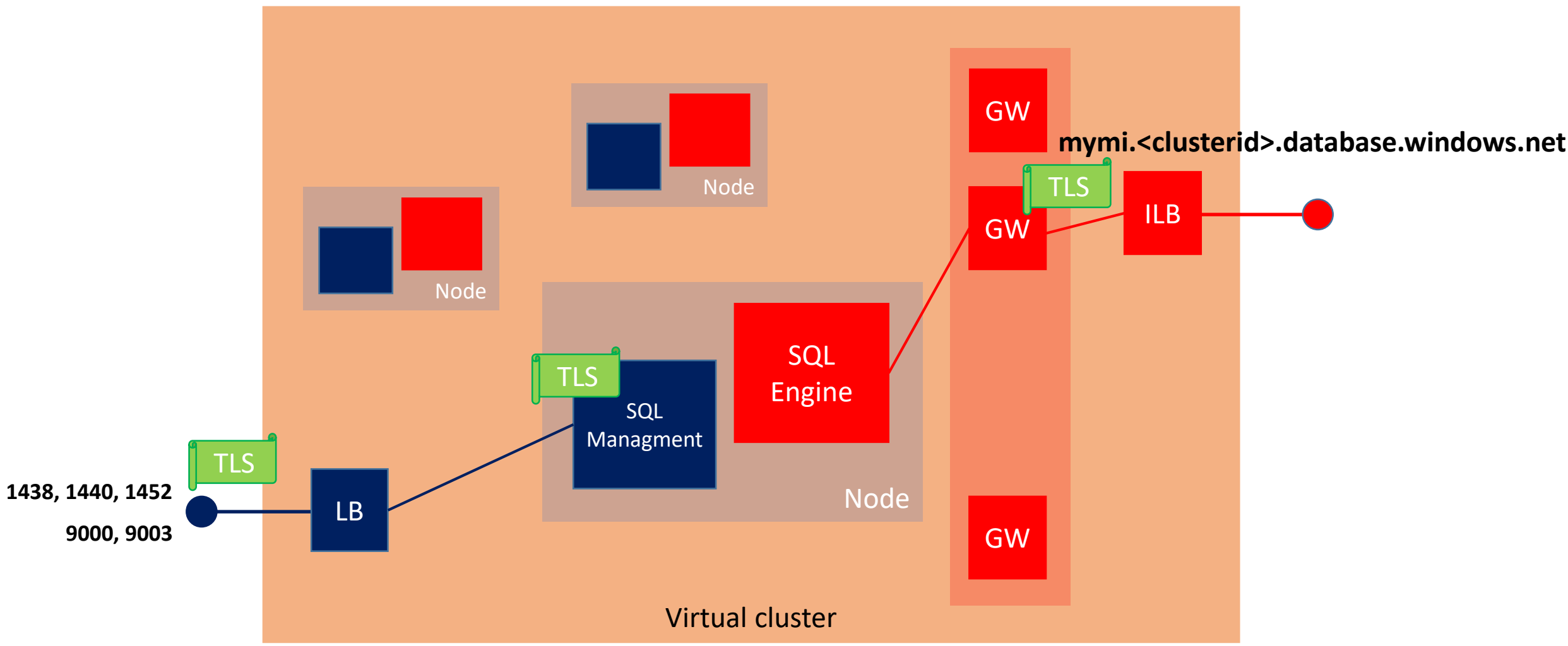








Managed Instance communication channels





-  SQL Managment(public IP)
-  TDS endpoint (private IP)

Demo

Part 2

TAKEAWAYS

Managed Instance is the **best DBaaS destination for all SQL workloads**, enabling frictionless migration

Ultimate SQL Server compatibility

Full DBaaS capability set for optimal TCO

Full networking isolation and security

Transparent business model

Learn more

- [SQL Database Managed Instance](#)
- [Create Managed Instance – Tutorial](#)
- [Azure SQL Database Managed Instance T-SQL differences from SQL Server](#)
- [Migrate to SQL Database Managed Instance](#)
- [Connect your application to Azure SQL Database Managed Instance](#)
- [Azure Hybrid Benefit for SQL Server](#)
- [Azure Database Migration Service](#)



PLEASE FILL IN THE
EVALUATION FORM.

YOUR OPINION IS
IMPORTANT!

AT THE ENTRANCE AFTER THE LAST SESSION OF THE DAY



#TUGABEER sponsored by

lcreate|it|
INNOVATING LIFE

THANK YOU TO OUR SPONSORS



Microsoft

GOLD SPONSOR

bi4all

CREATING BUSINESS INTELLIGENCE

SILVER SPONSOR

|create|it|

INNOVATING LIFE

TUGA BEER SPONSOR

FARFETCH

SWAG SPONSOR

