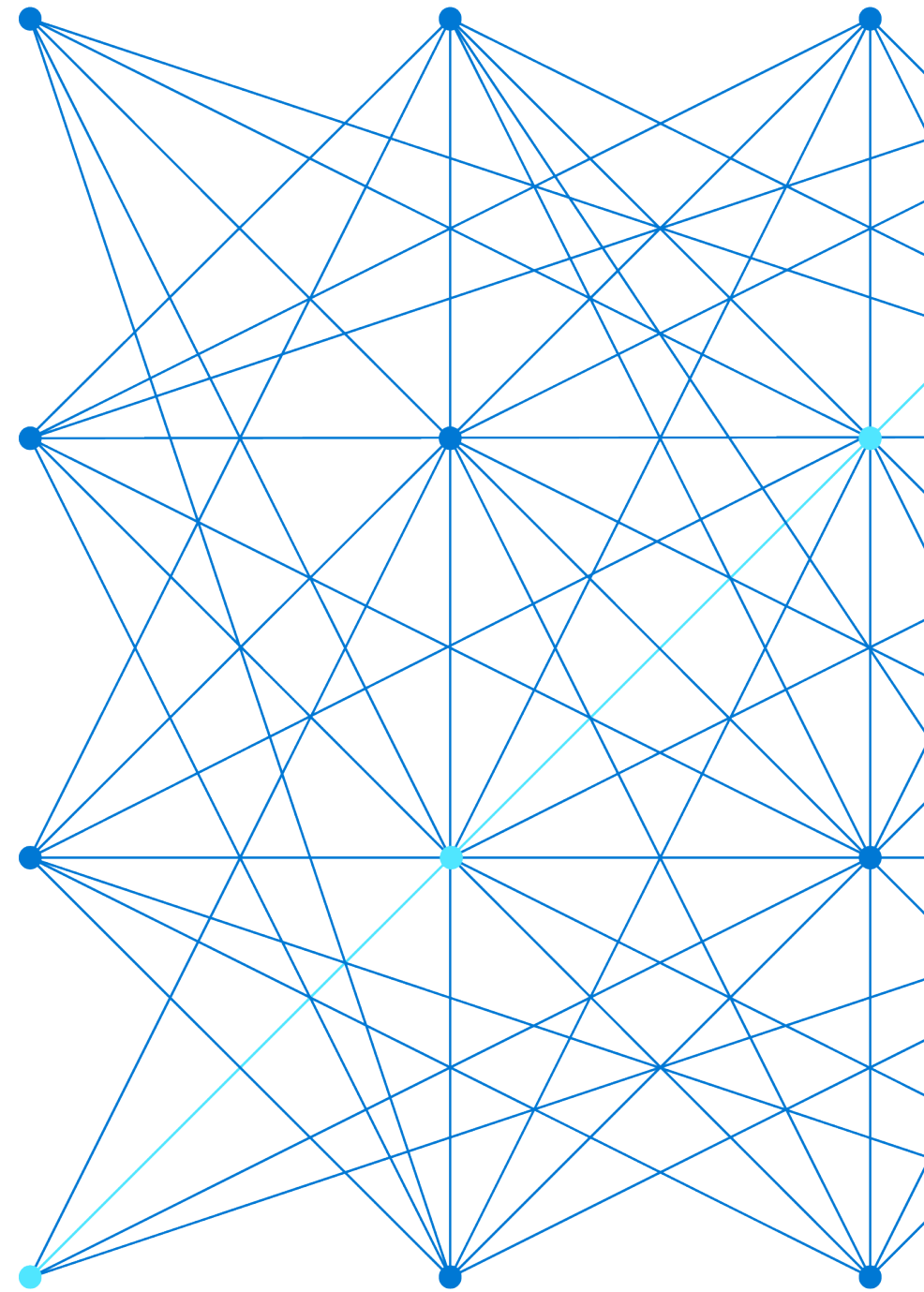
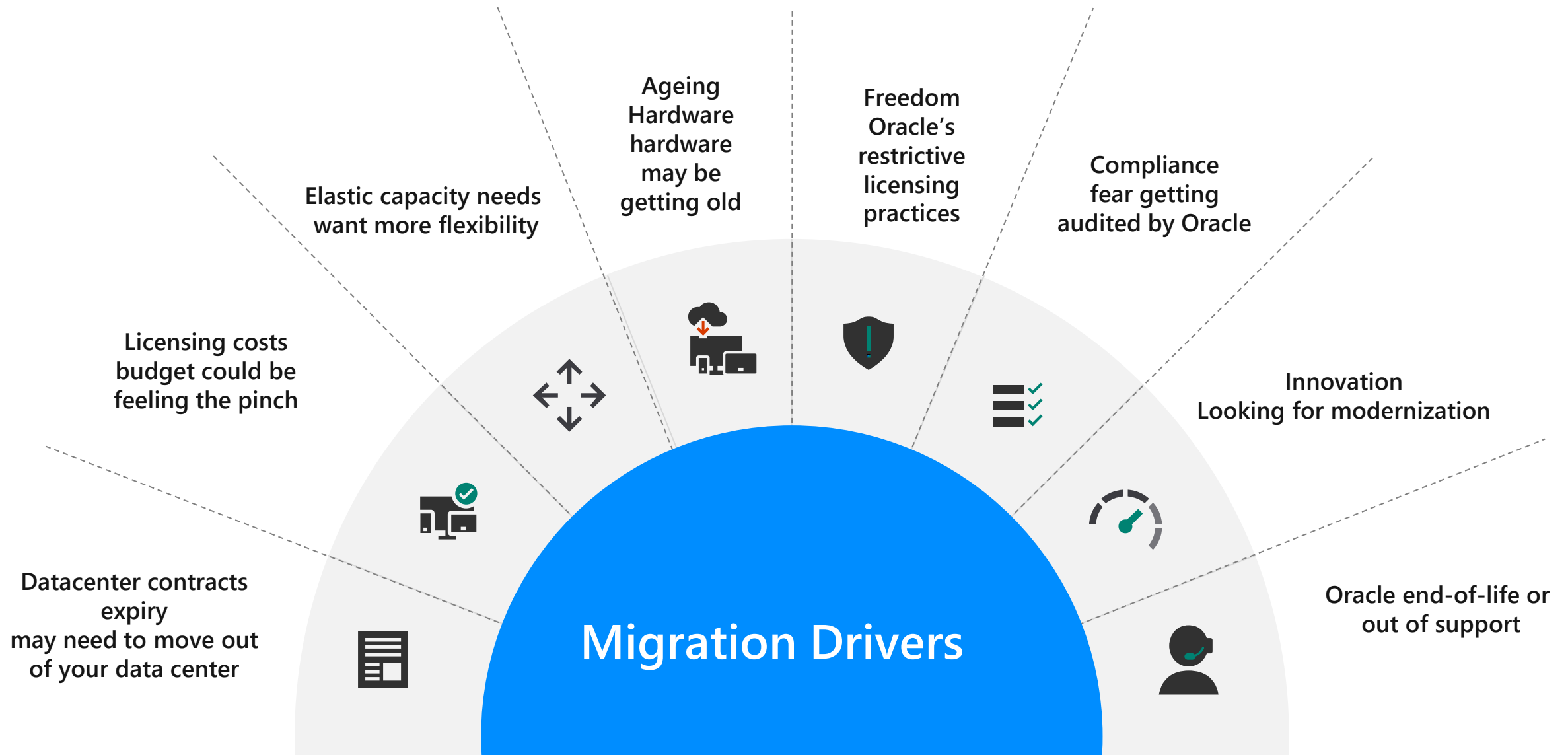


# Oracle to Azure Modernization



# The decision

... to migrate on-prem Oracle databases can have multiple drivers



# Oracle migration options

Data migration Migrate to ▾ Migrate from ▾ Migration tools ▾ Resources ▾

## Azure Database Migration Guides

Step-by-step guidance for modernizing your data assets.

### SQL Server to

- SQL Server (upgrade)
- Azure SQL Database
- Azure SQL Managed Instance
- SQL Server on Azure VMs
- Azure Synapse Analytics

### Oracle to

- Azure Database for PostgreSQL
- SQL Server
- Azure SQL Database
- Azure SQL Managed Instance
- SQL Server on Azure VMs
- Azure Synapse Analytics

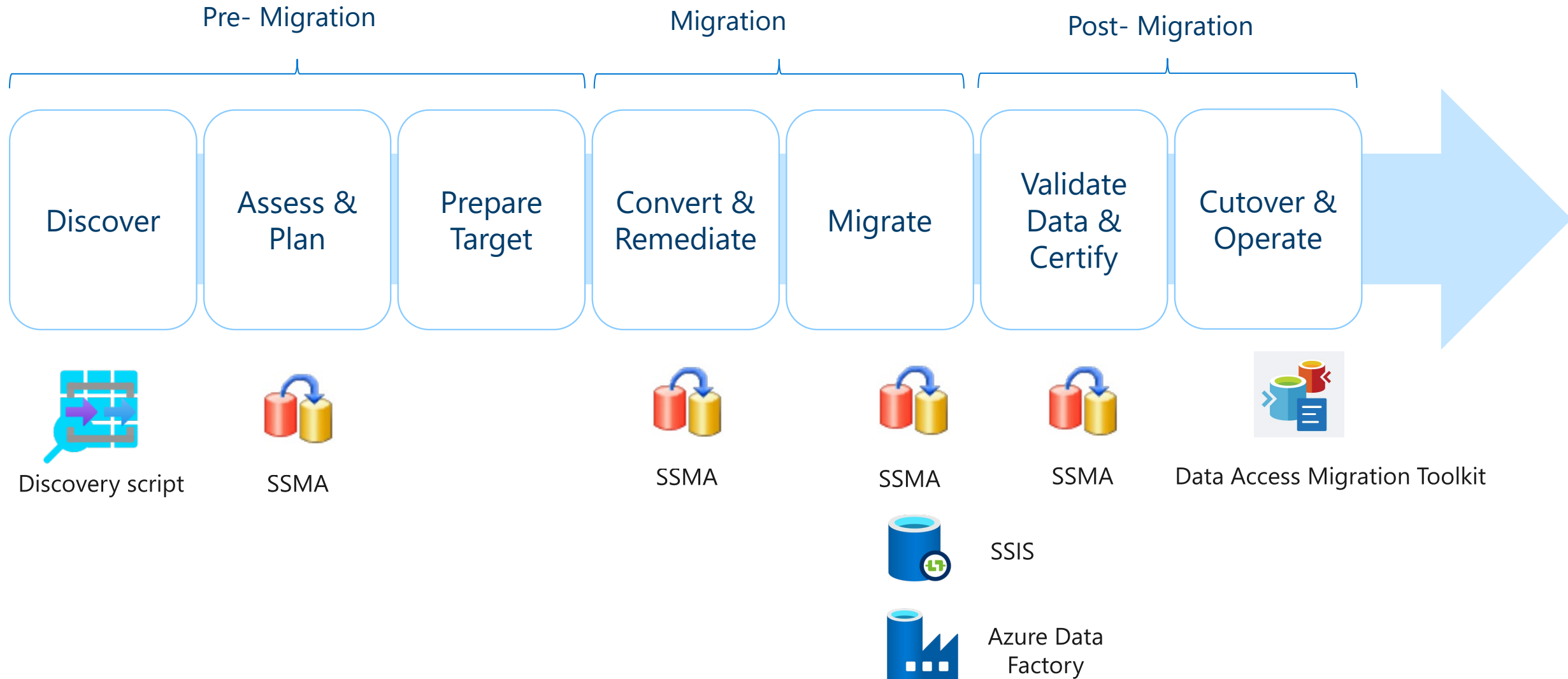
### Db2 to

- SQL Server
- Azure SQL Database
- Azure SQL Managed Instance
- SQL Server on Azure VMs



# Oracle to Azure SQL

# Oracle to Microsoft SQL Migration Journey



# Pre-migration: Assess and Convert

- Assessment Report
- Conversion statistics
- Estimated manual conversion effort
- Navigation tree
- Code comparison

Microsoft SQL Server® Migration Assistant 7.1.0

HR

Procedures

Sequences

Synonyms

Tables

User Defined Types

Views

Schemas > HR

Conversion statistics

Statement Type	Total	Converted	Not converted
ALL	116	94.82 %	6
argument	5	100 %	0
block-statement	2	100 %	0
check-constraint	2	100 %	0
column	57	98.24 %	1
create-statement	5	100 %	0
foreign-key	10	100 %	0
if-statement	1	100 %	0
index	11	100 %	0
insert-statement	1	100 %	0
object-attribute	2	0 %	2

Objects by categories

Object type	Total	With errors
procedure	2	0
sequence	3	0
synonym	2	2
table	10	1
index	11	0
trigger	2	0
object-type	1	1
view	1	0
schema	1	1

Errors (4)

Warnings (5)

Info

Navigate by Errors

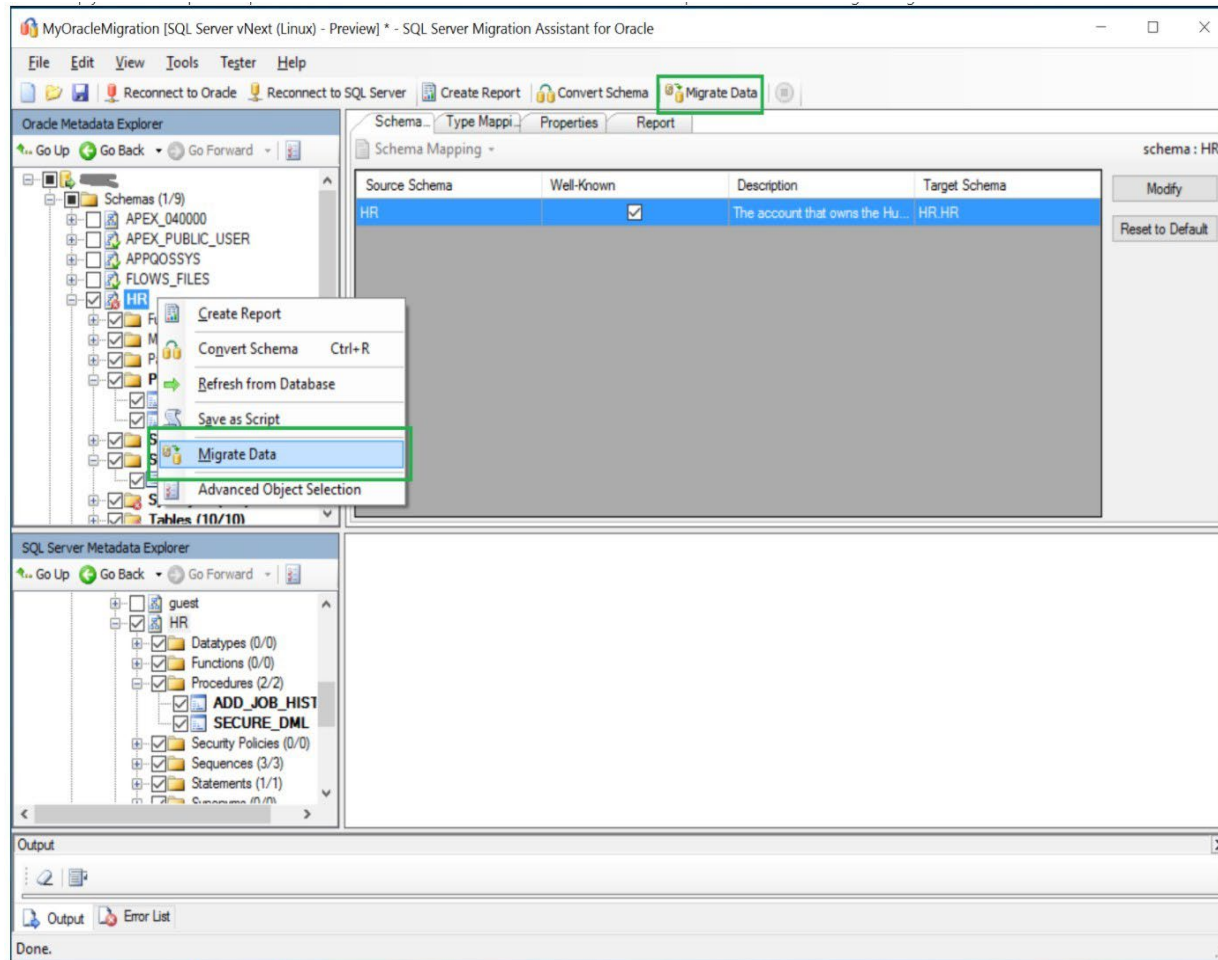
Total estimated manual conversion time: 1.3 hr(s)

O2SS0005: SQL Server Migration Assistant for Oracle Error message: Source datatype not recognized(1) Estimated manual conversion time: 0.3 hr(s)

O2SS0129: SQL Server Migration Assistant for Oracle Error message: Synonym not converted(2) Estimated manual conversion time: 0.6 hr(s)

O2SS0456: SQL Server Migration Assistant for Oracle Error message: User defined types conversion is not supported(1) Estimated manual conversion time: 0.4 hr(s)

# Migrating schema



After you have completed assessing your databases and addressing any discrepancies, the next step is to execute the migration process

Migration involves two steps – publishing the schema and migrating the data

SSMA for Oracle is the correct tool to use for this process

# Data Movement



SQL Server Integration  
Services

Azure Data Factory

Azure Databricks

Databox

SSMA (client side)

SSMA (server side)

3rd Party solutions



# Demo

SSMA for Oracle  
Database schema Conversion Toolkit



# SSMA Console



## Why

Automated conversion & migration

Large number of schema objects

Parallel schema conversion



## What

Separate Application

Console only



## How

Invoke using UI project

Invoke from scratch

# Applications Migration

```
mirror_mod = modifier_ob.  
Set mirror object to mirror.  
mirror_mod.mirror_object =  
operation == "MIRROR_X":  
mirror_mod.use_x = True  
mirror_mod.use_y = False  
mirror_mod.use_z = False  
operation == "MIRROR_Y":  
mirror_mod.use_x = False  
mirror_mod.use_y = True  
mirror_mod.use_z = False  
operation == "MIRROR_Z":  
mirror_mod.use_x = False  
mirror_mod.use_y = False  
mirror_mod.use_z = True
```

```
selection at the end -add  
mirror_ob.select= 1  
modifier_ob.select=1  
context.scene.objects.active  
("Selected" + str(modifier_ob.  
mirror_ob.select = 0  
= bpy.context.selected_object  
data.objects[one.name].select  
print("please select exactly
```

--- OPERATOR CLASSES ---

```
types.Operator):  
X mirror to the selected  
object.mirror_mirror_x"  
mirror X"
```

```
context):  
context.active_object is not
```

# Oracle Migration Decision Matrix


ORACLE WORKLOAD	APP TYPE	SQL Server	Azure SQL DB	Azure SQL MI	EXPLANATION
OLTP/ODS	ISV	RA	RA	RA	Rearchitect and revise because of assessment/conversion tooling advantages in SQL Server. Requires certification to run in a heterogeneous environment by ISV.
	Custom Apps	RA	RA	RA	Rearchitect and revise because assessment/conversion tooling advantages in SQL Server.
	Oracle Apps	RP	RP	RP	Needs to remain in Oracle (EG: Oracle HCM, Oracle EPM, etc.), Replace with existing COTS/own solution
Exadata	OLTP	RA	RA	RA	Rearchitect to optimize around development effort and existing RDBMS skillset.
	OLAP/MPP/DWH	RA	RA	RA	Significant re-architecture required.
Oracle RAC	Apps without XA transactions	RA	RA	RA	Rebuild or Rearchitect based on customer's business and technical requirements. Rearchitect to optimize around development effort and existing RDBMS skillset.
Non-relational	JSON/IoT/Timeseries	RP	RP	RP	Replace with existing COTS/own solution

Rs	
Rehost	RH
Refactor	RF
Revise/rearchitect	RA
Rebuild	RB
Replace	RP

# Data Access Migration Toolkit

- Tool designed to help migrate application source code from one database platform to another
- Scan your entire source code for database usage and SQL queries
- Use the tool to find compatibility issues between your application and your Azure SQL

Visual Studio Code > Programming Languages > Data Access Migration Toolkit



**Data Access Migration Toolkit** Preview

Microsoft | 10,347 installs | ★★★★★ (2) | Free

Analyze database access in your application.

[Install](#) [Trouble Installing?](#)

[Overview](#) [Version History](#) [Q & A](#) [Rating & Review](#)

## Data Access Migration Toolkit

The Data Access Migration Toolkit provides tools to help migrate application source code from one database platform to another.

- Discover and extract SQL queries from files
- Catalog data access APIs used (Java only)

### Current supported source database backends

- Oracle Database
- SQL Server

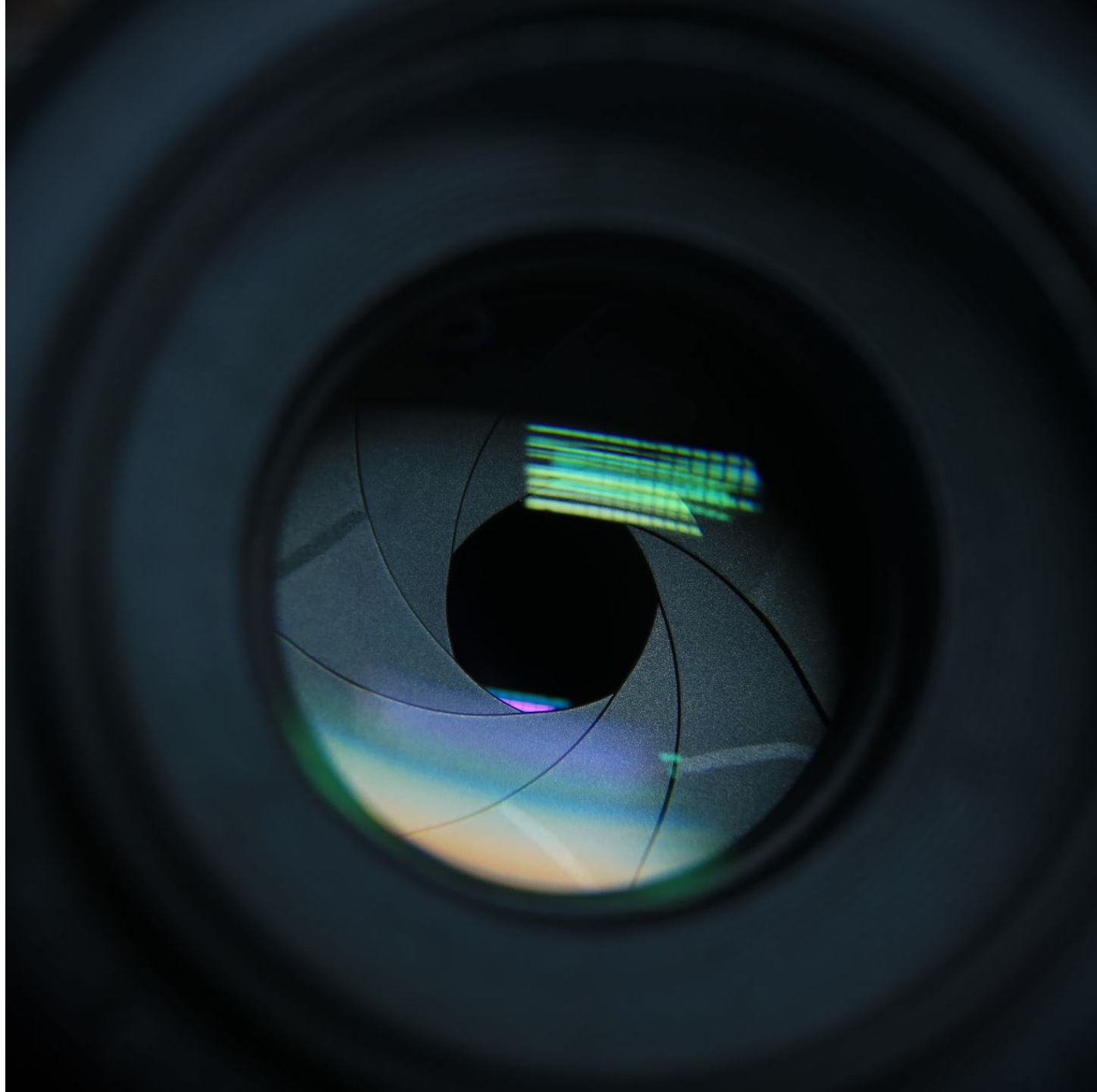
### Current supported file types

- Java
- C#



Demo

Data Access Migration Toolkit





# Oracle to Azure PostgreSQL

# Azure marketplace

## ... enables partners to help in migrations

### DMAP Oracle to Azure PostgreSQL Migration

Newt Global Consulting, LLC



### DMAP Oracle to Azure PostgreSQL Migration

Newt Global Consulting, LLC

Create

Overview

Plans + Pricing

Usage Information + Support

Reviews

Azure offers solutions to migrate on-prem licensed Oracle RDBMS to Azure PostgreSQL. But the enterprise users may have to overcome an expensive & tedious process of converting database schema to the target database schema seamlessly. Newt Global addresses this issue through its proven automation platform "DMAP". This accelerates the database schema migration process through progressive automation. Enterprises can eliminate licensing cost through migration of their licensed RDBMS to Opensource Azure PostgreSQL DMAP converts stored procedures, functions, SQL queries, business logic and custom schema constructs beyond the standard conversion tools provided by public cloud platforms. Automation through DMAP helps in saving significant time and effort needed in database migration.



### StreamShift by Striim

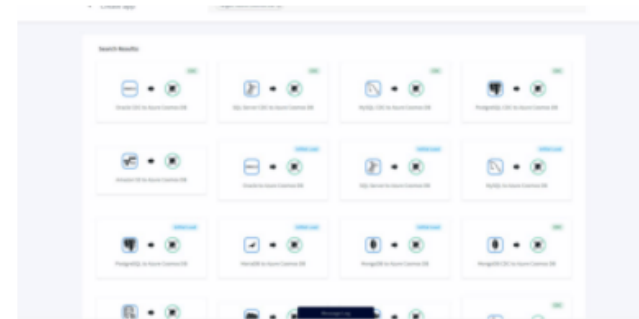
♡ Add to Favorites

Striim, Inc.

Plan

StreamShift Small Migration plan

Subscribe





# Oracle to PostgreSQL migration guide

... with you every step of the way

- Oracle conversion best practices in one place
- Topic-by-topic overview of how each feature in Oracle maps to PostgreSQL.
- 300+ pages of details showing –
  - General compatibility level of an Oracle feature in PostgreSQL
  - Ora2pg automation capability
  - Summary of differences with code snippets explaining the feature
  - Comparison of how the feature will work in PostgreSQL 11 vs. 12 vs. 13

## Oracle Procedures and Functions Conversion to PostgreSQL Functions

[back to summary](#)

General compatibility level: ●●●●○

Ora2pg automation capability: ●●●○○

### Differences Summary:

- Expect syntax and features differences when performing code conversion.
- PostgreSQL supports the creations of stored procedures since PostgreSQL version 11, until PostgreSQL version 11 only functions were supported (PostgreSQL function can be used to return values or perform database operations).

### Oracle and PostgreSQL - Transactions Configuration Comparison

Feature/parameter	Oracle	PostgreSQL	Notes
Auto Commit	Default: Off	Default: On	PostgreSQL can be set to Off as Oracle
MVCC	Supported	Supported	
Isolation Level	Default: Read Committed	Default: Read Committed	
Supported Isolation Levels	<ul style="list-style-type: none"><li>• Read-only</li><li>• Serializable</li></ul>	<ul style="list-style-type: none"><li>• Repeatable Reads</li><li>• Serializable</li></ul>	
Configure Session Isolation Levels	Yes	Yes	
Configure Transaction Isolation Levels	Yes	Yes	
Nested Transaction Support	Yes	No	PostgreSQL workaround: transaction savepoints (more information <a href="#">here</a> )
Support for Transaction Savepoints	Yes	Yes	

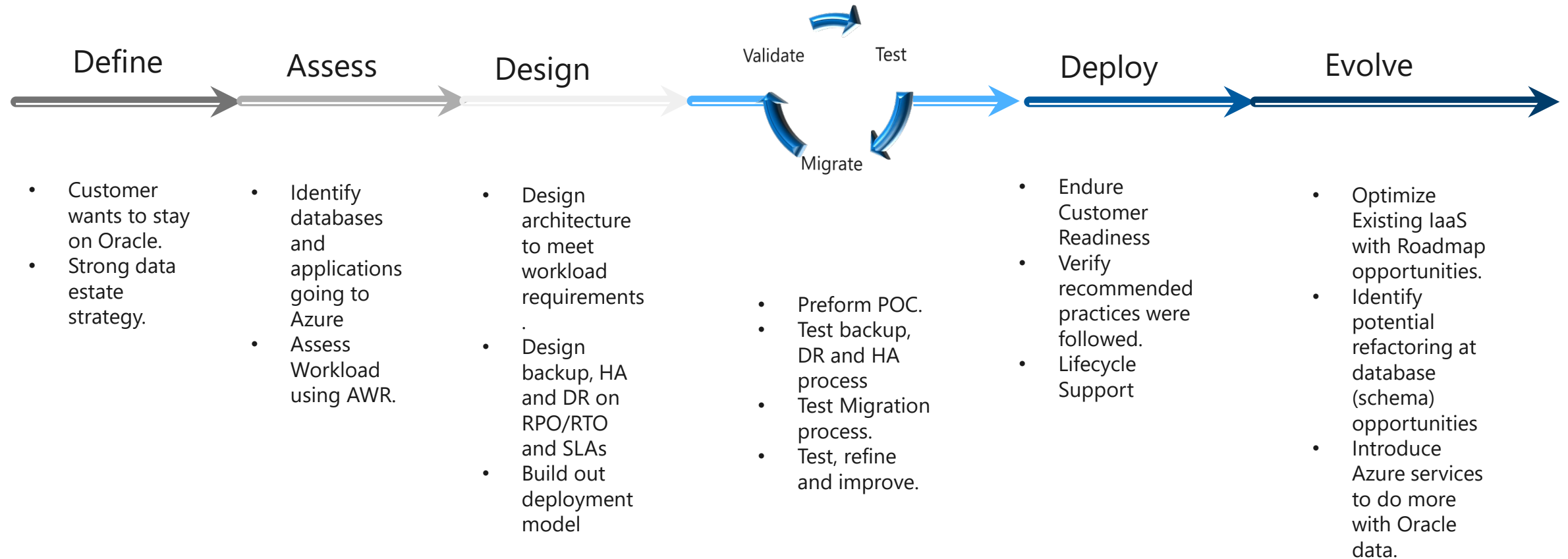
### Oracle and PostgreSQL Partitions Comparison Summary

Partition Feature	Oracle	PostgreSQL
Range Partition	Yes	Yes
List Partition	Yes	Yes
Hash partition	Yes	Yes
Composite Partitioning (Sub-Partitioning)	Yes	Yes
Interval Partitioning	Yes	No
Partition Advisor	Yes	No
Reference Partitioning	Yes	Yes
Virtual Column Based Partitioning	Yes	No
Automatic List Partitioning	Yes	No
Split / Exchange Partitions	Yes	Yes by using: ATTACH PARTITION DETACH PARTITION <a href="#">sub-commands</a>



# Oracle to Azure VM

# An Oracle on Azure IaaS Migration



# Azure is the Home for All Oracle Workloads

## Oracle on Azure IaaS

- Supports Oracle single instance with BYOL model
- Multiple customers running Oracle in Azure IaaS
- Oracle applications, Exadata and high IO workloads migrate in as little as 6 weeks.

## Oracle Solutions for

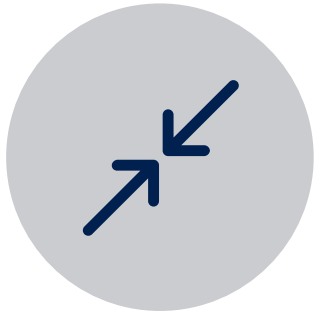
- Workloads right-sized via Automatic Workload Repository (AWR)
- Uses D, E and M-series VM compute
- Supports upwards of 416vCPU, 12 TB RAM and 30K MBPs/900K IOPs with multiple storage solutions

## Oracle on Azure Collateral

- [Oracle on Azure Documentation](#)
- [Oracle on Azure Github](#)
- [Oracle on Azure Recommended Practices White Paper](#)
- [Microsoft Data Architecture Blog](#)



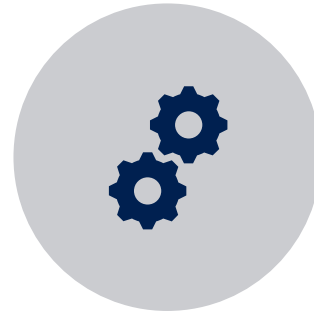
# Post-migration



REMEDiate  
APPLICATIONS



PERFORM TESTS



OPTIMIZE



REDIRECT  
APPLICATIONS

# The team

---

**Neel Ball**  
(Program Manager)



**Kellyn Gorman**  
(Cloud Solution Architect)



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(Program Manager)



**Sumit Gaur**  
(Program Manager)



