

# Is Application Refactoring Holding Back Your Oracle to PostgreSQL Migrations?

Datavail Introduces Intelligent Database Virtualization from Liberatii

PGConf NYC



**dat**Avail

# Speaker Introductions



**Eric Russo**  
SVP – Database Services  
Datavail



**Nima Torabi**  
CEO & Co-founder  
Liberatii



**Dr. James Reynolds**  
Chief Software Architect  
Liberatii

# The Flight From Oracle to PostgreSQL

## ✓ What the industry is saying

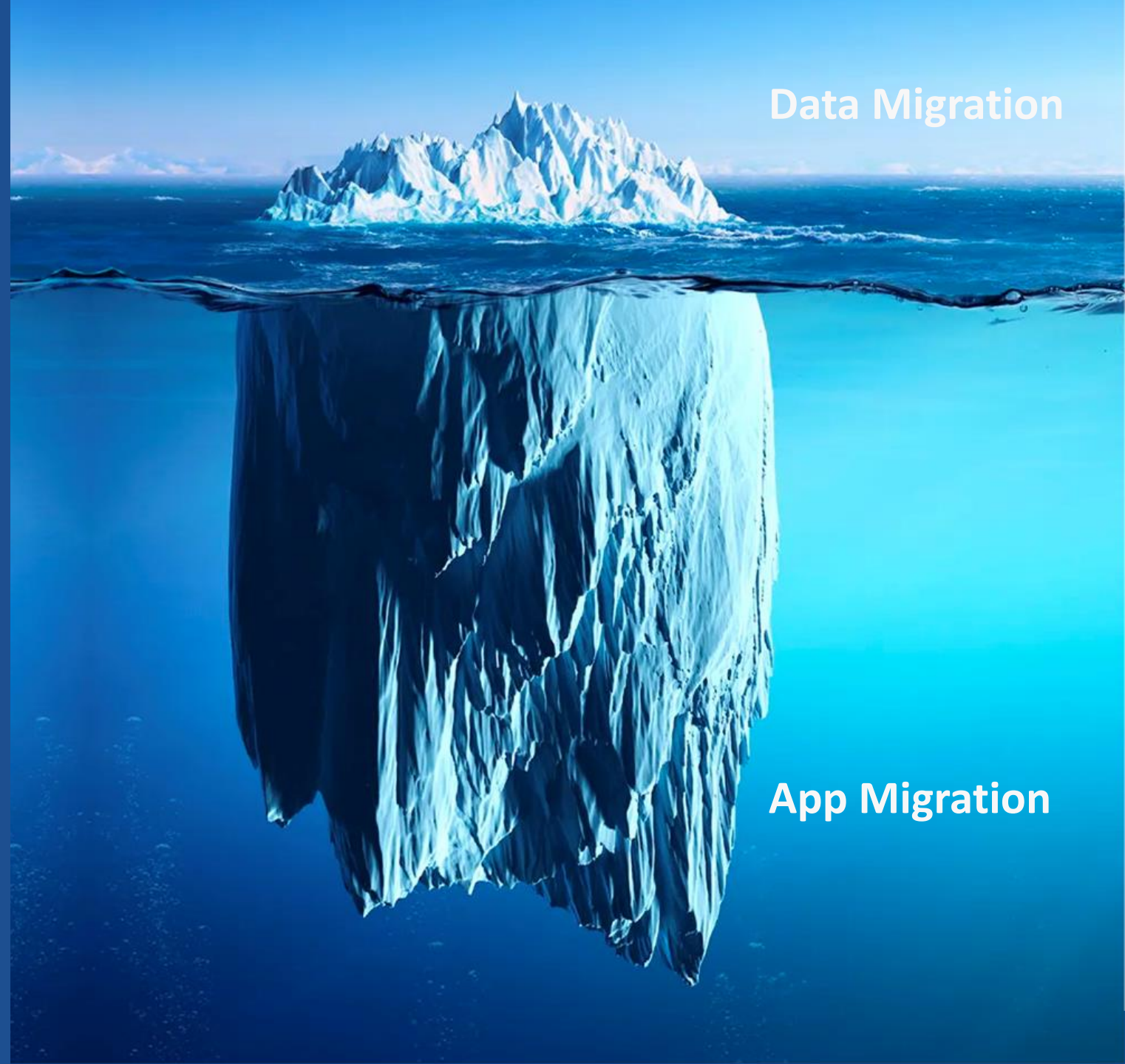
- Popularity skyrocketing but because of licensing costs, market share/spend reported by Gartner and other research firms is still in Oracle/Microsoft SQL.
- For those companies wanting to move off of especially Oracle, PostgreSQL is #1 choice – especially among developers.
- AWS and Azure making it easier to move to their clouds.
- New projects – PostgreSQL #1 database of choice.
- PostgreSQL Database of the Year in 2023.



# Challenges with Oracle Databases

- ❗ **Cost Burden:** High licensing and maintenance fees strain IT budgets.
- ❗ **Complex Licensing:** Restrictive licensing agreements hinder optimal utilization.
- ❗ **Vendor Lock-in:** Heavy reliance on Oracle-specific makes migration daunting.
- ❗ **Rigidity and slow innovation:** Legacy systems can impede the adoption of newer, more efficient technologies.

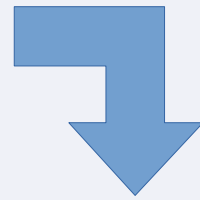
**The Real  
Challenge Is  
App Migration,  
Not Data  
Migration.**



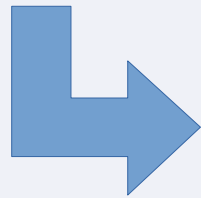
Data Migration

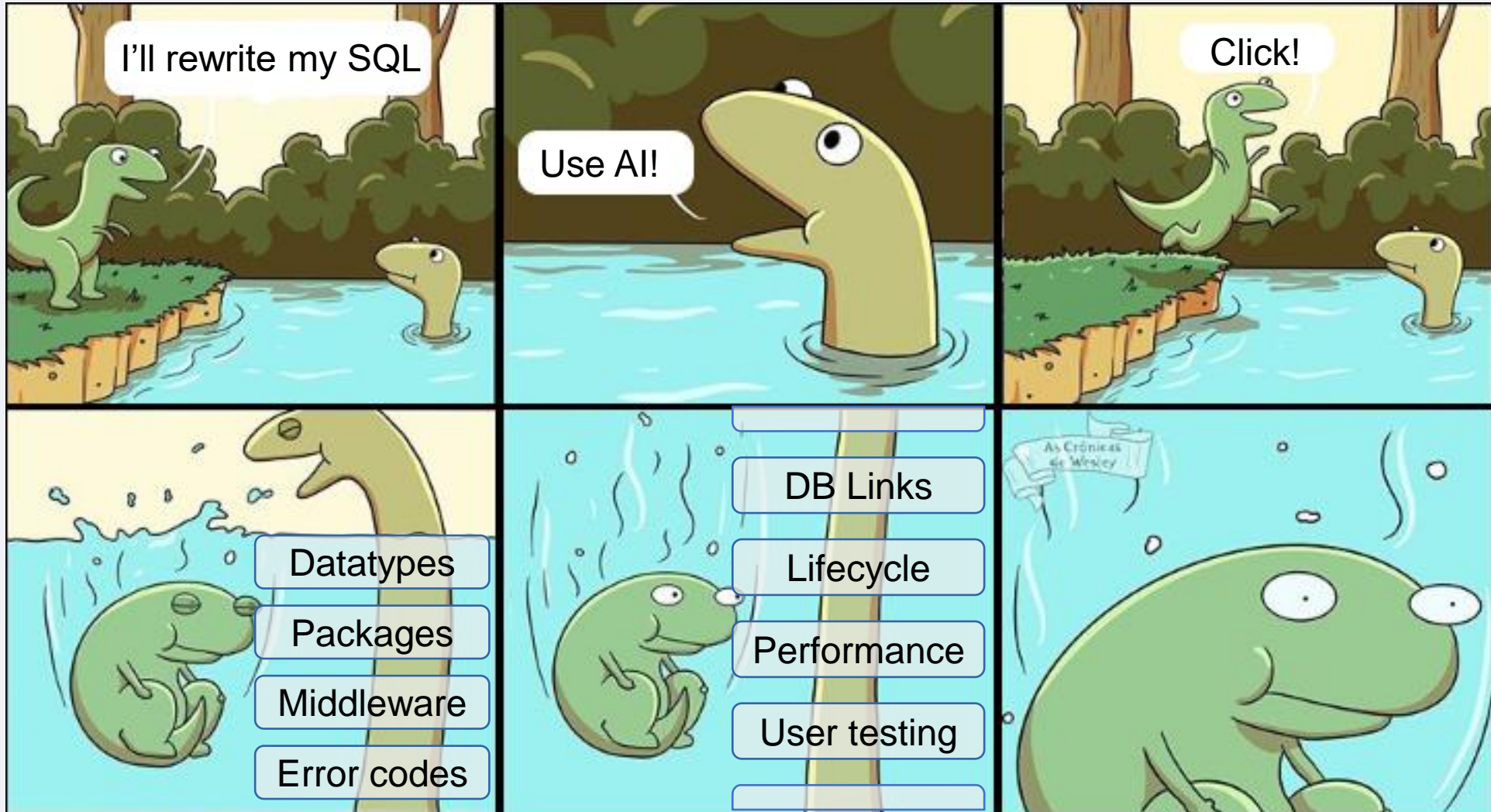
App Migration

```
SELECT first_name || ' ' || last_name full_name,
       salary +
       NVL (commission_pct, 0) sal_com,
       DECODE (NVL(e.department_id, -3),
              60, d.department_name,
              50, d.department_name,
              30, d.department_name,
              -3, 'UNKNOWN',
              'OTHER') dep,
       TO_CHAR(e.hire_date) hire_date
FROM employees e, departments d
WHERE d.department_id(+) = e.department_id
      AND e.last_name like 'G%'
ORDER BY first_name || ' ' || last_name
```



```
SELECT first_name || ' ' || last_name AS full_name,
       salary + COALESCE(commission_pct, 0) AS sal_com,
       CASE
         WHEN COALESCE(e.department_id, -3) = 60 THEN d.department_name
         WHEN COALESCE(e.department_id, -3) = 50 THEN d.department_name
         WHEN COALESCE(e.department_id, -3) = 30 THEN d.department_name
         WHEN COALESCE(e.department_id, -3) = -3 THEN 'UNKNOWN'
         ELSE 'OTHER'
       END AS dep,
       TO_CHAR(e.hire_date, 'YYYY-MM-DD') AS hire_date
FROM employees e
LEFT JOIN departments d ON d.department_id = e.department_id
WHERE e.last_name LIKE 'G%'
ORDER BY first_name || ' ' || last_name;
```





# Conventional Oracle Database Migration and Its Inherent Challenges



Rewriting  
millions of  
lines of code



Spending  
millions of  
dollars



Spending  
1-3 years



83% Failure  
rate

# Datavail's Experiences Helping Clients Migrate

- ✓ Migrations can be complex and span over multiple months
- ✓ Data types and schema conversion have gotchas
  - Issues with converting defined data types
  - Complex Oracle packages cannot be converted to PostgreSQL easily
- ✓ Application Challenges
  - Seen situations where continued development on the legacy application delayed the cut over month after month – some businesses have to keep adding functionality
- ✓ Minimizing down time and the cutover



# Datavail's Search for a Better Way... Brought Us to Liberatii

- ✔ Datavail has managed and migrated database environments for clients since 2007.
- ✔ From start-ups to enterprises, Datavail managed hundreds of thousands of databases for 400 clients.
- ✔ Intense interest especially in moving from Oracle to PostgreSQL – but challenges abound.



- ✔ RDBMS continue to be dominant players, however, NoSQL and Open Source systems are growing dramatically – especially with the move to cloud-based environments.
- ✔ Our search for a better way brought us to Liberatii's database virtualization platform.



# **Intelligent Database Virtualization Platform**

# Liberatii makes Oracle apps work with cloud databases

No Code required



Applications on Oracle



Liberatii Data Platform



Cloud Databases

# No more Oracle lock-in

**10X  
Faster**

Database migration  
in weeks not years

**Up to  
90%**

Reduction in  
database  
TCO

**Near-Zero  
Risk**

Seamless  
migration by  
keeping the app

# Migrate to cloud at maximum velocity with optimum TCO

- 1 Lift and shift legacy apps on Oracle to the cloud
- 2 Re-platform to cloud managed databases using Liberatii (Break free from Oracle databases)
- 3 Modernise apps with purpose-built Liberatii Data Platform at your own pace

# Deploy Liberatii in Azure or AWS within minutes

- 1 Connect Liberatii to the **Source** and **Target** database
- 2 Migrate the schema and data with Liberatii
- 3 Configure the application to point to Liberatii

# Design Principles



No code  
change



No compromise  
on performance



100% Application  
correctness

# Database Support

## Source Databases

Oracle (10g, 11g, 12c, 18c, 19c, 21c)

SQL Server (10 to 15)

PostgreSQL

## Target Databases

PostgreSQL (community edition)

MySQL (community edition)

Amazon Aurora

Azure Database for PostgreSQL/MySQL

Azure SQL

SQL Server (Managed Instance)

SQL Server on Azure Virtual Machines

NoSQL (MongoDB)

# Liberatii Data Platform Features

## Very Low Latency

(2-3 Milliseconds for OLTP)

## High Availability (99.99%)

Across multiple regions

## High Scalability

Up to 1000 Instances

## Secure Connection

Support for TLS protocol across all connections

## Near-Zero Database Downtime

Supercharge replication with Change Data Capture (CDC)

## Application Agnostic

Provides connectors for OCI, JDBC, ODBC  
And Pro\* C

# Liberatii's purposefully built for risk-averse organisations

- ✓ **Secure Data:** Liberatii is deployed in your Azure tenant. Your data stays in your tenant, never exposed to the public internet.
- ✓ **End-to-End Encryption:** Liberatii encrypts data in motion and in transit.
- ✓ **Zero-Trust Architecture:** Trust No One, Secure Everything: zero trust architecture for impeccable in-tenant security.
- ✓ **Open-Security Platform:** Customize your security with Our flexible security integration options (add your extra security features to our platform).

# Oracle-Specific syntax examples

Join (+) operator

```
SELECT *  
FROM A, B WHERE A.id =  
B.id(+);
```

```
SELECT *  
FROM A LEFT JOIN B ON  
A.id = B.id;
```

Collections/Records/Objects

```
TYPE my_record IS RECORD (  
  field1 VARCHAR2(100),  
  field2 NUMBER);
```

```
CREATE TYPE my_record AS (  
  field1 TEXT,  
  field2 INTEGER);
```

Synonyms

```
CREATE SYNONYM  
my_synonym  
FOR schema.object;
```

```
CREATE VIEW my_synonym  
AS SELECT *  
FROM schema.object;
```

# Oracle-Specific syntax examples

Nested functions

```
DECLARE
FUNCTION f1(p2 NUMBER)
  RETURN VARCHAR2 AS
BEGIN
  RETURN p2;
END;
BEGIN
  DBMS_OUTPUT.PUT_LINE(f1(3));
  DBMS_OUTPUT.PUT_LINE(f1(10));
END;
```

Packages...

```
CREATE OR REPLACE FUNCTION
anonf1v0
  (p2 NUMERIC)
  RETURNS TEXT AS
$$
BEGIN
  RETURN p2::TEXT;
END;
$$ LANGUAGE pgsql;

DO $$
BEGIN
...
```

Autonomous Transactions...

# Advanced Query Translation Features



Query  
Optimisation



Query  
Translation  
Cache

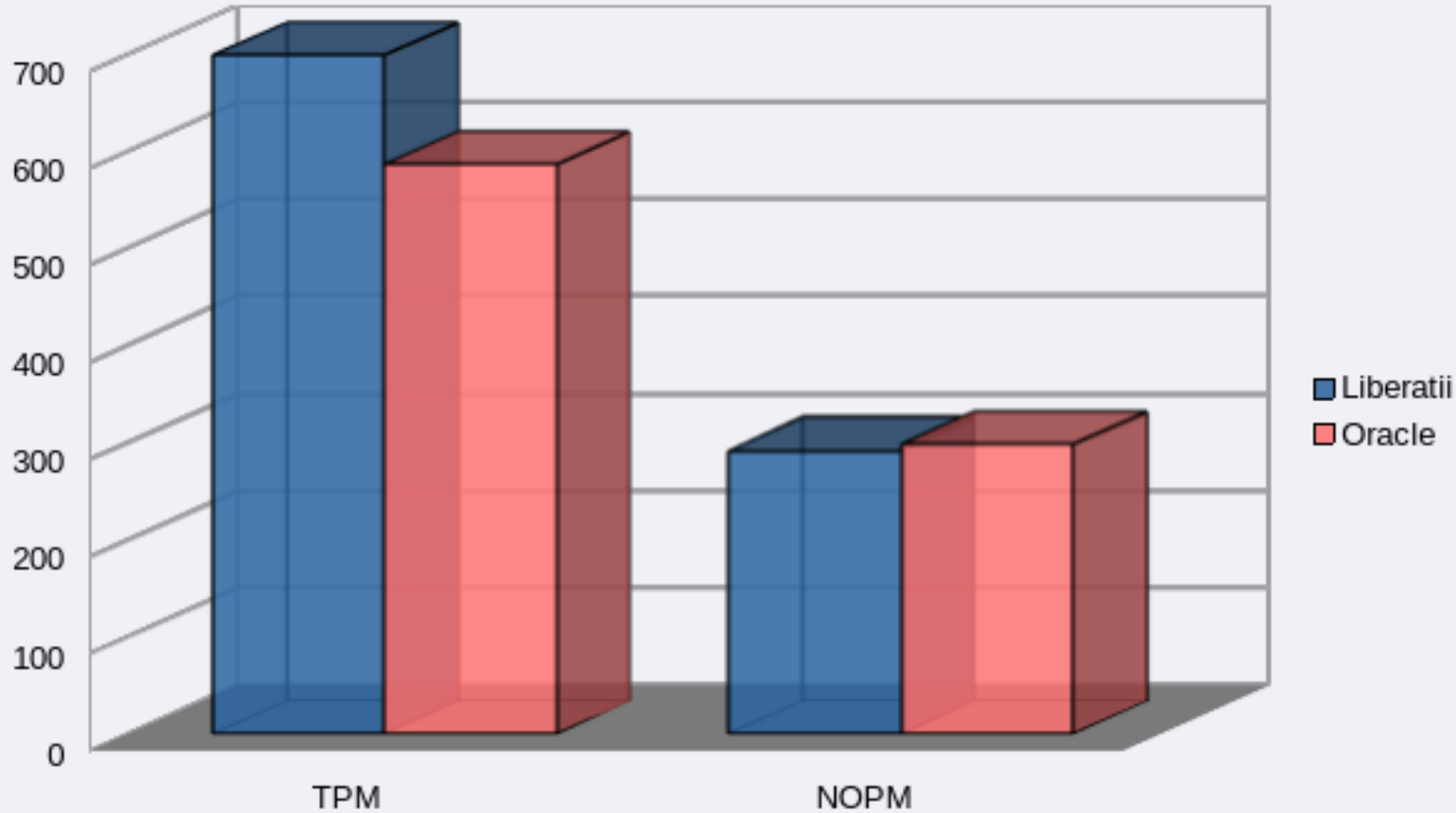


Error  
Message  
Mapping



Override  
Query  
Translation

# Transaction Performance (TPC-C) Benchmarks



## Oracle:

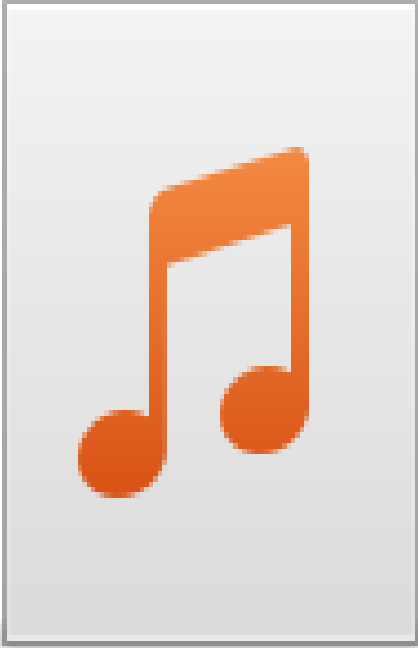
Standard F8s v2 (8 vcpus, 16 GiB memory)

## Gateway:

Standard D4s v3 (4 vcpus, 16 GiB memory)

## Postgres:

Standard F8s v2 (8 vcpus, 16 GiB memory)



# Migration Process

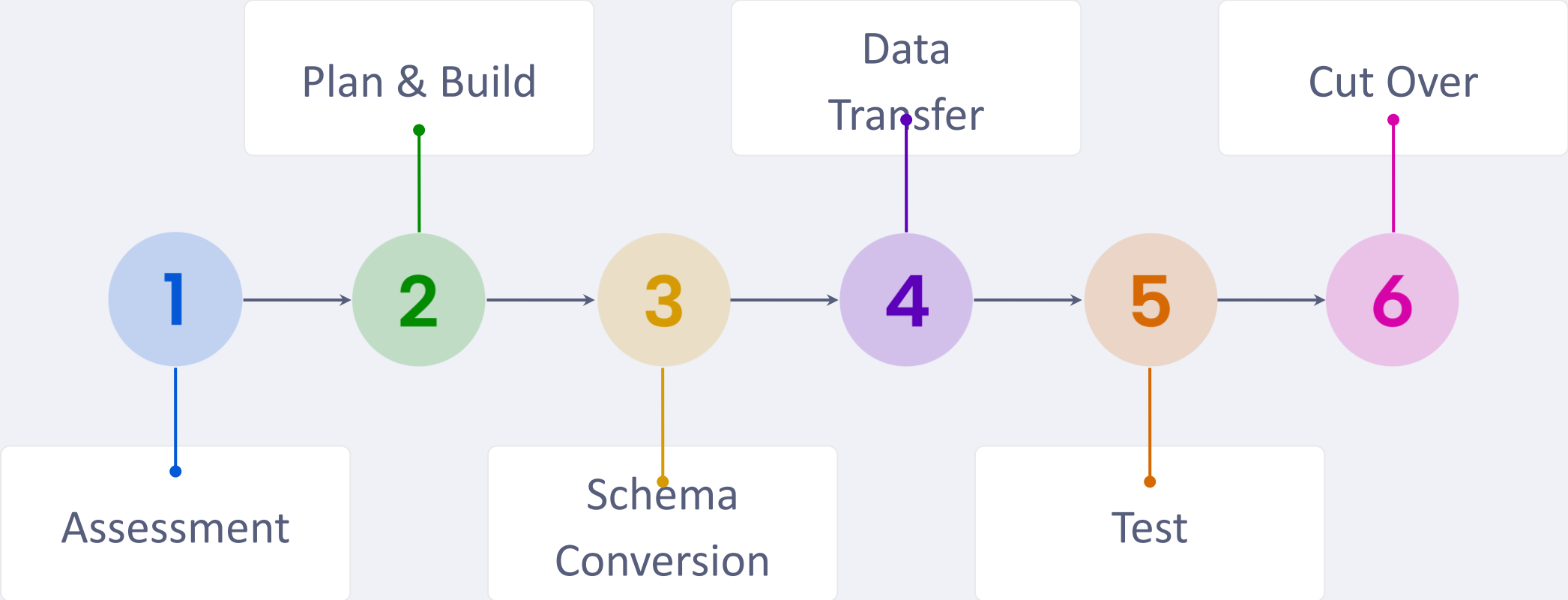
## ✓ Timeline:

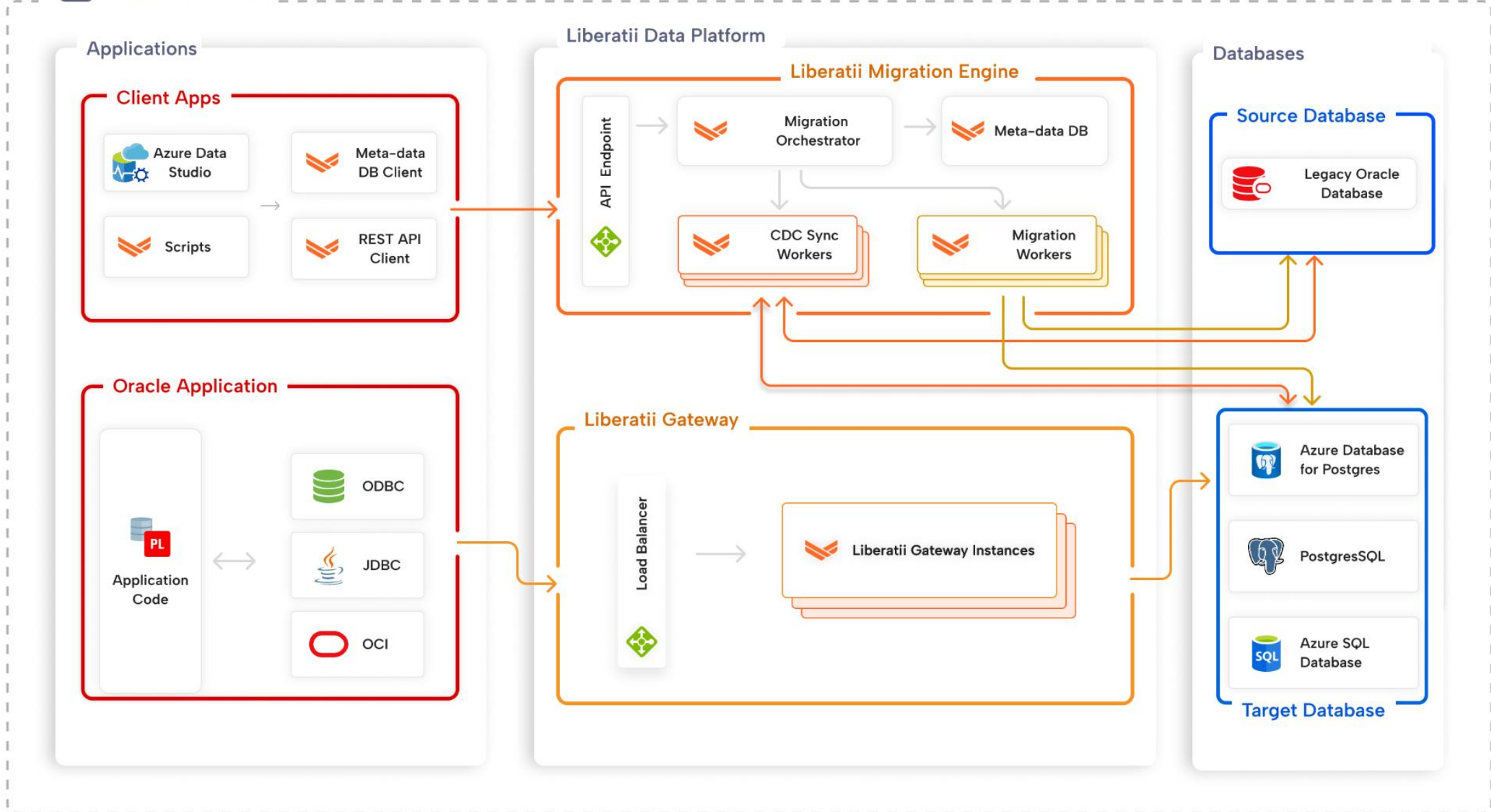
- **4 to 8 weeks** for medium-complexity migration projects
- **6 to 10 weeks** for highly-complex migration projects

## ✓ Required Staff Resources:

- **One Application Developer:** Replicate the application in the sandbox environment, change application connectivity driver, run the tests and replay existing workloads for performance
- Client side resource allocation - approx 10~12hrs weekly
- **One Database Administrator (Oracle DBA):** Provision a new Oracle database in the sandbox environment, migrate data and collect database traces and logs
- Client side resource allocation - approx 10~12hrs weekly

# Migration Process





# Liberate Your Enterprise From Oracle

- ✓ Move off Oracle in weeks, not years
- ✓ Keep existing Oracle apps, run natively on cloud databases
- ✓ Overcome vendor lock-in and reduce total cost of ownership

# How We Can Help

- ✓ Plan your migration – white board session
- ✓ Analyze options for funding from Datavail and Liberatii partners - AWS and Microsoft
- ✓ For instance - AWS MAP Funding Program
  - MAP Methodology has three phases:
    1. Assessment Phase
    2. Mobilize Phase
    3. Migrate or Modernize

Datavail can leverage MAP Partner Cash Funding in the Assess and Mobilize phases to support customers in building strong AWS cloud foundations, accelerate and reduce risk, and offset the initial cost of migrations. MAP also offers AWS Promotional Credits (MAP Credits) to customers in the Migrate & Modernize phase.



# Fill out Session Evaluation Form to Win!



## Put Your PostgreSQL Pieces Together

### WIN A LEGO SET!

CHOOSE YOUR FAVORITE:

- Star Wars: Millennium Falcon
- Statue of Liberty
- Notre-Dame de Paris
- Volkswagen T2 CamperVan
- Harry Potter: Hogwarts
- Super Mario: Bowser

# Questions?

