



# AN ORACLE TO POSTGRES MIGRATION JOURNEY (NATWEST)

Presented by:

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# A new world has emerged



Companies must shift to new **digital** operating models to compete and **stay relevant**

- Data is the currency
- Data ownership is an economic advantage
- Databases are a strategic asset

# The benefits of Open Source

Customers move to open source for these main reasons:

- Cost reduction
- Innovation
- Agility and deployment flexibility
- Talent attraction
- Infrastructure modernization
- Digital transformation and cloud



# Oracle is holding back innovation

- Higher cost
- Difficult licensing terms
- Limited platform choices

Save as much as

**80%**

With EDB Postgres

# Moving from Oracle to Postgres is a transformational step

Considering Postgres

Getting enterprise support

Mapping to goals & outcomes

Migrating from other vendors

Upskilling staff and reducing overhead

Harnessing the full power of Postgres

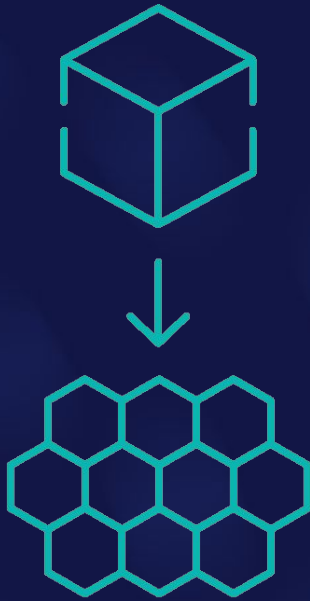


EDB Guides You Through Every Phase

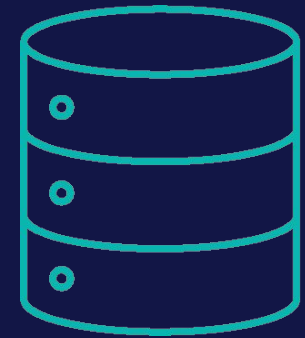
# EDB Postgres was designed to transform



**Any cloud,  
any OS**



**Microservices**



**Containers  
and K8s**

# EDB Postgres offers flexibility

From self-managed to fully managed DBaaS in the cloud

- Same applications
- Faster innovation
- Performance and scalability
- Stability, security and control
- Seamless integration



Private



Hybrid



Multi-cloud



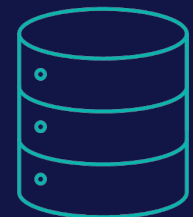
Public



Bare Metal



Virtual Machines



Containers

# Legacy software is like being stuck in the mud

- Higher cost
- Acceleration difficulties
- Slow modernization
- Lack of flexibility and agility





# EDB Postgres unshackles business



Understandable  
licensing - savings  
with EDB of up to  
**80%** over legacy



Community driven  
- **144** companies  
and **412**  
contributors\*



Freedom of choice  
in IT stack - any  
**cloud**, any **OS**



Ability to scale -  
spin up new  
databases in  
**minutes**

# Built for the future, not your past

## EDB Ensures:

- **Performance**  
The ability to do anything that proprietary, legacy databases can do.
- **Flexibility**  
Both self-managed and fully managed.
- **Scalability**  
Tools and services to meet the demands of your growing enterprise.
- **Availability**  
Tools to deliver more than 99.999% high availability.
- **Portability**  
Technology that can be deployed anywhere.



# Migration concerns

- “Will our SQL and PL/SQL translate, or will we need to recode?”
- “Will we have downtime?”
- “Will the new database be as secure or more secure than the legacy systems?”
- “Will our applications continue to work?”
- “Can we verify that the data is equivalent?”



# Delivering business value

EDB is the fastest, easiest way to migrate from oracle to postgres

A majority migrate in

**<20**

days per Oracle  
based application

Automate

**>95%**

of Oracle schema  
migration

# EDB's key migration tools and services



## Compatibility with Oracle

Features built into EDB Postgres Advanced Server and tools

Allows many Oracle objects to run in Postgres with little or no changes

Reduces migration effort



## Migration Portal

Free, web-based tool

Assesses Oracle schema compatibility

Converts Oracle objects to EDB Postgres



## Migration Toolkit & Replication Server

EDB tools included in subscription

Migrates data from Oracle to Postgres

Migrates data changes from Oracle to Postgres

Supports fallback scenarios



## Migration Services

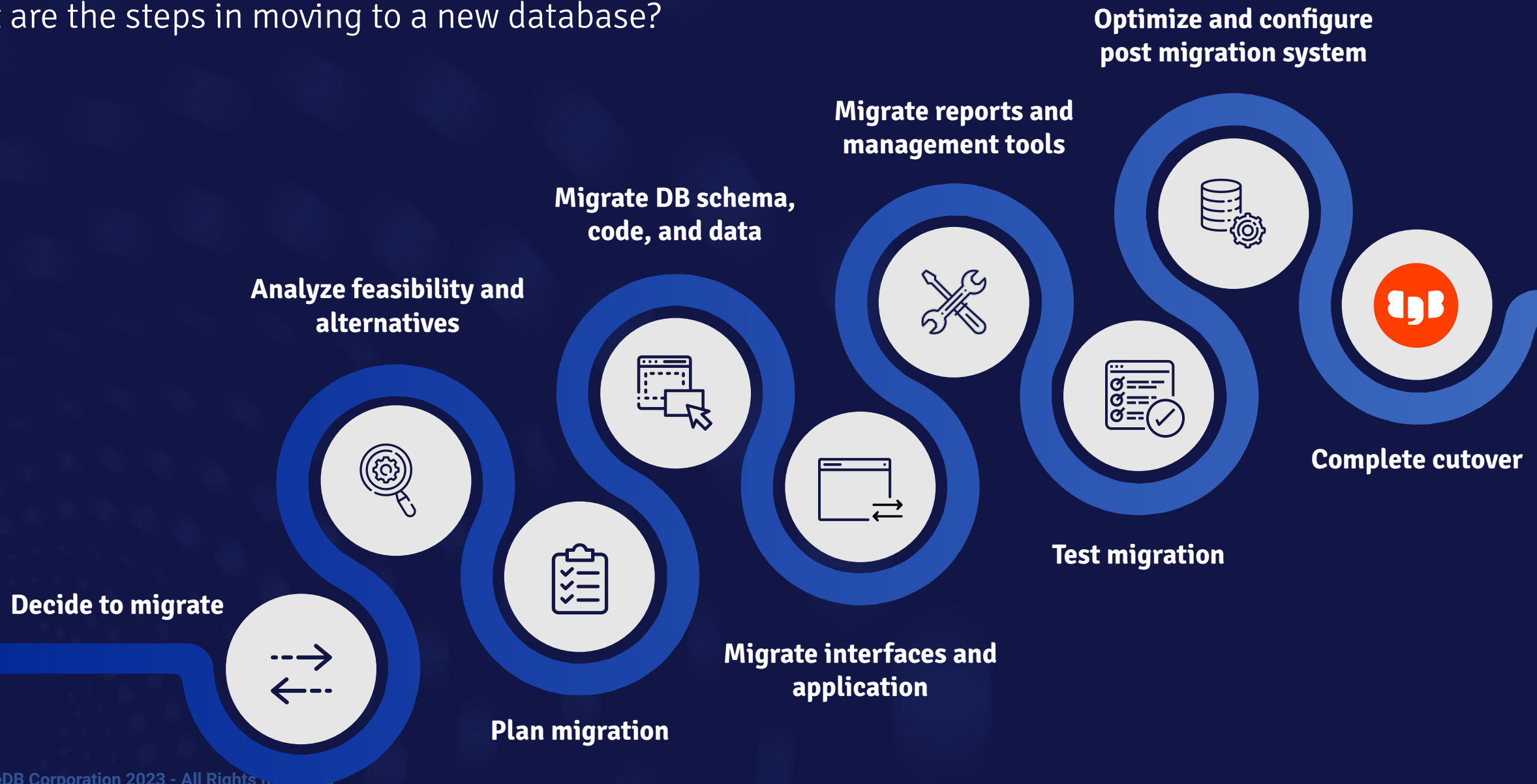
EDB Professional Services  
Experts on Oracle migrations

For organizations that are short-staffed

Helps ensure a smooth transition

# Legacy Application Database Migration Journey

What are the steps in moving to a new database?



# INITIAL ASSESSMENT ON PROVIDED DBs

## PROCESS FOR IN SCOPE APPLICATIONS

68 Applications reviewed

- 168 Databases

- 835 Schemas

We first classified each **database** as **LOW / MEDIUM / HIGH complexity** from a migration perspective

Based on the rating per DB and the alignment of DBs to apps, **EDB has assigned each application an overall L/M/H (migration) rating**

We do have some open questions on the data received ([see link](#))

## SUMMARY FINDINGS: COMPLEXITY

Complexity	Applications	%
Low	41	61
Medium	3	4
High	13	19
No-Data	11	16
<b>Total:</b>	<b>68</b>	

## BRIEF DESCRIPTION OF CATEGORISATION

**Low:** Oracle schema is highly compatible with EDB Postgres Advanced Server, and to make it totally compatible, only minor definitional changes are needed.

**Medium:** Oracle schema is mostly compatible with EDB Postgres Advanced Server. Mapping feature has functional difference, that has to be rewritten with EDB syntax and workaround.

**High:** Oracle schema has unsupported feature with EDB Postgres Advanced Server, and it has to be rewritten (designed, develop, and tested) to work with EDB Postgres. *Note: Some functionality delivered via Oracle DB features today, may be better placed in the application tier. Which in turn, may ease effort to remediate)*

**No-Data:** Either, the provided Oracle DDL is corrupt or required files not available

# LOW COMPLEXITY APPLICATIONS

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Applications	Complexity	Databases	Schemas
Bankline Direct Digital (Non production) (Legacy CI record)	Low	1	17
BIP/SLF Reporting Database (Non-Production) (Legacy CI record)	Low	2	194
BOOKWORM (LONDON) (Legacy CI record)	Low	4	31
Camunda SAT (Test ENV) (Non-Production) (Legacy CI record)	Low	1	21
CES - Customer Event System (Non production) (Legacy CI record)	Low	1	25
CID (Non production) (Legacy CI record)	Low	1	27
Cloud 9 Desktop (Non - Production) (Legacy CI record)	Low	2	10
CSS (Global) (Legacy CI record)	Low	1	31
DDIC Agile App (global) (Legacy CI record)	Low	1	33
eOBAO - On-boarding and Account Opening (NW)	Low	4	46
FCL (Edinburgh) (Legacy CI record)	Low	1	5
Finance Portal (Global) (Legacy CI record)	Low	1	35
Fire (LONDON) (Legacy CI record)	Low	1	71
FMS - Fraud Management System (Non production) (Legacy CI record)	Low	2	21
FUSION (LONDON) (Legacy CI record)	Low	4	64

## Example

important point to note is that, even though technical complexity may be low, **effort to remediate will be multiplied relative to the volume of schemas** (more schemas / objects = more work)



# Oracle database migration solutions



Schema



Data



DB Code



API



Tools

Part of the way  
Schema and data only



Most of the way  
Schema, data and code



Almost there  
Schema, data, code and interface



All the way  
Schema, data, code, interface and operational tools



# Oracle compatibility matters!

EDB Postgres Advanced Server's compatibility is wide and deep

Data Types

Object Types

PL/SQL

Query Syntax

Data Dictionary  
Views

Built-in PL/SQL  
Packages

Database Drivers

Work-alike DBA  
Tools

- **What are the benefits of compatibility?**
  - Significantly reduces the amount of time and effort required for a migration from Oracle
  - Eases the transition from Oracle to Postgres for Oracle DBAs and developers

# Oracle compatibility observations

## Constructs

Table and indexes are important, but they are only a part of the challenge.

Object type	Prominence
TABLE	28.78%
INDEX	20.41%
SYNONYM	15.74%
CONSTRAINT	9.39%
VIEW	6.91%
SEQUENCE	5.74%
TRIGGER	3.21%
PROCEDURE	2.96%
PACKAGE	2.74%
PACKAGE BODY	1.87%
FUNCTION	1.25%
TYPE	0.65%
MATERIALIZED VIEW	0.14%
TYPE BODY	0.10%
DATABASE LINK	0.08%
USER	0.02%
ROLE	0.01%
	100.00%

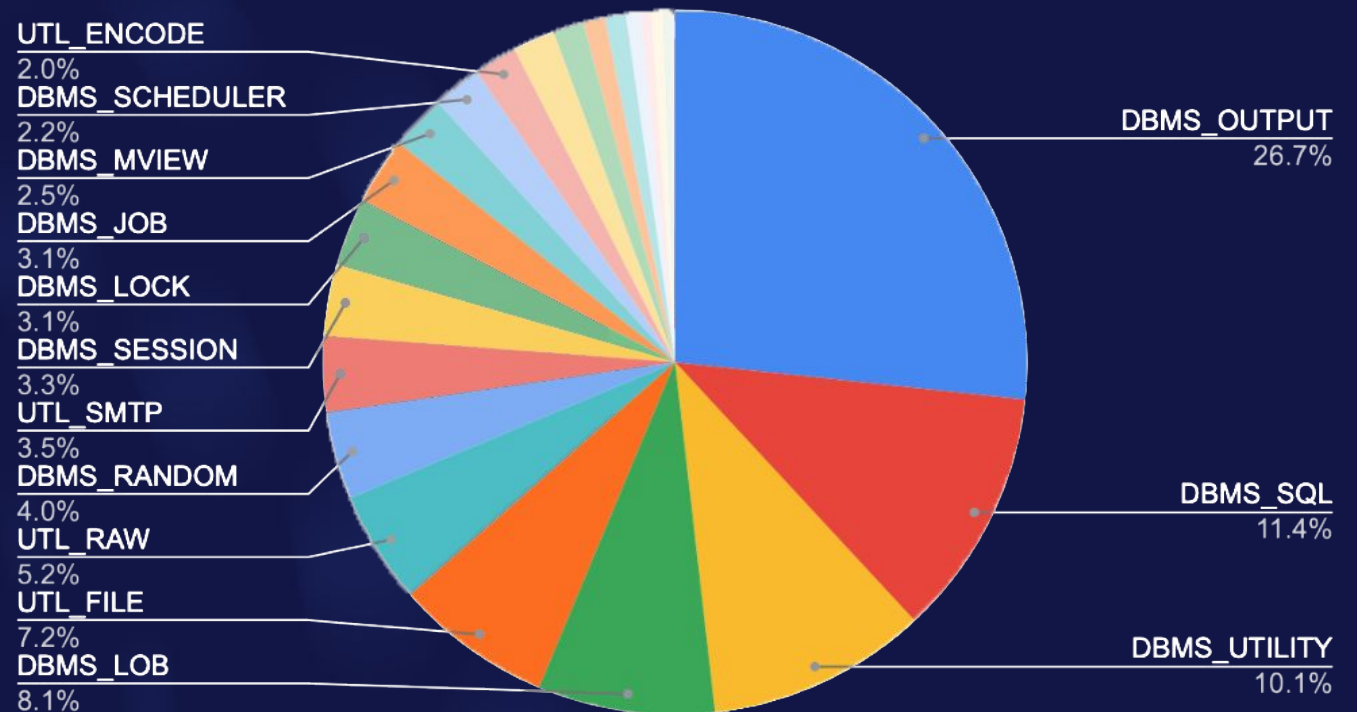
# Oracle compatibility observations

## Packages

### Practical findings

- Over 18 million DDL constructs analyzed since January, 2019
- 14% of all schemas had at least one reference to PRAGMA AUTONOMOUS\_TRANSACTION
- 14% of all schemas had at least one HINT
- 31% of all schemas referred to at least one of the EDB supported Oracle packages

Frequency of EDB Supported Oracle Packages (2019-2022)



# Oracle compatibility observations

## Effort Assessments

### 61% of Oracle migrations to EDB Postgres are easy/moderate

- < 20 person days of effort
- Migrate schema and data
- Leverage EDB Oracle Compatibility

### EDB BigAnimal with Oracle Compatibility

- Accelerates migration
- Reduces infrastructure set up time (10-15 person days ⇒ 1 person day)

Average person days for schema and data migration  
(Source: 2022 EDB Oracle Migration Assessments)

4. Very Hard (>40)

10.9%

1. Easy(<5)

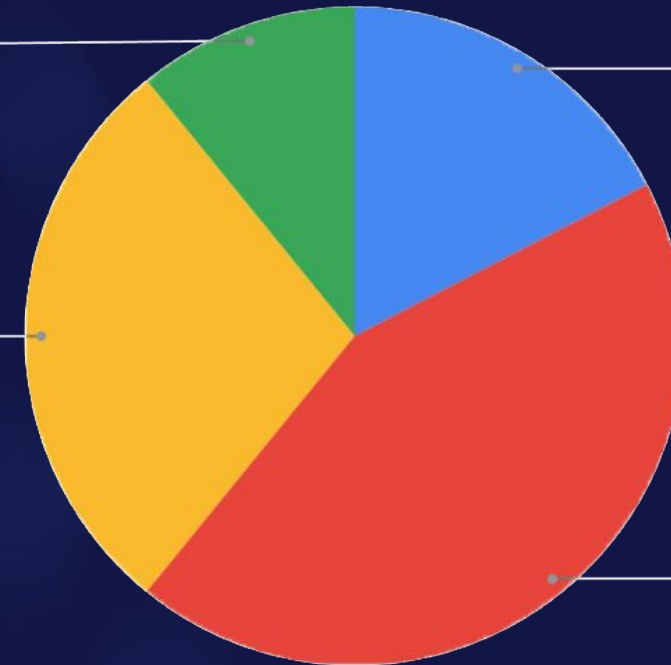
17.4%

3. Hard (21 - 40)

28.3%

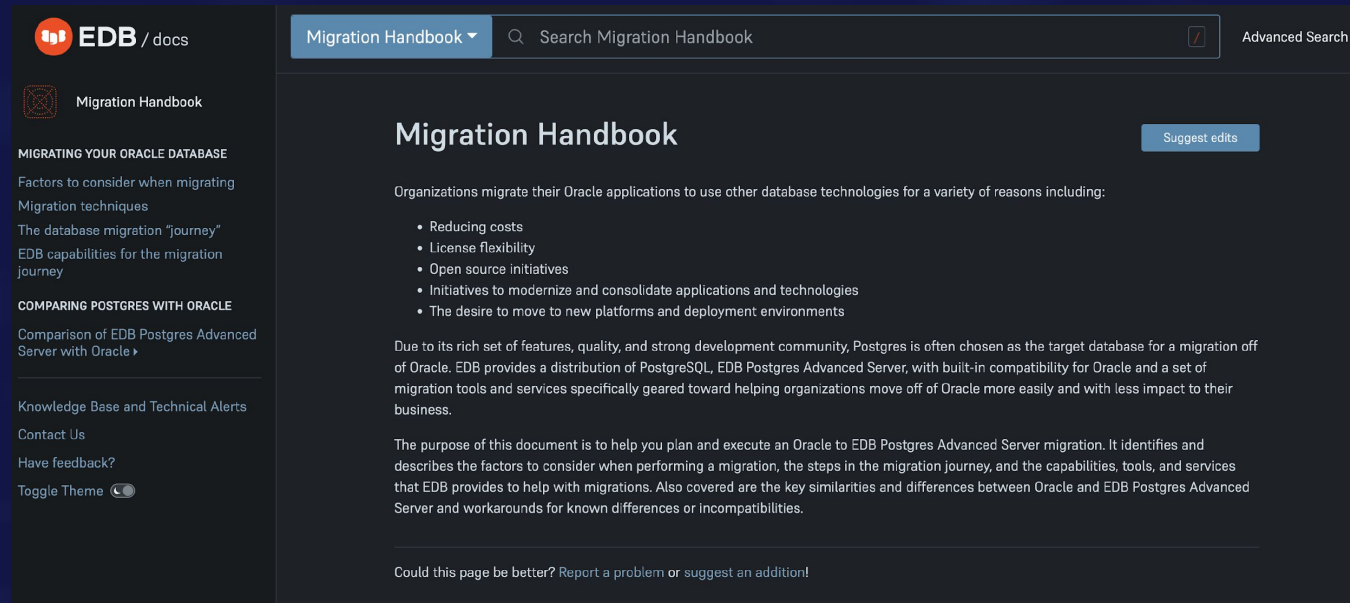
2. Moderate (6-20)

43.5%



# EDB Migration Handbook

## Read and learn about EDB Oracle compatibility



EDB / docs

Migration Handbook

Search Migration Handbook

Advanced Search

### Migration Handbook

Suggest edits

Organizations migrate their Oracle applications to use other database technologies for a variety of reasons including:

- Reducing costs
- License flexibility
- Open source initiatives
- Initiatives to modernize and consolidate applications and technologies
- The desire to move to new platforms and deployment environments

Due to its rich set of features, quality, and strong development community, Postgres is often chosen as the target database for a migration off of Oracle. EDB provides a distribution of PostgreSQL, EDB Postgres Advanced Server, with built-in compatibility for Oracle and a set of migration tools and services specifically geared toward helping organizations move off of Oracle more easily and with less impact to their business.

The purpose of this document is to help you plan and execute an Oracle to EDB Postgres Advanced Server migration. It identifies and describes the factors to consider when performing a migration, the steps in the migration journey, and the capabilities, tools, and services that EDB provides to help with migrations. Also covered are the key similarities and differences between Oracle and EDB Postgres Advanced Server and workarounds for known differences or incompatibilities.

Could this page be better? Report a problem or suggest an addition!

Read more :  
<https://www.enterprisedb.com/docs/migrating/oracle/>

- Factors around migration to consider
- Typical migration techniques
- The database migration journey
- EDB capabilities that can be used to assist on that journey
- A detailed comparison between EDB Postgres Advanced Server and Oracle database
- Syntax and PL/SQL support, and where there are differences

# Oracle Compatibility Observations

What makes a good migration candidate?



- ORM (Hibernate, Spring, etc. )
- Procedures, functions, packages written in PL/SQL



- Ability to modify source code
- Availability of Application Developer



- No use of RAC for scalability
- No need for Flashback

# Oracle Compatibility Observations

What is a more challenging migration candidate?



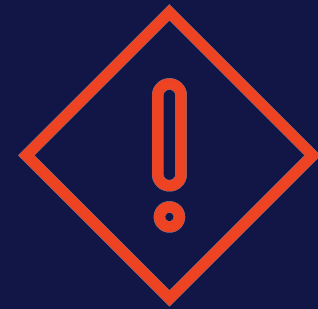
## Moderate candidates

- OCI interface
- Spatial/XML
- Oracle extensions of .NET and ODBC



## Typically difficult candidates

- ProC interface
- Transaction management control inside PL/SQL (Commit/rollback/savepoint/exceptions)
- Stored procedures written in Java
- Must have RAC capabilities and Flashback



## Other Oracle proprietary extensions



# EDB is the solution to empowering your team



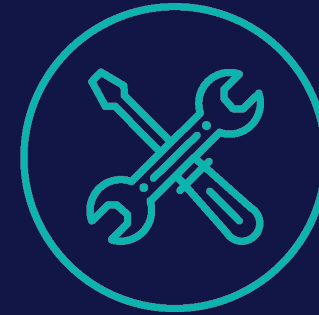
## Compatibility

- EDB Postgres Advanced Server
- Database drivers to enhance Oracle compatibility



## Support

- EDB support
- Remote DBA
- EDB Professional Services
- EDB Training



## Tools

- Migration Portal
- Postgres Enterprise Manager
- Postgres Distributed

# EDB Professional Services

## Why use EDB Professional services for your migration journey?

- Some migrations are more complex than others
- EDB has over 17 years of experience in helping customers with their migrations
- You may not have sufficient resources to perform a migration on your own
- You may not have sufficient PostgreSQL expertise
- You need help in assessing, prioritizing, and planning migrations for a large number of databases in your organization

**Challenge:** Highly successful telecom app used by the world's largest providers needed upgrades to their legacy architecture

**Solution:** Re-architect MDS Global's signature platform onto Postgres and migrate off Oracle

**Result:** Uninterrupted uptime and high availability across a global network

## Key Takeaways

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Modernized applications, providing greater development agility and confidence in ability to accelerate growth



Reduced solution costs, enabling MDS Global to be more cost effective in emerging markets



Simplified the maintenance burden thanks to the widespread availability of Postgres resources and the speed of community development



The Global Standard for Business Research

Challenge: 350+TB of data across SAS, MySQL, Microsoft SQL Server, Oracle and BDB in need of a single source

Solution: Transformation of how data is managed by transitioning and centralizing to Postgres

Result: Postgres provides WRDS with the foundational DBMS to continue providing their services, while EDB ensures that Postgres is constantly meeting the needs of both WRDS and their client institutions.

## Key Takeaways

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Empowered its teams and clientele alike, to make it easier to access the breadth of data.



EDB support will give you the right answer. “If we’re wondering ‘is this possible,’ we can bounce it off EDB and get that insight.”



Seamless transition and continued evolution

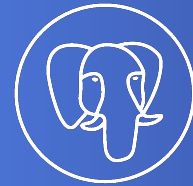
Challenge: With global expansion comes the need to control costs and prepare for future scale

Solution: EDB Postgres Advanced Server controlled cost while facilitating a move to the cloud without sacrificing scalability and performance

Result: Migrated both hosted and on-premises environments without customer disruption, improved user response times and data access time all the while lowering costs.

## Key Takeaways

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Achieved a seamless move to Postgres with zero disruptions to business continuity



Significantly reduced licensing costs



Improved user response times and speed to access data ensure growth is unencumbered

# Guaranteed Postgres migration program

Zero-risk guarantee to migrate from Oracle

- Free migration assessment
- Free migration services:
  - Migrated schema and data
  - Remediate up to 25 application queries
  - Tune up to 10 queries for same or better performance



THIS IS **YOUR**  
MOMENT TO  
LEAD, BUILD,  
CHALLENGE AND  
DO MORE

And we are by  
your side every  
step of the way.

THANK YOU!