



**EDB**<sup>TM</sup>  
POSTGRES

vs.

MariaDB

---

**COMPARATIVE ANALYSIS**  
MARCH 2019

**EDB**<sup>TM</sup>  
POSTGRES

# CONTENTS

**03**

Executive Summary  
EDB Postgres vs. MariaDB

**05**

Introduction  
Comparative Analysis

**09**

Enterprise Reliability  
Feature Comparison

**11**

Security  
Feature Comparison

**13**

Performance  
Feature Comparison

**15**

Manageability  
Feature Comparison

**17**

Oracle® Database Compatibility  
Feature Comparison

**19**

Cloud / DBaaS  
Feature Comparison

**21**

Conclusions  
EDB Postgres vs. MariaDB

**22**

Explanation of Ratings  
Appendix

# EDB POSTGRES vs. MARIADB

EXECUTIVE SUMMARY | March 2019

In this report, we compare EDB Postgres™ and MariaDB on their respective capabilities for six crucial enterprise requirements:

- Reliability and High Availability
- Security
- Performance
- Manageability
- Oracle® Compatibility
- Cloud / DBaaS

Specifically, we compare the EDB Postgres Enterprise Platform Version 11 to MariaDB X3, as of March 2019, examining key components of each requirement and assessing the relative strengths of these two open-source-based database solutions on each of these components.

Table 1 on Page 3 summarizes our findings.



**Table 1: Summary Comparison by Category**

Category	EDB Postgres	MariaDB
Reliability & High Availability	●	◐
Security	●	◐
Performance	◑	◐
Manageability	●	◐
Oracle Compatibility	●	◑
Cloud / DBaaS	◑	◑



See Appendix on page 22 for a detailed Explanation of Ratings

Across the board we discovered that EDB Postgres offers broader functionality, greater feature completeness and higher level of product maturity than MariaDB. In many cases, differences in architectural approach favor EDB Postgres.

In others, EDB Postgres provides a more comprehensive solution, without dependence on an ecosystem of individual products from third-party vendors. Enterprise customers who worry about reducing complexity and building trusted support relationships favor complete solutions that rely on fewer vendors. Often where features appear similar on paper, EDB Postgres separates itself by the duration and breadth of usage in the field—in most cases, many years of wide production usage—which validates its fitness in these key areas for enterprise use.

Overall, our conclusion is clear: EDB offers a superior database platform for enterprise applications compared to MariaDB, whether these are new, emerging applications or migrations of existing workloads from legacy databases and whether these systems are deployed on-premises or in the cloud.

# INTRODUCTION

Enterprises large and small are adopting open source databases to power more of their applications and are increasingly entrusting business critical systems to open source database solutions. Fueling this trend, vendors like EnterpriseDB and MariaDB have developed richer enterprise capabilities across these products, including areas like system reliability, rich API, coverage of the SQL standard, comprehensive security, high availability, performance and scalability, and enterprise maturity. In addition, Oracle® compatibility is a big plus given Oracle's 50% share of the database market.

Today, an open source database management systems (OSDBMS) can compete effectively against leading proprietary database products for most enterprise workloads. In fact, in Gartner's "State of the Open-Source DBMS Market, 2018" the authors note that "by 2022, more than 70% of new in-house applications will be developed on an OSDBMS, and 50% of existing commercial RDBMS instances will have been converted or will be in process of converting."

EnterpriseDB and MariaDB differ in their ability to address requirements for wide-ranging enterprise use cases, including "run-the-business" applications, reporting and analysis, and customer engagement. Examples include accounts receivable applications, human resource systems, sales, inventory, business intelligence, and web and e-commerce applications. Potential customers need to understand the comparative strengths and weaknesses of competing open source solutions offered by EnterpriseDB and MariaDB.

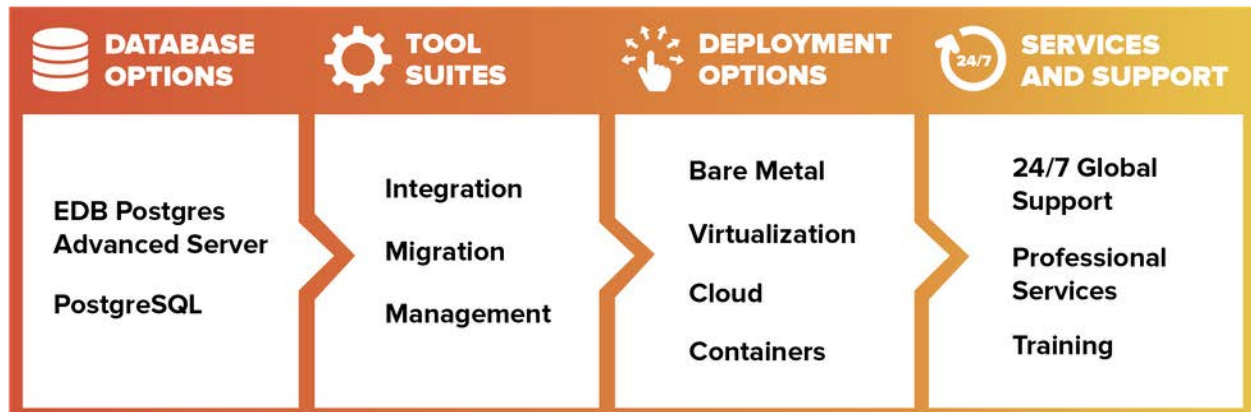


Architecture Overview

Before exploring each of the six enterprise requirements, let’s highlight a few relevant architectural features of each platform: EDB Postgres and MariaDB.

EDB Postgres

EDB Postgres offers an enterprise platform suite that provides a complete software and services solution from a single vendor. It includes two database options, community PostgreSQL and EDB Postgres Advanced Server. EDB Postgres offers rich integration and management tools with highly experienced professional services that can be deployed on a wide variety of platforms from in-house bare metal servers to the public cloud. EDB Postgres Advanced Server contains additional features for security, performance, high availability and Oracle compatibility on top of community PostgreSQL, and importantly, it maintains compatibility with the underlying PostgreSQL system, with a few minor exceptions. Most EDB Postgres tools work with either database option.



EDB Postgres Advanced Server includes proprietary extensions to open source PostgreSQL that are included as part of an EDB Postgres subscription.

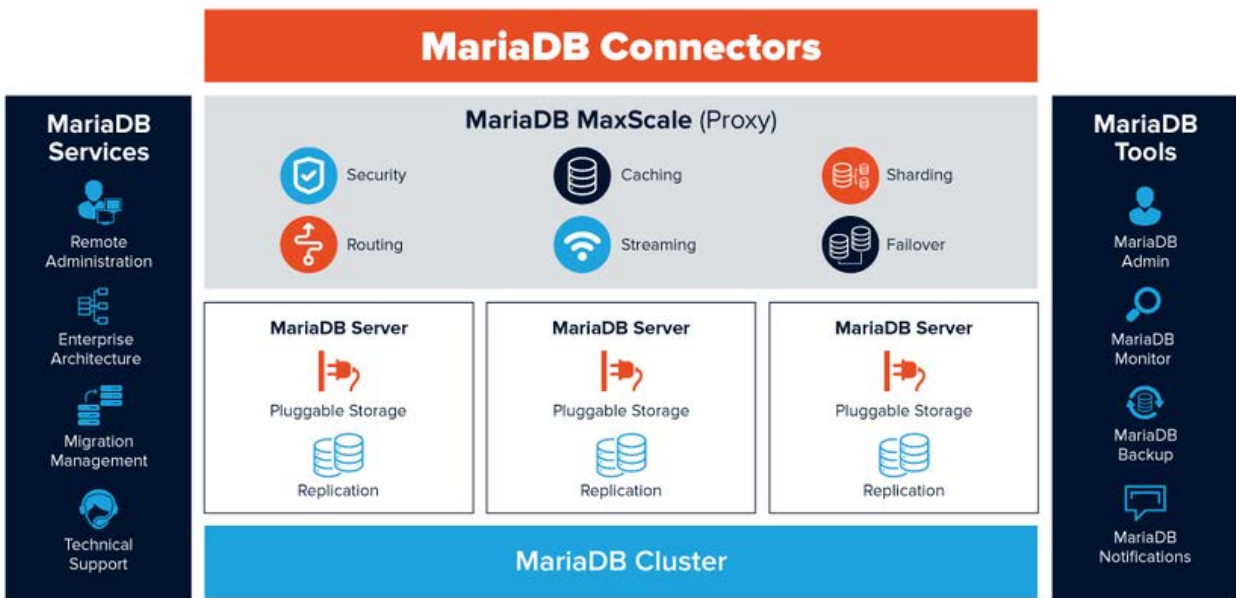
EDB Postgres Advanced Server is very popular among EnterpriseDB enterprise customers because of its advanced capabilities. We have included the added capabilities of EDB Postgres Advanced Server in our comparison.

The EDB Postgres Platform also includes optional components, PgBouncer and Pgpool, to enable connection pooling and load balancing using database proxy servers.

[1] SQL keywords is an example of the type of minor differences here. EDB Postgres Advanced Server adds keywords that are not in PostgreSQL. This may necessitate local code changes during a migration from community PostgreSQL to Advanced Server.

MariaDB

MariaDB was created as a fork of MySQL® following Oracle’s acquisition of Sun Microsystems® and the open source MySQL code base it held. Thus, MariaDB is a separate product from MySQL and, like any forked product, does not guarantee compatibility with its antecedent product. While MariaDB attempts to maintain compatibility with MySQL, every Release Note documents a long list of mainly minor incompatibilities. Most third-party vendors in the MySQL ecosystem support both MySQL and MariaDB, but MariaDB is often a separate product development effort.

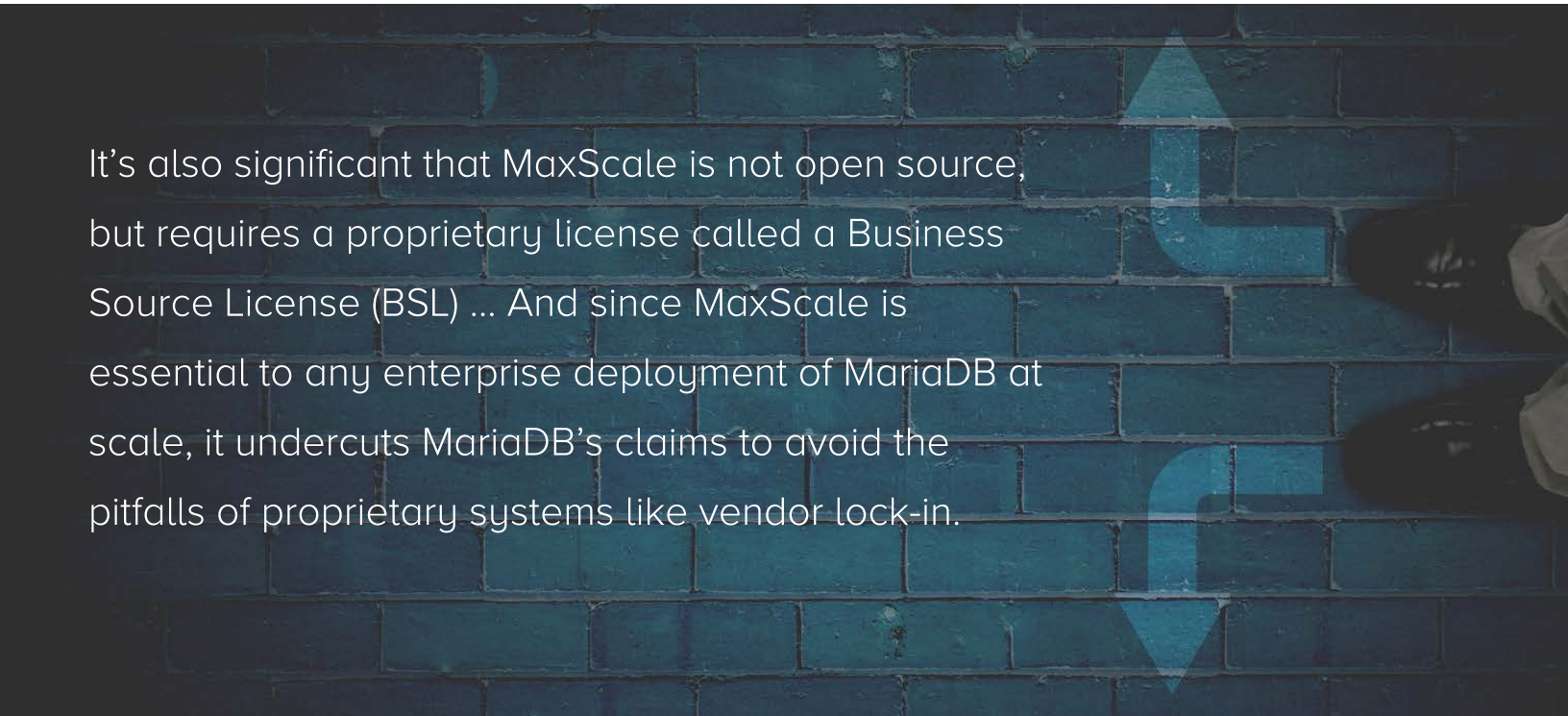


Many of MariaDB’s advanced features for security, high availability, load balancing and management require MaxScale™, a database proxy that sits in front of the MariaDB cluster. While greatly extending MariaDB capabilities, it also adds complexity and cost to the data management environment. It requires additional servers, constitutes a single point of failure by default, can be bypassed unless configured correctly, and may be a bottleneck if resources are not allocated properly. Proxy servers like MaxScale increase system risk and complexity that enterprises may want to avoid if possible.<sup>2</sup>

[2] While both MariaDB and EDB Postgres employ database proxies, EDB Postgres limits proxy use to optional connection pooling and load balancing. For MariaDB, the MaxScale proxy is required to enable most advanced security and high availability features needed by enterprises.

It's also significant that MaxScale is not open source but requires a proprietary license called a Business Source License (BSL). While claiming that the BSL will revert to an open-source GPL basis once the MaxScale version is obsolete (several years after release), it eliminates any community development of MaxScale or other software covered by a BSL, which is the lifeblood of open source software. And since MaxScale is essential to any enterprise deployment of MariaDB at scale, it undercuts MariaDB's claims to avoid the pitfalls of proprietary systems like vendor lock-in.

For other enterprise capabilities, MariaDB requires an extensive ecosystem of third-party vendors to fill the gaps in product features and capabilities provided by MariaDB or community MySQL. Software developers may readily embrace the advantages of a large ecosystem, but for enterprise customers, it can complicate relationships for critical application operations and support. Enterprises generally prefer a single vendor who takes responsibility for resolving issues and problems. In this comparison, we focus on the capabilities provided directly by MariaDB.



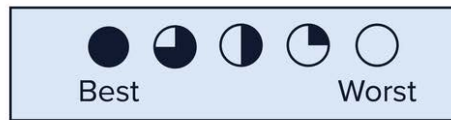
It's also significant that MaxScale is not open source, but requires a proprietary license called a Business Source License (BSL) ... And since MaxScale is essential to any enterprise deployment of MariaDB at scale, it undercuts MariaDB's claims to avoid the pitfalls of proprietary systems like vendor lock-in.



# ENTERPRISE RELIABILITY

## Feature Comparison

Feature	EDB Postgres	MariaDB
Transaction Management	●	◐
Backup and Restore	◐	◑
Point-In-Time Recovery	●	◐
Automatic Failover	●	◑
Replication	●	◐
Master Slave Replication	●	◐
Multi-master Replication	●	◐
Heterogeneous Replication	◐	○
Database Upgrade	◐	◑
Management	◐	◑



See Appendix on page 22 for a detailed Explanation of Ratings

### Discussion

Data integrity and business continuity are critical to successful operation of enterprises, especially at scale. Both EDB Postgres and MariaDB support full ACID compliance on an MVCC architecture that allows readers and writers to coexist without blocking one another. Starting with V11, EDB Postgres supports autonomous transactions, which enables more complex transaction patterns and enhances Oracle compatibility.

Both EDB Postgres and MariaDB support incremental backup. EDB Postgres supports online backup, which eliminates the need for an offline backup window. The EDB Postgres Backup and Recovery Tool (BART) enables superior ease of use for Backup and Restore compared to MariaDB. EDB Postgres also supports point-in-time recovery to a specific time or transaction ID, whereas MariaDB supports recovery to a specific time or log location.

EDB Postgres and MariaDB both support asynchronous and synchronous replication, as well as both master-slave and multi-master replication architectures with automatic failover. Beyond these features however, EDB Postgres alone supports bi-directional heterogeneous replication between EDB Postgres (either Advanced Server or PostgreSQL database options) and Oracle, Microsoft SQL Server®, and PostgreSQL.

EDB Postgres also provides easier-to-use tools for configuring and managing an organization's high availability environment.

MariaDB relies on the MaxScale proxy server to provide automatic failover and enable some replication configurations. As noted earlier, proxy servers add complexity and cost to an existing cluster configuration and create additional points of failure and malicious penetration opportunities. Most enterprises will benefit from avoiding this added complexity and vulnerability whenever possible.

Few things are more important in a crisis than a simple, reliable process for failover and recovery, so this advantage of EDB Postgres is very significant to organizations with an interest in continuous or near-continuous operation.

Few things are more important in a crisis than a simple, reliable process for failover and recovery so this advantage of EDB Postgres is very significant ...



# SECURITY

## Feature Comparison

Feature	EDB Postgres	MariaDB
Authentication	●	◐
Authorization	●	●
Auditing	●	◐
Directory Support	●	●
Password Management	●	◐
Encryption	◐	◐
Data Redaction	●	◐
Database Firewall	●	◐
Row Level Security	◐	○
Virtual Private Database	◐	○
Procedural Language Obfuscation	●	○
PCI Compliance	●	◐
GDPR Readiness	◐	◐



See Appendix on page 22 for a detailed Explanation of Ratings

### Discussion

Like data integrity and availability, data protection is an essential requirement for enterprise class information systems. Both EDB Postgres and MariaDB offer advanced authentication options, including support for single sign-on via directory

services like LDAP and PAM. Many MariaDB authentication services, however, require the MaxScale proxy, which can add complexity and security vulnerabilities. In addition, EDB Postgres supports password profiles to allow management of password strength, duration, and change rules when authentication is not managed by a central directory service. MariaDB offers a plug-in with limited password management.

Both products support detailed logging, but EDB Postgres offers session tagging to better identify individual users in a connection pooling environment. EDB Postgres also differentiates itself by enabling a separate, secure audit log not visible to database administrators, enhancing security tracking of malicious actions by disgruntled staff or intruders.

Both EDB Postgres and MariaDB also support multi-layer encryption for client connections, data at rest, and data in motion, including private key encryption, as well as rich data value redaction and obfuscation. In addition, EDB Postgres adds column encryption via user functions. Both also support database firewalls to prevent SQL injection attacks. MariaDB, however, relies on the MaxScale proxy to provide these encryption, redaction, and firewall capabilities, entailing a more complex, less robust security environment.

EDB Postgres offers built-in row level security to enable virtual private database support in a multiple user class or multi-tenant environment. EDB Postgres also supports procedural language obfuscation to protect business rules or other intellectual property from exposure. MariaDB does not support these features.

Finally, while it is important to note that a whole-application-based approach is required to meet Payment Card Industry (PCI) requirements for point-of-sale applications—and to address strict European Union data privacy guidelines included in GDPR regulations in effect since May 2018—EDB Postgres has robust security capabilities that can assist customers in achieving compliance.

# PERFORMANCE

## Feature Comparison

Feature	EDB Postgres	MariaDB
Indexing	●	◐
Partitioning	●	◐
Statistics	◐	◐
Data Compression	◑	◐
Query Optimization	◐	◐
Query Execution	◐	◐
Parallel Query	◐	○
Parallel Load	◐	○
External Data Support	●	◐
Performance Tools	●	◐



See Appendix on page 22 for a detailed Explanation of Ratings


### Discussion

Many enterprise applications have demanding performance requirements. Use cases often involve multiple access paths to the data of interest. EDB Postgres offers richer indexing and partitioning options than MariaDB, including support for partial indexes and subpartitions, allowing its richer design capabilities to provide better performing applications in more cases. Geospatial data is an increasingly important component of many applications; EDB Postgres has much better support for specialized geospatial indexes.

While MariaDB has better data compression than EDB Postgres, reducing I/O at greater CPU cost, EDB Postgres supports automatic statistics collection and superior optimization to enable faster query execution. EDB Postgres alone supports parallel query and load operations to optimize performance.

Using foreign data wrappers, EDB Postgres enables a richer heterogeneous query environment than MariaDB, supporting queries against not only data in Postgres databases but also external data stored in HDFS, Oracle, SQL Server, MongoDB, and MySQL, in as well as flat files and generic ODBC/JDBC data sources. This improves performance in hybrid data environments by eliminating the need for extensive preparation and loading of foreign data. In addition, EDB's foreign data wrappers use predicate pushdown to data targets to further enhance query performance.

EDB Postgres offers comprehensive performance monitoring and management tools, including resource management of critical CPU and I/O resources; SQL query profilers; index, tuning, and configuration advisors; and graphical system monitors. By contrast, MariaDB only provides low-level interfaces for DIY performance monitoring and management or relies on its third-party ecosystem for these tools. In either case, the result is that MariaDB has a much more limited and challenging performance management environment.



MariaDB has a much more limited and challenging performance management environment.

# MANAGEABILITY

## Feature Comparison

Feature	EDB Postgres	MariaDB
Database Administration	●	◐
System Monitoring	●	◐
Alerting	◑	◐
Reporting	●	◑
System Management	◑	◐
Performance Tuning	◑	◐
System Optimization	◑	◑
Cloud Services Management	●	◑



See Appendix on page 22 for a detailed Explanation of Ratings

### Discussion


Good management tools improve enterprise usability. In addition to monitoring a wide range of system and application health metrics, they aid administrators to take the right remedial action, especially under the stress of unexpected failures.

EDB Postgres provides both graphical and command line tools to administer the database—creating or altering needed database objects—and to monitor multiple systems from a single pane of glass and provide automatic alerts to multiple targets as targeted thresholds are exceeded. EDB Postgres also comes with a broad array of out-of-the-box reports and supports an API for developing custom reports. This provides an easy path to monitor system health, diagnose problems, and track resource utilization for capacity planning purposes.

By contrast, MariaDB provides command line low-level interfaces for administrators to roll their own monitoring scripts, or it relies on third-party tools developed by other vendors from the MySQL ecosystem. MariaDB itself has no built-in management reports and does not offer a graphical system management tool.

In addition, EDB Postgres supplies native tools to manage the high availability cluster infrastructure, EDB Postgres Failover Manager (EFM), and the EDB Postgres Backup and Recovery Tool (BART), while MariaDB relies on the MaxScale proxy for administering its high-availability systems.

In the cloud, EDB Postgres has tools to manage the database environment, whether customers want platform infrastructure services for backup and HA clusters or full-blown DBaaS capabilities. MariaDB primarily relies on cloud vendor provisioning tools to provision its database platform. MariaDB is currently in the process of introducing a cloud managed services offering on the Amazon Web Services® (AWS) Cloud.



In the cloud, EDB Postgres has tools to manage the database environment, whether customers want platform infrastructure services for backup and HA clusters or full-blown DBaaS capabilities.



# ORACLE® DATABASE COMPATIBILITY

## Feature Comparison

Feature	EDB Postgres	MariaDB
Schema Compatibility	●	◐
SQL Language	●	◐
Stored Procedures	●	◑
Built-In Packages	●	○
Tools	●	◑
Dictionary Views	●	○
Partitioning	●	◐
APIs	●	○
Migration	◑	○



See Appendix on page 22 for a detailed Explanation of Ratings


### Discussion

Given Oracle’s dominant position in enterprise database solutions, compatibility with Oracle databases enhances the ability of an open-source-based database platform to coexist in a predominantly Oracle environment and enables easier migration from Oracle to a lower cost database solution for enterprise applications.

EDB has a more than 10 years history of Oracle database compatibility supporting application migration, including not only schema and datatype compatibility but also compatible database options like partitioning, comprehensive and field-tested PL/SQL support, and commonly used built-in packages. EDB also offers sophisticated Oracle migration tools. The result is that EDB has hundreds of successful Oracle migrations under its belt.

MariaDB released Oracle compatibility capabilities only in May 2018 and has limited field experience to date. MariaDB requires that the configuration be in a special “Oracle” mode to avoid some datatype name changes for common types like Number and Varchar2. MariaDB offers limited support for hash partitioning and sub-partitioning, which limit its schema compatibility with Oracle. The latest MariaDB version, 10.3, can only handle a subset of Oracle PL/SQL and allows the creation of packages, but it does not have any built-in packages. It also does not support Oracle dictionary views. MariaDB does not support the Oracle Call Interface (OCI) frequently used by performance sensitive applications. MariaDB has no parallel for Oracle tools like SQLPlus or the Oracle Loader. MariaDB offers migration services at added cost but does not include any customer-facing migration tools.

In the area of product compatibility, the devil is in the details. While on paper MariaDB claims to offer similar Oracle compatibility features to EDB Postgres, MariaDB is far from fully compatible. In addition, EDB has the advantage of years of field experience with demanding customers to work out Oracle compatibility issues. This is critical because in any migration effort, 90% of the effort revolves around getting the last 10% of the details right. This means that a migration effort will be much longer and more costly with MariaDB than with EDB Postgres.



A migration effort will be much longer and more costly with MariaDB than with EDB Postgres.

[3] EDB Postgres Advanced Server includes configuration parameters to handle a few behavioral differences between Oracle and native Postgres, such as null handling, but supports Oracle data types natively.

# CLOUD / DBAAS

## Feature Comparison

Feature	EDB Postgres	MariaDB
Public Cloud	●	●
Private Cloud	◐	◐
Hybrid Cloud	◑	◑
Managed Cloud	●	◑
DBaaS	●	◑
Containerization	◑	◑
Automatic Scaling	◑	○
Cloud Management	◑	○
Cloud Migration	◑	○



See Appendix on page 22 for a detailed Explanation of Ratings

### Discussion

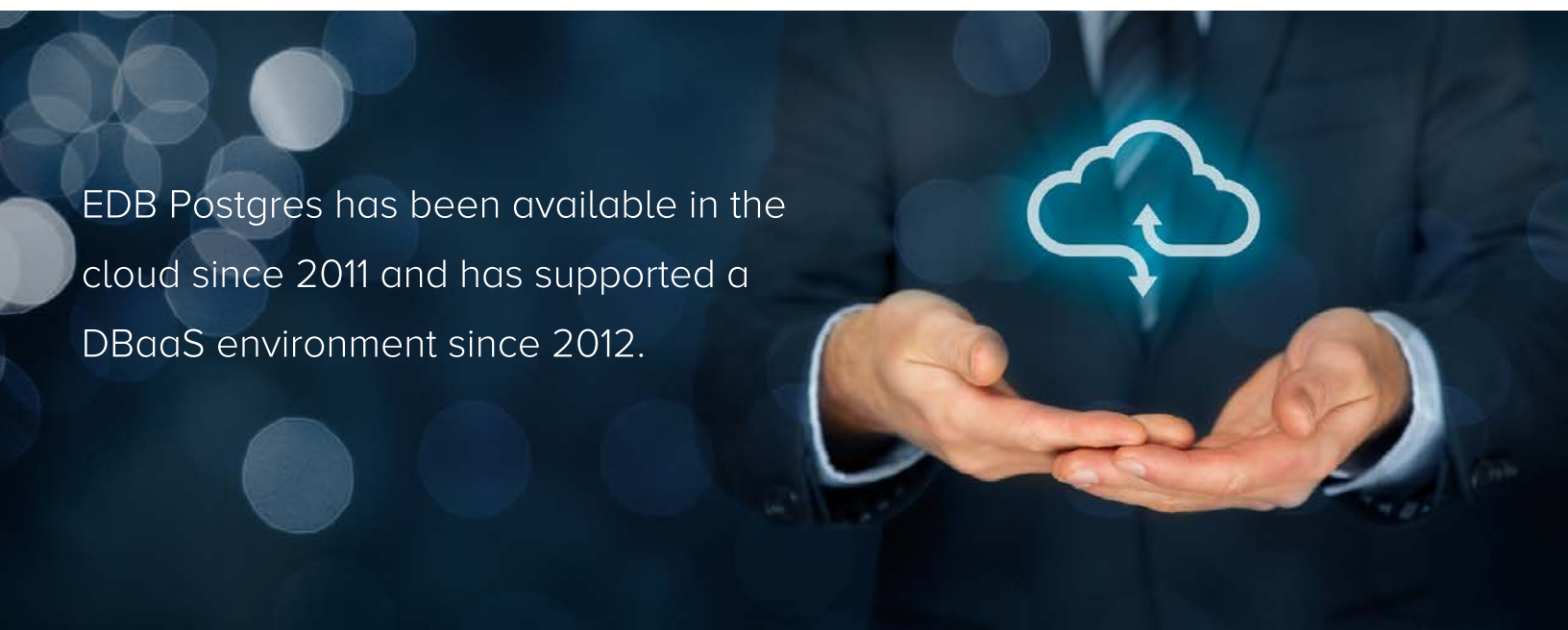
Enterprise cloud adoption is accelerating, and open source database platforms are adding cloud support. Cloud is not just another platform, however, but one that offers new capabilities like rapid provisioning, elasticity, and utilization pricing that enterprises find increasingly attractive. It also frees customers from hardware and system software acquisition, hosting, and maintenance.

Both EDB Postgres and MariaDB are available in a number of public clouds, including Amazon Web Services, Microsoft Azure, and Alibaba Cloud. Both platforms also support private clouds in customer data centers via Docker® containers.

Until now MariaDB has relied on cloud vendor services to provision infrastructure for DIY database installation, but it is currently in the process of introducing a managed cloud service. Details are still being released.

EDB offers a much broader range of cloud services, from DIY infrastructure support to database platform management, including backup and provisioning high availability cluster environments with automatic scaling, to a comprehensive Database as a Service (DBaaS) offering, complete with graphical provisioning and management capabilities. EDB Postgres has been available in the cloud since 2011 and has supported a DBaaS environment since 2012.

In addition, EDB offers a cloud-based Oracle migration portal to support migrations from the Oracle cloud or on-premises installations to the EDB Platform in the public cloud.



EDB Postgres has been available in the cloud since 2011 and has supported a DBaaS environment since 2012.

# CONCLUSIONS

## EDB POSTGRES VS. MARIADB

Enterprises have demanding requirements for their database systems. Our review of six critical requirements of enterprise-class database applications reveals significant differences between database platforms from EnterpriseDB (EDB) and MariaDB.

### We found that:

- EDB Postgres has better integrated and more user-friendly data integrity and high availability features than MariaDB that promise customers superior reliability at lower risk and reduced complexity
- EDB Postgres supports broader built-in security capabilities than MariaDB to address growing customer needs and the requirements of PCI and GDPR
- Compared to MariaDB, EDB Postgres offers richer physical design options to address performance needs of a wider variety of enterprise applications
- EDB Postgres offers much more comprehensive and user-friendly management tools and interfaces than MariaDB
- EDB has a more than 10-year lead over MariaDB for Oracle compatibility features that have been successfully field tested in hundreds of customer migrations from Oracle to EDB Postgres
- EDB offers significantly better cloud options than MariaDB, including a comprehensive DBaaS solution
- Finally, EDB offers a more mature, field-tested solution that reduces risks for enterprise applications.

Overall, our conclusion is clear: EnterpriseDB offers a superior database platform for enterprise applications compared to MariaDB, either new, emerging application—or migration of existing workloads from legacy databases—whether these systems are deployed on-premises or in the cloud.

# EXPLANATION OF RATINGS

## APPENDIX

### ENTERPRISE RELIABILITY

#### Transaction Management (EDB Postgres: ● MariaDB: ● )

Both EDB Postgres and MariaDB support ACID compliance on and MVCC database (for MariaDB, at least on some storage engines like InnoDB). EDB Postgres also supports autonomous transactions to enable more complex transaction patterns and extend Oracle compatibility; MariaDB does not.

#### Backup and Restore (EDB Postgres: ● MariaDB: ● )

EDB Postgres and MariaDB (at least for InnoDB) both support full, incremental and cumulative backup. Both also support online backup. EDB Postgres provides a command line Backup and Recovery tool (BART) that enables better ease of use compared to MariaDB.

#### Point-in-time recovery (EDB Postgres: ● MariaDB: ● )

Both products support point-in-time recovery. EDB Postgres allows specification of a specific time or transaction ID and provides an easier method of selecting the recovery point. MariaDB has a more cumbersome process for finding the right recovery point and requires the user to specify a time or log location (rather than transaction ID).

#### Automatic Failover (EDB Postgres: ● MariaDB: ● )

Both EDB Postgres and MariaDB support automatic failover. EDB Postgres Advanced Server provides native support, while MariaDB requires the MaxScale proxy server, which is less desirable as it adds cost, complexity, and risk to the replication environment.

#### Replication (EDB Postgres: ● MariaDB: ● )

EDB Postgres and MariaDB both support synchronous and asynchronous replication. Both support master-slave and multi-master replication. Both support local and distributed replication topologies. EDB Postgres alone supports partial replication. MariaDB requires the MaxScale proxy server to enable some replication scenarios and automatic failover, which has the architectural disadvantages described earlier.

# EXPLANATION OF RATINGS

## APPENDIX

### ENTERPRISE RELIABILITY

**Master-Slave replication (EDB Postgres: ● MariaDB: ● )**

Both products support master-slave replication, but MariaDB uses the MaxScale proxy server to enable some replication scenarios and automatic failover.

**Multi-master replication (EDB Postgres: ● MariaDB: ● )**

Both products support multi-master replication (MariaDB requires InnoDB storage engine), but MariaDB uses the MaxScale proxy server to enable some replication scenarios and automatic failover.

**Heterogeneous replication (EDB Postgres: ● MariaDB: ○ )**

EDB Postgres supports bi-directional replication between EDB Postgres (either PostgreSQL or Advanced Server) and Oracle, Microsoft SQL Server and community PostgreSQL. MariaDB does not support heterogeneous replication.

**Database upgrade (EDB Postgres: ● MariaDB: ● )**

Both products support rolling software upgrades to the database code, but MariaDB relies on its MaxScale proxy to manage connection routing.

**Management (EDB Postgres: ● MariaDB: ● )**

EDB Postgres provides graphical tools like EDB Postgres Failover Manager and Postgres Enterprise Manager to manage and monitor the database high availability environment. MariaDB relies on command line environment and scripting. As a result, EDB Postgres provides easier-to-use tools for configuring and managing the customer's high availability environment.

Overall EDB Postgres has a superior architecture and tools for configuring and managing a high availability database environment. When facing system failures or the prospect of data loss, a simple, reliable process for failover and recovery is critical. EDB's advantage is very significant to customers with an interest in continuous or near-continuous operation.

## SECURITY

### Authentication (EDB Postgres: ● MariaDB: ◐ )

EDB Postgres and MariaDB both offer advanced authentication services, including single sign-on via directory services, like LDAP and PAM, Kerberos support, and white/black list connection rules. EDB Postgres, like Postgres, disables connections by default. MariaDB relies on the MaxScale proxy for some advanced services, which adds architectural complexity and security vulnerabilities.

### Authorization (EDB Postgres: ● MariaDB: ● )

Both EDB Postgres and MariaDB support comprehensive role-based authorization controls.

### Auditing (EDB Postgres: ● MariaDB: ◐ )

Both products support detailed audit logging, but EDB Postgres offers session tagging to better identify individual users in a connection pooling environment. EDB Postgres also differentiates itself by enabling a separate, secure audit log not visible to database administrators, enhancing security tracking of malicious actions by disgruntled staff or intruders.

### Directory support (EDB Postgres: ● MariaDB: ● )

Both products support LDAP, Microsoft Active Directory. Both enable controlling passwords via Pluggable Authentication Modules (PAM). Both also support Kerberos.

### Password Management (EDB Postgres: ● MariaDB: ◐ )

EDB Postgres Advanced Server offers native password profiles that enables complete management of user passwords, including strength, duration, and change rules. MariaDB has a plugin that only controls password strength.

### Encryption (EDB Postgres: ◐ MariaDB: ◐ )

EDB Postgres and MariaDB both support multi-layer encryption for client connections, data at rest and on the wire, including private key encryption, as well as rich data value redaction and obfuscation. EDB Postgres also supports column encryption via pre-built UDFs. Note that MariaDB relies on the MaxScale proxy to provide these encryption capabilities.

### Data redaction (EDB Postgres: ● MariaDB: ◐ )

EDB Postgres Advanced Server offers built-in data masking, full or partial, and data obfuscation. MariaDB relies on the MaxScale proxy to provide data masking and obfuscation.

### Database firewall (EDB Postgres: ● MariaDB: ◐ )

EDB Postgres Advanced Server offers SQL Protect, a built-in database firewall that uses flexible role-based technologies to detect and disarm SQL injection attacks. MariaDB supports database firewall capabilities via the MaxScale proxy, a more complex and vulnerable architecture.



## SECURITY continued

### Row level security (EDB Postgres: MariaDB: )

EDB Postgres Advanced Server offers built-in row level security to provide fine grained access control over what table rows different users can view. This is valuable in a multiple user class or multi-tenant environment. MariaDB does not support row level security.

### Virtual Private Database (EDB Postgres: MariaDB: )

EDB Postgres supports of row level security enables Virtual Private Databases similar to Oracle, thus improving EDB Postgres Oracle compatibility as well as offering more robust security environment. MariaDB does not support Virtual Private Databases.

### Procedural language obfuscation (EDB Postgres: MariaDB: )

EDB Postgres supports the EDB\*Wrap command line utility to obfuscate human readable source code in stored procedures, functions, triggers, and packages to protect sensitive business rules or application intellectual property from being viewed by unauthorized users. MariaDB does not offer procedural language obfuscation.

### PCI Compliance (EDB Postgres: MariaDB: )

The robust security features of EDB Postgres Advanced Server enable customers to meet Payment Card Industry (PCI) requirements for point-of-sale applications. MariaDB has fewer needed security features, and relies on the MaxScale proxy for some of its advanced security features.

### GDPR readiness (EDB Postgres: MariaDB: )

The robust security features of EDB Postgres Advanced Server enable customers to address strict European Union data privacy guidelines included in GDPR regulations in effect since May 2018. MariaDB has fewer needed security features, and relies on the MaxScale proxy for some of its advanced security features.

## PERFORMANCE

### Indexing (EDB Postgres: ● MariaDB: 🌓 )

Both EDB Postgres and MariaDB support Btree and hash indexes. Both support covering indexes. EDB Postgres has better support for geospatial Rtree indexes. In addition, EDB Postgres supports partial indexes, while MariaDB does not.

### Partitioning (EDB Postgres: ● MariaDB: 🌓 )

EDB Postgres supports range, list and hash partitioning as well as sub partitions, while MariaDB only offers limited support for hash partitioning and sub partitions. In MariaDB, partitioned tables do not support data integrity constraints, which limits usability as well as Oracle compatibility.

### Statistics (EDB Postgres: 🌓 MariaDB: 🌓 )

Both EDB Postgres and MariaDB collect basic statistics via the Analyze command. In addition, EDB Postgres supports automatic statistics collection.

### Compression (EDB Postgres: 🌓 MariaDB: 🌓 )

EDB Postgres only supports log compression. MariaDB supports data and index compression (at least for some storage engines) as well as log compression.

### Query optimization (EDB Postgres: 🌓 MariaDB: 🌓 )

EDB Postgres offers richer optimization options including query rewrite and many techniques for planning scans and joins, enabling more performant query plans than MariaDB.

### Query execution (EDB Postgres: 🌓 MariaDB: 🌓 )

Both EDB Postgres and MariaDB support partition pruning to reduce I/O and improve query performance. EDB Postgres offers more execution options, including parallel operations, to improve query performance.

### Parallel query (EDB Postgres: 🌓 MariaDB: ○ )

EDB Postgres supports parallel scans, sorts, joins, and aggregations. MariaDB does not.

### Parallel load (EDB Postgres: 🌓 MariaDB: ○ )

EDB Postgres supports parallel loads; MariaDB does not.

### External data support (EDB Postgres: ● MariaDB: 🌓 )

EDB Postgres, via foreign data wrappers, enables a richer heterogeneous query environment than MariaDB, supporting queries against not only data in Postgres databases, but also external data stored in HDFS, Oracle, SQL Server, MongoDB, MySQL, as well as flat files and generic ODBC/JDBC data sources, eliminating the need to copy and load data before it can be queried.

### Performance tools (EDB Postgres: ● MariaDB: 🌓 )

EDB Postgres offers comprehensive performance monitoring and management tools, including resource management of critical CPU and I/O resources, SQL query profilers, Index, tuning, and configuration advisors, and graphical system monitors. MariaDB only provides low-level interfaces for DIY performance monitoring and management.

## MANAGEABILITY

### Database administration (EDB Postgres: ● MariaDB: ◐ )

EDB Postgres has a graphical DBA tool, the Postgres Enterprise Manager (PEM) to administer the database, including creation, alteration, monitoring and management of all database objects and the monitoring of multiple EDB Postgres instances from a single pane of glass. PEM works both with vanilla PostgreSQL and EDB Postgres Advanced Server. MariaDB only provides command line low-level interfaces for administrators to roll their own management and monitoring scripts, or rely on third-party products.

### System monitoring (EDB Postgres: ● MariaDB: ◐ )

Postgres Enterprise Manager (PEM) provides graphical monitoring of system health, resource utilization, query performance, and troubleshooting. PEM supports monitoring multiple EDB Postgres systems from one panel. MariaDB only provides command line low-level interfaces for administrators to roll their own monitoring scripts.

### Alerting (EDB Postgres: ◐ MariaDB: ◐ )

Postgres Enterprise Manager (PEM) uses probes to capture system metrics and thresholds set by administrators for alerting once any of these metrics exceeds the threshold. Alerts can be sent via charts and dashboards on the PEM window, email, text, as well as SNMP. MariaDB supports alerting but does not have a graphical tool to set, manage, or monitor alerts.

### Reporting (EDB Postgres: ● MariaDB: ◐ )

Postgres Enterprise Manager (PEM) ships with a broad set of prebuilt monitoring reports, plus an API to add custom reports. MariaDB has no built-in management reports and does not offer a graphical system management tool. MariaDB only provides a low-level API for administrators to roll their own management reports.

### System Management (EDB Postgres: ◐ MariaDB: ◐ )

Postgres Enterprise Manager (PEM) provides graphical system management. EDB Postgres has native tools to manage the high availability cluster infrastructure (EFM) and the backup and restore processes (BART). MariaDB does not offer a graphical system management tool. Instead MariaDB relies on a command line interface to allow administrators to roll their own system management and monitoring scripts. MariaDB relies on the MaxScale proxy for administering its high availability systems.

### Performance tuning (EDB Postgres: ◐ MariaDB: ◐ )

EDB Postgres provides a SQL profiler to trace queries and diagnose any performance issues. MariaDB relies on administrator's ability to extract query performance data from system logs.

### System optimization (EDB Postgres: ◐ MariaDB: ◐ )

EDB Postgres provides a configuration wizard to recommend instance configuration parameter values to optimize the configuration for the system size and workload. MariaDB relies on administrators writing SQL scripts to tune their configuration.

### Cloud Services management (EDB Postgres: ● MariaDB: ◐ )

EDB Postgres has tools to manage the database environment, whether customers want platform infrastructure services for backup and HA clusters or full blown DBaaS capabilities. MariaDB, until 2019, primarily relies on cloud vendor provisioning tools to provision their database platform. MariaDB is in the process of introducing a cloud managed services offering.

## ORACLE® DATABASE COMPATIBILITY

MariaDB has only recently introduced its Oracle compatibility features. It still lags behind EDB Postgres in compatibility features, has limited field experience, and suffers from immaturity as a result. This lowers MariaDB's rating in every category. As a result, customer migration efforts will be much longer and more costly with MariaDB than with EnterpriseDB.

### Schema Compatibility (EDB Postgres: ● MariaDB: 🟡)

EDB Postgres Advanced Server natively supports Oracle data type names, MariaDB requires the configuration to be in a special Oracle mode to avoid manual renaming of some Oracle data types like Number and Varchar2. EDB Postgres supports range, list and hash partitioning, and sub partitions, while MariaDB only offers limited support for hash partitioning and subpartitions. In MariaDB, partitioned tables do not support data integrity constraints, which limits usability as well as Oracle compatibility.

### SQL Language (EDB Postgres: ● MariaDB: 🟡)

EDB Postgres offers strong support for ANSI SQL 2008 standard and goes beyond to support common Oracle SQL functions and syntax extensions, including Oracle-style query optimizer hints. MariaDB supports fewer advanced SQL language features and fewer Oracle extensions and functions.

### Stored Procedures (EDB Postgres: ● MariaDB: 🟡)

EDB Postgres Advanced Server offers a rich stored procedure language compatible with Oracle PL/SQL and is backed by years of field experience. MariaDB only supports a subset of PL/SQL, recently introduced in the V10.3 in May, 2018, that by definition has much less field experience.

### Built-in Packages (EDB Postgres: ● MariaDB: ○)

EDB Postgres provides over 24 frequently used Oracle packages, like DBMS\_Alert and DBMS\_Scheduler that ship with Advanced Server. MariaDB supports package creation and deletion but does not have any pre-built packages

### Tools (EDB Postgres: ● MariaDB: 🟡)

EDB Postgres Advance Server provides equivalent client tools to Oracle SQL\*Plus and SQL\*Loader (EDB\*Plus and EDB\*Loader respectively) to support existing query and load scripts and lessen retraining requirements. MariaDB does not offers any comparable Oracle compatible tools.

### Dictionary Views (EDB Postgres: ● MariaDB: ○)

EDB Postgres Advanced Server provides over 70 commonly used Oracle dictionary views like DBA\_Tables. MariaDB does not provide any compatibility with Oracle dictionary views.

### Partitioning (EDB Postgres: ● MariaDB: 🟡)

EDB Postgres supports the full range of Oracle partitioning methods, including range, list, and hash, as well as sub-partitions. MariaDB supports range and list partitioning, but only offers limited support for hash partitioning and for sub-partitions.

### APIs (EDB Postgres: ● MariaDB: ○)

EDB Postgres supports the Oracle Call Interface (OCI) via its Open Client Library. OCI is heavily used by customers because of its superior performance. MariaDB does not offer OCI support.

### Migration tools (EDB Postgres: ● MariaDB: ○)

EDB Postgres offers migration tools to simplify online or offline conversion of schema DDL and porting of data via a parallel loader. EDB also offers a cloud-based migration portal to streamline the migration process. MariaDB does not have any migration tools, although it does offer migration services at extra cost.

## CLOUD / DBaaS

### Public cloud (EDB Postgres: ● MariaDB: ● )

Both EnterpriseDB and MariaDB support running their products in multiple cloud infrastructures, including Amazon Web Services, Microsoft Azure, and Alibaba Cloud.

### Private cloud (EDB Postgres: ● MariaDB: ● )

EDB Postgres and MariaDB platforms both support private clouds in customer data centers via Docker containers.

### Hybrid cloud (EDB Postgres: ● MariaDB: ● )

EDB's graphical cloud management tool, Ark, can set up, monitor, and manage hybrid cloud environments across multiple cloud vendors and between public and private clouds. MariaDB can be run in a hybrid cloud environment, but offers no tools to set up, monitor, and manage a hybrid environment.

### Managed cloud (EDB Postgres: ● MariaDB: ● )

EDB offers a broad range of cloud services, from DIY infrastructure support to database platform management including backup and provisioning high availability cluster environments with automatic scaling, to a comprehensive Database as a Service (DBaaS) offering, complete with graphical provisioning and management capabilities. Until 2019, MariaDB has relied solely on cloud vendor services to provision infrastructure for DIY database installation. MariaDB is only now introducing a managed cloud offering.

### DBaaS (EDB Postgres: ● MariaDB: ● )

EDB offers a comprehensive Database as a Service (DBaaS) offering, complete with graphical provisioning and management capabilities in both AWS and Microsoft Azure. MariaDB is only now introducing a managed cloud offering. Exact details are still not available.

### Containerization (EDB Postgres: ● MariaDB: ● )

Both EDB and MariaDB provide pre built light weight Docker containers for their respective products.

### Automatic scaling (EDB Postgres: ● MariaDB: ○ )

EDB provides automatic scaling of EDB Postgres clusters via its graphical Ark hybrid cloud management tool. MariaDB does not offer yet automatic scaling in the cloud.

### Cloud management (EDB Postgres: ● MariaDB: ○ )

EDB Postgres Ark provides graphical management of EDB Postgres database platforms in the cloud, including automated backup and provisioning of high availability clusters, as well as comprehensive DBaaS services. MariaDB is just introducing a managed cloud offering. Details of the management capabilities are not yet available.

### Cloud migration (EDB Postgres: ● MariaDB: ○ )

EDB offers a cloud-based Oracle migration portal to support easier migrations from Oracle to the EDB Postgres Platform in the public cloud. MariaDB only provides migration services.



**EDB**<sup>TM</sup>  
POSTGRES

VS

MariaDB

---