Migrating Oracle Workloads into Google Cloud

Evaluating Google Cloud for Your Business

Pythian Google Cloud

love your data

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Should you migrate your Oracle workloads to Google Cloud, and if so, which cloud option should you choose?

Oracle databases and related software are often viewed as large, complex, and expensive. Databases are the foundation of your business — the controller of your operational data. As you drive transformation and modernization of your Oracle environment, you've likely begun evaluating your cloud options to manage cost and complexity. But it takes time to assess which technologies will best serve your unique business needs, and the planning and deployment of a cloud migration is a large undertaking.

Oracle workloads are good candidates for Google Cloud, employing services such as Cloud SQL for PostgreSQL, AlloyDB for PostgreSQL, Cloud Spanner, Bare Metal Solution, and AlloyDB Omni, as well as new Oracle Database@Google Cloud services recently announced as part of a partnership between Google and Oracle. Today, most organizations want to reduce overhead, drive innovation, and become more agile. They also want to future-proof their organization and lay a foundation for Generative AI (GenAI). Migrating Oracle workloads can enable your business to achieve all of the above.

In this guide, you'll find:

- What's driving change, and why businesses are migrating Oracle databases into Google Cloud.
- The benefits and challenges of different Google Cloud options, including Cloud SQL for PostgreSQL, AlloyDB for PostgreSQL/ Omni, Cloud Spanner, and Bare Metal Solution, as well as newly announced Oracle-related services running on Google Cloud.

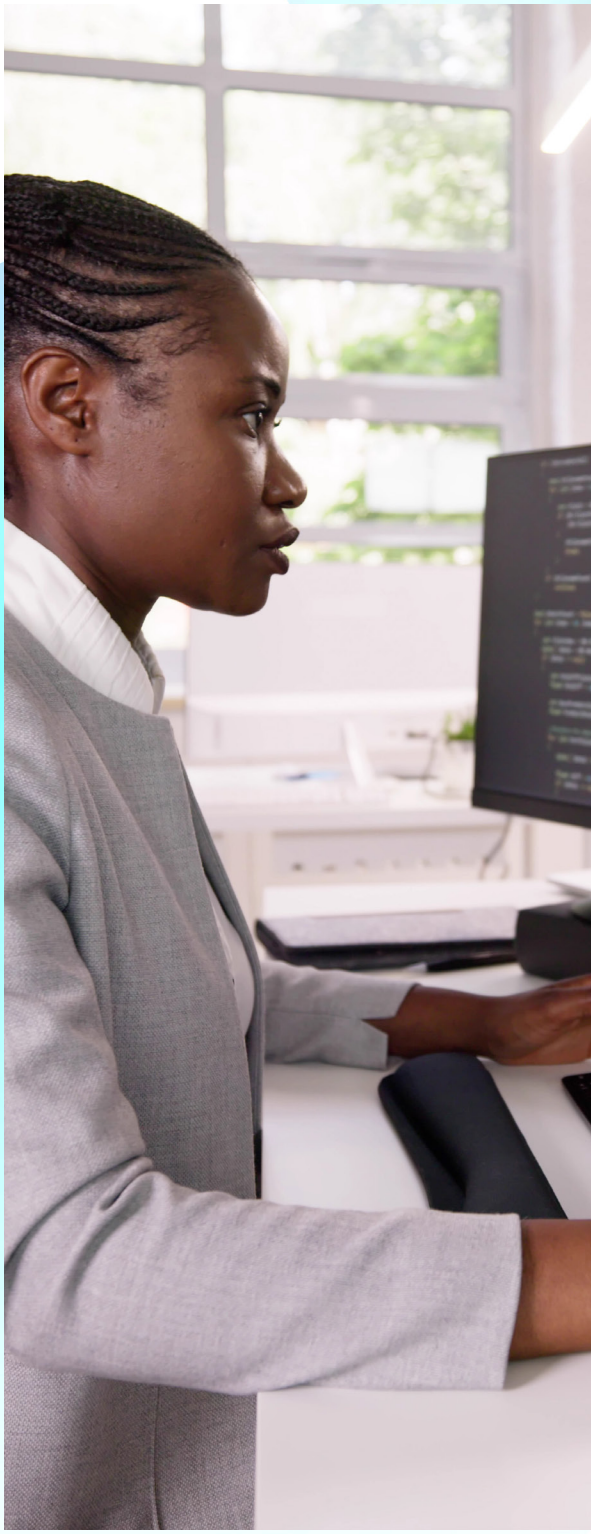
Introduction

Your database, which serves as the foundation of your business, houses and controls your operational data. Oracle databases are one of the most popular enterprise-level database management systems on the market, known for their ability to quickly and efficiently manage large volumes of data.

However, Oracle databases also require significant hardware, extensive SQL knowledge and administrative expertise, and are often expensive to operate. Many organizations are looking for ways to reduce their overhead, drive innovation, and become more agile.

Before you begin evaluating your cloud options, consider why you're evaluating cloud options in the first place, and then build an operational data strategy for your business. There are typically three primary business drivers for migrating workloads or completely replacing an Oracle database.

1. **Reduce total cost of ownership (TCO):** Decrease upfront hardware, software, and maintenance costs (such as licensing).
2. **Easily scale and ensure high availability:** Essential applications and systems require dependable databases that can easily scale to meet increasingly demanding business needs (e.g. increase in data volume.)
3. **Simplify management and operations:** Reduce data center and database management by leveraging managed infrastructure and managed database services.



Your Google Cloud Options

There are a range of solutions available for migrating your Oracle database to Google Cloud. Depending on your business drivers, the right solution can help to reduce costs and enable scalability, flexibility, and high availability, with simpler data management.

Google AlloyDB for PostgreSQL

If your Oracle workload is a candidate for migration to a PostgreSQL database, then Google AlloyDB may be a good choice for a Google-managed database. AlloyDB provides a four-fold performance boost against native open-source PostgreSQL and can scale both vertically and horizontally. It also has capabilities to support analytics workloads, rather than just being focused on transactional workloads, which PostgreSQL supports by default.

When migrating Oracle databases into a PostgreSQL-type database engine, consider the following factors:

- Schema changes that may include type conversions
- New indexing strategies
- Quantity and complexity of PL/SQL code
- Usage of Oracle's unique features
- Performance criteria and measurement

Benefits

- Reduction of Oracle licensing fees
- Free security authentications
- Major updates and bug fixes every three months
- Free open-source extensions
- Supports logical and native streaming replication

Challenges

- Complex Oracle environments require significant preparation and planning to migrate to AlloyDB or any PostgreSQL environment
- Time-consuming to migrate large data volumes
- May not support some packaged software applications

Financial SaaS Company Migrates to Google AlloyDB for PostgreSQL

A financial software-as-a-service company was running its blockchain consumption platform on Amazon's Aurora PostgreSQL, which generated a block of data every 1.5 seconds. After experiencing data ingestion performance and scalability issues, the company needed to optimize speed and improve scalability — with no time to waste.

To help, Pythian worked with the company to build a migration plan and then conduct a comparative test to evaluate the current database environment on Amazon Aurora PostgreSQL against Google AlloyDB. Pythian provisioned Google AlloyDB, carefully reviewing and adjusting the configuration to achieve settings as similar as possible to the source AWS database.

The company's migration to Google AlloyDB dramatically improved its database performance — performing 3x faster. Additionally, the company saved 60% in operational data costs.

Read the full case study >>

Cloud SQL for PostgreSQL

Cloud SQL for PostgreSQL is an open-source database that enables you to migrate to a compatible platform while keeping your core application code. With Cloud SQL, you can set up, maintain, manage, and administer PostgreSQL relational databases on Google Cloud with out-of-the-box high availability, replication, encryption, and automatic storage increases. Establishing a managed PostgreSQL database could appeal to businesses that want to deploy their PostgreSQL workloads after migrating from Oracle.

When migrating Oracle databases to Cloud SQL for PostgreSQL, consider the following factors:

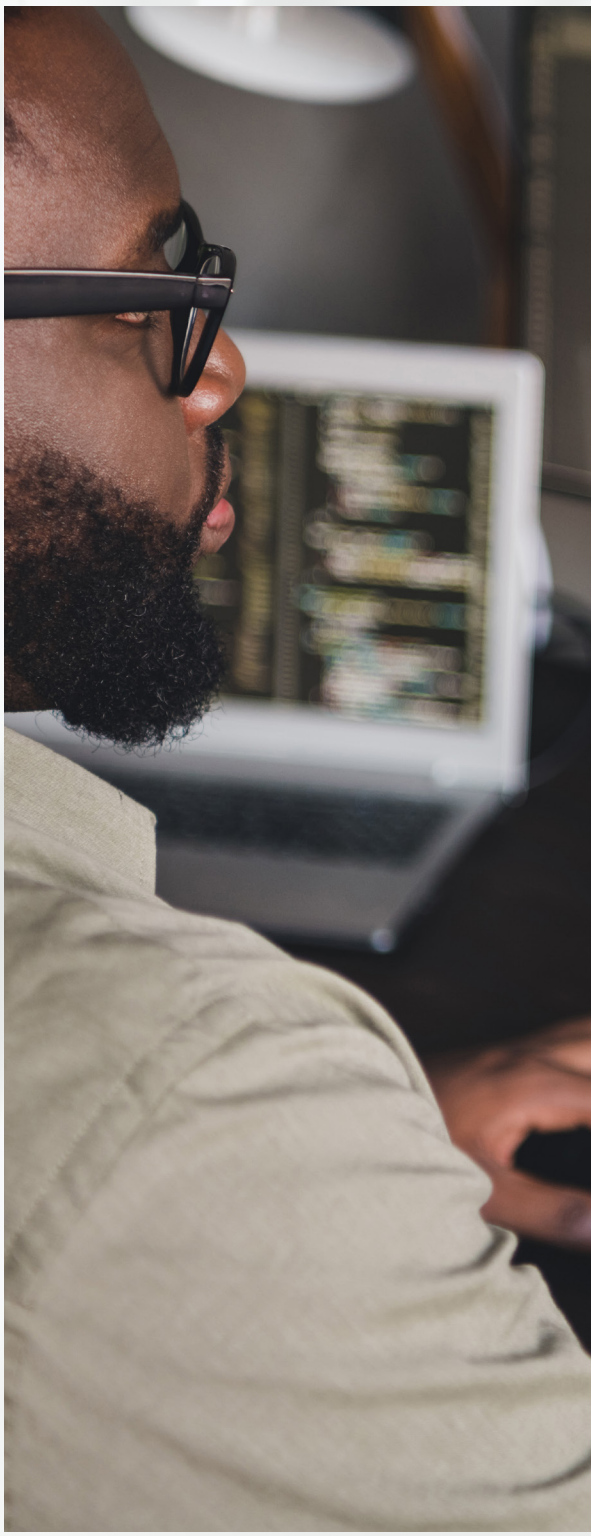
- Assessment and discovery
- Success criteria (data validation, performance, and application tests)
- Environment setup
- Data migration
- Migration validation
- Rollback strategy

Benefits

- Reduce licensing and maintenance costs
- Reduce and/or eliminate reliance on a single database vendor
- Reduce the TCO of database deployments
- Adopt open-source and cloud-native database technologies

Challenges

- Schema conversion
- Real-time data migration through change data capture (CDC)
- Eliminating vendor lock-in caused by proprietary features
- Application support



Cloud Spanner

If your application requires a relational database with global reach and scalability, it will require a rewrite. Fortunately, that's possible with cloud-native databases. Cloud Spanner is the only enterprise-grade, globally distributed, and strongly consistent database service built for the cloud that combines the benefits of a relational database structure with non-relational horizontal scaling. Cloud Spanner has a consistent scale-out relational database management system (RDBMS) cluster, interleaved tables, and support for secondary indexes.

When migrating Oracle databases to Cloud Spanner, consider the following factors:

- Schema and data model conversion
- SQL queries translation
- Migration of application to use Cloud Spanner and Oracle
- Bulk export of data from Oracle and import into Cloud Spanner using Cloud Dataflow
- Consistency maintenance between both database systems during migration
- Migration of application away from Oracle

Benefits

- Focus on app logic instead of spending time managing hardware and software
- Scale-out RDBMS solutions without complex sharding or clustering
- Gain horizontal scaling without migration from relational to NoSQL databases

Challenges

- Difficulty with data migration
- Lack of views
- Does not support stored procedures and triggers
- Does not implement a sequence generator
- Only supports database-level access controls using IAM access permissions and roles

Bare Metal Solution

Bare Metal Solution provides direct access to dedicated physical servers, allowing seamless access to all Oracle capabilities while eliminating the need to manage complex on-premises infrastructure. You can optimize resource usage and enhance database performance, while leveraging the power of Google Cloud's computing environment. Bare Metal Solution supports customization of configurations to better meet specific database requirements, while reducing latency and improving scalability. Google Cloud also provides the core infrastructure, network, physical and network security, and hardware monitoring capabilities.

When migrating Oracle databases to Bare Metal Solution, consider the following factors:

- Architecture changes
- Operating system and chipset changes
- Database upgrades
- Consolidation
- License portability
- Migration downtime

Benefits

- Ability to provision infrastructure using Oracle-certified hardware
- Faster migration time
- Fewer application rewrites
- Familiarity with using current stack
- Unique Oracle licensing approach

Challenges

- Server sizing and configuration (e.g. a huge source Oracle database will require splitting up)
- Operating system and chipset changes
- Possible database upgrades

AlloyDB Omni

AlloyDB Omni is a downloadable edition of AlloyDB designed to run on almost any platform — in a private data center, in any cloud, at the edge, even on developer laptops. It includes the AlloyDB columnar engine, which keeps frequently queried data in an in-memory columnar format. This, in turn, provides faster performance for hybrid transactional and analytical processing workloads, so you can build applications faster. It also includes built-in support for GenAI.

When migrating Oracle databases to AlloyDB Omni, consider the following factors:

- Self-managed
- Compatible with open-source PostgreSQL
- Requires switch to Opex model
- Integrates with BigQuery and Gemini

Benefits

- 2x faster than PostgreSQL for transactional workloads
- 100x faster than PostgreSQL for analytical queries
- Fraction of the cost of legacy databases
- Free developer edition
- Can deploy databases across multiple cloud platforms

Challenges

- Requires more disk space than Google Compute Engine

Oracle Database@Google Cloud

If you're not ready to give up your Oracle database, a new partnership between Google and Oracle will allow you to combine Google Cloud technologies with Oracle Cloud Infrastructure (OCI) to accelerate application migrations and modernization. Google Cloud has begun rolling out OCI database services and a high-speed network interconnect with Oracle to select regions, with more to follow.

Oracle Database@Google Cloud gives you direct access to Oracle database services running on OCI and deployed in Google Cloud data centers. This new offering is designed to help you accelerate your migration to the cloud, so you can modernize your IT environment and take advantage of Google Cloud infrastructure, tooling, and AI services, including data and analytics, Vertex AI, and Gemini foundation models.

You can also benefit from flexible options to simplify and accelerate migrating your Oracle databases to Google Cloud, including compatibility with proven migration tools such as Oracle Zero-Downtime Migration. Oracle Database@Google Cloud also offers a simplified purchasing and contracting experience via Google Cloud Marketplace that enables you to purchase Oracle database services using your existing Google Cloud commitments.

Oracle Interconnect for Google Cloud gives you the ability to deploy workloads across both OCI and Google Cloud regions with no cross-cloud data transfer charges. This service combines OCI FastConnect and Google Cloud Partner Interconnect, which allows you to innovate using a combination of Oracle and Google Cloud services based on their features, performance, and pricing. You can use a direct interconnection between OCI and Google Cloud for first-class multi-cloud network performance and build new cloud-native applications using Google Cloud and OCI technologies, including Google Cloud's enterprise-grade AI technologies.

As part of the partnership, Google and Oracle are offering flexible deployment options on Compute Engine/GKE, so you can leverage your existing Oracle licenses to transform and run your Oracle ecosystem on high-performance, reliable Google Cloud infrastructure.

Conclusion

If your business is looking to reduce operational data costs and licensing fees in your Oracle database environment, Google Cloud solutions could potentially reduce your costs by up to 60%. But it's not just about cost savings: If your business is experiencing exponential growth or anticipating a boom in data volume, migrating from Oracle to Google Cloud can provide the freedom of complete scalability and simpler database management. And if you need to keep your core application code, Google AlloyDB for PostgreSQL has proven to be an ideal solution for many businesses.

Migrating Oracle databases to Google Cloud starts with evaluating your unique business drivers. From there, build an operational data strategy that includes your transformation and modernization needs. With this foundation, you can begin to explore Google Cloud solutions and confidently determine the best option for your business.

FREE Oracle to Google Cloud Workshop

Pythian offers a free full-day workshop to help businesses evaluate Google Cloud for their business needs. Our top Oracle and Google database experts run the workshop, learning about your business needs ahead of the session to maximize value.

To learn more about migrating Oracle workloads to Google Cloud, sign up for our free workshop.

About Pythian

Founded in 1997, Pythian is a data and analytics services company that helps organizations transform how they compete and win by helping them turn data into valuable insights, predictions, and products. From cloud automation to machine learning, Pythian designs, implements, and supports customized solutions to the toughest data challenges.

Contact us

+1-866-798-4426 | info@pythian.com | Linkedin | X

Offices

Ottawa, Canada

Minneapolis, USA

New York City, USA

London, England

Hyderabad, India

Bangalore, India

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