

Migration from Oracle to PostgreSQL

Introducton

In 2019, the primary focus of most nimble organizations was centered on the pros and cons of migrating from legacy Oracle driven RDBMS to open source.

Was it worth the effort?

Would it give the leverage the business needed?

Could it really prove to be the silver bullet to make the data technology environment more value responsive?

By March of 2020, the wavering on the merits of a switch-over in the RDBMS regime had become moot. No longer could CIOs ponder fundamental questions on migration in the luxury of time. The impact of the COVID-19 pandemic suddenly and radically altered the allocation landscape. Within the new cost realities, many Enterprise IT decision makers teetering on taking that leap into open source are now, more than just considering it as a potential future solution; they are actively pursuing it as a critical long-term.

The reason is clear: the maintenance of the traditionally high and complex ‘core factor’ pricing of the Oracle database license is now a cost burden on a business’s IT budget. In a pandemic-impacted cost sensitive framework, this has become a magnet for cost containment, which could lead to greater business resilience and continuity.

Through this PostgreSQL White Paper, Ashnik - as an experienced open source business services provider, presents how its EDB Postgres Advanced Server solution provides an adaptable and viable alternative for businesses to exit rigid and costly Oracle driven or other RDBMS vendor lock-ins. An opportunity to unlock millions of dollars in savings that can be repurposed for business growth.

Explore the EDB Postgres Advanced Server with Ashnik

Ashnik has a depth of experience with database solutions across a range of austere to complex regimes. To enable easier disengagement from an Oracle legacy, Ashnik builds foundations on the robust EnterpriseDB Postgres Advanced Server.

This capable alternative is based on the reputed open source PostgreSQL database solution with a wide range of Oracle compatibility features.

Every path to migration is tailored and supported at all stages by a certified team with advanced knowledge on PostgreSQL, its compatibility and migration tools from EDB Postgres. Our skilled, across-project expertise puts cost-effective RDBMS migration within easy reach of every enterprise.

Advantages of moving to PostgreSQL from Oracle:

- Save on Oracle license costs by up to 70%
- Erase technology stack compatibility restrictions
- Run everywhere flexibility
- Deep database compatibility for easier transitions
- Comprehensive migration solution services
- 24x7 global support
- Insulation from software/vendor obsolescence

Identifying workloads and successful stories

The hardest part about letting go is having confidence in what will take its place. Phase-out planning in most enterprise IT structures is fraught with potential risks and challenges. Definitely no easy task, especially when mission critical databases are involved. Ashnik understands this and creates a structure where it can partner your Business and Technical teams to help create smoother transitions. Here are some of the business adoption scenarios where Ashnik can empower your IT transformation plans:

- **Evaluation in-operation with new Reporting Server**

It stands to reason that virtually no one wants to risk a new technology in full-scale production mode. But there is a need to start somewhere. The best method is to create a new Reporting Server using EDB Postgres Advance Server. We are experienced at setting up such servers for various scenarios and workloads. **This can help offload reporting queries from the Production database (in Oracle or MS SQL Server) and simultaneously help your team evaluate EDB Postgres Advance Server.**

Business use example:

We used the Reporting Server in-operation experience approach for **a well-known Malaysian telecom firm**, in their existing project. Daily data changes were updated from the Oracle database to EDB Postgres Advance Server Database using packaged replication technology. Eventually, the telecom firm completely migrated the Archive Database to EDB Postgres Advance Server. This resulted in Oracle licensing fee savings and boosted the performance of OLTP queries.

- **Confidence building with failover to DR Site**

For some businesses, trying out a new Database Reporting server is not enough; there is a need to test the whole application. In such instances, we have implemented DR solutions in EDB Postgres Advance Server. **Occasional failovers to these DR sites (during low workload cycles) can test full production capability and functionality of EDB Postgres Advanced Server as a database.** On gaining confidence, increasing switchovers during heavy workload can transition to a seamless Oracle phase out.

Business use example:

A major telecom player in Thailand was having major performance issue in their IT environment. The database was hosted on Exadata with various Times Ten in-memory databases being used for catering to application requests. This was a customer-facing application used by subscribers of their broadband services. After analyzing the issue, we offered a migration solution to EDB Postgres Advance Server under a new Database Infrastructure at a significantly lower cost structure. At first, the client was hesitant about adopting a different technology into their ecosystem and chose to implement this new solution at their DR site. We assisted the functional tests to certify the application and queries on the new database. We also helped tune the database and performed load tests that simulated 1.5-2 times the actual load. In a short cycle, the new system, based on the EDB Postgres Advance Server, outperformed their existing system. The asynchronous replication setup was able to do real-time replication from Oracle to EDB Postgres Advance Server and vice versa for their current peak load. The client gained the confidence to adopt the new system; beginning with production loads a few times and has since moved their application to the new system.

● **Lower budgeted New Application implementation:**

If budget constraints are ham-stringing your new projects, here's the rethink that can revitalise your IT plans. **Explore the possibility of implementation at a lower cost using supported Open Source Technology and EDB Postgres Advanced Server as backend.** Once confident of the new tech stack stability in your IT ecosystem, you can plan on the migration of more applications to the lower outlay structure as well.

Business use example:

A budget constraint was exactly what was holding back the new projects of **one of the largest retail chains in Singapore**. Initially, the client was only discussing the potential of an Oracle migration project with us. However, on internalizing the technological capability we offered, the client gained confidence to start new projects on EDB Postgres Advance Server. Ashnik teams worked closely with the client's application vendors to certify applications on the EDB Postgres Advance Server. We also implemented a sophisticated HA and DR solution.

Once the client's IT team realized the significant cost reduction, and resulting capability expansion compared to existing Projects running on Oracle, they utilized Ashnik expertise in migrating critical applications out from under Oracle.

- **Assessment expertise for Migration decision-making:**

Taking the call to migrate a business database needs a thorough analysis. **Here's where Ashnik offers certified expertise to conduct a database migration assessment, with detailed reporting.**

The structured reports can recommend the optimal migration approach with compatibility analysis of existing data and structures, along with effort and costs required to migrate independently or with assisted services. This report helps in creating an effective framework for migration decision makers.

- **Legacy ecosystem switchover to new build performance:**

Escalating performance issues are the arbiter of change for many business organisations that are running systems with a 3 to 5 year vintage. When there is significant cost in time and effort to re-write/re-factor the code, the smarter choice is to consider writing the application code in open standard, which works well with any RDBMS. Hence, there is an increasingly popular move to scrap the old for new-build switchovers, using Open Source and EDB Postgres Advanced Server. Generally, such projects also involve a change in the database structure and any programming logic stored in database. So instead of writing new logic into an existing platform, writing them in an EDB Postgres Advanced Server compatible language is preferable. These application upgrades are never complete without an ETL, which extracts the old stored data, maps and transforms it to the new structure during migration. This can be easily done from your existing RDBMS to the new system using Open Standard tools (which may not have otherwise worked with specific source and target database).

Application candidacy. A necessary first step.

Many of your existing application could be ideal candidates for migration, but not every application is fully compatible and not all may benefit from migration. Candidacy identification can help you generate a list of potential applications to migrate. Consider this the 'look before you leap moment'. If you have already made the decision, or still need to make a decision on migration, identifying the right application database candidate, is an important first step. Why is this necessary?

At this initial stage, planning may not dig deeply into technical considerations; therefore it is critical to assess individual candidates for their migration suitability. While PostgreSQL and EDB Postgres Advance Server offer wide programming platform support, there are some applications that are tightly coupled with a particular database and there is no way to specify the driver or load library because of the way they are hard coded. This situation often arises with packaged applications from Independent Software Vendors (ISV) who have their own RDBMS products, or who have tied up with an RDBMS vendor.

At this stage, Ashnik will work with your teams to help with recommendation on start points for Migration Assessment and the level of effort required to match or upgrade current functionalities.

10 questions to validate right application candidate

- 1) Developed using open standards
- 2) Vendor already supports Postgres or EDB Postgres
- 3) Supports ORM (Hibernate, Spring etc)
- 4) Procedures, Functions, Packages written in PL/SQL
- 5) Possibility of source code modification
- 6) RAC capabilities and Flashback recovery
- 7) OCI / ProC interface
- 8) Transaction Management Control inside PL/SQL (Commit, Rollback, Savepoints)
- 9) Stored Procedures written in Java
- 10) Other Oracle proprietary extensions

Ashnik Migration Process



A thorough Migration Assessment.

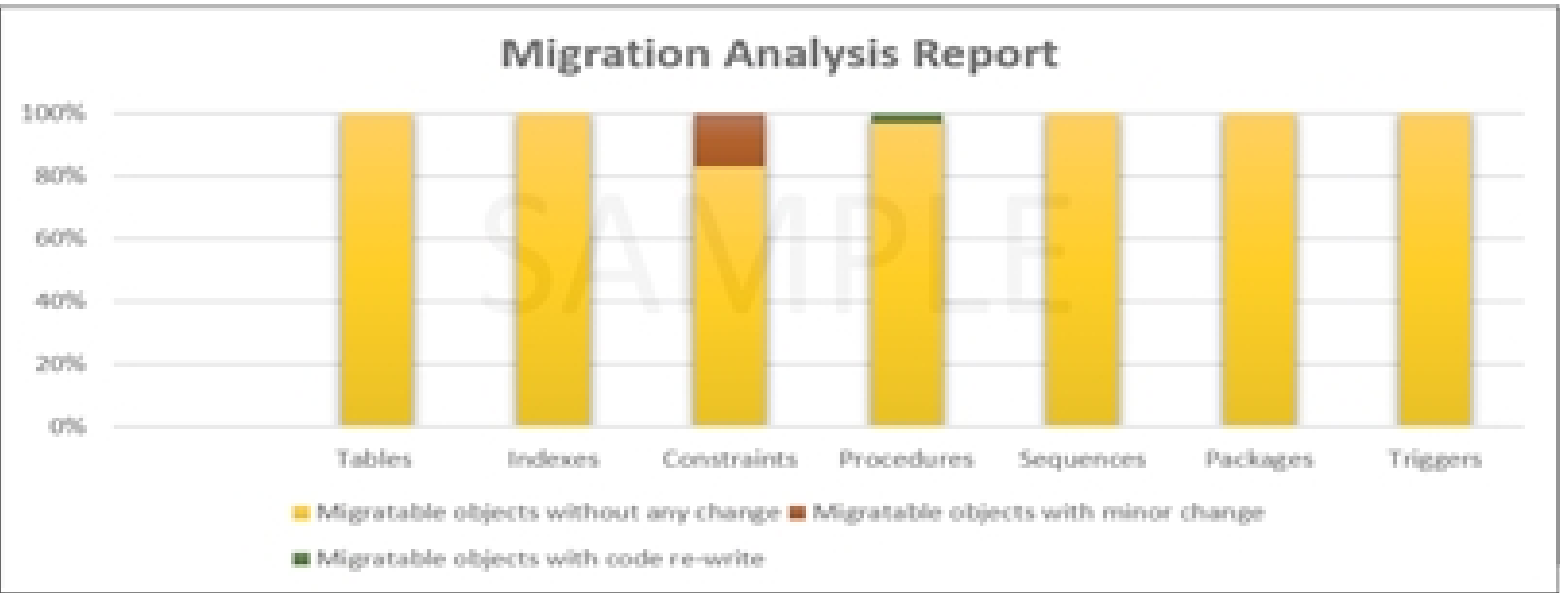
During the Migration Assessment stage, Ashnik works closely with client teams to evaluate technical details on compatibility, required architecture, scale expectations and dependencies, to ensure effective migration.

Reports are generated, with detailed object level analysis, to display results which clearly convey the compatibility percentage of a database with EDB Postgres Advanced Server. This includes analysis of stored procedures, functions, packages and views for any incompatible programming construct or keywords. Scans of the table metadata will also be conducted to check for incompatible constraints, partitioning and data type usage. If necessary, workaround suggestions and solutions could be provided. On completion, the reports will provide a viability estimate based on the challenges and efforts involved in the migration project. Additionally, the assessment report will cover the right migration approach as per the current database

**Workaround /wrapper
functionality support**

If Oracle’s MERGE statement or regexp_like function has been used in a code, it may not operate when the database is ported to the EDB Postgres Advance Server. So, as a solution, the Ashnik team will guide you to achieving the same results by using workarounds or build wrapper functions with the same name (e.g.: regexp_like) and similar functionality (matching two regular expressions).

Object Type	Object Count	Migratable objects without any change	Migratable objects with minor change	Migratable objects with code rewrite	Compatibility
Table	49	49	0	0	100%
Indexes	2	2	0	0	100%
Constraints	35	29	6	0	100%
Procedures	31	30	0	1	100%
Sequences	6	6	0	0	100%
Packages	1	1	0	0	100%
Triggers	6	6	0	0	100%



Let us plan a seamless migration for you.

In these dynamic and uncertain times, if you are taking a hard look at your IT allocations, let Ashnik help you make an informed decision on migration from the cost-intensity of Oracle to the effective and highly compatible EDB Postgres Advanced Server. Begin the process to a migration plan that is practical, cost-effective and seamless with us.

About Ashnik

In a world of technological evolution, Ashnik believes in creating velocities for businesses across every segment from standalone organizations to enterprise level networks. Incorporating the best practices in Open Source and building around a core of high competencies and experience, we deliver contemporary technical solutions based on Enterprise Open Source, Database and Cloud services.

We blend our passion for entrepreneurial excellence with a proven record in technology solution deployments that cover customization, innovative solution design, product management and development.

To explore our range of technical solutions, request an assessment service or for a quote, do write to success@ashnik.com or call +65 6438 3504

Solution suite

- Core Oracle Migration
 - Installation and Deployment services
 - Setup of Database HA cluster
 - Database DR Setup
 - Architectural Health Check-up services
 - Annual Maintenance Contract (AMC)
- Ashnik’s expertise covers everything you need for installation, configuration, deployment and service maintenance of Open Source solutions.

FAQs on the EDB Postgres Advanced Server solution

▶ **How good is EDB Postgres Advanced Server's Oracle compatibility?**

One of the key reasons to choose EnterpriseDB is its proven level of Oracle compatibility. It covers the most used Oracle features and currently offers version 12 enhancements with around 85-95% compatibility.

▶ **Do other businesses use PostgreSQL or EDB Postgres Advanced Server?**

PostgreSQL is widely in use with over 4000 global organisations that include Sony Online, Netflix, Instagram, Skype, Yahoo, NASA and the NSA. The EDB Postgres Advanced Server is used by over 1000 companies like InMobi, Sony Online, Korean Telecom, State Farm and others.

▶ **Why EDB Postgres is a better choice for business needs?**

While PostgreSQL offers advanced open source database solutions, EDB Postgres Advanced Server presents greater advantages. These include:

- Enhanced Oracle compatibility
- In-memory cache to store selective tables or whole database in cache for access performance
- Bulk loader with 400% faster data loads than native PostgreSQL commands from flat files
- SQL Protect for an extra database security against injection attacks
- User Profile Management to create named profiles/password management rules
- Query Optimizer Hints direct query execution plan based on specific criteria.

▶ **Who is responsible for the migration process?**

Ashnik will carry out the 1st schema migration using the EnterpriseDB toolkit. To manage identified incompatibilities, Ashnik will assist on the required conversion and migration of such objects in your database. Your team can then proceed to deep testing and final data migration. We also offer expertise for incremental data migration solutions.

▶ **Can I just run with the application or do I need to test any changes?**

As with any IT project that covers new developments, changes/bug-fixes or migration, a thorough testing cycle is recommended post database migration. Our bundled migration services cover a 5-week window of offline support during the application testing, which includes functional and performance testing. Our database consultants will work with your team to provide work-around solutions and enable resolutions wherever applicable.

▶ **What makes Ashnik the right choice for migration services?**

Ashnik realizes the value impact of your project. This is why we concentrate on optimal migration timelines. Beyond our vast experience and highly skilled expertise on Oracle & EDB Postgres Advanced Server, our teams are trained to simplify complexity, reduce development effort and enhance efficiency of processes. Offline support is provided for functional and performance testing with fixes wherever required. Every step we take is calibrated by key information reports that enable effective resolutions and guide the optimal migration route. This helps shorten the timeframe to project realization. For projects that may not be able to take a cohesive transition route, we offer an incremental migration plan that enables your migration goal achievement.

▶ **Does EnterpriseDB offer other tools?**

EDB Postgres Advance Server is a highly capable solution that offers a variety of enterprise level tools to create a familiar environment. These include:

- Postgres Enterprise Manager for infrastructure monitoring and tuning
- EDB Failover Manager for high availability and disaster recovery
- BART to perform PITR
- Tools to build across multiple data sources including traditional DBMSs, Hadoop, NoSQL with EDB replication tool or Data adapters.