



EDB
Postgres® for the AI Generation



EDB Postgres® AI: How to Reduce Your TCO and Improve Postgres Performance on AWS

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Hybrid and multi-cloud strategies, surging adoption of open source databases such as PostgreSQL, and the continued push to modernize from legacy systems including Oracle — these trends and more are motivating many organizations to examine Postgres-based cloud solutions. Many technology leaders are hopeful that moving to a managed Postgres service will enable their developers to accelerate innovation while aligning with C-suite goals of scalability, operational agility, and cost reduction.

There is a range of managed PostgreSQL solutions on the market, with each of the major cloud service providers (CSPs) offering their own native services. In the case of Amazon Web Services (AWS), the native Postgres-compatible offerings are Amazon RDS and Amazon Aurora.

While managed services such as RDS and Aurora can help reduce administrative overhead, they also introduce new challenges for managing cloud infrastructure costs, database performance, cloud lock-in, [and other risks](#).

Best-of-breed solutions such as EDB Postgres AI offer a managed service capability similar to RDS and Aurora, while also supporting multi-cloud and hybrid strategies and offering fine-tuned performance and cost-efficiency.

This white paper serves as a guide for technology leaders who want to take a closer look at the different managed Postgres offerings within the AWS ecosystem.

AWS platform-native solutions for Postgres

When compared to self-managing PostgreSQL databases, fully managed solutions such as RDS and Aurora offer the appeal of streamlined setup, automated maintenance and high availability, reduced administrative overhead, and enhanced reliability. Self-managed databases on Amazon EC2 can provide opportunities for greater customization, but they also require more hands-on management and lack the automation of managed Postgres services. Aurora and RDS both help organizations manage and run databases in the cloud without worrying about the underlying infrastructure, but they each have different features that set them apart.

RDS provides a flexible and scalable solution for setting up and operating a relational database in AWS. It supports a variety of databases, including MySQL, PostgreSQL, Oracle, Db2, SQL Server, and MariaDB. RDS simplifies routine database tasks by automating provisioning, backups, basic patch management, and handling routine administrative tasks.

Aurora, on the other hand, is a proprietary database engine built by AWS. It is compatible with MySQL and PostgreSQL, offering high performance, scalability, and reliability. Aurora achieves higher performance through a proprietary storage architecture that enhances resilience and performance across availability zones and regions.

The organizational decision to select Aurora or RDS depends on specific business needs. Aurora may be the better choice for users who prioritize performance, scalability, and high availability [despite the higher cost](#). On the other hand, RDS offers a broader range of database engine options and may be more cost-effective for specific applications that don't require the absolute highest performance.

EDB Postgres AI + AWS: Better together

CSP-native services such as RDS can be adequate depending on the use case, but many organizations have held back on migrating to these managed services because they lack certain mission-critical capabilities. For example, the lack of hybrid and multi-cloud support, insufficient performance and high availability, lack of granular control for administrators, incompatibilities with legacy systems, and lack of commercial support for the database engine itself may all contribute to enterprise hesitation around "moving to managed."

For organizations planning migrations to Postgres with demanding enterprise requirements, project success is better guaranteed by [partnering with vendors](#) equipped to deliver both Postgres and cloud infrastructure support, as well as [platform tools](#) and strategic planning, to ease the transition for developers and administrators.

As a certified [AWS partner](#), EnterpriseDB (EDB) offers enterprise-grade Postgres on AWS with unmatched scalability and flexibility, backed by industry-leading Postgres expertise. The [EDB Postgres AI Cloud Service](#) supports AWS as well as multi-cloud and hybrid deployments. It closes the high availability gap for Postgres running on AWS, offering up to 99.999% availability in self-hosted deployments, leveraging active-active, geo-distributed architectures needed to assure business continuity. EDB's Oracle migration tools, expertise, and support enable customers to migrate Oracle databases in fewer than 20 days, reduce app rewrites by up to 95%, and realize 80% in TCO savings versus using Oracle licensing.

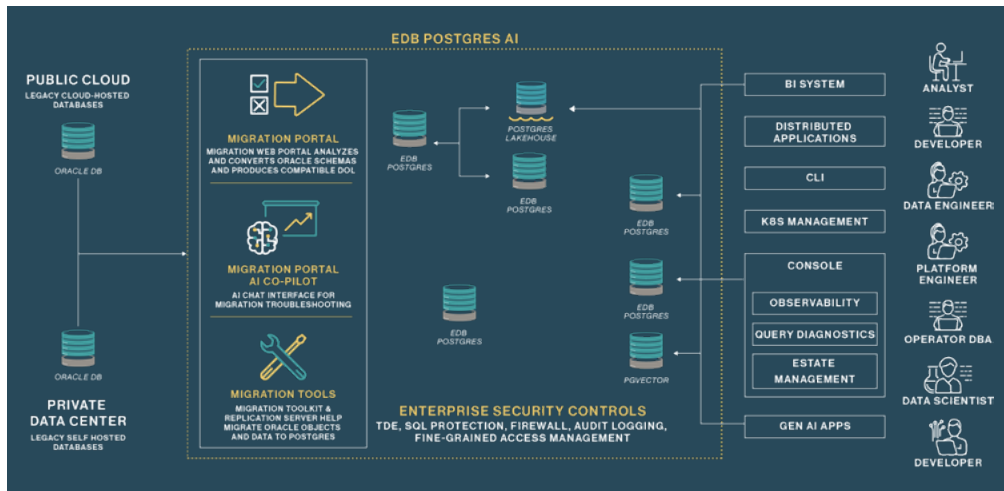


Figure 1. Modernizing legacy databases with EDB Postgres AI Cloud Service

Let's take a closer look at how EDB Postgres AI Cloud Service on AWS eases the path to modernization with Postgres and cloud.

Unrivaled Postgres mastery

EDB stands apart as a managed Postgres provider, as the world's largest contributor to open source PostgreSQL. EDB's expertise enables you to enjoy the same high-level Postgres experience everywhere — from Kubernetes, on-premises, hybrid environments, or multi-cloud environments involving AWS, Azure, and Google Cloud. This high "Postgres IQ" also enables EDB to be first to market with numerous innovations that help customers realize unparalleled database performance, regardless of the solutions they deploy.

When deploying Postgres on AWS, EDB was the [first to commit](#) to providing 99.995% uptime with distributed Postgres clusters. EDB also raised the bar for Postgres database security and compliance by delivering transparent data encryption (TDE), normally only available for commercial databases such as Oracle and SQL Server. [EDB's delivery of TDE](#) includes key management external to Postgres, with support for AWS Key Management Service. Additionally, EDB Postgres expertise is reflected in unmatched Oracle compatibility for Postgres databases running in AWS, which eases the migration experience while [reducing risks and costs](#).

But EDB Postgres expertise doesn't just excel at the level of code. EDB dedication extends to offering 24/7/365 production-level break-fix Postgres support that helps quickly solve specific Postgres problems. Unlike cloud providers that are jacks-of-all-trades, EDB's focus on Postgres differentiates cloud database performance issues from pure cloud infrastructure concerns. EDB Postgres AI's reporting and diagnostics functionality enables customers to fix performance issues more rapidly with intelligent observability. Operators can run query diagnostics, get automatic suggestions on performance optimization, and continuously monitor EDB Postgres AI on AWS with log analysis. With Postgres Workload Reports, operators can access detailed performance analysis in a format similar to Oracle Automatic Workload Repository reports.

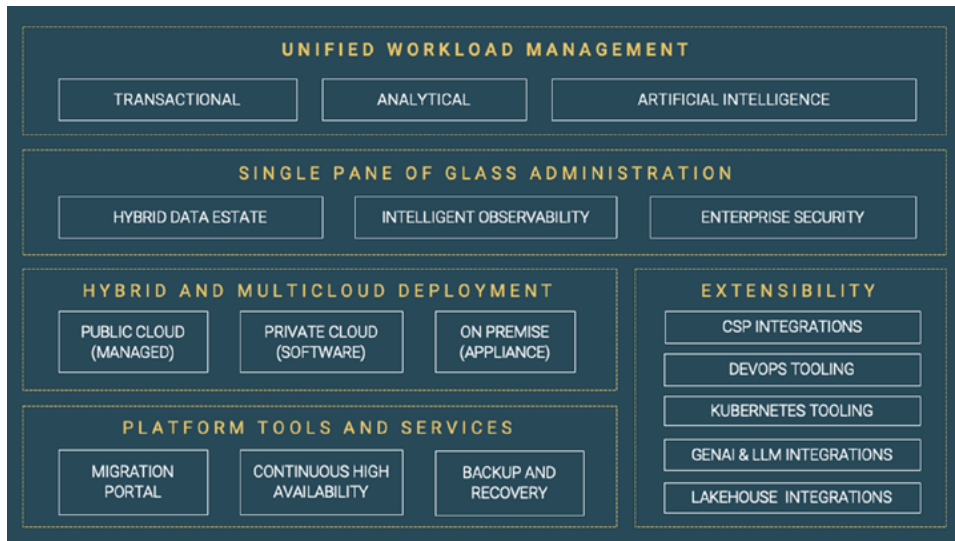


Figure 2. The EDB Postgres AI multi-cloud platform

Leverage EDB’s broad support of the Postgres tool ecosystem

EDB innovation complements and extends the utility of Postgres for enterprise use cases, delivering better performance, more security options, and best practices guidance and support, all while removing the need for specialized databases.

Rather than creating a fork of open source software to optimize it for the cloud or address vendor license restrictions, EDB Postgres AI allows you to remain committed to true open source. EDB Postgres AI tools and extensions help developers manage critical enterprise requirements, including organizing and managing data, unifying governance, enhancing observability, and hardening Postgres without compromising on security operations requirements. In maximizing the value of the Postgres tool ecosystem for developers, EDB supports third-party integrations with backup, developer, visualization and other tools. EDB Postgres [extension coverage](#) includes open source, EDB-supported open source, and commercial EDB extensions.

EDB performance engineering innovations further enhance Postgres with platform tools that include EDB Advanced Storage Pack, EDB Postgres Tuner (autonomous database operations), Postgres Enterprise Manager, and EDB PgBouncer (greater scalability and concurrency).

In addition, EDB provides hardened security to help enterprises standardize on Postgres without compromising on SecOps requirements. EDB Postgres AI provides the most secure Postgres available on AWS, helping protect sensitive information and ensure regulatory compliance with features such as TDE, row-level security, and database auditing.

EDB’s emphasis on securing cloud database operations reflects the importance of CTO decision-making regarding the importance of stability and consistency in CSP infrastructures, whether involving AWS, Azure, or Google Cloud. Understanding the limitations and vulnerabilities of Postgres and CSPs becomes crucial in ensuring uninterrupted operations.

Extend Postgres cloud deployment flexibility and value

EDB provides the same high-level Postgres experience on any cloud environment, including AWS, Azure, and Google Cloud. EDB Postgres AI's ability to run in three CSP environments and provide the same Oracle-compatible experience to developers eases the migration process, while supporting hybrid, multi-cloud, and cloud-first strategies prioritized for [new application deployments](#).

In this manner, EDB Postgres AI Cloud Service helps organizations avoid over-reliance on a single CSP vendor and supports emerging trends such as [PolycLOUD](#) adoption, which emphasizes deploying data workloads on specific CSPs based on the comparative strengths that vendor cloud offers in managing those business services.

You can also use Postgres AI's unified management console to gain observability into your hybrid data estate, including managed EDB Postgres databases on AWS, self-managed Postgres databases on Amazon EC2, and even Postgres databases in your private cloud and on-premises environments. This is achieved by installing the Postgres AI agent for your local deployments.

Access ongoing releases of developer-centric Postgres features

EDB's commitment to developers is unwavering. That's why EDB Postgres AI frequently introduces developer features that streamline processes, foster innovation, and ensure seamless operations when running Postgres in the cloud.

With EDB Postgres AI, developers find a dedicated environment to build and thrive without constraints, offering the benefits of:

- **Granular control:** Superuser privileges for granular control over database internals.
- **Efficient scripting:** [CLI](#) to efficiently script and automate operations.
- **Practical, standardized integration:** [REST APIs](#) for straightforward, standardized communication and integration with the database. In addition, the EDB Terraform Provider makes infrastructure deployment much easier.
- **Ultimate flexibility:** Develop once, deploy on any cloud, with a consistent Postgres experience no matter which cloud you choose.

Your developers can also choose the type of availability that's right for their application—ranging from preproduction environments to mission-critical, high-availability deployments with up to 99.999% uptime guaranteed.

Realize the benefits of geo-distributed, active-active EDB Postgres database architectures on AWS

For enterprise databases supporting globally distributed workloads, regional cloud outages, and disruptions—whether in AWS, Azure, or Google Cloud—can significantly deteriorate user experience and disrupt business operations. The major CSPs have taken some high-profile hits for wide-ranging customer impacts associated with cloud infrastructure downtime instances, including outages experienced by some customers in the midst of Aurora or RDS upgrades.

Beyond downtime, the issue of database latency is especially problematic for SaaS and customer-facing applications running in multi-cloud environments.

Additionally, for a globally distributed user base, the data in Postgres cloud services must adhere to regional differences and policies, as well as comply with data governance regulations.

EDB Postgres AI Cloud Service addresses these collective business and customer demands with EDB Postgres Distributed, providing continuous high availability Postgres operations on AWS with up to 99.999% availability in self-hosted deployments. In comparison, even with every replication enabled, [RDS](#) only offers a 99.95% uptime service level agreement (SLA), and [Aurora](#) provides a 99.99% SLA.

Running EDB Postgres AI Cloud Service in an active-active architecture provides continuous high availability and offers resilience to both zonal and regional failures, all of which help customer applications be more highly available. EDB Postgres Distributed eases disaster recovery (DR) processes by offering the advantages of multi-region, always-on architectures to ensure that your DR solution is continually operational. As a result, you benefit from continuous disaster recovery readiness, without the need for database interaction during failover to another region.

Using EDB Postgres AI Cloud Service, you can choose a multi-region deployment with an active-active database architecture. If a disaster occurs, you can simply repoint the queries and write to the available node.

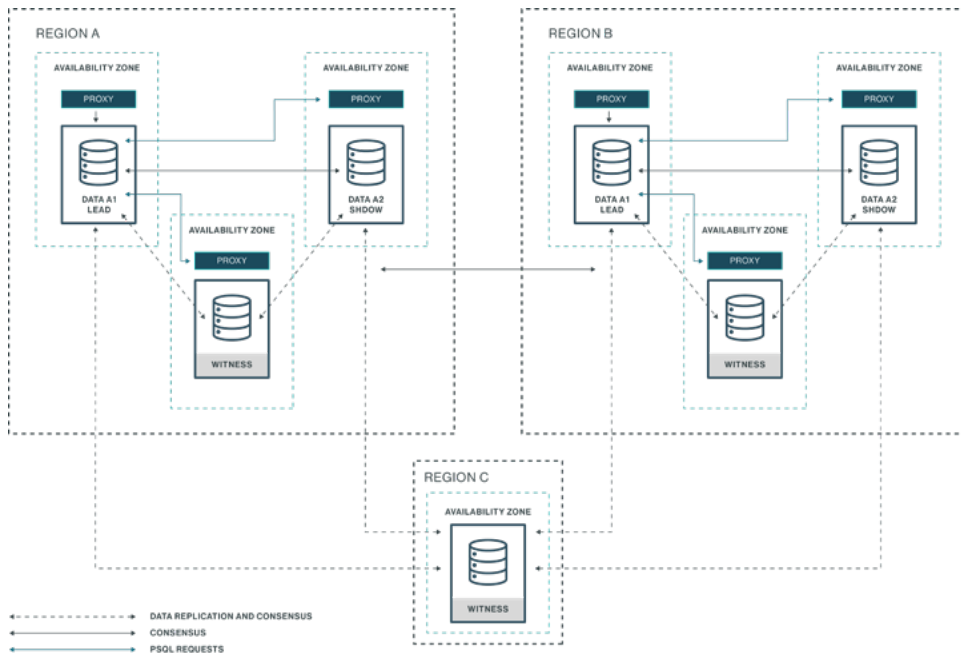


Figure 3. EDB Postgres Distributed, showing a distributed high availability, multi-region configuration, with three data nodes (x2) and one witness

When compared to RDS and Aurora, running EDB PGD enables you to optimize data geographically across multiple regions. Geo-distributed architectures address demands for reduced latency and directly improve application performance. By writing directly to the database closest to them, each team gets the same level of application performance, minimizing or eliminating any potential latency or lag associated with writing data to distant regions.



- ✓ ACTIVE-ACTIVE SETUP
- ✓ FLEXIBLE DEPLOYMENT
- ✓ EFFICIENT LOGICAL REPLICATION
- ✓ CUSTOMER'S CHOICE OF CONSISTENCY
- ✓ INDUSTRY LEADING TOOLING
- ✓ COMPLIANCE AND SCALABILITY

Figure 4. Running EDB Postgres AI Cloud Service distributed clusters improves application uptime, enhances geo-distributed data capabilities, and simplifies maintenance in AWS

Using EDB Postgres Distributed supports selective replication that enables replication at the schema, table, and transaction level. In this way, you can choose what level you need to replicate, then store the data where it needs to be.

As a result, EDB Postgres Distributed allows you to simplify regulatory compliance by implementing controls in multi-region clusters to replicate data selectively where necessary. Compliance readiness includes GDPR, PCI DSS, and SOC2.

Additionally, [EDB Postgres AI tools and extensions](#) deliver innovative secure open source software features and compliance support to our customers.

Maximize performance and reduce TCO—EDB Postgres AI Cloud Service on AWS

In addition to performance and security as described above, deployment ease and total cost of ownership (TCO) are two top-of-mind considerations for enterprises scrutinizing Postgres cloud database options.

As exhibited in Table 1, when compared to Amazon RDS and Aurora, EDB Postgres AI offers superior deployment flexibility, performance, and up to 3–5x reduced TCO when deployed on the customer’s AWS cloud infrastructure (“bring your own account”). When running in an organization’s AWS cloud infrastructure, EDB Postgres AI Cloud Service provides a lower-cost, higher performance Postgres solution—offering greater resilience, security, and control—than RDS, Aurora Standard, and Aurora IO Optimized.

The EDB Postgres AI “Cloud Service” pricing column in Table 1 reflects cloud components directly provisioned within the client account that are billed back through the AWS contract to the client. These costs would be reduced based on discounts within the customer’s AWS Commit Contract.

For comparative purposes, we identify the costs of running EDB Postgres AI Cloud Service in EDB AWS cloud instance in the hosted model.

MONTHLY COST, ON-DEMAND, US-EAST (VIRGINIA PRIMARY HA AND OHIO DR)			
	RDS POSTGRES	AURORA - IO OPTIMIZED	EDB Postgres AI Cloud Service
Instance Type: r6i.4xlarge 16vcpus-128Ram			
DBaaS	\$4,380.00	\$6,605.04	\$3,688.32
Storage 1000GBs			
Backups 1500GB	\$142.50	\$31.50	\$34.50
GP3 -12000 IOPS 500 MBps	\$345.00	\$450.00	\$420.00
Totals			
Services	\$4,867.50	\$6,861.54	\$4,142.82
Support	\$521.79	\$708.65	Included in EDB Postgres AI Cloud Service
Grand Total	\$5,389.29	\$7,570.19	\$4,142.82

Table 1. Comparing TCO – EDB Postgres AI Cloud Service deployed in customer’s AWS account

In the EDB Postgres AI Cloud Service hosted model, EDB provides everything necessary to run the database server in a standalone mode and charges the client for the sum of necessary components.

This comparison assumes the following reference architecture:

- **Compute/memory:** EC2 instance – r6i.2xlarge (8 Intel Ice Lake cores, 64GB RAM) and using a one-year reserved, no-up-front pricing (where possible).
- **Storage:** Using 1000TBs and appreciating the differences in storage pricing depending on the storage family (with a focus on GP3 and IO), IOPS, and throughput (where applicable).
- **Backups:** Presume over a month a 1.5x of storage used for backups to database storage.
- **Monitoring:** Given AWS CloudWatch's pricing complexity, it was not considered; however, AWS CloudWatch can be used with RDS, Aurora, and EDB Postgres AI Cloud Service. Note: EDB also supports monitoring and altering to be managed outside of AWS cloud-native tooling.

One variable that causes the greatest confusion in AWS is the topic of input/output operations per second (IOPS) within AWS Elastic Block Store (EBS). This confusion stems from the variability of performance needs, the multitude of EBS options, cost implications, dynamic workload nature, optimization requirements, and the need for continuous monitoring and adjustment. Clear understanding of these factors is essential for effectively managing costs and ensuring optimal performance of RDS and Aurora on AWS.

We factored these considerations in providing the storage options seen in Table 1. As io2 workloads get larger in size, the costs of RDS and Aurora increase significantly when compared to running EDB Postgres AI Cloud Service on the customer's AWS cloud infrastructure. In the EDB Postgres AI Cloud Service bring-your-own-account model, EDB takes advantage of the best of AWS components (io2 storage, newest EC2 instances), enabling clients to have cross-region active/active Postgres to scale out and strive for near-zero downtime — with 100% automated recovery and rehydration to tackle any potential issues.

EDB Postgres AI offers options to run in your AWS account and bring you the best Postgres experience at a core-CPU/per-hour basis—all at a single price. As a result, there is a proper balance of control to fit the database to the workload.

Take advantage of AWS Marketplace pricing for EDB Postgres AI Cloud Service solutions

Deploying EDB Postgres AI on AWS allows you to take advantage of your existing AWS spend commitments. EDB Postgres AI Cloud Service and EDB Professional Services can be purchased directly from the [AWS Marketplace](#), offering AWS customers the following benefits:

- Recognize volume-based discounts by consolidating purchasing power.
- Draw down on committed AWS spend for both cloud infrastructure and EDB Licensing.
- Simplify vendor management by avoiding the onboarding of an additional vendor.
- Consolidate IT spend and billing by purchasing through a single vendor.
- Accelerate time-to-value by minimizing vendor onboarding and maximizing the AWS relationship.
- Get access to the same geo-distributed EDB Postgres AI experience on AWS across any delivery region.

Government agencies can additionally purchase EDB Postgres AI through the [AWS GovCloud Marketplace](#).

Partnering with EDB for Postgres success on AWS

As the largest builder of Postgres and the world-leading cloud infrastructure provider, respectively, EDB and AWS offer a “better together” solution for high availability, Oracle-compatible Postgres, with enhanced performance and up to 99.999% availability on the cloud.

Running EDB Postgres AI on AWS addresses key enterprise and developer pain points:

- **Empowering cloud migration:** Seamlessly migrate to the cloud with EDB Postgres AI Cloud Service on AWS, reducing the burden on IT teams and allowing for a focus on core business objectives.
- **Providing cost-efficient Oracle alternatives:** EDB Postgres AI on AWS provides Oracle-compatible flexibility without the associated expenses, increasing agility and reducing costs.
- **High availability and performance:** Ensure unparalleled availability, security, and performance with EDB Postgres AI on AWS, achieving up to 99.999% availability and leveraging advanced features for optimized workloads.

Your Next Steps

Discover the power of EDB Postgres AI on AWS from the trusted experts. Whether you're a CTO looking to revolutionize your data infrastructure or a developer seeking unparalleled scalability and flexibility, EDB and AWS have the solution you need to unlock cloud innovation.

[Contact Us](#)



EDB provides a data and AI platform that enables organizations to harness the full power of Postgres for transactional, analytical, and AI workloads across any cloud, any time.

For more information, visit www.enterprisedb.com.