

# Why Customers Choose Percona for PostgreSQL

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### **Enterprise-Grade PostgreSQL Out of the Box**

Recognized as a formidable, open source, object-relational database system, PostgreSQL earns accolades for its dependability, extensive features, and performance. In fact, the 2023 Stack Overflow Developer survey ranked it the most admired (42%) and desired (71%) database among all developers, and DB-Engines declared it the DBMS of the year in 2020. It's a top choice for developers and DBAs due to its advanced SQL compliance, strong support for complex queries, robust transactional integrity, and ability to efficiently handle large volumes of data.

As popular as it is, preparing it for production in mission-critical environments can be difficult. It involves tackling certain challenges, ncluding selecting, configuring, and maintaining the right extensions for an enterprise setup and acquiring the internal expertise necessary to operate PostgreSQL for peak performance. One could, hypothetically, go through those challenges on their own or choose a vendor-created fork and potentially get locked into a long-term, expensive contract. But the smarter choice, by far, is to opt for a much better solution — Percona for PostgreSQL.

Percona for PostgreSQL delivers enterprise-grade PostgreSQL straight out of the box, empowering your development with a reliable, feature-rich database solution suitable for the most demanding environments. This comprehensive approach not only includes the software but also extends to support and services, ensuring a seamless and efficient PostgreSQL experience.

With Percona, you can innovate, scale, and deploy your PostgreSQL databases wherever and whenever you need, backed by expert support and managed services - without the risk of vendor lock-in.

This comprehensive guide gives you an in-depth understanding of Percona for PostgreSQL, detailing how our solution combines advanced software with exceptional support services needed for an optimized PostgreSQL experience.

We will also look at real-world case studies, demonstrating the tangible benefits and diverse applications of our all-encompassing PostgreSQL solution that bypasses the usual configuration complexities while avoiding vendor lock-in.

# Vanilla tastes great but isn't suitable for enterprise use

PostgreSQL is outstanding software, but deploying it for enterprise use requires additional tools and extensions. These tools are necessary for high availability, disaster recovery, monitoring, and observability, but users must first search for what will work for their environment, manually configure them, and then test them to ensure seamless operation. "Vanilla" PostgreSQL, essentially the basic database version not assembled with additional tools or enhancements, lacks specific enterprise-grade features necessary for large-scale or complex deployments.

Getting these features often requires a DIY approach, which increases the complexity of the work faced by IT teams. Setting PostgreSQL up for specific enterprise needs requires in-depth knowledge, time, and resources. The PostgreSQL community does provide numerous extensions and tools to bolster PostgreSQL's security, resilience, and performance, but DBAs face the intricate task of manually choosing, assembling, and fine-tuning these components. Additionally, maintaining vanilla PostgreSQL, without modifications or enhancements, along with these extensions, poses issues, particularly given the limitations of the community version.

The challenge is more pronounced in serious production deployments, where the database engine needs complementary tools for clustering, high availability, disaster recovery, and monitoring. Adding to this complexity is the need for reliable, repeatable deployment on cloud-native platforms and validation by a trusted vendor.

So, while vanilla PostgreSQL is a capable database, its unmodified form may not meet all the demands of enterprise integration, performance, and scalability. There are many problems with using a vanilla version of PostgreSQL, including:

Lack of enterprise features: Complex or large-scale deployments require certain enterprise-grade functionality. These features could include more sophisticated monitoring and analytical capabilities, enhanced performance tools, or advanced security measures. Additionally, high availability requirements are critical for these types of deployments. This entails the implementation of failover mechanisms, load balancing, and redundancy systems that can withstand failures with minimal downtime, ensuring continuous operation despite high demand or maintenance activity.

**Configuration and setup challenges:** A thorough grasp of the database and its possible configurations is necessary for properly setting up and configuring the vanilla version of PostgreSQL, which can be resource- and time-intensive.

**Limited support:** Vanilla PostgreSQL users may depend on community support, which varies in responsiveness and level of expertise, without a professional, on-site support team, which is an additional staffing expense. On the other hand, proprietary database versions, which typically come with vendor support, usually entail vendor lock-in, which binds you to the ecosystem of a single provider.



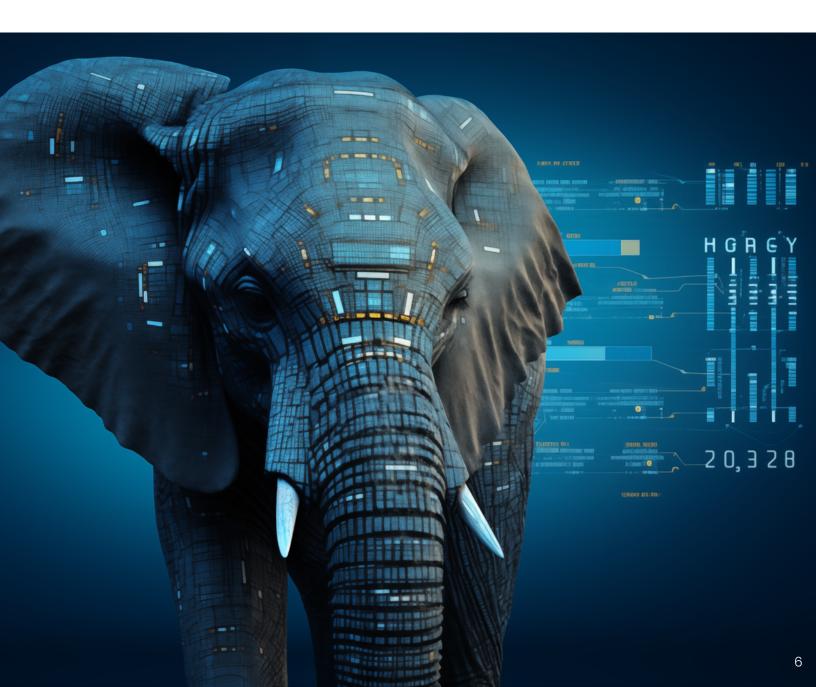
**Scalability limitations:** PostgreSQL, in its basic form, may encounter scalability issues that can become a big issue for applications with fluctuating workloads. So, even if you believe that vanilla PostgreSQL would be able to handle your current challenges, you still need to take scalability into account. In five years, will it still be effective? Or are you just pushing a potential problem down the road as the system grows and evolves?

**Performance optimization:** While PostgreSQL is known for its performance, the vanilla version may not be optimized for specific use cases or workloads. This can result in subpar performance in some settings, particularly those that handle immense amounts of data or need high throughput.

**Integration challenges:** Integrating vanilla PostgreSQL with other tools and systems might require additional effort or customization. This can be particularly true in complex IT environments where integration and data flow between multiple systems are essential.

**Security concerns:** Although PostgreSQL is secure, the vanilla version may not include all of the most recent security updates or features catered to specific industry requirements, such as financial services. Businesses may become vulnerable to security flaws as a result of this.

**Maintenance and updates:** Regular updates and maintenance are essential for any database system. On the other hand, handling these for a vanilla PostgreSQL system with extras added on can be more difficult, particularly for businesses without a specialized IT staff experienced in PostgreSQL.



In addition, PostgreSQL, known for its complexity compared to other databases, presents a steep learning curve for new users, requiring developers to invest more time mastering its effective use. While it boasts of a large and active community, PostgreSQL lacks the same level of commercial support found in databases like Oracle or Microsoft SQL Server, posing challenges for businesses needing support, especially for compliance requirements. The vast wealth of knowledge within the PostgreSQL community is extensive, but it can be overwhelming and difficult to navigate, particularly for those with less experience in PostgreSQL. The abundance of documentation its many experts create sometimes makes finding specific answers more challenging than anticipated.

Because of these challenges and others, organizations often turn to assembled or enhanced versions of PostgreSQL for a more tailored, robust, and support-backed database solution. But don't take our word for it; when it comes to the use of third-party database support services, nearly all (99%) high-performing organizations report receiving third-party support.Let's see what others are saying about trying to use vanilla PostgreSQL in enterprise environments:

"One viable solution to avoid lock-in is to choose "vanilla Postgres" – the basic open source version of PostgreSQL available from postgres.org or any cloud provider. This will certainly provide initial flexibility, but you are likely to encounter limitations as your application grows and requires enterprise-level features." – DevOps

While open source projects welcome contributions from developers across all skill levels, many of these contributors may not always be fully up-to-date with the latest security best practices, potentially leading to **inadvertent security oversights**.

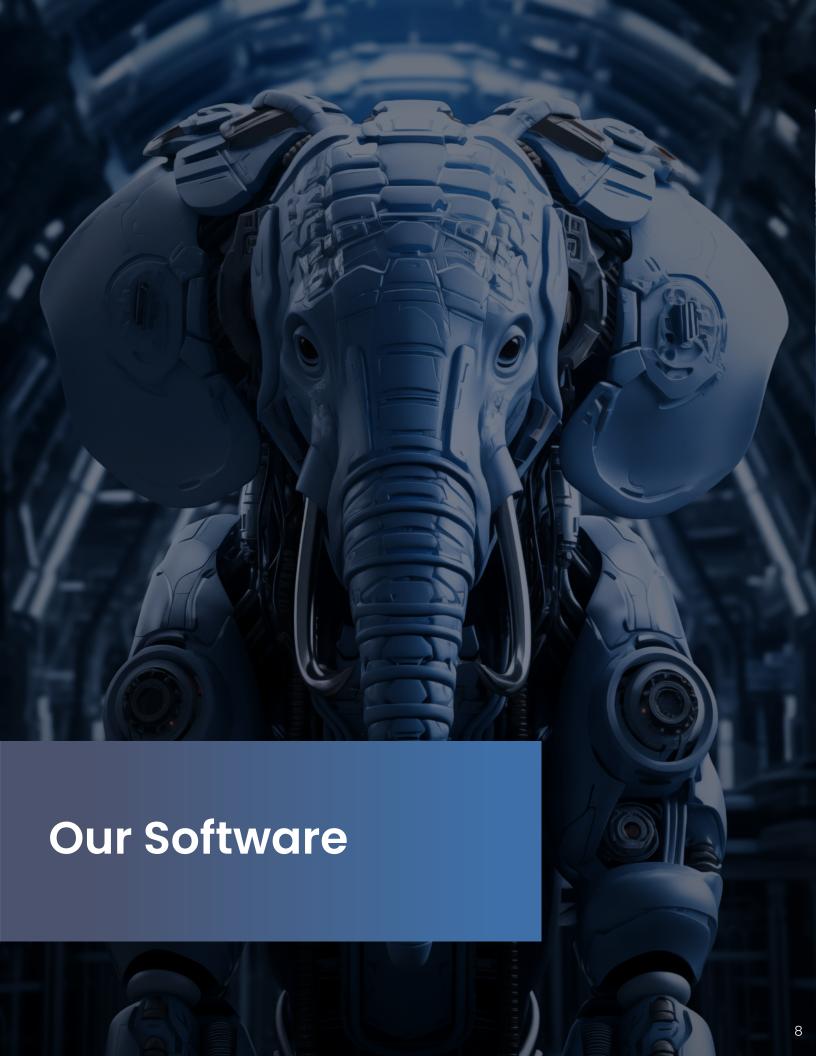
- Open Source Security Foundation

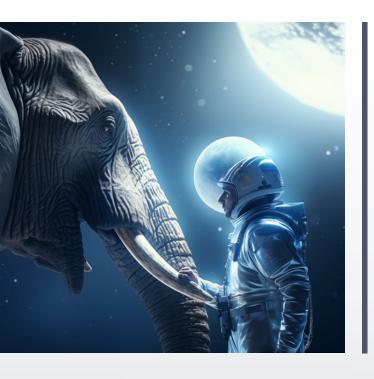
"There's generally an **underestimation of the work required** (to use open source software successfully)," said William McKnight, president of McKnight Consulting Group. "They think it's in the cloud, and they won't have to do much, but they have to bring a lot of expertise to bear." - TechTarget

The interconnectedness of the open source ecosystem implies that a vulnerability in one application can cascade, affecting multiple other applications and potentially impacting a wide range of systems and users. Due to this interconnected vulnerability, there expects to be a substantial increase in the formation of and need for specialized open source security teams in 2024. - Open Source Security Foundation

Percona meets the requirements for enterprise-grade PostgreSQL via a unique combination of software and support, offering enhanced performance, scalability, and features as well as comprehensive 24/7 expert support and services.

Let's look at each component of Percona for PostgreSQL in greater detail.





### First, our software

Percona for PostgreSQL is our solution for those looking for an enterprise-grade database system. It consists of our Percona Distribution for PostgreSQL for running PostgreSQL in any Unix-based system and Percona Operator for PostgreSQL for running it in cloud-native environments. Combined with our powerful monitoring tool Percona Monitoring and Management (PMM) to monitor, manage, and improve the performance of your databases no matter where they are located or deployed, it's easy to see why Percona and PostgreSQL are better together.



# Essential components of Percona for PostgreSQL

#### Percona Distribution for PostgreSQL

Percona Distribution for PostgreSQL combines the best and most critical enterprise-level components from the open source community, all carefully selected, certified, and tested to function seamlessly as a single, integrated solution. At the heart of this distribution is an enhanced version of the standard PostgreSQL database, known for its reliability, data integrity, and feature set. In addition, the distribution includes a range of add-ons for high availability, backup, security, and monitoring, all certified and thoroughly tested. These enhancements not only maintain the core strengths of PostgreSQL but also provide a more resilient, secure, and monitored database environment suited for enterprise demands.

#### A complete package

Percona Distribution for PostgreSQL is a complete package. This package includes a carefully curated and rigorously tested set of tools and extensions designed to meet a wide variety of production deployment scenarios, offering database administrators and developers support for key functionalities such as monitoring, ensuring high availability, and managing backups.

Percona is dedicated to keeping these components up-to-date and is committed to continuously testing and optimizing them, ensuring they remain current and consistently deliver peak performance and reliability.

Percona Distribution for PostgreSQL components include:

**PostGIS** is an important extension for PostgreSQL that adds support for geographic objects, enabling the database to store and query data about locations and mapping. This functionality is crucial for applications that handle geographical information, such as mapping services, geospatial analysis, and location-based services.

**pg\_repack** is used to rebuild PostgreSQL database objects. It reorganizes tables and indexes to reduce bloat without locking out writes for an extended period. This is particularly useful for busy databases where downtime needs to be minimized.

**pgAudit** provides detailed audit logging capabilities. It enables session and object-level audit logging through the standard PostgreSQL logging facility, allowing for comprehensive tracking of database activity for security and compliance purposes.

**pgAudit set\_user** is part of the pgAudit extension and enhances security and logging. It allows unprivileged users to escalate their privileges to superuser or object owner roles for maintenance tasks while maintaining a detailed log of these actions for security and audit purposes.

**pgBackRest** is a sophisticated backup and restore solution for PostgreSQL. It is reliable and easy to configure, providing capabilities such as full, differential, and incremental backups and efficient restore processes, even for large databases.

**Patroni** is a high availability (HA) solution for PostgreSQL. It handles database failover and leader election, ensuring that the database remains accessible even in the event of server failures. Patroni is essential for maintaining uptime in critical database environments.

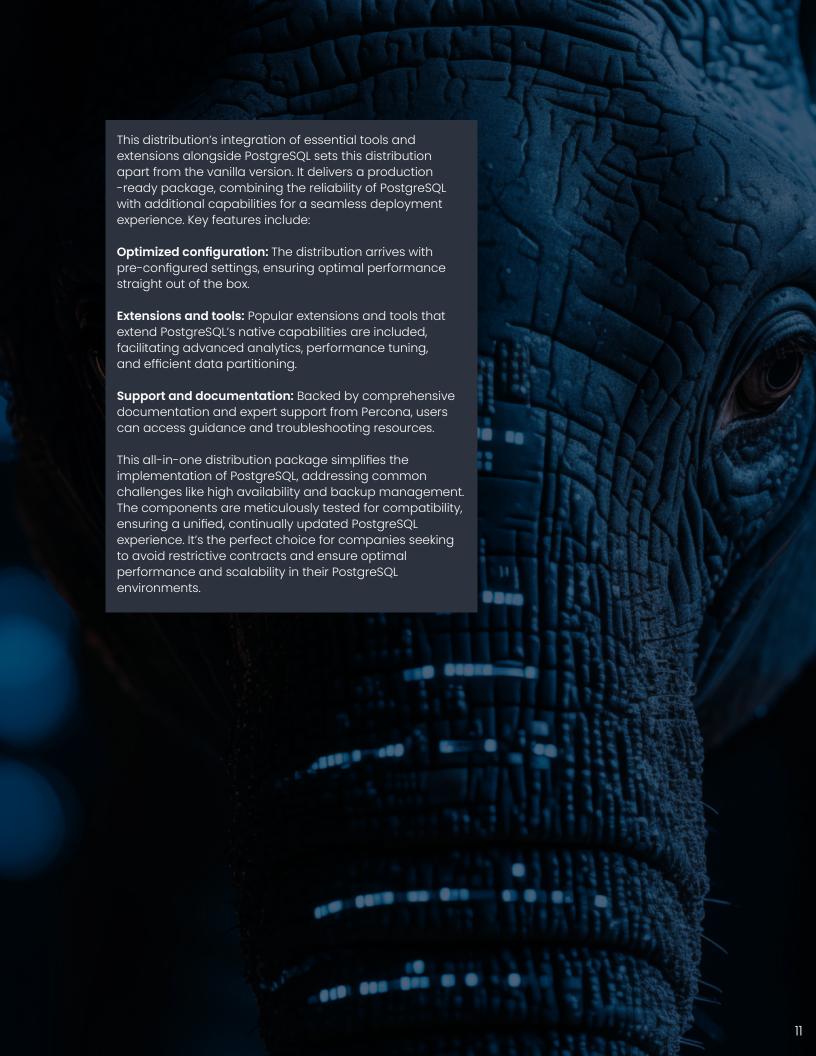
**pg\_stat\_monitor** collects and aggregates statistics from PostgreSQL. It provides detailed information, including histogram data on database queries, which is crucial for performance tuning and troubleshooting.

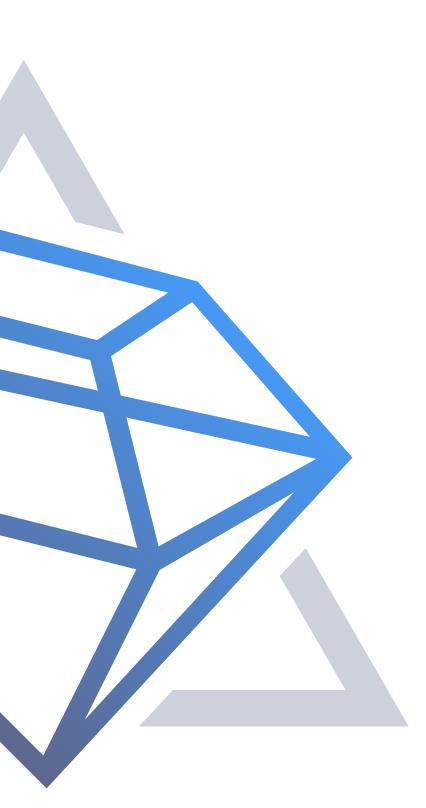
**PgBouncer** is a lightweight connection pooler for PostgreSQL. It reduces the overhead of establishing new connections by reusing existing ones, thereby improving the efficiency and scalability of database access in high-throughput environments.

**pgBadger** is a fast PostgreSQL log analyzer. It processes database logs to generate detailed reports, helping in performance analysis, error tracking, and identifying slow queries.

**wal2json** is a logical decoding output plugin that produces JSON-formatted data from PostgreSQL's write-ahead logs (WAL). It's useful for replication and integration with external systems that consume JSON data.

**HAProxy** is a high availability, load balancing, and proxy solution. In the context of PostgreSQL, it can be used to distribute database requests across multiple servers for load balancing, thereby improving performance and availability.





#### Percona Operator for PostgreSQL

Percona Operator for PostgreSQL is powerful open source software that automates the entire lifecycle of cloud-native PostgreSQL database operations in Kubernetes environments. It supports and enhances cloud-native strategies, drawing on best practices for configuring and setting up highly available, enterprise-grade Percona Distribution for PostgreSQL clusters. The operator simplifies Day 1 Operations into a single step and fully automates Day 2 Operations, including backups and restores with point-in-time recovery, cluster scaling, and zero-downtime upgrades. Being 100% open source, Percona Operator for PostgreSQL offers a flexible, cost-effective solution for diverse deployment scenarios, including cloud, hybrid-cloud, and multi-cloud environments.

#### Core attributes of the Percona PostgreSQL Operator

**Cloud-native Kubernetes Operator:** The Operator is optimized for Kubernetes, facilitating the deployment, management, and scaling of PostgreSQL databases in these environments. This feature is crucial for businesses adopting cloud-native strategies or operating in cloud-based environments.

**Automated cluster management:** The Operator automates routine tasks, including deployments, backups, updates, and scaling, significantly simplifying database administration. This automation is a key benefit for maintaining efficient and reliable database operations.

**High availability and failover:** The Operator ensures high availability of PostgreSQL databases with automated failover and recovery processes. This is vital for maintaining continuous database operation and data integrity.

**Coded-in expertise:** The Operator works seamlessly with existing Infrastructure-as-Code and DevOps tools. It offers services and support for on-demand or hands-on expertise, catering to various operational needs.

**Hassle-free provisioning and management:** Percona software automates day-to-day database operations via Kubernetes, eliminating the need for manual database management or reliance on in-house scripts.

**Ready-to-use open source foundations:** Users can quickly build a container platform for PostgreSQL on Kubernetes, facilitating the creation of a private Database-as-a-Service (DBaaS) for internal or external use.

**Total freedom and flexibility:** The Operator allows databases to run anywhere and be moved between different environments without usage restrictions or vendor lockin. This flexibility ensures users always have access and control over their data.



# Enterprise-grade, open source monitoring for PostgreSQL

#### Percona Monitoring and Management

As an add-on to the Percona for PostgreSQL ecosystem, Percona Monitoring and Management (PMM) is a comprehensive, enterprise-grade, open source monitoring solution designed to provide deep insights into the behavior of various databases. It's an essential tool for identifying issues like slow-performing queries and anomalies that could impact application performance and features PostgreSQL-specific dashboards that offer extensive visibility into database health and infrastructure usage.

One of the key components of PMM is Query Analytics for PostgreSQL. This functionality enables users to understand their database's behavior clearly, specifically identifying slow queries and other anomalies. When the pg\_stat\_monitor extension is enabled, PMM offers several advanced features, including:

**End-to-end traceability:** Allows for complete visibility of database operations, enhancing troubleshooting and performance optimization.

**Aggregated performance stats:** Users can view performance statistics over configurable time windows, providing a comprehensive overview of database activity without limitations.

**Actionable histograms:** Offers a detailed breakdown of query execution times, allowing for targeted performance improvements.

PMM also includes robust alerting capabilities, so users can set critical metrics and acceptable thresholds, automatically enabling PMM to detect anomalies and issue alerts for necessary human intervention. This feature ensures that potential issues are addressed promptly before they impact end users.

Another significant feature is Percona Advisors, which plays a vital role in maintaining database security and performance. These advisors continuously scan PostgreSQL databases for potential security threats, misconfigurations, and performance optimization opportunities. The areas they monitor include risks to availability, replication inconsistencies, durability concerns, password security, unsecured connections, unstable OS configurations, and potential performance enhancements, and they are constantly updated to reflect the latest technological advancements and user feedback.



### **Support and services**

Percona's offerings go beyond just a PostgreSQL solution; they provide a unified support and services experience for dedicated PostgreSQL installations and diverse, multi-database environments. This approach empowers organizations to consolidate their open source database service providers securely and cost-effectively, enhancing their competitive edge and agility, all while avoiding vendor lock-in.

The performance of your database environment, whether on-premises or in the cloud, is a crucial component of your database operations. But maintaining performant databases is a tall order, and you might not have the on-staff expertise to go it alone. Or, maybe you can't afford a full-time database administrator. You need options but want to avoid an inflexible, multi-year contract. At Percona, we provide those options — and flexibility.

Percona can provide you with high-value PostgreSQL database services, making it easy for you to move between and combine the benefits of our Support, Managed Services, Consulting, and Training services. However, when you initially engage with Percona, choosing the right service might seem confusing because while people tend to be definitive about their challenges, they're typically more uncertain about what solutions they're seeking. One of the great things about Percona is that we make it easy for you to move between our different services as different needs arise. Many of our customers use multiple service offerings, and to help you make the right choice, we have broken down each service and what it includes.



#### Percona Support for PostgreSQL

Percona offers specialized support services for PostgreSQL, available through a contract for a specified duration. Catering to various needs, Percona provides two levels of support: Advanced Support, ideal for complex business and technical requirements in demanding environments, and Premium Support, designed for critical environments with high financial stakes. Clients can choose the support agreement that aligns best with their specific needs.

Even if you consider yourself a proficient database administrator, there might be times when you feel that additional improvements are possible or you face challenges where the solution isn't entirely clear. In such situations, Percona Support can be an invaluable resource. It's well-equipped to address a wide array of issues, such as poorly optimized queries, slow response times, security vulnerabilities, incorrect software installation, and misconfigured settings.

Companies frequently rely on Percona Support for problems beyond their resolution capabilities. They've often already dedicated considerable effort and resources to solving these issues. Early engagement with Percona Support can be highly beneficial, saving time and money. Percona's support engineers are adept at providing the best solutions, whether by validating your approach or suggesting a completely new strategy.

The benefits of opting for Percona Support include:

**Reduced application downtime:** Enhance uptime and service restoration, implement performance improvements, and navigate the complexities of modern deployments with 24x7x365 comprehensive support.

**Support across applications:** Regardless of the complexity, Percona provides assistance in configuring and tuning environments that utilize multiple database applications.

**Reduced operational costs:** Swiftly resolve issues that could otherwise take weeks to diagnose, significantly improving mean time to recovery by up to 300%. Additionally, benefit from Percona's expertise in architecture and optimization, potentially saving 80-90% on hosting expenses.

**Secure and bug-free databases:** Gain immediate access to rapid releases of PostgreSQL enhancements and urgent bug fixes, ensuring your databases remain secure and efficient.

#### Percona Managed Services for PostgreSQL

Percona Managed Services for PostgreSQL extends your database team by adding Percona's expertise to your operations through an annual contract. These services are divided into Standard Managed Services, perfect for production environments, and Premium Managed Services, tailored for mission-critical environments. With these services, monitoring and response are assured, complemented by a variety of monthly, quarterly, and annual reports.

The beauty of Percona Managed Services lies in the convenience it offers – there's no need to stress about hiring and retaining in-house staff. Percona provides a team always ready to tackle arising issues, ensuring that your database needs are met without the hassle of staffing concerns. Percona's round-the-clock monitoring also eliminates the need for 24x7x365 coverage from your side, sparing your DBAs from middle-of-the-night emergencies.

A key part of the service is setting up your environment to align with Percona's best practices. This includes implementing high availability and establishing a backup strategy that meets or exceeds your business requirements for Recovery Time Objective (RTO) and Recovery Point Objective (RPO). Such measures ensure that your data is secure and readily available for your applications, ultimately satisfying end-users.

The benefits of Percona Managed Services for PostgreSQL include:

**Reduced staffing costs:** Percona experts act as an extension of your team, providing continuous coverage without the need to hire full-time database administrators.

**Data protection:** Reliable, automated backup and recovery processes ensure your data's safety in emergencies or disasters.

**Continuous monitoring:** Proactive monitoring and alert/response systems help maintain secure, high-performing databases.

**Reduced storage costs:** Efficient backup procedures aid in cutting storage costs and reducing management overhead.

**Industry-best SLAs:** A 15-minute Service Level Agreement (SLA) underscores Percona's commitment to rapid support response.

#### Percona Consulting for PostgreSQL

Percona Consulting offers specialized consulting services for PostgreSQL, executed under a clearly defined scope agreement. Our team provides a detailed scope of work, outlining the tasks to be accomplished, along with an estimated duration and a comprehensive pricing structure for the project. Should additional issues be identified during the engagement, our consultant will flag these for attention, and a separate quote will be prepared for any new work that arises.

At the core of Percona Consulting is the commitment to delivering unbiased, optimal solutions for your database environment. This approach is geared towards helping you achieve your specific business objectives.

#### **Percona Training**

Percona Training offers an excellent opportunity for teams to enhance their skills in managing PostgreSQL databases. This training, which can span one to three days, is priced based on several factors and is designed to provide a comprehensive learning experience.

The training sessions are characterized by their hands-on approach. This method ensures that participants learn theoretical aspects and apply what they have learned in practical exercises. The ability to ask questions and engage with instructors throughout the sessions further enriches the learning experience.

Percona delivers this training in various formats to suit different needs, including on-site, online, or blended classroom settings and is designed to maximize comprehension, knowledge retention, and skill application, making it an ideal investment for teams looking to boost their proficiency in PostgreSQL database management.



# Customer case studies: Embracing enhanced PostgreSQL with Percona

Organizations increasingly recognize the value of enhanced, enterprise-ready versions of PostgreSQL. This shift is driven by the need for tailored solutions that align with specific business requirements and the desire to avoid vendor lock-in constraints. The following customer case studies highlight how various organizations have leveraged Percona for PostgreSQL to their advantage. These stories showcase not just the preference for a more sophisticated version of PostgreSQL but also the importance of having dedicated support that ensures optimal performance, reliability, and scalability. Each case study is a testament to how Percona's PostgreSQL solutions have been instrumental in transforming database management, offering a blend of customization, advanced features, and the freedom that comes from open source technology.



## Percona Advanced Support Reduces Solera's Costs and Improves Database Performance

Solera, a global leader in insurance and automotive data, applications, and services, has significantly benefited from Percona's Advanced Support, especially optimizing its database performance. The company recently transitioned its PostgreSQL database from Pivotal Cloud Foundry database services to a Percona PostgreSQL v12 Patroni Cluster on virtual machines, aimed at cost savings and performance optimization.

The switch to Percona PostgreSQL Distribution, guided by Percona Consulting, provided Solera with advanced open source database performance and tools. Percona's support has been instrumental in identifying and resolving bottlenecks across multiple database technologies, ensuring Solera's databases remain stable, scalable, and highly available. This support has allowed Solera to improve reliability and performance, enabling their DevOps team to focus more on performance metrics.

Julio Alvarez, Open Source DBA at Solera, commends Percona's efficient technical support and valuable insights in PostgreSQL, which have been essential in improving various aspects of their database operations and helping Solera implement a robust, scalable, and highly available open source database solution, improve performance times, and swiftly resolve any arising issues.



## Recip-e Improves Electronic Healthcare System Performance with Proximus and Percona

In a significant case study involving Recip-e, a provider of electronic prescriptions in Belgium, and Proximus, Belgium's leading ICT service provider, Percona played a crucial role in optimizing and future-proofing Recip-e's electronic healthcare system. Tasked with the digital transformation of Belgium's healthcare system, Recip-e, in collaboration with Proximus, implemented a fully available PostgreSQL database infrastructure across two Proximus data center locations. This setup, supported and enhanced by Percona's expertise, not only improved application performance but also provided higher availability, safeguarding against potential downtime.

Percona's swift and precise support during implementation addressed critical issues, enhancing performance and ensuring a stable, highly available database setup. Continual support from Percona guarantees that Recip-e has access to responsive, expert PostgreSQL database assistance, essential for meeting the evolving needs of their healthcare provider clients and maintaining optimal system performance and availability.

### This all sounds great; how do I get started?

Getting started with Percona for PostgreSQL is designed to be as effortless and informative as possible. Whether you're looking to optimize your current PostgreSQL setup or migrate from a different database system, Percona provides clear pathways and resources to help you get started.

#### **Quickstart guide**

For those eager to dive in, our quickstart guides are the perfect first step. These comprehensive guides are crafted to help you swiftly set up and configure Percona for PostgreSQL. They offer step-by-step instructions, ensuring a smooth and efficient setup process.

Percona Distribution for PostgreSQL Quick Start Guide
Percona Operator for PostgreSQL Quick Start Guide
Percona Monitoring and Management Quick Start Guide

#### **Support and services**

For more detailed information on the various support and services available for Percona PostgreSQL, we encourage you to visit our **support and services page**. Here, you'll find a wealth of information about how Percona can assist you, from routine maintenance and troubleshooting to more complex tasks like performance tuning and high availability setups.

#### More information about Percona for PostgreSQL

If you'd like to learn more about Percona for PostgreSQL, including our commitment to providing our customers enterprise-grade PostgreSQL out of the box, click the link below.

Learn more about Percona for PostgreSQL



percona.com