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SOLUTION BRIEF

Making the Right Database Decision For Your Business

As your applications grow, the requirements and workload of your database also increases. In this solution brief, we examine which databases are best for cloud computing, and explore how to set up and manage the best DBaaS environment for your business.

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What Do You Need From Your Database?

Once you have decided to establish, or move your database in the cloud, the first issue to consider is how to pick the right database. There are a multitude of options available, from relational databases like MySQL or PostgreSQL, to non-relational choices such as MongoDB. Each will have strengths and weaknesses.

Choosing to run your database in the cloud will not make the wrong database choice into a better option. In fact, it is likely to end up costing you more over time.

You have to think about how you will run your database. Should you use your own cloud instance and an open source database that you implement from scratch? Perhaps a commercially supported open source database on your own cloud instance? Or, you might consider using database as a service (DBaaS?)

The wide range of options add another level of complexity to your decision. In these circumstances, getting the right consulting advice up-front can help you avoid much higher costs further down the line.

To find the best solution for your business, it is important you look at your application and data requirements.

Are adaptability and scalability important to you? If so, MongoDB might be the best option, as it is extremely quick to set up and has database design flexibility. MongoDB is good for iterative design processes where your needs might change over time, or where other sources of data may be added in the future.

Key Questions to Consider

- How will the new database support my application?
- How much customization will I need to do, and how much will make a difference to the application?
- How much control do I need to maintain over my data, and how much can I pass on to a third party or cloud provider?

However, due to their recent licensing change, your options around MongoDB as a managed service are very limited. If you need a DBaaS option with the same speed and service you will need to look at other databases, or offerings provided by public cloud operators.

Conversely, your data may need to be more structured. In this case you should be clear from the start which schema you intend to use. You might be receiving data from a third party, which already has its own schema in place, or you may want to use common database design best practices.

Another alternative to consider is a schema based around geospatial and location data. In this case, a relational database may be a better option than a NoSQL database. Popular choices here are MySQL and PostgreSQL. The high availability of database administrators and developers familiar with SQL means it is easy to find support for this type of database. Additionally, implementing MySQL and PostgreSQL in the cloud is relatively easy.

Whatever your database requirements, it is important that you take time to understand your data model and schema requirements upfront. This enables you to select the best possible platform for your business. Picking cloud compute services and DBaaS offerings can become a balancing act, as you may choose to base your decision on how much control you want to retain and which responsibilities you want to keep. Making the right choice helps you avoid future spending on additional resources to achieve the same results, or a potentially-costly future migration project.

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Popular Database Options

MySQL

MySQL is the world's most popular open source database. With proven performance, reliability and ease-of-use, MySQL is a popular database choice for web-based applications and is used by high profile web properties including Facebook, Twitter, YouTube, and Yahoo!

MySQL is part of the Linux, Apache, MySQL, PHP (LAMP) architecture, a combination of platforms frequently used to deliver and support advanced web applications.

Oracle drives MySQL innovation, delivering netw capabilities to power next generation web, cloud, mobile and embedded applications. MySQL is written in C and C++ and is compatible with all major operating systems.

In a nutshell:

- MySQL has the biggest install base
- It enjoys huge third party support
- There is a large and active Community
- It's easy to find experienced MySQL talent
- It is commercially backed by Oracle
- MySQL continues to release enhanced features making it future-ready and user/developer friendly.

How Percona supports MySQL users:

Percona offers Percona Server for MySQL, a free, fully-compatible, enhanced, open source drop-in replacement for MySQL. It provides excellent performance, scalability, and instrumentation. With over 5,300,000 downloads, Percona Server's self-tuning algorithms and support for extremely high-performance hardware delivers excellent performance and reliability.

Percona Server for MySQL can be easily integrated with Percona's full suite of products, including Percona Monitoring and Management, Percona XtraBackup, Percona XtraDB Cluster, Percona Toolkit and more.

Free Enterprise-Grade Features:

- Percona Server for MySQL utilizes the write-optimized storage engine, TokuDB, the only transactional storage engine for MySQL optimized for higher data compression and cost-efficient operation in the cloud and for Internet of Things (IoT) applications.
- Percona Server for MySQL includes features previously only available in Oracle's commercial MySQL Enterprise Edition,such as advanced and full-enabled external authentication, audit logging, and threadpool scalability.
- With Percona XtraBackup you can enable features unavailable to other MySQL variants. These include Fast Incremental Backups: a bitmap-based backup that creates incremental backups faster than MySQL Enterprise Backup.

Percona offers expert Support, Consulting and Managed Services to organizations who use any variation of MySQL.

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MongoDB

MongoDB is a general purpose, document-based, distributed database built for modern application developers and the cloud. It stores data in JSON-like documents. MongoDB offers a comprehensive suite of tools to make working with data easier.

MongoDB has more than 15,900 customers in more than 100 countries. The MongoDB database platform has been downloaded over 80 million times and there have been more than 1 million MongoDB University registrations.

In a nutshell:

- Growth continues to be steady - however, most new growth is in Atlas
- There is debate over whether SSPL is really open source
- It's great for developers
- Solid for use in game development and mobile applications
- The document design stored in BSon integrates nicely
- On the negative side, Enterprise version pricing is becoming increasingly expensive

How Percona supports MySQL users:

Percona created Percona Server for MongoDB, a free and open-source drop-in replacement for MongoDB Community Edition. It combines all of the features and benefits of MongoDB Community Edition with enterprise-class features from Percona.

Built on the MongoDB Community Edition, Percona Server for MongoDB provides flexible data structure, native high availability, easy scalability, and developer-friendly syntax, all for free. With over 530,000 downloads, the Percona Server for MongoDB community is vibrant and growing.

Key Benefits:

- Excellent for mobile apps, product catalogs, Internet of Things devices, and countless other use cases.
- Includes an in-memory engine; hot backups; LDAP authentication; database auditing; and log redaction.
- New code releases and MongoDB technical insight from our professional services team are regularly published on the Percona Database Performance Blog.

Additionally, Percona Backup for MongoDB offers an alternative for users who don't want to pay for MongoDB Enterprise and Ops Manager but still want a fully supported community backup tool. With an easy command-line interface, it allows you to perform consistent backup/restore of clusters and non-sharded replica sets, and improve cluster backup consistency. This saves you time and effort if you are implementing MongoDB backups for the first time.

Whether you're running MongoDB Community Edition, MongoDB Atlas, Percona Backup for MongoDB, Kubernetes Operator for Percona Server for MongoDB, or Percona Server for MongoDB, Percona Support for MongoDB offers a comprehensive, responsive, and cost-effective plan to help your organization's MongoDB deployment succeed. Percona also offers expert MongoDB Consulting and Managed Services to help with your MongoDB deployment and ensure optimal ongoing performance.

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PostgreSQL

PostgreSQL is a powerful, open source object-relational database system that uses and extends the SQL language, and includes many features to safely store and scale even the most complicated data workloads.

PostgreSQL has earned a strong reputation for its proven architecture, reliability, data integrity, robust feature set, extensibility, and the dedication of the open source community. It runs on all major operating systems, is ACID-compliant, and has many innovative add-ons.

Able to handle all levels of workload with thousands of tools, extensions, connectors and community-contributed add-ons, PostgreSQL is a popular choice for Oracle database migration. Designed to be developer-friendly, it has support for special data types, a robust procedural language, and special functions, making it easy to expand to fit any environment or need.

In a nutshell:

- Relatively easy to learn and run
- Robust, powerful and highly available
- There is still a lack of available PostgreSQL talent
- Many extensions and add-ons available
- Strong and enthusiastic community support
- A great option for users looking to migrate from Oracle

How Percona supports PostgreSQL users:

Percona Distribution for PostgreSQL delivers a single source that provides an enterprise-grade, open-source installation of PostgreSQL Core Distribution. This means you don't need to find your own solutions for common requirements, such as high availability and backup.

The PostgreSQL server has many features, but it doesn't meet all the needs of a modern enterprise. The community has built many extensions and add-ons to fill in these gaps. However, these often overlap or provide similar functionality to one another which can lead to confusion and possible incompatibility when using combinations of tools together.

Companies need a way to guarantee that the tools, add-ons, and extensions they require are going to work together, are easy to deploy, are certified, and supported by a trusted vendor.
Installing Percona Distribution for PostgreSQL offers a complete package for PostgreSQL that meets the needs of all companies. It provides:

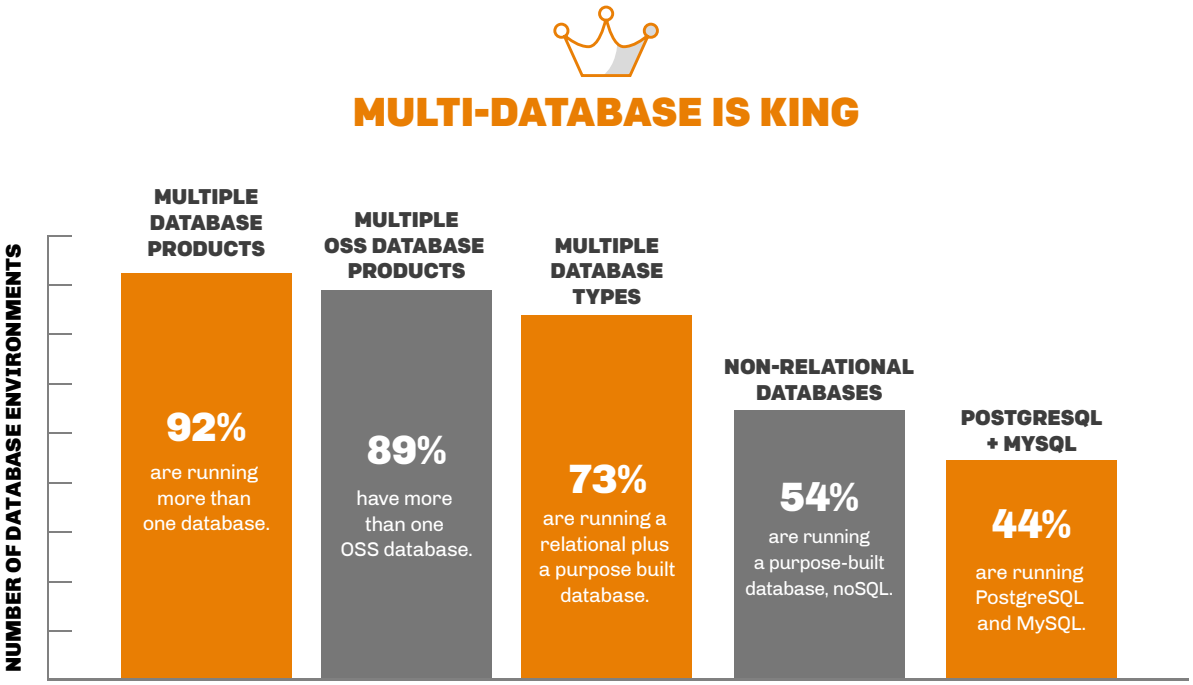
- PostgreSQL Core Distribution version 11.5
- pg_repack extension to enable altering tables without locks
- pgaudit to provide a complete trail of session and/or object-level changes
- pgBackRest for safe and secure backup and restore functionality
- Patroni for a tested solution for high availability (HA)

Whether you're running Percona Distribution for PostgreSQL or another PostgreSQL distribution, Percona offers a comprehensive, responsive, and cost-effective Support plan to help your organization's deployment succeed. Percona also offers expert PostgreSQL Consulting services to help with your deployment and ensure optimal ongoing performance.

Hybrid Database and Cloud Options

It is also worth noting that these days, choosing just one database isn't enough. The market is evolving rapidly with multi-database, hybrid private/public and multiple clouds all becoming common. Businesses want their data to be secure but also portable, with less risk of vendor lock-in.

It is unlikely that a single database will meet all of your demands. Complex, multi-platform databases are the future according to our latest survey.



So when selecting your database you should consider the specific tasks required of it, and how it might interact with the other databases you run. You also need to ensure that your staff are fully up-to-speed and able to understand, operate, optimize and fix each different technology.

The Emergence of DBaaS

Database as a Service (DBaaS) is the commoditization of databases as a service. DBaaS offerings are available on demand and usually paid for by a monthly or annual fee, based on usage. The vendor completely manages the service so that (in theory) you don't need to maintain, upgrade or administer your database. According to a recent report, the Cloud Database and DBaaS market worldwide is projected to reach over US$320 Billion by 2025.

There are many advantages to this model, including not being responsible for installing or maintaining your software. However, you might find yourself scaling by credit card and losing control over performance and database optimization. You can read our recent white paper 'What is Fully Managed in the Cloud' to find out more about these specific risks.

What Does a Fully Managed DBaaS Offering Really Mean?

It is important to realize that although vendors claim to offer a 'fully managed' DBaaS service, these often fall short.

Cloud providers are an excellent resource for creating and maintaining cloud database infrastructure, but they rarely provide the necessary technical expertise to get the best business value out of your database. It is ultimately your responsibility to develop, implement, and optimize the architecture that best serves your business goals.

Selecting the most suitable database technologies and cloud providers to achieve business success is crucial. Businesses are looking for the best database solutions at the right price, but having so many options can be confusing.

Our latest solution brief addresses this issue, comparing the "fully-managed" offerings of Percona Managed Database Services and Amazon Aurora. We examine the tasks that you should take responsibility for, in order to get the best possible performance from your data.

Conclusion

Choosing the right database is rarely simple. You need to carefully consider your requirements, as well as the configuration of the data you are processing. You should assess whether your business needs are best met by adopting a multi-database strategy, which may incur additional costs and involve expert advice from third parties.

Along with your database choices, you should also decide the best location for your database.

Throughout this solution brief we have suggested resources or links to help inform you of the possible options and pitfalls. Some more examples are below, but please also feel free to browse the white papers, solution briefs, webinars, and blogs on percona.com for more insight:

- White Paper: Why Cloud is Right for Your Next Database Project
- Webinar: Choosing the Right Open Source Database

As a market-leading, unbiased, open source database expert, Percona provides support, consulting, managed services, training, and software for on-premises, cloud-based and hybrid open source databases.

Percona has a long history of solving complex database problems for a wide variety of users and customers. You can feel confident that we will support you regardless of your database software or location; ensuring that you get the very best performance from your data.