Introduction to Databases

- MySQL
- PostgreSQL
- SQL SERVER
- Comparison between MySQL, PostgreSQL and SQL SERVER

MySQL

- MySQL is a relational database management system (RDBMS) based on the SQL (Structured Query Language) queries. It is one of the most popular languages for accessing and managing the records in the table. MySQL is open-source and free software under the GNU license. Oracle Company supports it.

➢ Features:

- Relational Database Management System (RDBMS)
- Fast, flexible, and easy to use
- Secure
- Client/ Server Architecture
- Free to download
- Scalable
- High performance and productivity...

PostgreSQL

- It is one of the most popular databases supporting JSON (non-relational) queries and SQL for (relational) queries. PostgreSQL is an **object-relational database management system (ORDBMS)**. It contains the various advanced data types and robust feature sets, which increase the extensibility, reliability, and data integrity of the software.

➢ Features:

- Compatible with various programming languages and several operation systems
- Free to download
- Compatible with Data Integrity
- Support multiple features of SQL
- Compatible with multiple data types
- Highly extensible
- Secure
- Highly Reliable

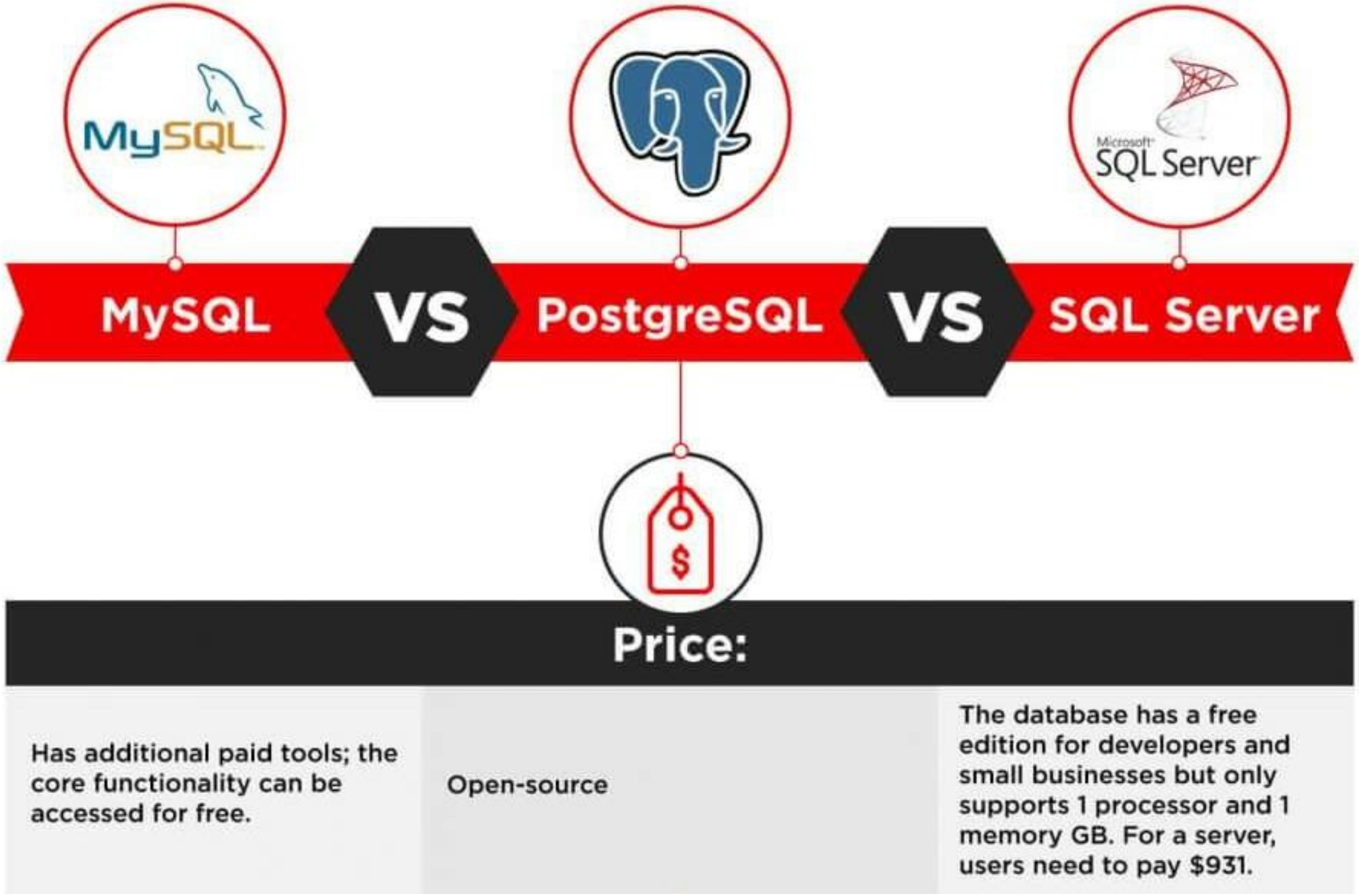
SQL SERVER

- **SQL Server** is a relational database management system (RDBMS) developed by Microsoft. It is primarily designed and developed to compete with MySQL and Oracle database. SQL Server supports ANSI SQL, which is the standard SQL (Structured Query Language) language. However, SQL Server comes with its own implementation of the SQL language, T-SQL (Transact-SQL).

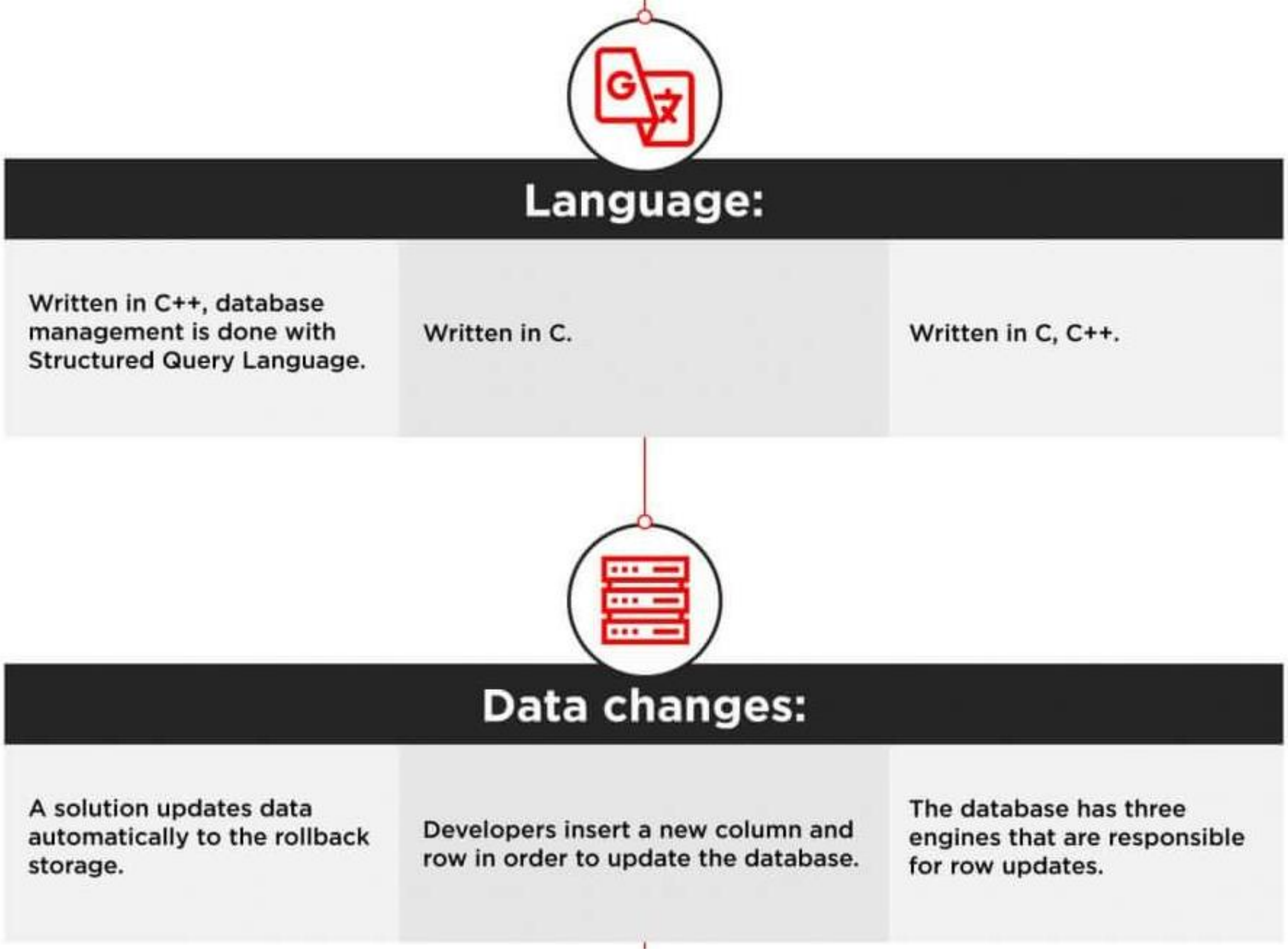
➢ Features:

- Installation of different versions on one machine
- Cost Reduction
- Maintain production, development, and test environments separately
- Reduce temporary database problems
- Separate security privileges
- Maintain a standby server

Comparison between MySQL, PostgreSQL and SQL SERVER



MySQL	PostgreSQL	SQL Server
Price:		
Has additional paid tools; the core functionality can be accessed for free.	Open-source	The database has a free edition for developers and small businesses but only supports 1 processor and 1 memory GB. For a server, users need to pay $931.

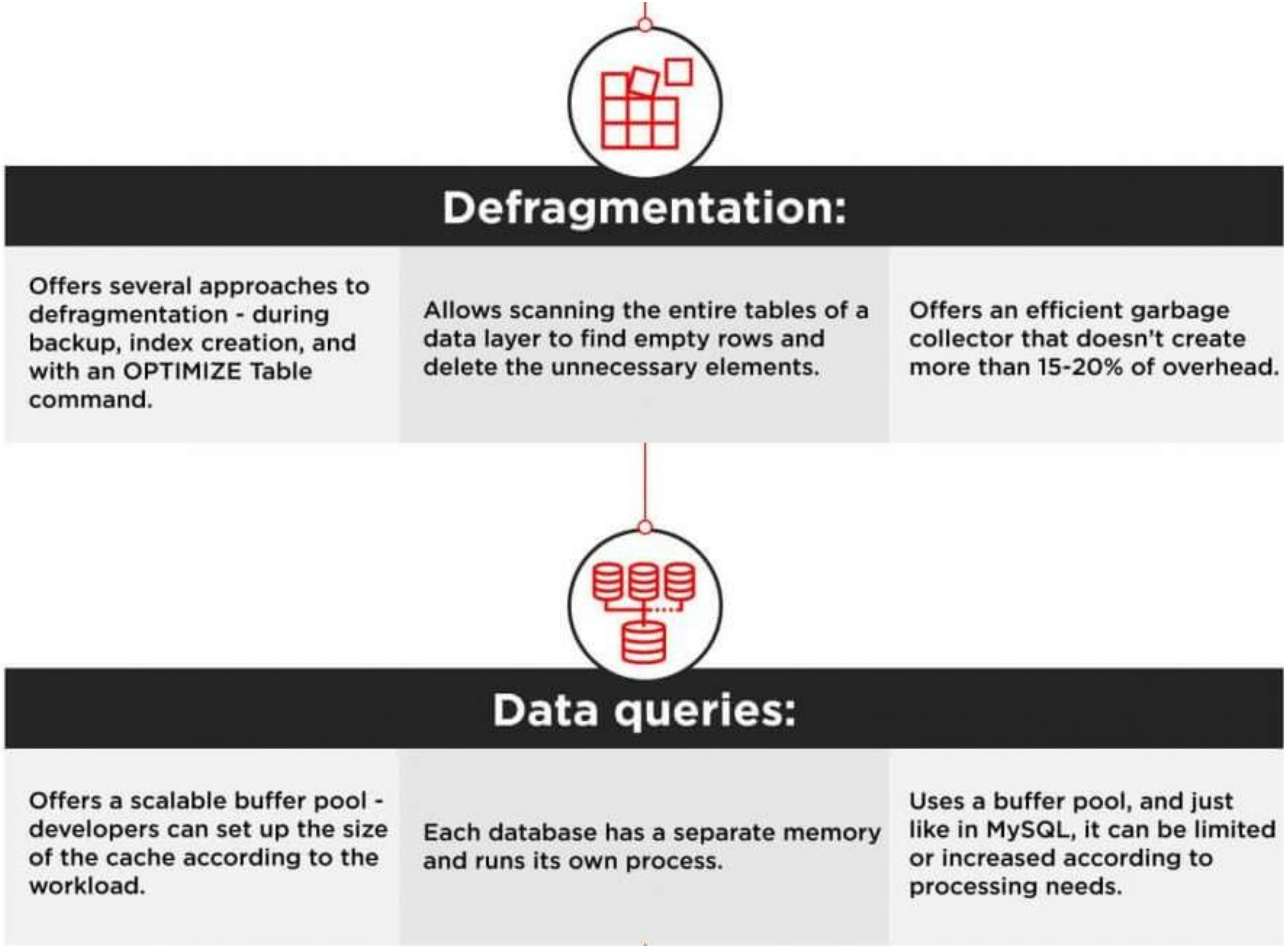


Language:

Written in C++, database management is done with Structured Query Language.	Written in C.	Written in C, C++.

Data changes:

A solution updates data automatically to the rollback storage.	Developers insert a new column and row in order to update the database.	The database has three engines that are responsible for row updates.

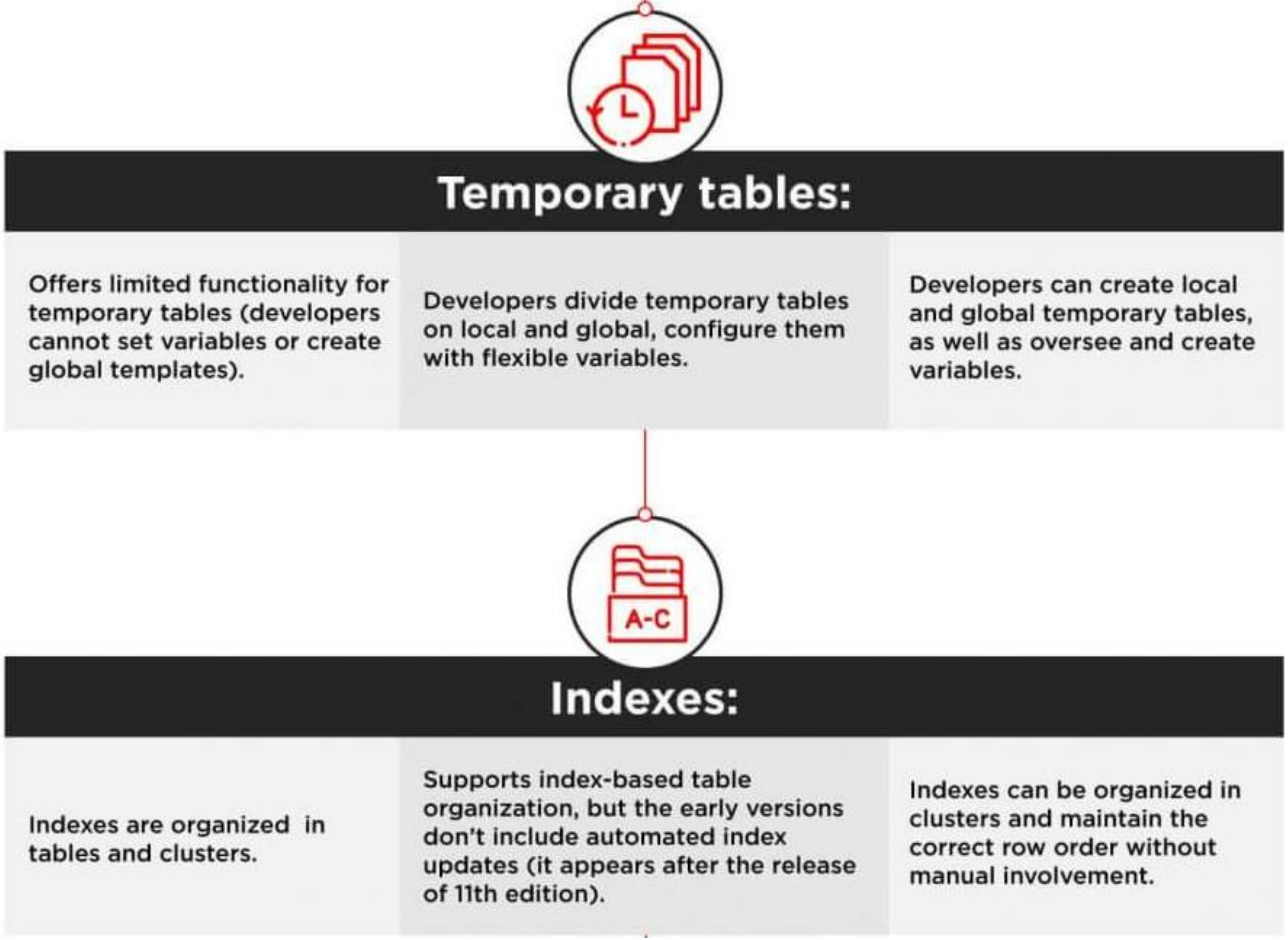


Defragmentation:

Offers several approaches to defragmentation - during backup, index creation, and with an OPTIMIZE Table command.	Allows scanning the entire tables of a data layer to find empty rows and delete the unnecessary elements.	Offers an efficient garbage collector that doesn't create more than 15-20% of overhead.

Data queries:

Offers a scalable buffer pool - developers can set up the size of the cache according to the workload.	Each database has a separate memory and runs its own process.	Uses a buffer pool, and just like in MySQL, it can be limited or increased according to processing needs.

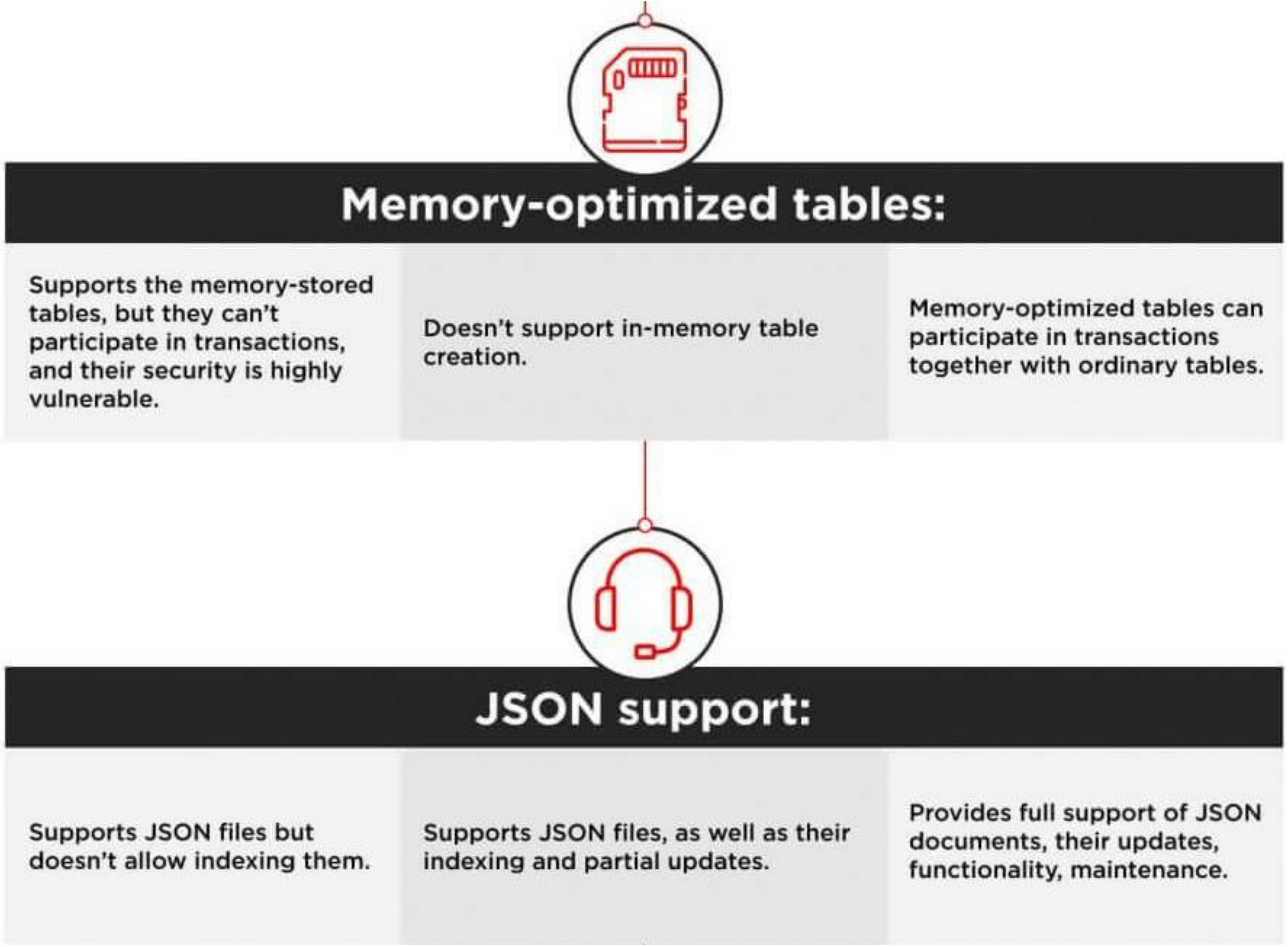


Temporary tables:

Offers limited functionality for temporary tables (developers cannot set variables or create global templates).	Developers divide temporary tables on local and global, configure them with flexible variables.	Developers can create local and global temporary tables, as well as oversee and create variables.

Indexes:

Indexes are organized in tables and clusters.	Supports index-based table organization, but the early versions don't include automated index updates (it appears after the release of 11th edition).	Indexes can be organized in clusters and maintain the correct row order without manual involvement.

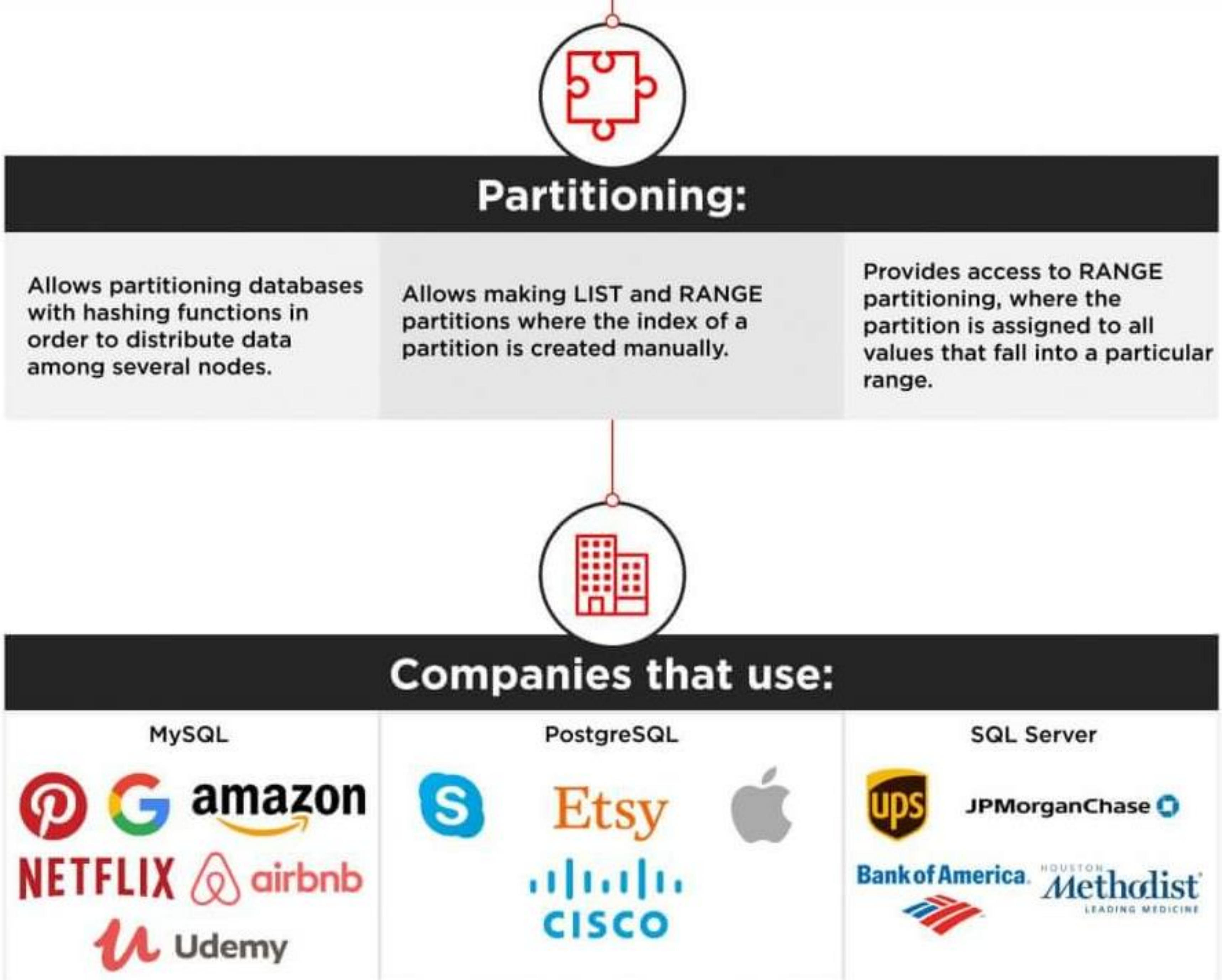


Memory-optimized tables:

Supports the memory-stored tables, but they can't participate in transactions, and their security is highly vulnerable.	Doesn't support in-memory table creation.	Memory-optimized tables can participate in transactions together with ordinary tables.

JSON support:

Supports JSON files but doesn't allow indexing them.	Supports JSON files, as well as their indexing and partial updates.	Provides full support of JSON documents, their updates, functionality, maintenance.



Partitioning:

Allows partitioning databases with hashing functions in order to distribute data among several nodes.	Allows making LIST and RANGE partitions where the index of a partition is created manually.	Provides access to RANGE partitioning, where the partition is assigned to all values that fall into a particular range.

Companies that use:

MySQL	PostgreSQL	SQL Server
amazon NETFLIX airbnb Udemy	Etsy cisco	ups JPMorganChase BankofAmerica HOUSTON Methodist LEADING MEDICINE