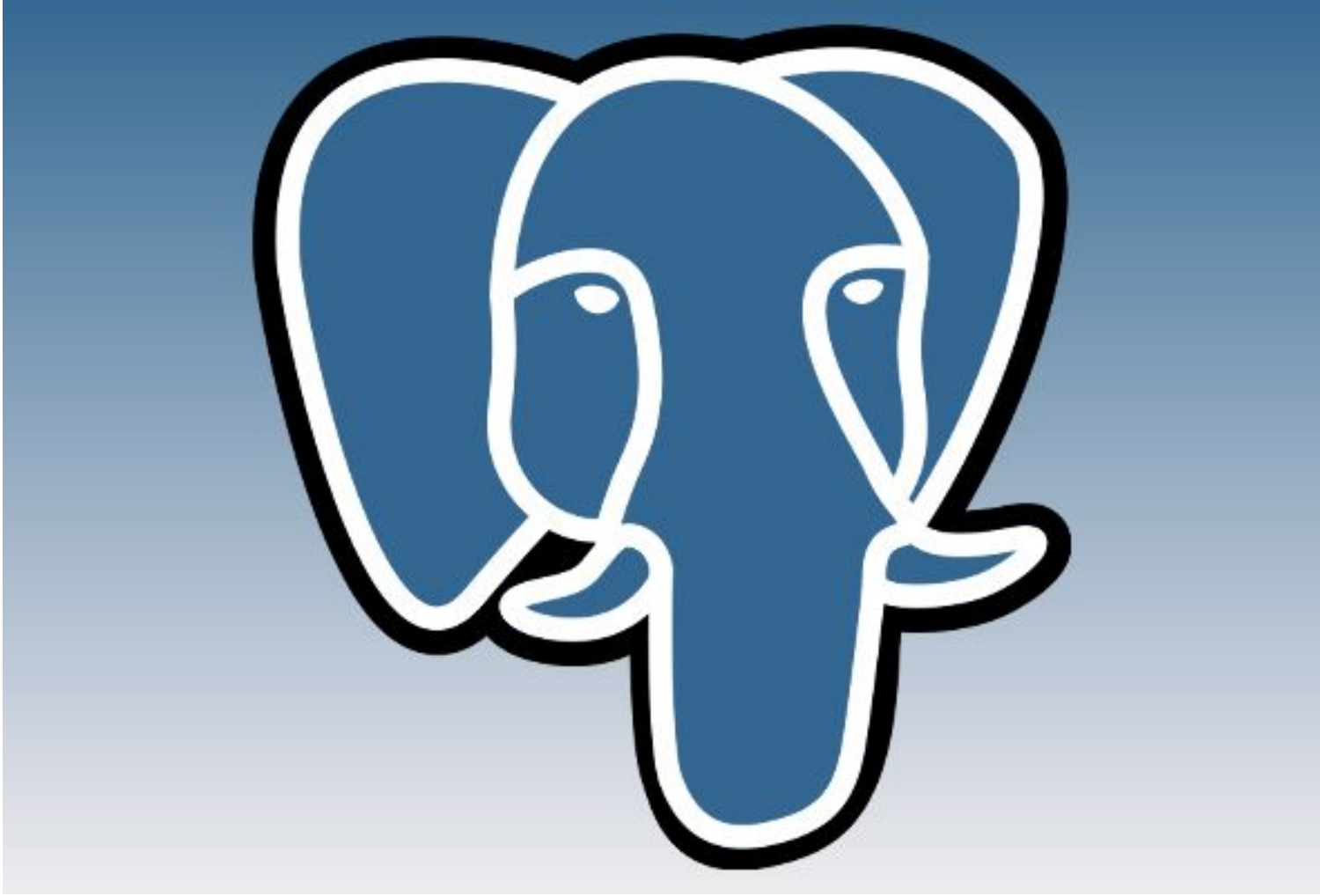

PostgreSQL in Plain English

Learn the fundamentals about “the world’s most advanced open source relational database”

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The Headline:

PostgreSQL is a powerful, free, and open-source database system built for reliability and handling massive amounts of data.

This makes it an attractive choice for companies to store everything from user accounts and customer data through to website logs. It is open-source and constantly being improved by a large community of developers.

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How Does it Work?

PostgreSQL provides a structured approach to data storage and retrieval. It stores information in tables with clearly defined rules to provide a clear and simple way for complex data to be stored and managed.

What's more, the tables have defined relationships with each other in order to make it easy to retrieve specific data points or subsets and conduct analysis across all the stored information.

This is known as an open-source relational database management system (RDBMS).

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Case Study: Securely Managing Sensitive Data with PostgreSQL

The following example revolves around customer accounts for a financial institution. While it would be up to those involved to decide how to manage the data, one potential way for the information to be sorted into tables could be:

Customers: This table stores basic information like customer IDs, names, and contact details.

Accounts: This table details account information, potentially including account numbers. It would link to the "Customers" table using a foreign key (e.g., customer ID) to connect a customer to their respective accounts.

Transactions: This table tracks financial transactions, with relevant details like transaction IDs, dates, and amounts. It could potentially link back to the "Accounts" table using a foreign key to associate transactions with specific accounts.

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What makes the postgres system so strong is the use of ‘foreign keys’.

This is because they create a web of connections between the tables enforcing data accuracy by preventing outdated/orphaned entries and reducing redundancy by referencing existing data.

This not only simplifies data management but also improves retrieval efficiency by allowing you to fetch related data from multiple tables in a single query through joins.

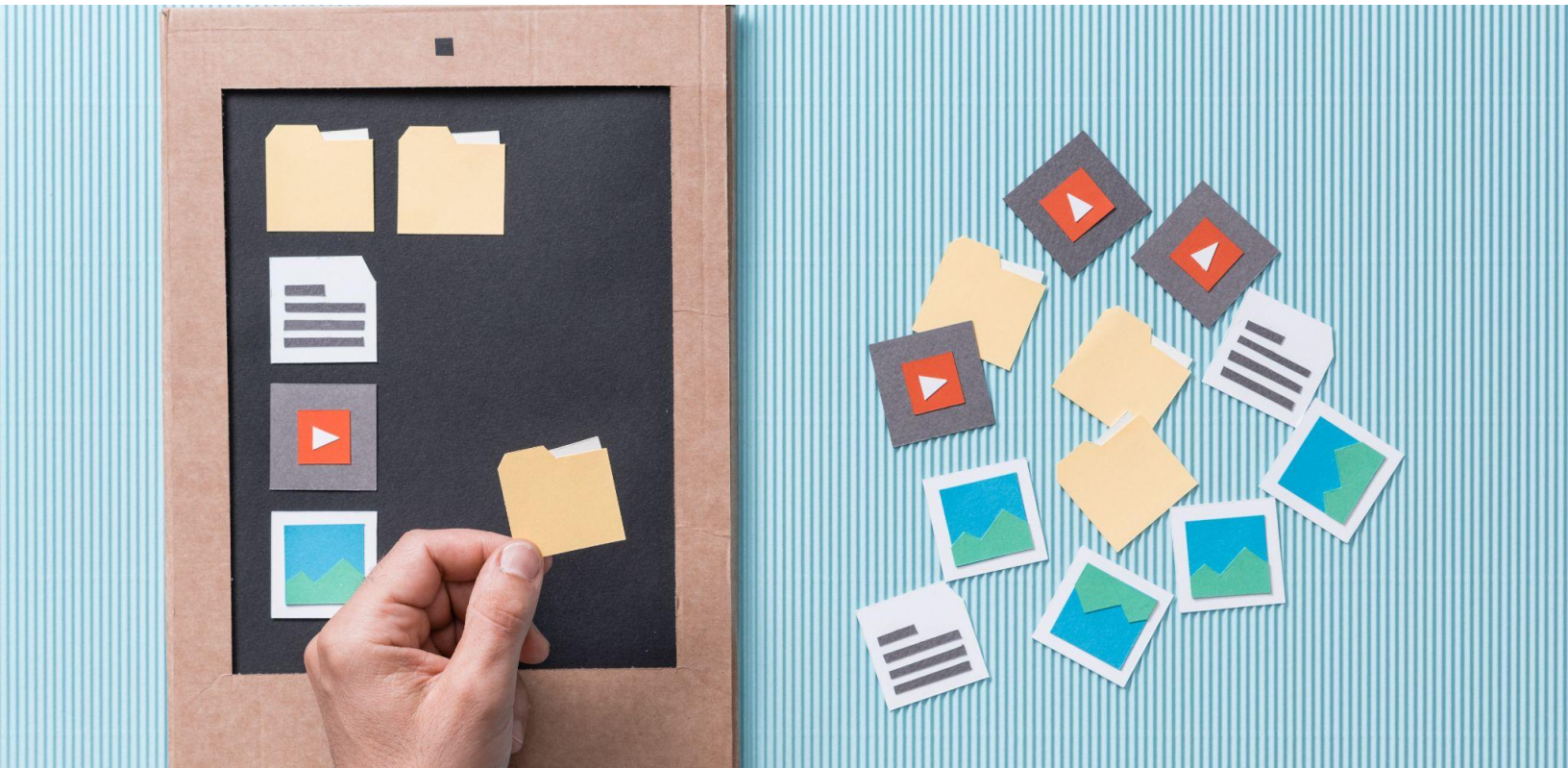
In the previous example, the "Accounts" and "Transactions" tables connect back to the "Customers" table, enabling efficient access to a customer's complete account information and transaction history.

As much of this data is sensitive and potentially regulated, it is important to safeguard it. Postgres has a number of security features built in for this, including:

Access Control: User permissions can be tightly controlled, restricting access to specific data based on an individual's role and responsibilities. Only authorized personnel would have access to sensitive fields like account numbers.

Data Encryption: Critical data fields within tables can be encrypted, adding an extra layer of security.

Auditing: PostgreSQL can log all data access attempts, providing a detailed audit trail for monitoring and compliance purposes. This allows you to track data access.



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What are the Advantages of Postgres Being Open Source?

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PostgreSQL is an Open Source database, meaning it is both free to use and free to modify the underlying code base. This does not mean it is less good than other expensive alternatives, such as Oracle or MS SQL. Merely that support for it can be purchased separately with no set charge for using it.

Indeed, it is actually one of the most advanced database engines in the world with support for many different technical services including AI, ML and SQL. What truly makes Postgres stand out and keeps it at the top of the field is that it is actively maintained with a lot of developers maintaining and extending it to keep it not just up to date with the latest advancements, but also ahead of the trends. Indeed, recent reports suggest over forty percent of PostgreSQL users with 15+ years of experience have actively contributed at least once.

As a developer myself, the core benefit to Postgres however is that the database is written entirely in the C language. This provides a faster and more stable engine due to its tight approach to memory usage and management and the fact that it runs on the computer hardware as opposed to requiring an intermediary layer.

Finally, it is simply an incredibly successful and highly used database with a huge and varied user base. This includes Apple, Netflix, Spotify and Uber as well as tens of thousands of other companies of all sizes.

Indeed, Stack Overflow named Postgres as the most used database in their annual developers survey with 45% reporting to use it compared to 41% for MySQL. As such, people know how to use it with its system being industry standard and fully embedded in people's workflows.

How Does OmniIndex Use Postgres?

PostgresBC is a web3 data platform created by OmniIndex utilizing Web3 data decentralization and immutability as well as native AI and homomorphic encryption. It is a postgres fork providing an alternative platform with the same workflow, but enhanced data security.

Furthermore, PostgresBC is the only database with native AI enabling analytics of fully encrypted data with no external data sharing or risk of exposure.

To learn more, visit the OmniIndex website.