



Introdução ao PostgreSQL

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PostgreSQL

- É um sistema gerenciador de bancos de dados objeto-relacional open-source (licença ao estilo BSD):
 - <http://www.postgresql.org>
- O código fonte do seu núcleo encontra-se escrito na Linguagem de Programação C.
- Disponível para diversas plataformas: Linux, macOS e Microsoft Windows.
- Versão que usaremos durante o curso: 14.5

Funcionalidades

- Funções (UDFs): PL/pgSQL, PL/Perl, PL/Python, PL/Tcl, C, C++, ...
- Triggers (gatilhos)
- Índices: B⁺-tree, Hash, R-Tree, GiST
- Transação e Concorrência
- Chaves estrangeiras (foreign keys)
- Tipos de dados e funções definidos pelo usuário
- hstore (key => value)
- PostGIS
- Full Text Search (FTS)
- Terminal interativo: psql
- Interface gráfica para administração: pgAdmin
- Replicação
- Segurança

História do PostgreSQL



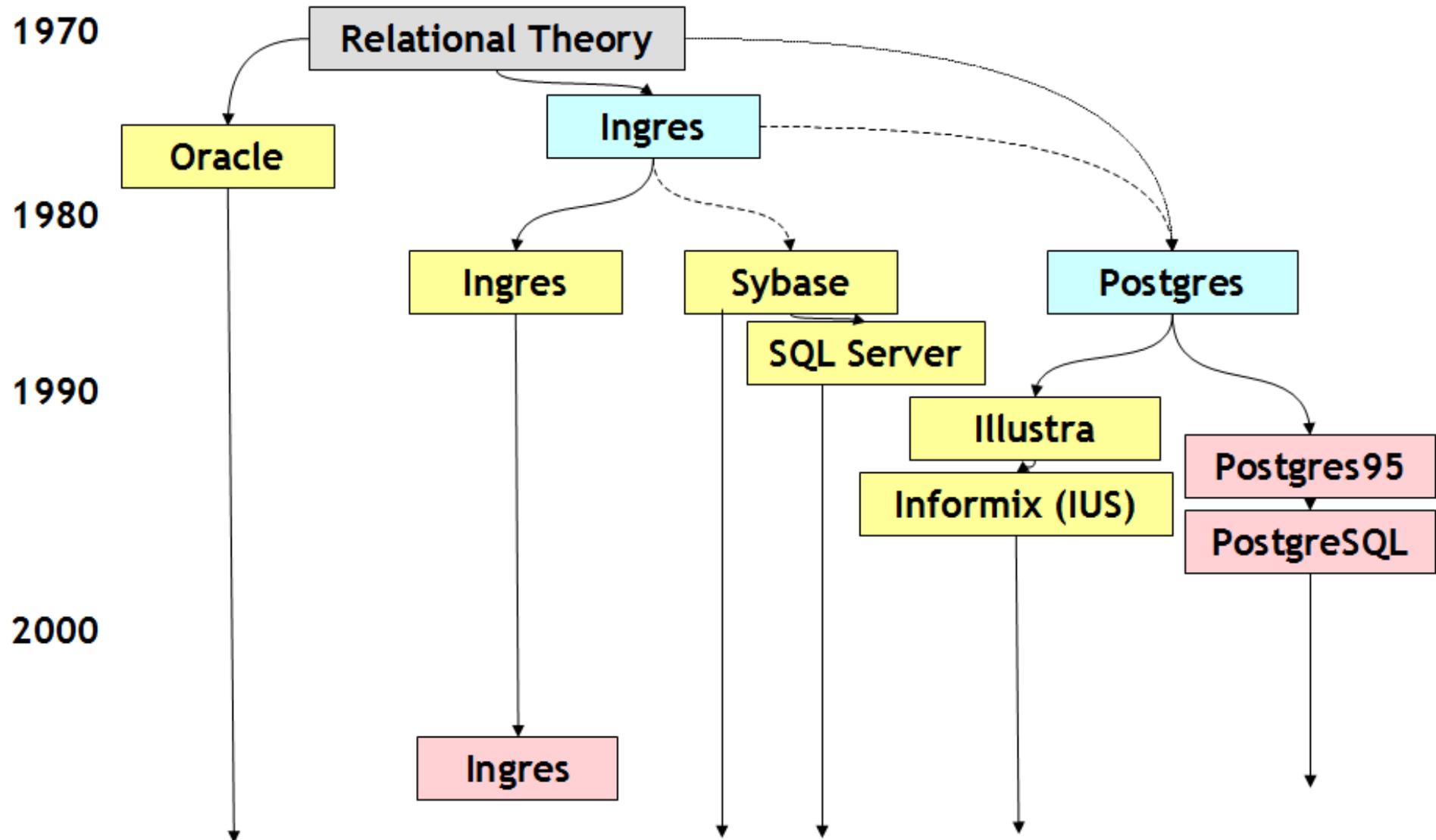
Michael Stonebraker*

Fonte: [Wikipedia](#) (2022)

*ACM Turing Award (2014)

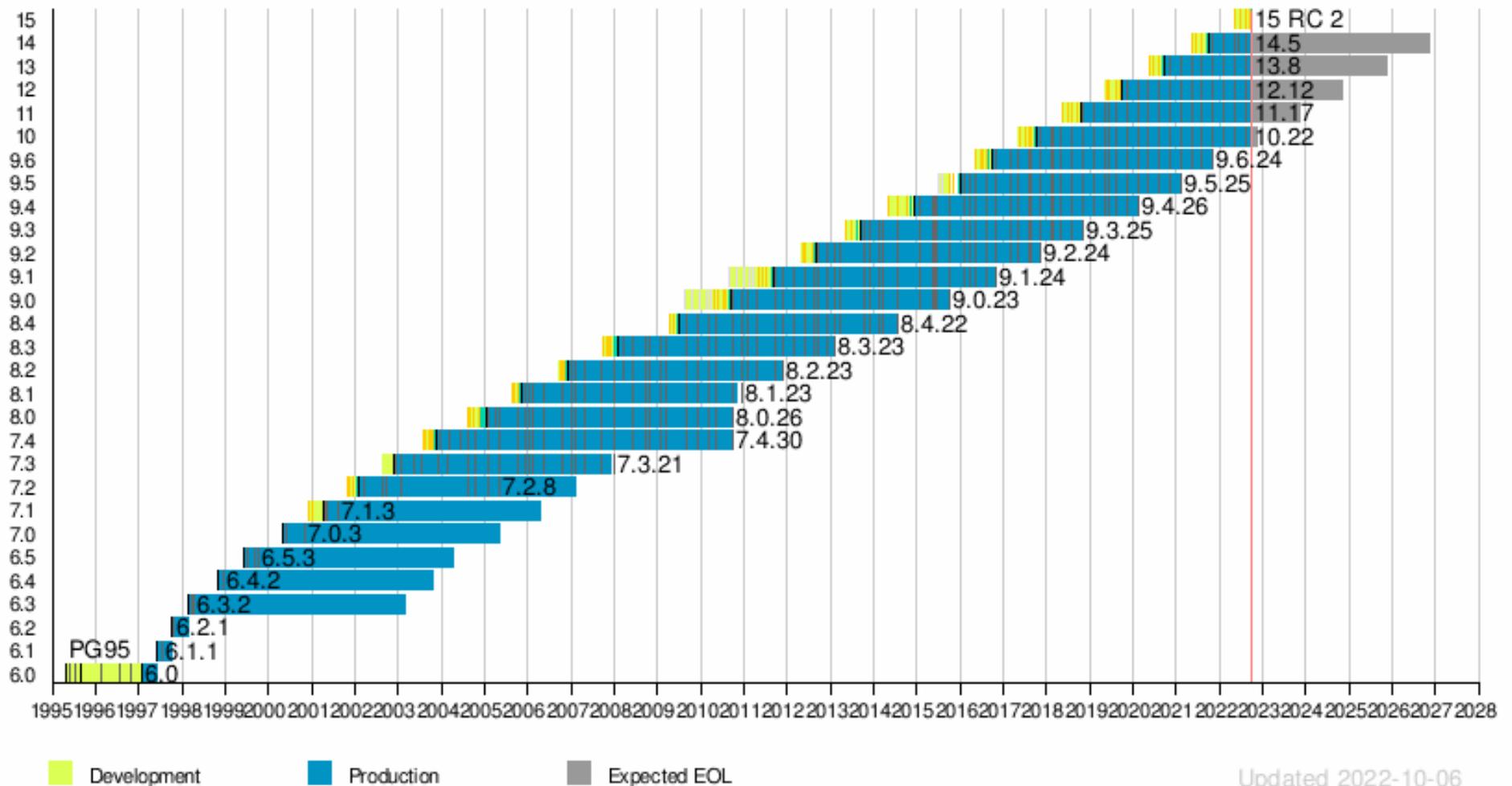
- Grupo de pesquisa em bancos de dados da Universidade Califórnia, Berkeley.
- Liderou um time de alunos de graduação que criaram implementações reais de SGBDs:
 - Ingres (1974-1984)
 - Postgres (1985-1993)
 - Cohera (1997-2001)
 - Aurora
 - C-Store (Vertica)
 - VoltDB
 - SciDB

História do PostgreSQL



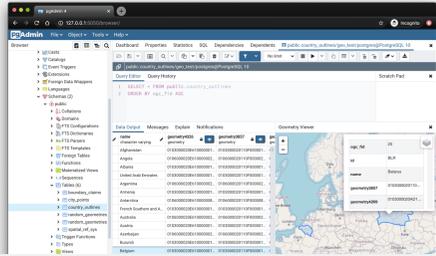
Fonte: Ramsey (2007)

Timeline – Lançamento Versões

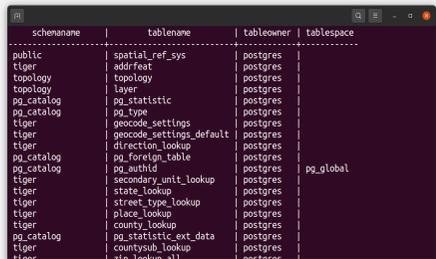


Fonte: [Wikipedia](#) (2022)

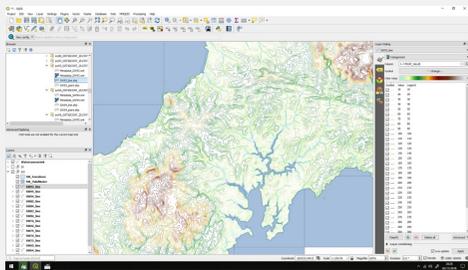
Arquitetura Cliente/Servidor



pgAdmin



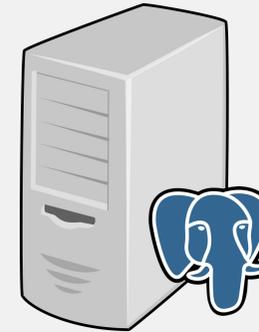
psql



QGIS

Lado Cliente

host: 10.10.1.10
port: 5432
database: bd#1
user: gilberto
password: segredo



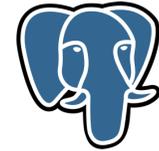
bd#1



bd#n

Lado Servidor

psql



```
root@7248baecb097:/# psql -h localhost -p 5432 -d bdgeo -U postgres
psql (14.5 (Debian 14.5-1.pgdg110+1))
Type "help" for help.

bdgeo=# SELECT * FROM pg_tables;
```

<https://www.postgresql.org>

pgAdmin



The screenshot shows the pgAdmin interface with the following components:

- Navigation Tree (Left):** Servers (1) > local-server > Databases (2) > bdgeo > Schemas (1) > public > Materialized Views.
- Top Menu:** pgAdmin, File, Object, Tools, Help.
- Top Bar:** Dashboard, Properties, SQL, **Statistics**, Dependencies, Dependents, Processes.
- Search:** Search input field.
- Table:** Active backend processes.

PID	User	Database	Backend start	Client	Application
15794			2022-10-07 11:41:07...		
15791			2022-10-07 11:41:07...		
23416	postgres	postgres	2022-10-08 17:13:39...	127.0.0.1/32:50154	pgAdmin 4 - C
15796	postgres		2022-10-07 11:41:07...		
15793			2022-10-07 11:41:07...		
15792			2022-10-07 11:41:07...		

<https://www.pgadmin.org>

DBeaver



The screenshot displays the DBeaver 22.2.1 interface for a database named 'bdgeo'. The main window title is 'DBeaver 22.2.1 - bdgeo'. The menu bar includes File, Edit, Navigate, Search, SQL Editor, Database, Window, and Help. The toolbar contains various icons for navigation and editing, along with a search icon and a refresh icon. The 'Database Navigator' on the left shows a tree view of the database structure, with 'bdgeo' selected under 'localhost:5432'. The 'Properties' panel on the right shows the following configuration:

- Name: bdgeo
- Default Encoding: UTF8
- Collate: (empty)
- DBA: postgres
- Ctype: (empty)
- Default Tablespace: pg_default
- Description: (empty)
- Connection Limit: 0
- Template:
- Allow Connect:

The 'Schemas' table below the properties panel shows the following data:

Name	Comment
public	standard public schema

The 'Project - General' panel at the bottom left shows a table with columns 'Name' and 'DataSource', containing 'Bookmarks', 'Diagrams', and 'Scripts'. The bottom status bar shows '1 items', 'BRT', and 'en_US'.

<https://dbeaver.io>

Instalando o PostgreSQL

Estrutura Servidor

Considerações Finais

Considerações Finais

- Visão geral das principais funcionalidades do PostgreSQL.
- Breve histórico sobre o desenvolvimento do PostgreSQL.
- Conexão ao servidor.
- Ferramentas clientes.