

The Advantages of PostgreSQL

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POSTGRESQL offers companies many advantages that can help their businesses thrive.

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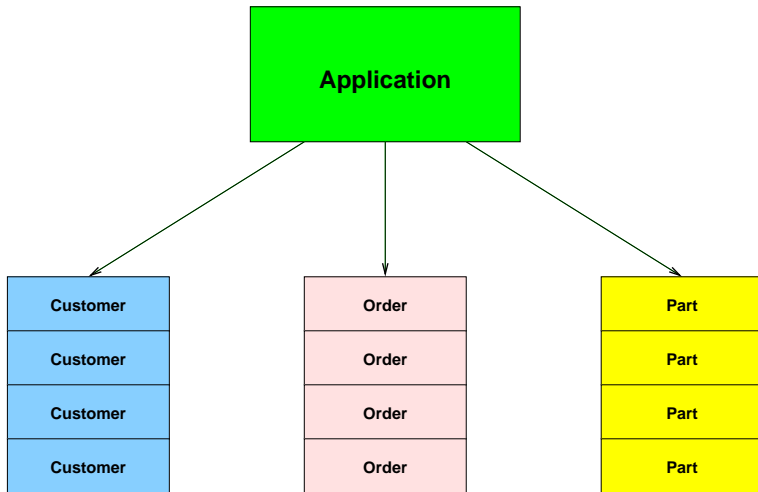
Last updated: November 2021

Introduction

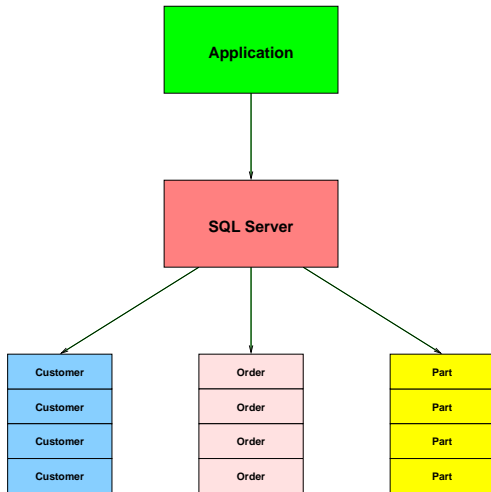
- Why use databases?
- Why use open-source?
- PostgreSQL history
- PostgreSQL in the real world

Why use databases?

Non-SQL Database Applications



SQL Database Applications



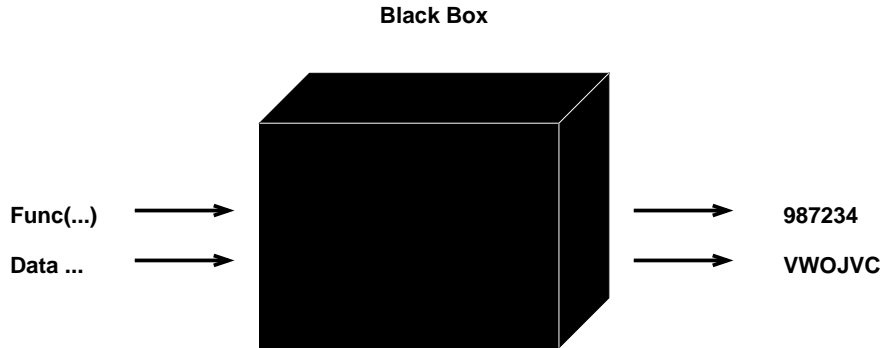
Database Transaction Protection (ACID)

- Multiple changes either all take place, or none of them
- Data always in a consistent state
- In-process changes invisible to outside users
- Data reliably stored

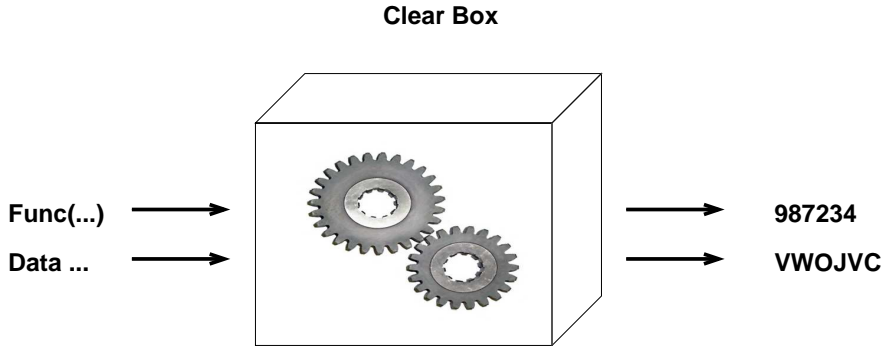
- High level of concurrency and reliability

Why use Open Source Software?

Closed-Source Software




Open-Source Software



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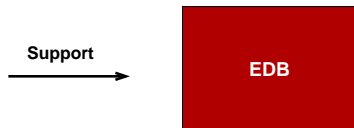
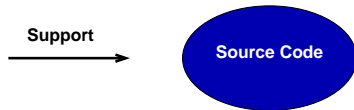
Support of Close-Source Software

Support

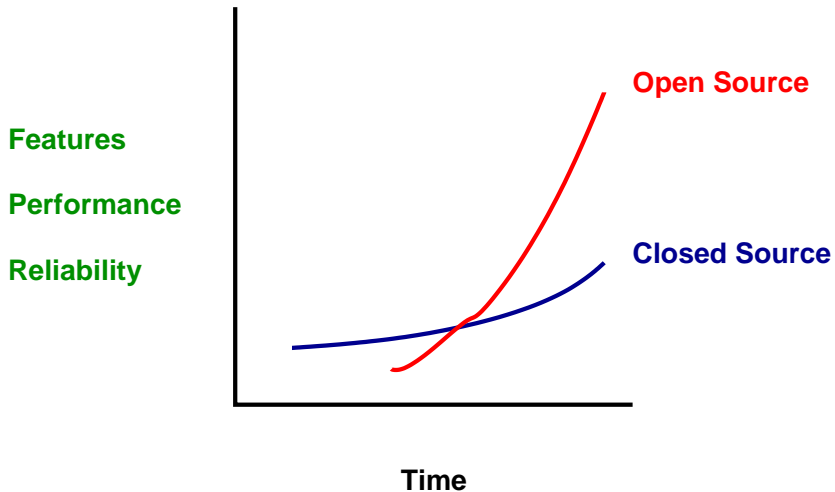


Database
Company

Support of Open-Source Software



The Future of Open Source



PostgreSQL License

Use for any purpose, including sale of customized versions with your closed-source modifications. PostgreSQL supports custom:

- Functions
- Operators
- Data Types

PostgreSQL History

The University of California at Berkeley





Michael Stonebraker



Jolly Chen and Andrew Yu

PostgreSQL Code Base History

- Ingres — research prototype, spawned Relational Technologies, purchased by Computer Associates
- Postgres — research prototype, spawned Illustra, purchased by Informix
- Postgres95 — added SQL, spawned PostgreSQL

PostgreSQL Through the Years

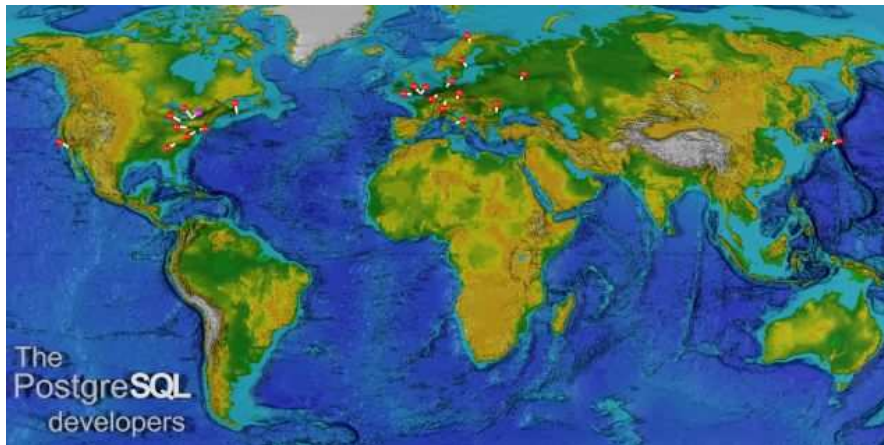
1977–1985 Ingres

1986–1994 Postgres

1994–1995 Postgres95

1996– PostgreSQL

Developer's Globe



PostgreSQL Core Team



Top row: Thomas Lockhart, Jan Wieck, Tom Lane, Marc Fournier
Bottom row: Vadim Mikheev, Bruce Momjian

Release Dates and Sizes

| Date | Release | Lines of code |
|------------|---------|---------------|
| 1994 | | 244,581 |
| 1996-08-01 | 1.02.1 | |
| 1996-10-27 | 1.09 | 178,976 |
| 1997-01-29 | 6.0 | |
| 1997-06-08 | 6.1 | 200,709 |
| 1997-10-02 | 6.2 | 225,848 |
| 1998-03-01 | 6.3 | 260,809 |
| 1998-10-30 | 6.4 | 297,918 |
| 1999-06-09 | 6.5 | 331,278 |
| 2000-05-08 | 7.0 | 383,270 |
| 2001-04-13 | 7.1 | 410,500 |
| 2002-02-04 | 7.2 | 394274 |
| 2002-??-?? | 7.3 | 453282 |

PostgreSQL Releases

Release 1.02

Date: 1996-08-01

- Initial release by PostgreSQL Global Development Team
- Apply all outstanding email patches.

PostgreSQL Releases (Continued)

Release 1.09

Date: 1996-11-04

- Fixes for server and command failures.

PostgreSQL Releases (Continued)

Release 6.0

Date: 1997-01-29

- Unique indexes
- GIST added
- Improved authentication
- IN/BETWEEN added

PostgreSQL Releases (Continued)

Release 6.1

Date: 1997-06-08

- New data types: DATETIME, TIMESPAN, CIRCLE
- GEQO
- Improved optimizer statistics
- Libpq++ overhauled
- Multi-column btree indexes
- new SET/SHOW/RESET commands
- New SEQUENCE feature

PostgreSQL Releases (Continued)

Release 6.2

Date: 1997-10-02

- New Java JDBC driver
- Triggers added
- Server Programming Interface (SPI) added
- NOT NULL constraint
- DEFAULT and CONSTRAINT added
- ANSI functions added for DATE/TIME and PRECISION

PostgreSQL Releases (Continued)

Release 6.3

Date: 1998-03-01

- Subselcts
- Unix domain socket support for performance
- Improved user password configuration
- Much improved documentation
- Separate permissions for VIEWS
- PRIMARY KEY support
- PL/TCL procedural language added
- UNION added
- Python added
- ECPG added
- New ODBC driver
- Pgaccess added

PostgreSQL Releases (Continued)

Release 6.4

Date: 1998-10-30

- Improved RULES and VIEWS
- PL/PgSQL added
- Multi-byte character support
- Internet address data types
- HAVING added

PostgreSQL Releases (Continued)

Release 6.5

Date: 1999-06-09

- MVCC
- Live backups
- NUMERIC data type
- Temporary tables
- CASE
- INTERSECT
- EXCEPT
- LIMIT/OFFSET
- SELECT...FOR UPDATE
- Optimizer overhaul

PostgreSQL Releases (Continued)

Release 7.0

Date: 2000-05-08

- Foreign keys
- More optimizer improvements
- ANSI JOIN syntax
- PL/Perl
- Oracle compatibility functions

PostgreSQL Releases (Continued)

Release 7.1

Date: 2001-04-13

- Write-ahead Log (WAL)
- TOAST
- Outer Joins
- Overhauled function manager

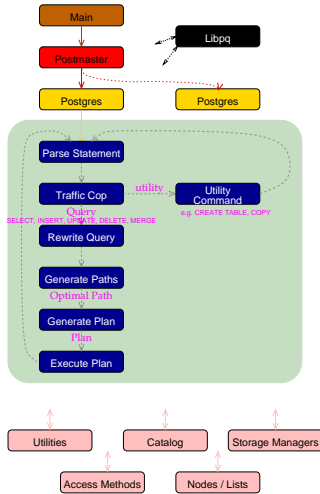
PostgreSQL Releases (Continued)

Release 7.2

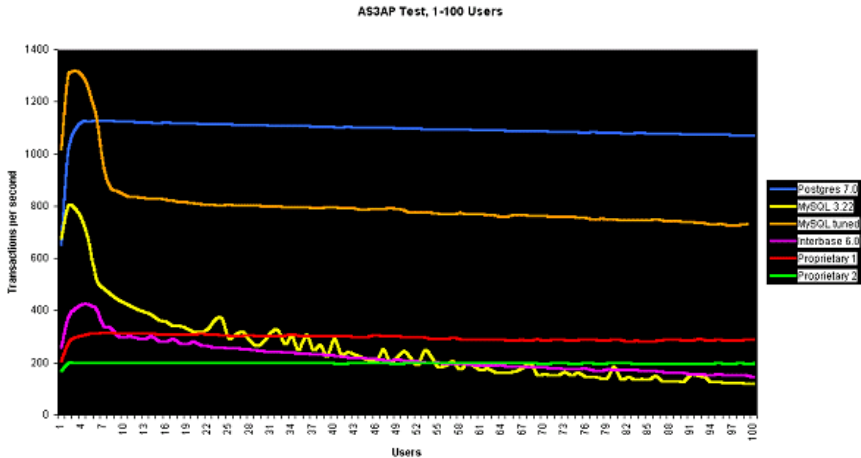
Date: 2001-12-??

- Non-locking VACUUM
- Fix for Transaction id / OID wraparound
- Security fixes
- Optimizer improvements
- Error message internationalization

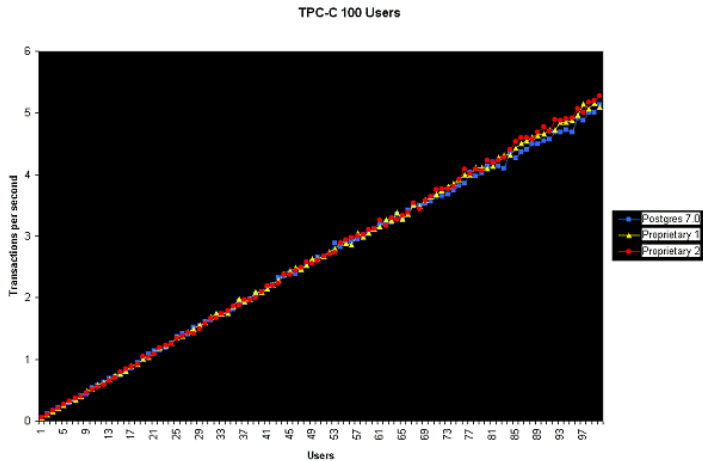
Internals Flowchart



Performance - AS3AP



Performance - TPC-C



PostgreSQL in the Real World

Database Migration

- Oracle
- IBM's DB2
- Microsoft-SQL
- Microsoft Access
- Informix
- Interbase
- Dbase/FoxPro
- MySQL

Database Languages

- C
- C++
- Embedded C
- Java
- Perl
- Python
- Tcl/Tk
- Php
- Odbc

PostgreSQL Platforms

| | |
|---------|-----------------|
| AIX | NetBSD |
| BeOS | OpenBSD |
| BSD/OS | SCO UnixWare |
| FreeBSD | Solaris |
| HP-UX | SunOS |
| IRIX | Tru64 |
| Linux | Windows NT/2000 |
| MacOS | |

PostgreSQL Usage

- Order Entry, Inventory, Billing
- Customer Relations Management (CRM)
- Data warehouse, data analysis
- Medical/Hospital Records Storage
- Genetics
- Financial Accounting, Banking, Payroll
- Military
- Government, Social services, Elections
- Education
- Publishing
- Geography (GIS)
- Hotel Reservations, Restaurants
- Telephone billing, call tracking
- Helpdesk problem report tracking
- Sales Tracking
- Business to business commerce

PostgreSQL Web Site Usage

- Product purchase
- User preferences
- Job listings
- Auctions
- Real Estate listings
- Community building
- Dynamic content
- Text indexing

Future Directions



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Conclusion



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