

PostgreSQL Community

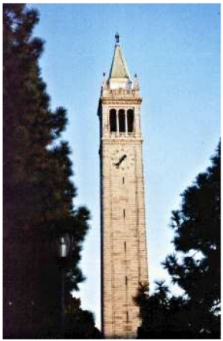
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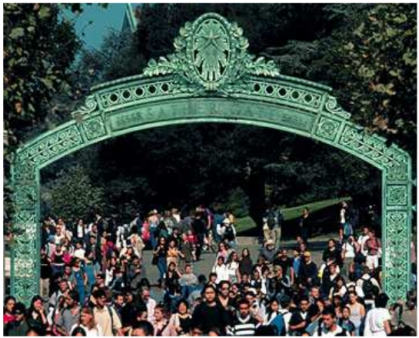
AWS
May 02, 2024

PostgreSQL Community

- History
- Community
- Development Process
- Contribution
- PostgreSQL 17 and Beyond

University of California Berkeley





Courtesy: Bruce Momjian

History: INGRES

- 1974 – 1985: University INGRES
  - INteractive Graphics REtrieval System
  - Prototype of a relational DBMS
  - University of California at Berkeley
  - Prof. Stonebraker
  - Spawned commercial databases: Sybase, MSSQL, NonStop SQL, others
- 1980 – Present: Commercialization
  - Commercial success
  - Relational Technologies $\Rightarrow$ Ingres Corp.
    $\Rightarrow$ Computer Associates $\Rightarrow$ Ingres Corp. $\Rightarrow$ Actian
- 2006 – Present: Open Source



History: POSTGRES

- 1986 – 1994: University POSTGRES
  - ”Post Ingres”
  - University of California at Berkeley
  - Prof. Stonebraker
  - Prototype of an object-relational DBMS
  - POSTQUEL query language
  - Spawned commercial databases: Illustra $\Rightarrow$ Informix, others

History: PostgreSQL

- 1994 – 1995: Postgres95
  - University of California at Berkeley
  - Andrew Yu and Jolly Chen
  - Conversion to SQL
  - More liberal license
- 1996 – present: PostgreSQL
  - Open-source project
  - PostgreSQL Global Development Group
  - Spawned many derived products

Originators

Postgres



Michael Stonebraker

Postgres95



Jolly Chen and Andrew Yu

Courtesy: Bruce Momjian

First Core Team + Jolly and Andrew



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

PostgreSQL 10 Year Anniversary Summit - 2006



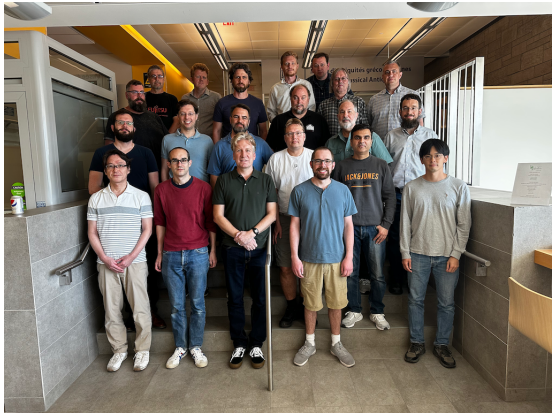
Courtesy: Alvaro Herrera

First PGCon - 2007



Courtesy: Michael Glaesemann

Most Recent PGCon Developer Meeting - 2023



Courtesy: Dave Page

PostgreSQL Community

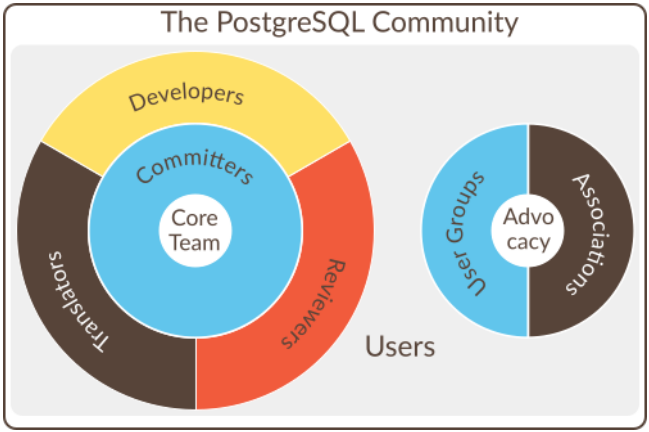


Diagram Courtesy of Lætitia Avrot

PostgreSQL Versioning

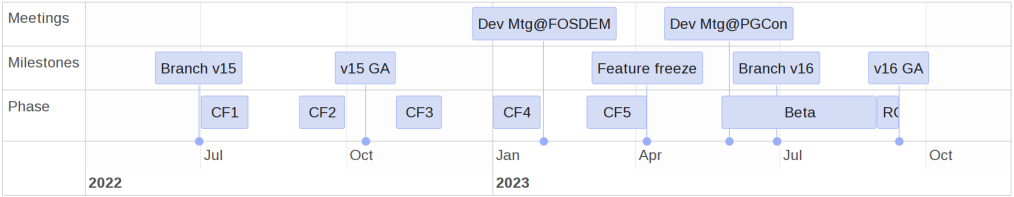
- Old Versioning scheme
  - Up to version 9.6
  - Three segments
  - Major X.Y (e.g. 9.6)
  - Minor X.Y.Z (e.g. 9.6.8)
- New Versioning scheme
  - Starting with version 10
  - Only two segments
  - Major X (e.g. 16)
  - Minor X.Z (e.g. 16.1)

PostgreSQL Supported Releases

- Major versions are supported by the community for about 5 years
- Support Matrix

Vers	First Minor Release	Final Minor Release
v16	September 14, 2023	November 9, 2028
v15	October 13, 2022	November 11, 2027
v14	September 30, 2021	November 12, 2026
v13	September 24, 2020	November 13, 2025
v12	October 3, 2019	November 14, 2024
v11	October 18, 2018	November 9, 2023
v10	October 5, 2017	November 10, 2022

PostgreSQL Development Cycle



Commitfests

- Commitfest App
- CF-entries:
  - Patch or set of patches
  - Implements some goal
  - Proposed for inclusion
  - One or more authors/reviewers
  - Examples: new feature, bugfix, refactoring, improved docs

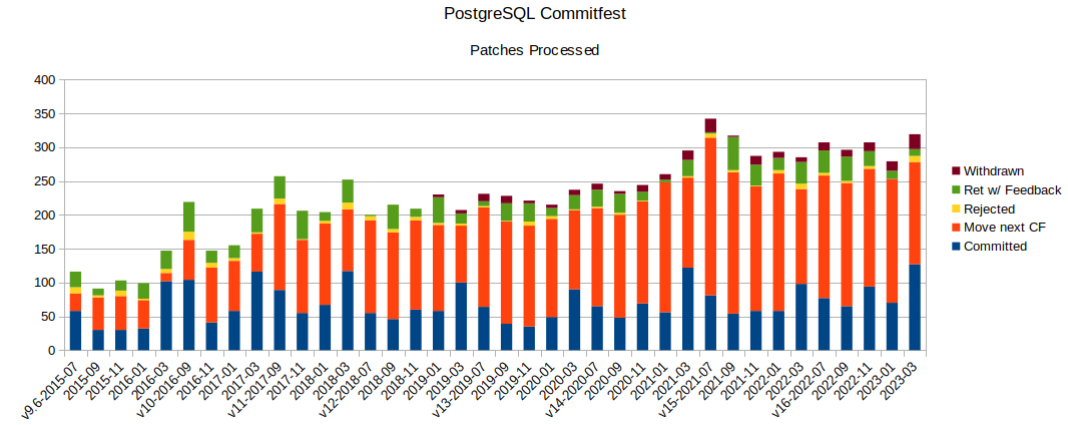
Commitfests

- Goals:
  - Patches do not get lost
  - Reviewers/committers can quickly find patches deserving attention
  - Single place tracking discussion and documenting state of CF-entries
  - Encourage:
    - people review other people's patches
    - review patches proportionally to patches submitted

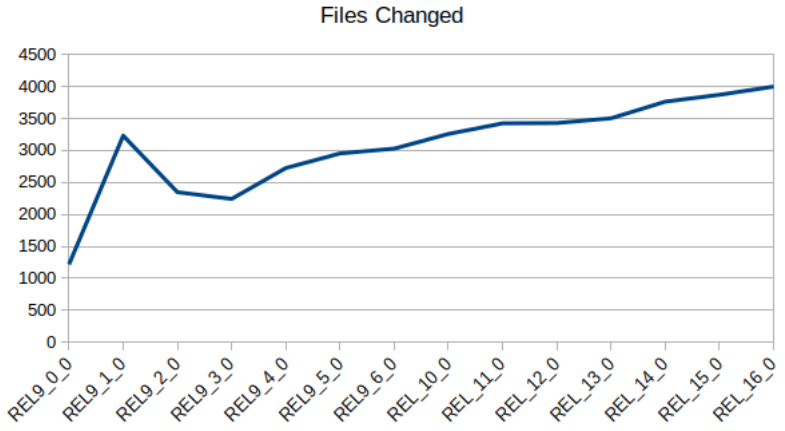
Commitfests

- Last Commitfest:
  - CF before the expected feature freeze date
  - Extra restrictions:
    - No nontrivial CF-entries unless previously submitted to earlier CF
    - CF-entries deemed unlikely to finish in last CF aggressively be moved early

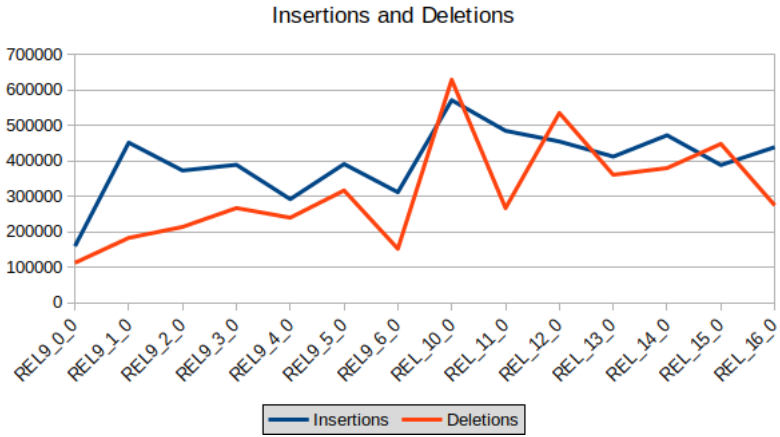
Commitfests



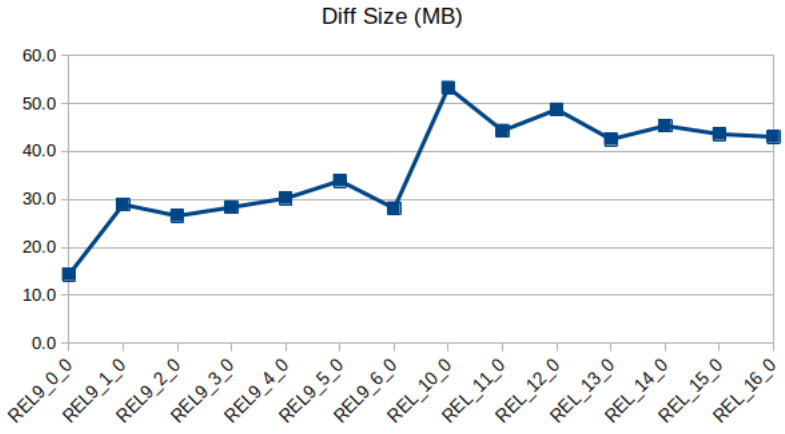
Major Release Stats



Major Release Stats



Major Release Stats



What Constitutes Contribution?

Core Engine Code

What Constitutes Contribution?

What Else?

What Constitutes Contribution?

- Contribution Activities
  - Governance
  - Infra Ops
  - Releases
  - NPOs
  - Conferences
  - Moderation
  - Committees
  - Blogs
  - Books
  - Training
  - Support

What Constitutes Contribution?

- Contribution Activities
  - Features
  - Fixes
  - Drivers
  - Extensions
  - Patch review
  - Testing
  - Security
  - Performance/Benchmarking
  - Packaging
  - Documentation
  - Translation
  - Development/commitfest discussions

What Constitutes Contribution?

- Related projects
  - PostGIS
  - pgjdbc
  - pgodbc
  - pg_tle
  - pgvector
  - pg_hint_plan
  - others...

Contributor Categories

- Community Principals
  - Core team
  - SysAdmin team
  - Committers
- Officially Recognized Contributors
  - Major Contributors
  - Contributors
  - Hackers Emeritus
  - Past Contributors



Contributor Categories

- Acknowledged Contributors
  - Non-trivial size/number of commits to major related projects (e.g. PostGIS, JDBC)
  - Listed on release notes in previous releases (e.g. v16, v15, v14, v13, v12, v11)
  - Attribution in the main PostgreSQL git repository in several commit messages over an extended period of time; e.g. Tom Lane

Contributor Categories

- Commitfest Participants
  - Authors
  - Reviewed-by
  - Tested-by
  - Reported-by
  - Commitfest Manager (CFM)

Contributor Categories

- Non Profit Organizations, e.g. PgUS, PGEU, PGCA, SPI
  - Board of Directors
  - Officers
  - Committees
  - Members
  - Donors

Contributor Categories

- Conferences
  - Organizers
  - Selection Committees
  - Volunteers
  - Sponsors
  - Speakers
  - Attendees

Contributor Categories

- Other
  - Release Management Team (RMT)
  - Release Team
  - PGDG Packagers

Core Team (Overall Governance)

- Core team
  - Bruce Momjian - EDB
  - Dave Page - EDB
  - Peter Eisentraut - EDB
  - Jonathan Katz - AWS
  - Andres Freund - Microsoft
  - Tom Lane - Crunchy Data
  - Magnus Hagander - Redpill Linpro

Sysadmin Team (Infra Ops)

- Sysadmin team
  - Álvaro Herrera - EDB
  - Dave Page - EDB
  - Joe Conway - AWS
  - Magnus Hagander - Redpill Linpro
  - Stefan Kaltenbrunner - Conova
  - Christophe Pettus - PGX

Committers (Maintainers)

- Committers
  - Total 32 people
  - EDB - 7
  - AWS - 6
  - Microsoft - 5
  - Crunchy Data - 1
  - NTT - 2
  - Google - 1
  - Neon - 1
  - Fujitsu - 1
  - Other - 8

Code of Conduct Committee

- CoC Committee
  - Eliza Bennett - City of London, Canada
  - Aleksandra Abramova - Percona
  - Anthony Nowocien - Société Générale
  - Chris Travers - Delivery Hero
  - Lucie Šimečková - Timescale
  - Sergei Kim - EPAM
  - Simon Pane - Pythian

Security Team

- Security Team
  - 16 members
  - EDB - 6
  - AWS - 3
  - Crunchy Data - 1
  - Microsoft - 1
  - Neon - 1
  - Google - 1
  - Other - 3

Contributors Team

- Contributors Team
  - Christoph Berg - Cybertec
  - Joe Conway - AWS
  - Melanie Plageman - Microsoft

Sponsors Committee

- Sponsors Committee
  - Tatsuo Ishii - Freelance
  - Jonathan Katz - AWS
  - Ilya Kosmodemiansky - Data Egret
  - Dave Page - EDB
  - Robert Treat - Freelance

New in PostgreSQL 17

- System
  - Logical replication
    - Upgrade support for pubishers and subscribers
    - Failover slots
  - Builtin Unicode collation provider
  - Incremental backups
  - Direct TLS handshake

New in PostgreSQL 17

- SQL and Clients
  - JSON_TABLE
  - MERGE - updatable VIEWs, RETURNING
  - COPY - new options
  - Partitions - Identity columns, Access methods
  - REINDEX event trigger support
  - Dump/Restore filters
  - Change Password in libpq and pgjdbc
  - login event trigger
  - Monitoring Improvements
  - MAINTAIN priv

New in PostgreSQL 17

- Performance
  - Vacuum - Adaptive radix tree, TidStore
  - WAL - Reduced locking, Read from buffers
  - AVX-512 instructions - pg_popcount(), visibilitymap_count()
  - COPY - COPY TO when encodings match, Speed up uuid_out()
  - Optimize various aggregate deserialization functions, take 2
  - Allow parallel CREATE INDEX for BRIN indexes

New in PostgreSQL 17

- Developer
  - DSM registry (Remove dependency to shared_preload_libraries)
  - Support custom wait events for wait event type ”Extension”
  - Injection Points - advanced testing
  - Streaming APIs - ANALYZE, Sequential scan, pg_prewarm
  - Bump Memory contexts - Short-lived allocations, cheaper and faster

aws

Ongoing Discussions

- AIO/DIO
- TDE
- Stats Import/Export
- Memory resource management
- Logical Replication - DDL
- Lots more
  ⇒ See next commitfest

Questions?

Thank You!
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