The Democratization of Databases

Bruce Momjian

Democratic governments have a long history of success, with some setbacks. This talk explains how democratic principles underpin the success of the open source relational database Postgres.

https://momjian.us/presentations

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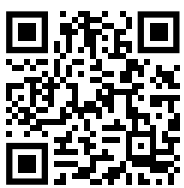


Last updated: September, 2020

Outline

1. History of governance structures
2. Strengths of each structure
3. Efficiency and messiness of democracy
4. Ultimate success of democracy
5. Software governance history
6. Where does this leave Postgres?
7. Democracy in action
8. Conclusion

1. History of Governance Structures

Pnyx Hill, Athens

https://www.flickr.com/photos/wallyg/

Autocracy

- Single person or small group in power
- Examples
  - dictatorship, e.g., Syria
  - absolute monarchy, e.g., Saudi Arabia
  - communist, e.g., North Korea
- First governing structure

Representative Democracy

- First established in ancient Athens
- Historically only a small group of the population could vote
- Elect representatives to vote on issues

2. Strengths of Each Structure

Chepstow Castle, Wales

https://www.flickr.com/photos/damiavos/

Autocracy Strengths

- Good for focusing a fixed amount of resources on a clear goal
- Examples
  - Space exploration
  - Military

Democracy Strengths

- Allows rapid adjustment for unclear goals
- Emboldens talent to act near the problem
- Expands the pool of talent
- Examples
  - consumer goods
  - software

3. Efficiency and Messiness of Democracy

Madison, Wisconsin

https://www.flickr.com/photos/dennisdeery/

Efficiency of Democracy

Mad

- Unleashes a flurry of activity based on agency, i.e., personal power
- Fluidity of solutions

Messiness of Democracy

- Hard to predict behavior
- Problems can get stuck
- Difficulty with large projects that span multiple elections
- Direct democracy rarely tried, yielded mixed results

4. Ultimate Success of Democracy

Moscow

https://www.flickr.com/photos/varfolomeev/

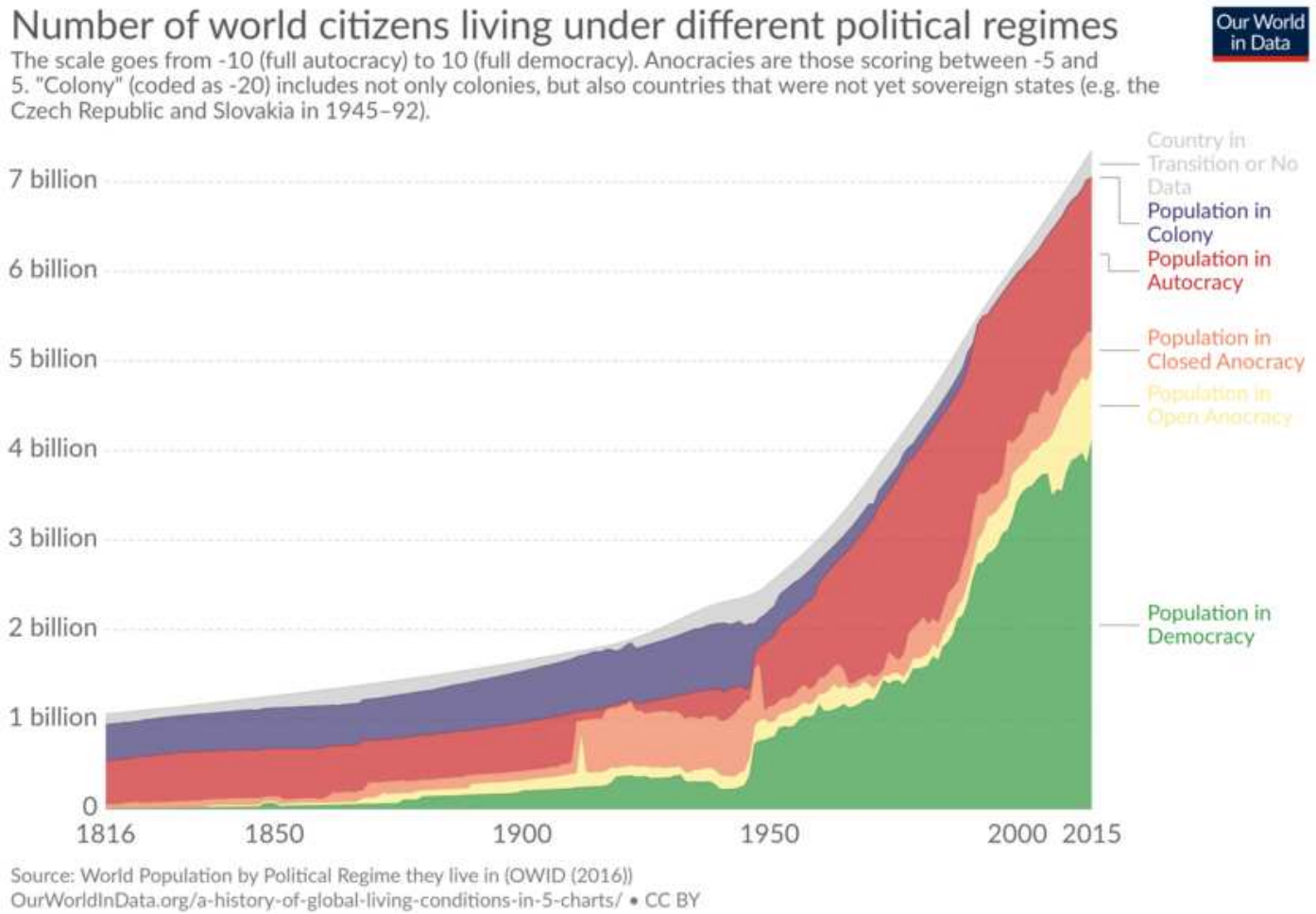
Democracy's Checkered History

- First democracy in Athens, suspended during wars
- Roman democracy ended in dictatorship
- Middle Ages, Magna Carta, Renaissance
- American Revolution, black and women's voting rights
- French Revolution leads to monarchy

Democracy Today

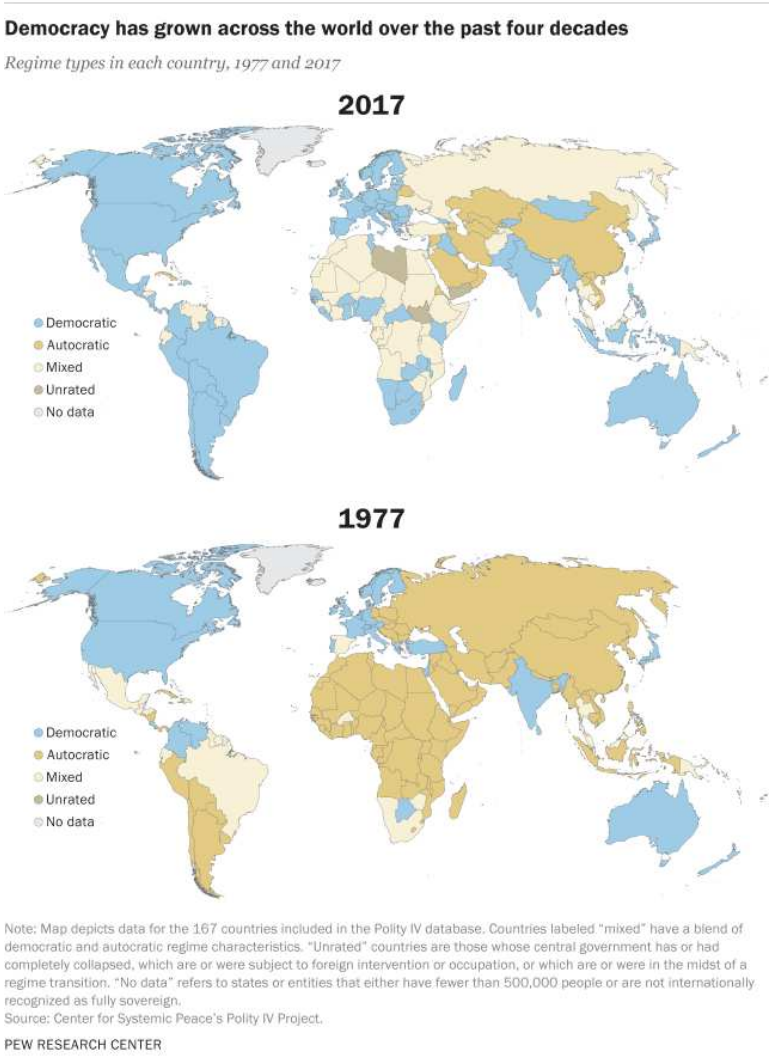
- Democracy continues to make steady progress
- There are still setbacks

Democracy in the Past 200 Years



https://ourworldindata.org/democracy

Democracy in the Past 40 Years



https://www.pewresearch.org/fact-tank/2019/05/14/more-than-half-of-countries-are-democratic/

5. Software Governance History

Redwood City, California

https://www.flickr.com/photos/nzdave/

Proprietary Autocracy

- Executives make decisions
  - input from sales and marketing
  - indirectly from customers
- Decision matrix
  - “If we do this, what percentage of customers will we gain?”
  - “If we don’t, what percentage of customers will we lose?”
  - gains are more sensitive to the decision than losses
  - do gains or avoided losses justify the implementation costs?

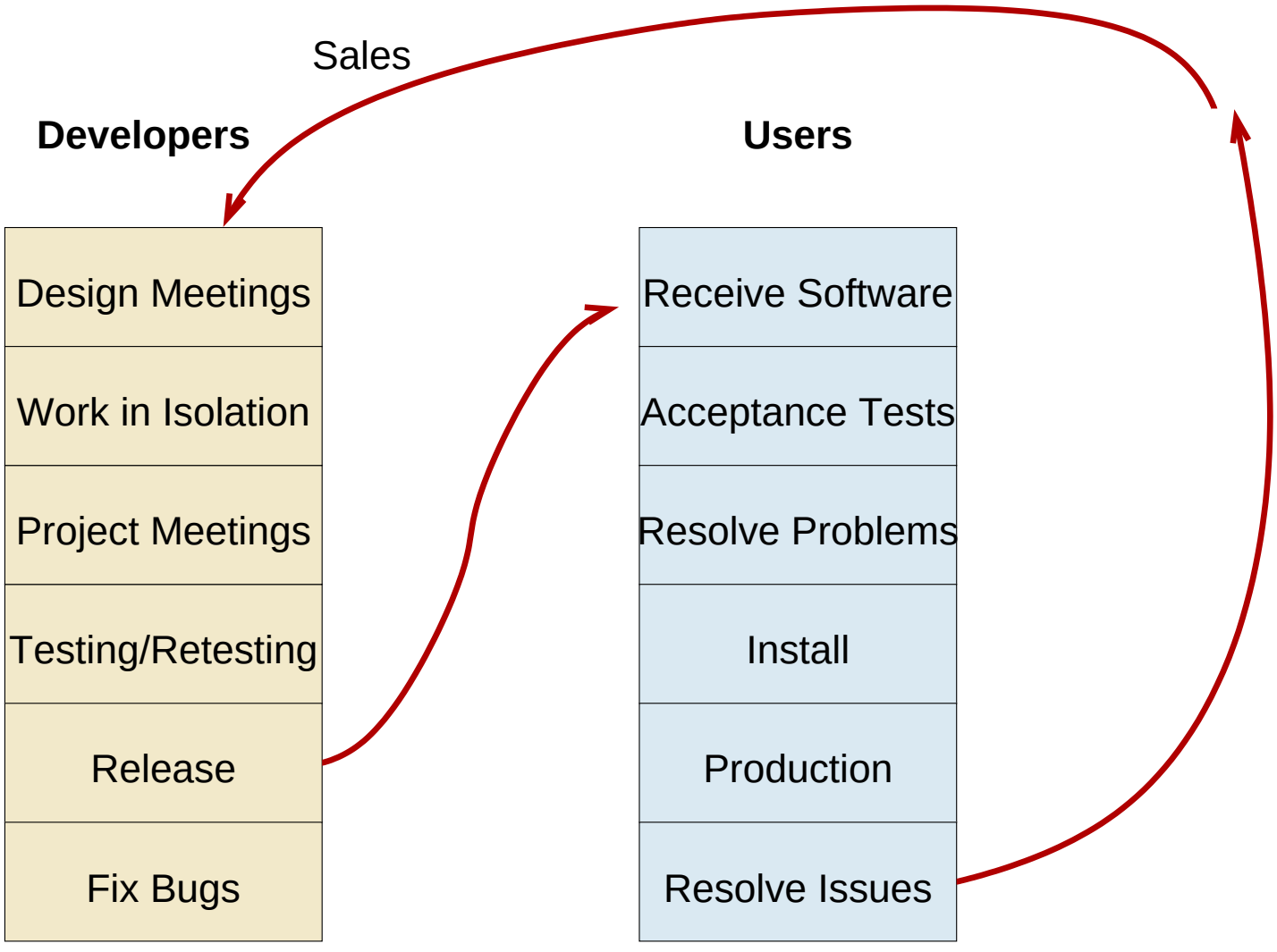
Open Source Democracy

- Mix of direct democracy and meritocracy
- Voting can be problematic
- Sometimes too much feedback
  - bike shedding
- Bad decisions can be quickly corrected, i.e., easy to revert
- No reliable road map

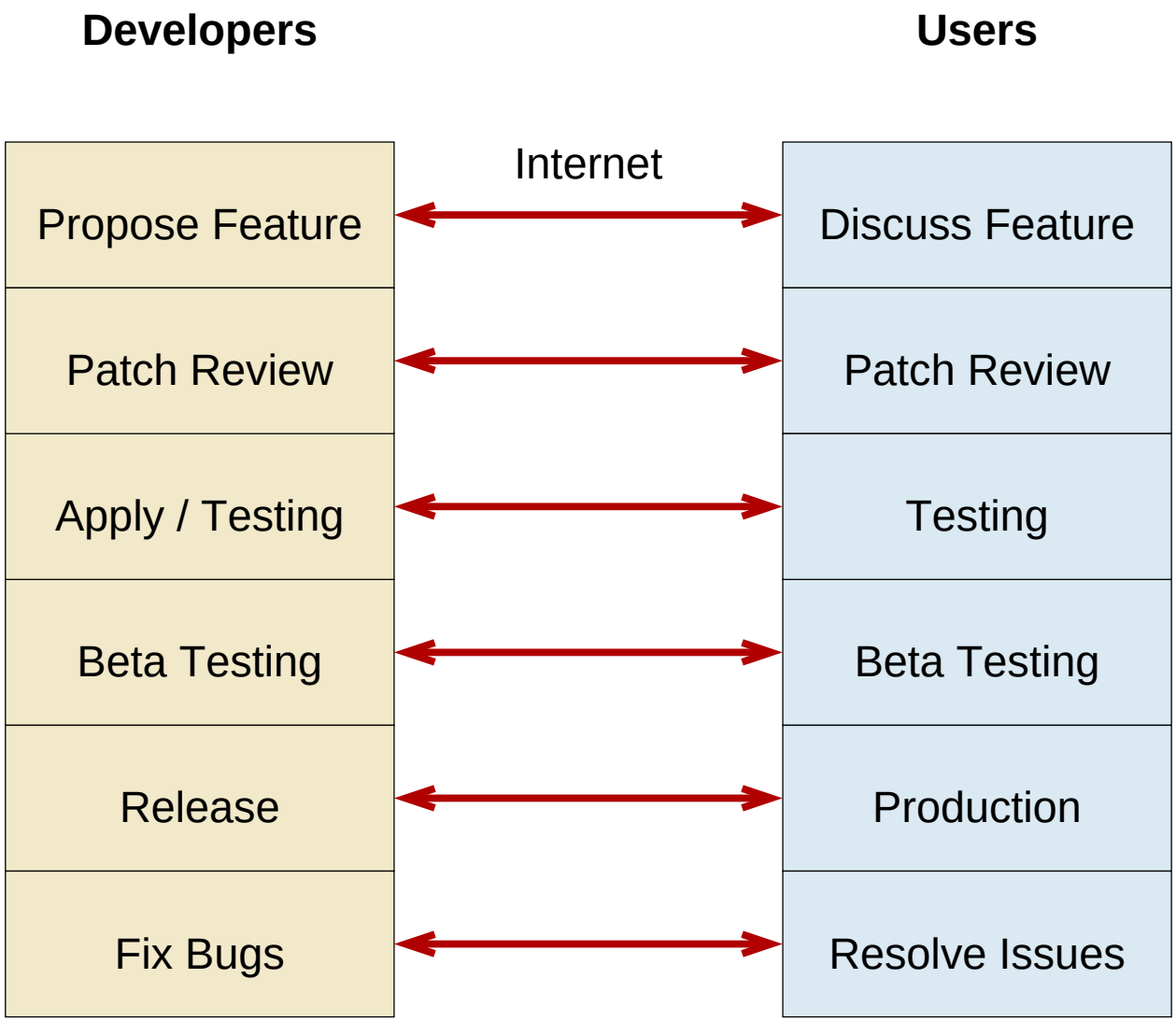
Internet Makes Direct Democracy Possible

- Easy to share ideas and iterate new solutions
- Rapid global communication

Autocratic Development Flow



Democratic Development Flow



Hybrid Development Models

- Single company controls development
- Open source distribution
- Uses autocratic decision matrix
- Lacks democratic feedback
- More comfortable for users transitioning from proprietary since there is a single company to contact
- Examples
  - MySQL, MariaDB
  - MongoDB

https://www.techrepublic.com/article/mongodb-ceo-tells-hard-truths-about-commercial-open-source/

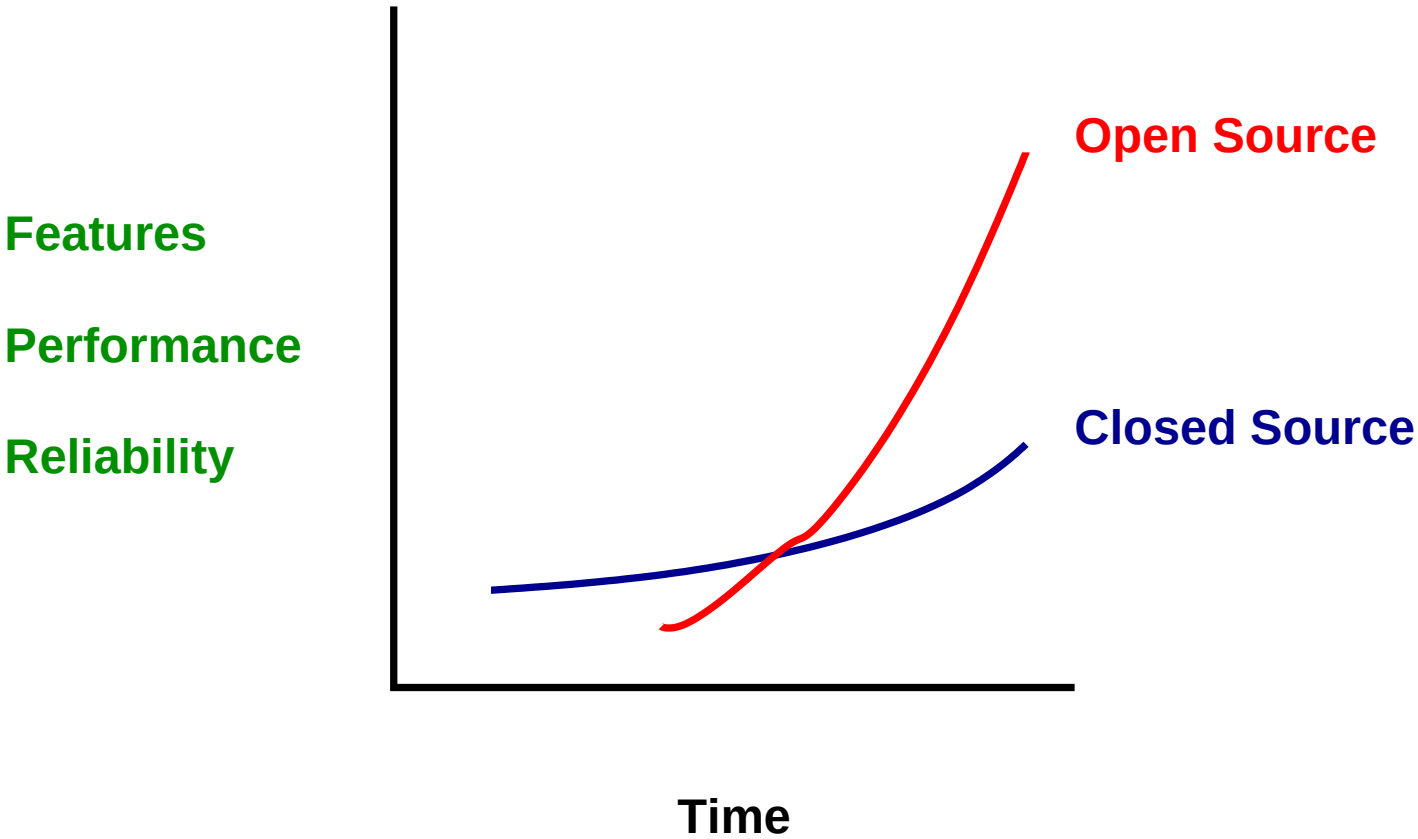
6. Where Does This Leave Postgres?

https://www.flickr.com/photos/tomas_vondra/

Postgres Wins Because Democracy Wins

- Uses democracy to attract talent
  - talent pool can easily compete with proprietary staff
- Superior feedback and decision matrix lead to success
- This is a challenge for niche software
- Setbacks still possible

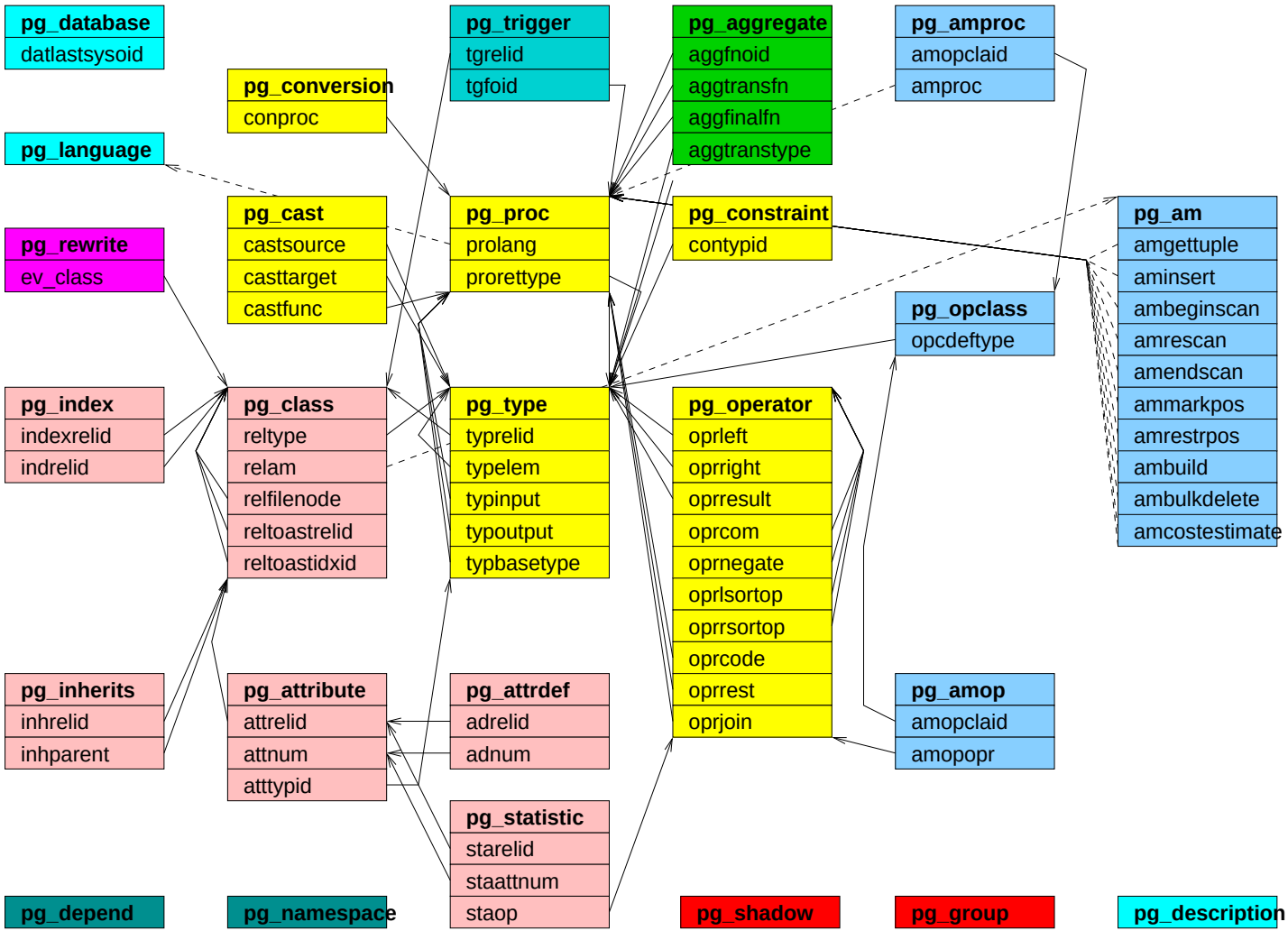
Rise of Open Source



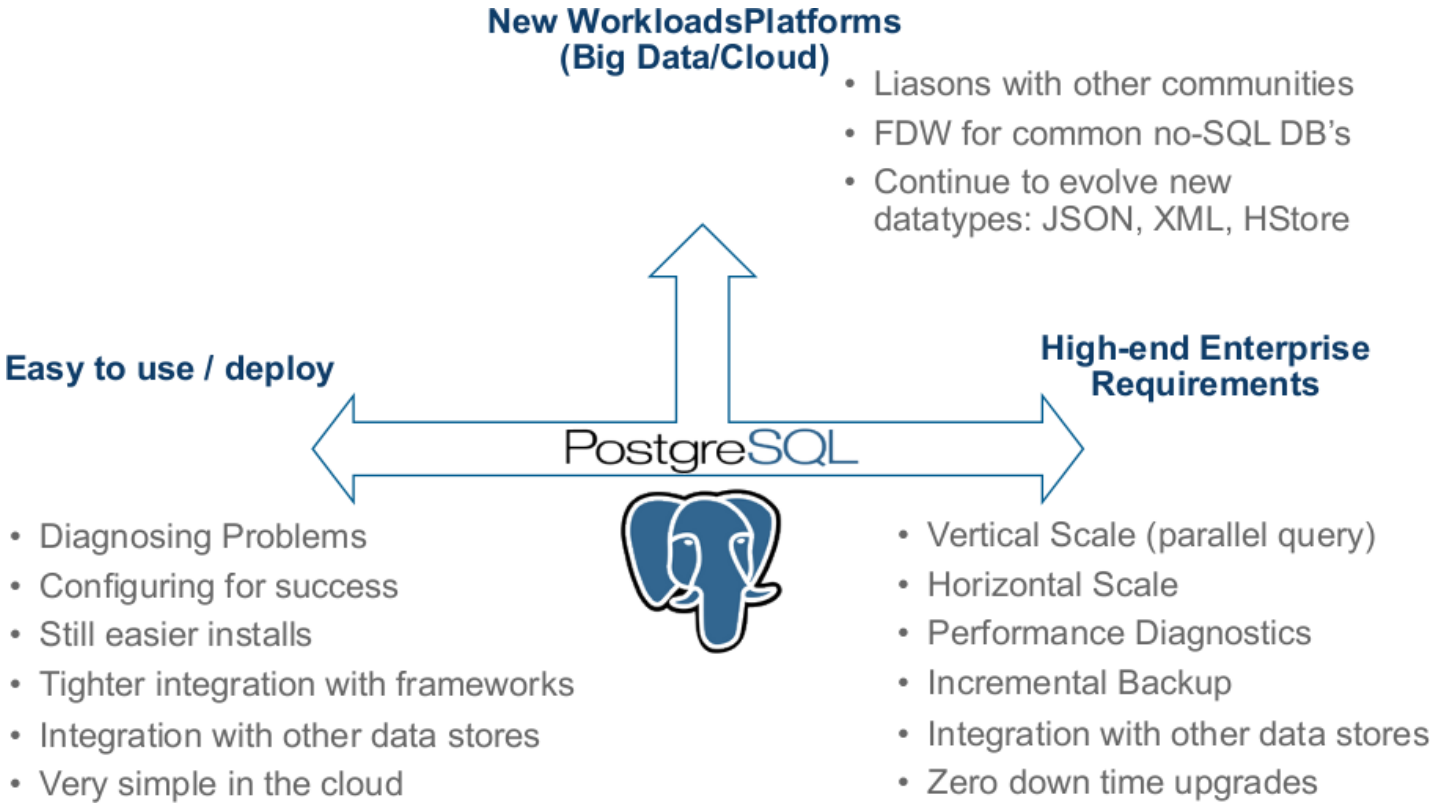
7. Democracy in Action

https://www.flickr.com/photos/tomas_vondra/

Postgres Extendability

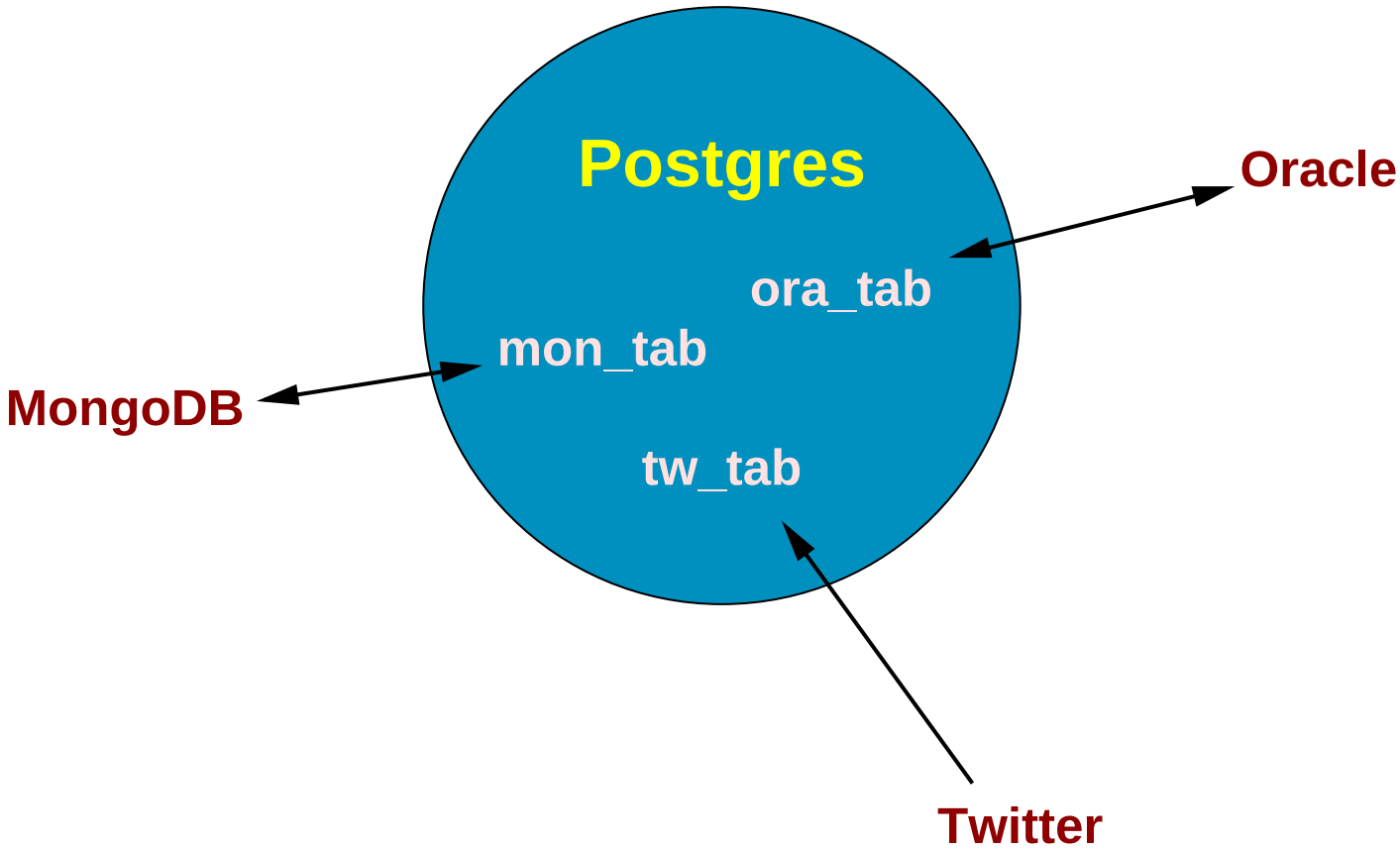


Many Focuses



Keith Alsheimer, EnterpriseDB

Foreign Data Wrappers

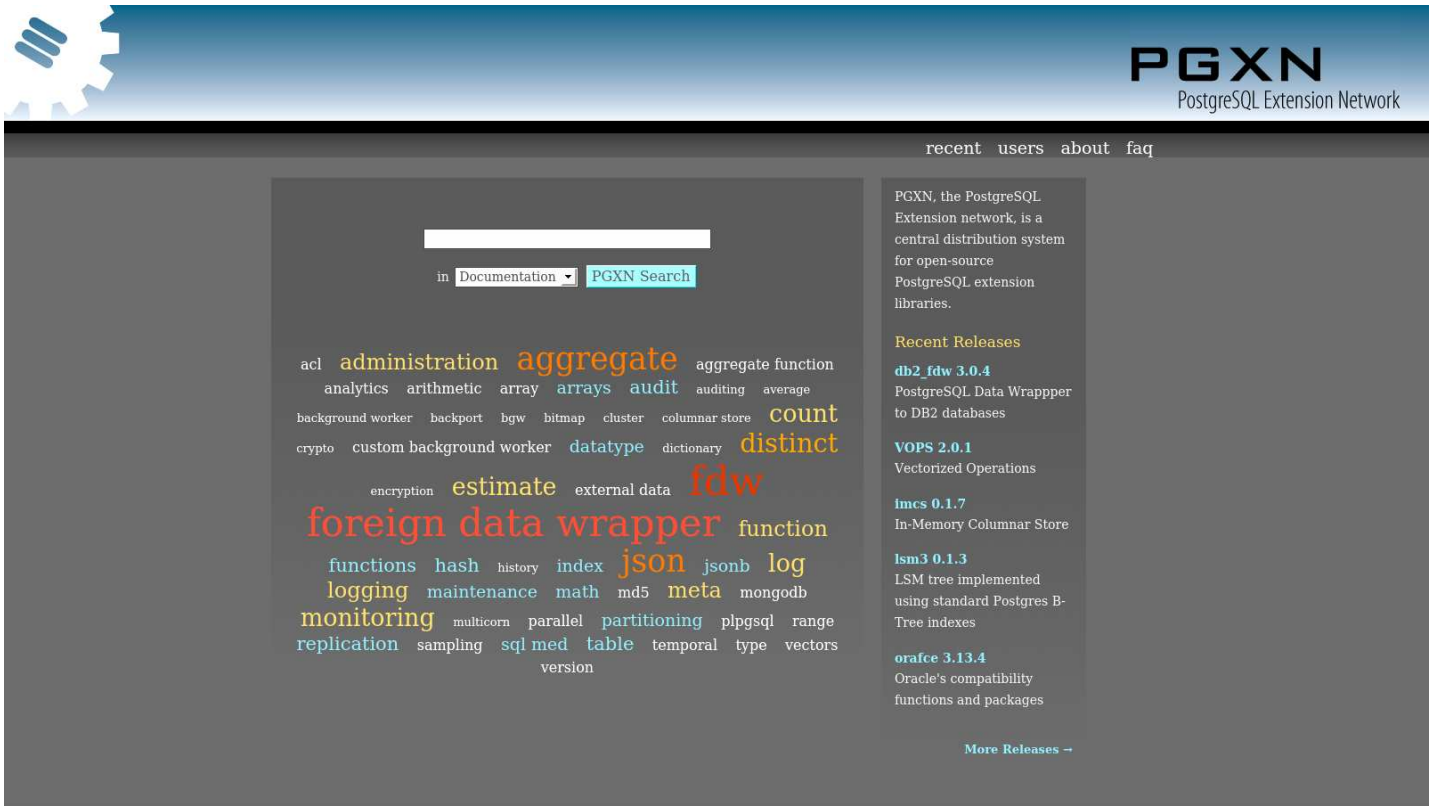


Foreign Data Wrappers

- 100+ interfaces to foreign data
- Read/write
- Sophisticated push down of joins, sorts, and aggregates

https://momjian.us/main/writings/pgsql/central.pdf

PGXN



http://pgxn.org

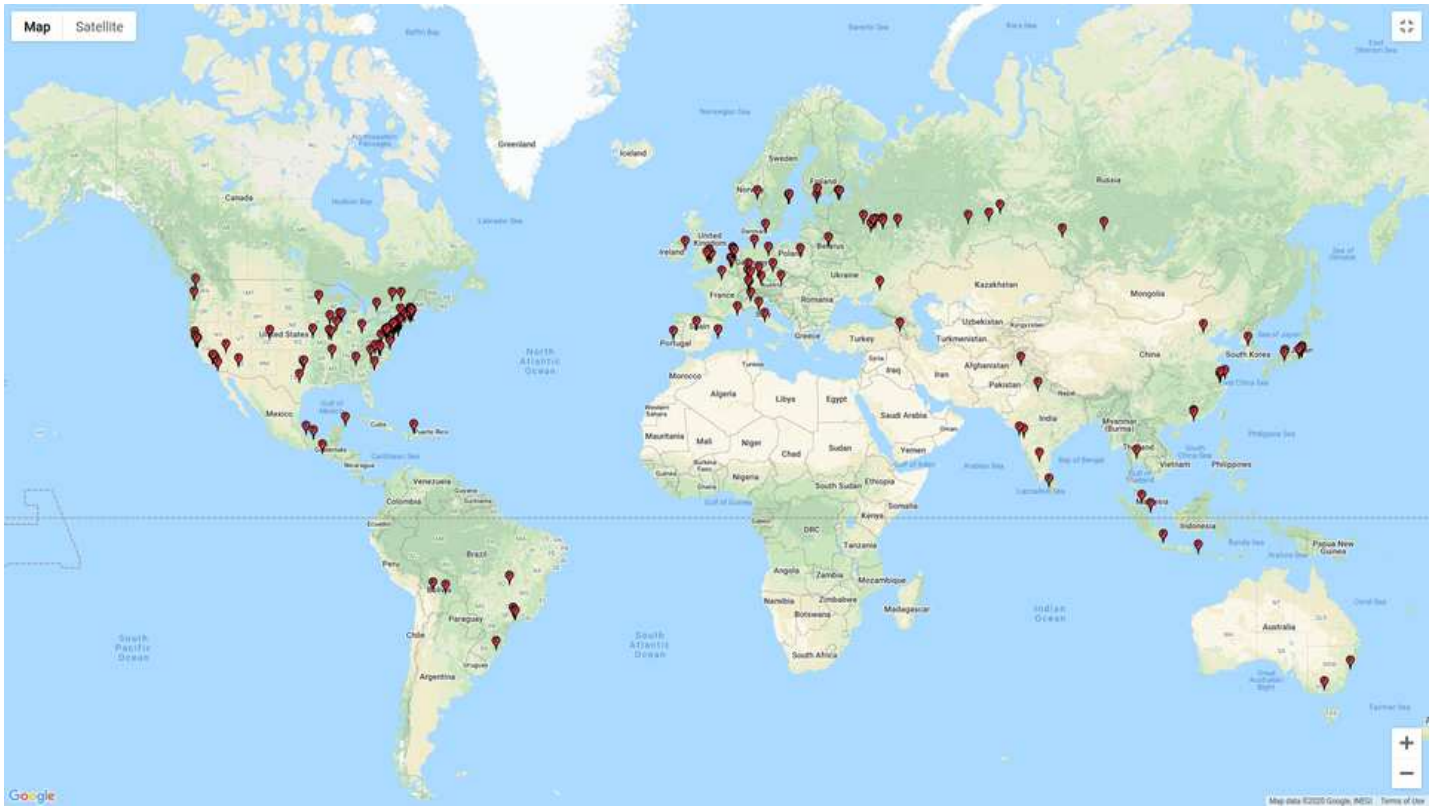
PostGIS

- PostGIS is a full-featured Geographical Information System (GIS)
- Implemented as a extension
- Independent development team and community

https://postgis.net/

PostgreSQL Tenth Anniversary in 2006

My Postgres Activities



Voting

- Committers nominate new committers
- Core nominates new core
- Development is open to all, even occasional visitors
  - “Let the best idea win!”
  - “Where did that guy come from?”
  - Focus talent like a lens on every task

Roadmap

- Individuals and political parties have roadmaps
- Democratic governments don't
- Developers and companies have roadmaps
- Postgres doesn't

PgLife

PgLife Postgres Community Life

Users	
General	Re: CRL reloading info - is it refreshed?
Other	Re: BUG #16622: pg_dump produces erroneus ALTER TABLE statement for a table with an inherited generated column
Announce	ORC Foreign Data Wrapper Update Version 1.1.0 is Released!
Developers	
Hackers	Re: Load TIME fields - proposed performance improvement
Commit	Stamp 13.0.
Versions	Stable: 12.4+, 11.9+, 10.14+, 9.6.19+, 9.5.23+ | Development: 13 rc1+, 14 devel, in commitfest
External	
Blogs	Bruce Momjian: The Berkeley 39
News	Pgpool-II 4.1.4, 4.0.11, 3.7.16, 3.6.23 and 3.5.27 are now officially released.
Tweets	RT by @PostgreSQL: The @PostgreSQL yum repository repository now includes ...
Media	EDB Postgres Advanced Server Achieves Good Software Certification - Business Wire
Events	PGConf.EU 2020 -- CANCELLED!

IRC (also Slack)

RhodiumToad: no
schinckel: Yeah, that's what I thought. Thank you.
xocolatl: schinckel: it doesn't actually matter if postgres does that or not. if you don't have an ORDER BY at the query level where you want an ordering, you ain't got it
ilmari: schinckel: the easiest way to guarantee that is an ordering column with a different constant in each unioned select, i.e. select 1 as ordering, ... union all select 2, ... order by ordering, ...;
kvda: How would you approach migrating a large jsonb field? I'm having an issue with a slow migration by just removing 2 keys from jsonb.
peerce: so you're doing an UPDATE thats removing two keys from a JSONB field in every row of a table? yeah, thats going to be expensive.
kvda: peerce yep that was the initial version, what other approaches are there?
kvda: JSONB turned out to be a lot larger than what I thought too

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8. Conclusion

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