State Of PostgreSQL 2022

Brought to you by Timescale

Contents
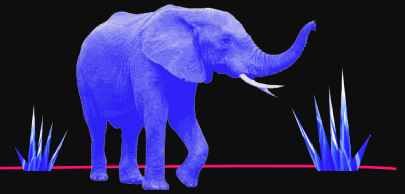
Survey Methodology

Timescale, the company behind the leading relational database for time-series TimescaleDB, created and distributed the State of PostgreSQL 2022 survey. The survey ran for four weeks between June 6, 2022 and June 30, 2022.

During that time, 992 people provided responses, which we (Timescale) aggregated to generate this report. In addition to sending the survey to past participants, we promoted the survey on social media, email newsletters (our own and third-party), TimescaleDB and PostgreSQL Slack channels, PostgreSQL mailing lists, Reddit, and Hacker News.

Please note that some of the percentages are rounded to the nearest full number for simplicity. We made minor grammatical edits to featured responses (e.g., capitalization, punctuation) but did not change the wording. The raw data includes wholly unedited responses.

This is the third State of PostgreSQL report. Check out the first and second report editions.

The 2022 survey includes many of the same questions to capture how responses evolve over time (we've noted where the question format changed). We have also included new questions about learning resources, third-party tools, and production systems.
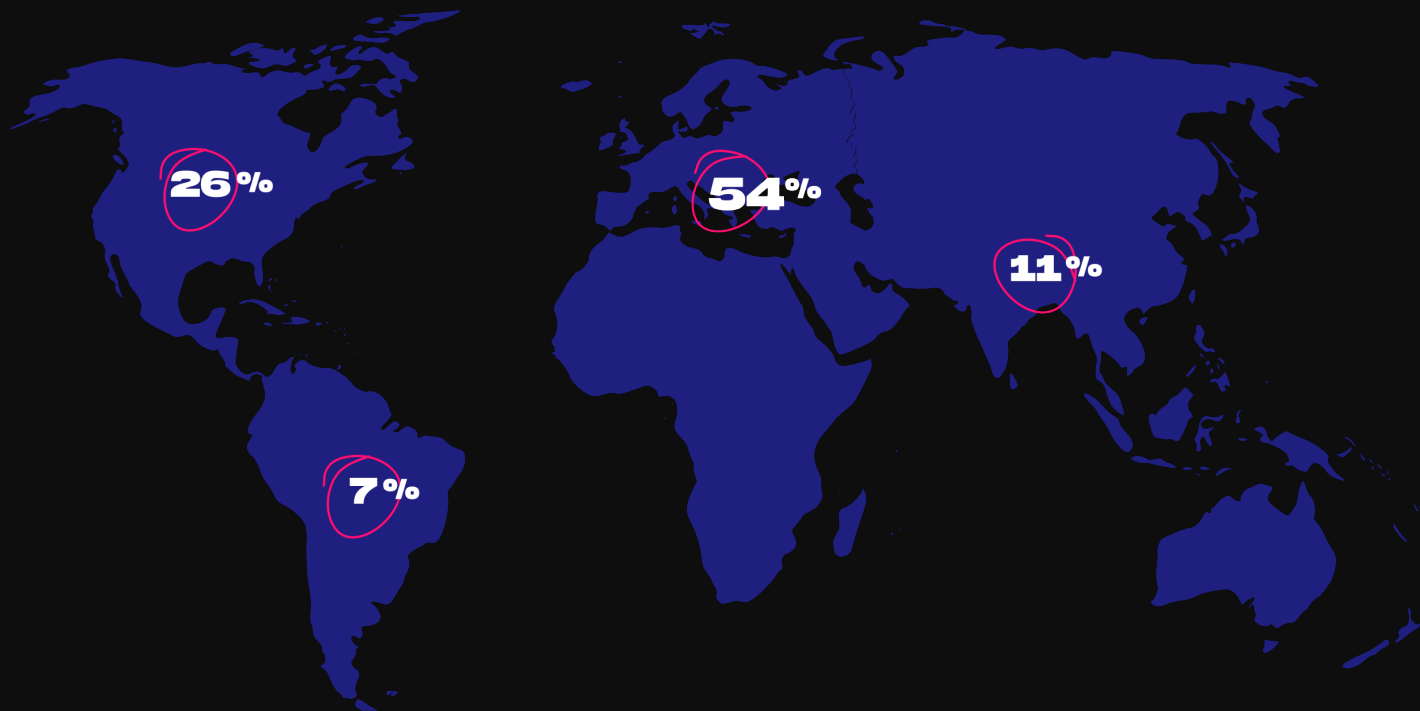
We look forward to issuing the survey annually.

Experiences
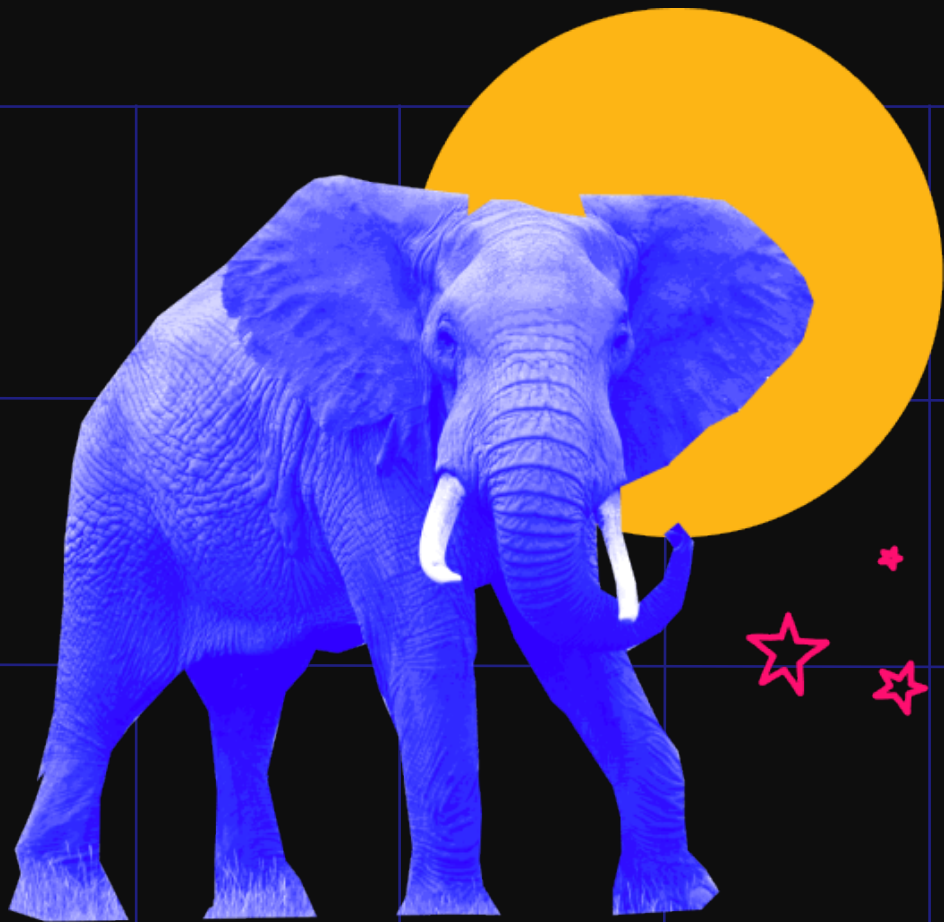
What is your primary geographic location?

Mirroring the 2019 and 2021 survey results, respondents from EMEA (Europe, Middle East, Africa) account for roughly half of all respondents, followed by North America with 25.9%.

26% (North America)

54% (EMEA)

11% (Asia)

7% (South America)

How many years have you been working in tech?

20+ YEARS	37.1%
16-20 YEARS	15.4%
11-15 YEARS	18%
6-10 YEARS	15.5%
0-5 YEARS	13.9%

How long have you been using PostgreSQL?

According to <u>DB engines</u>, PostgreSQL is getting more and more popular. It comes as no surprise that the number of new PostgreSQL users experimenting with the database for less than a year has grown from 6.1% in 2021 to 6.4% in 2022.

30%		
20%		
10%		
0%		
2019	**2021**	**2022**

● Less than a year   ● 1-2 years   ● 3-5 years   ● 6-10 years   ● 11-15 years   ● 15+ years
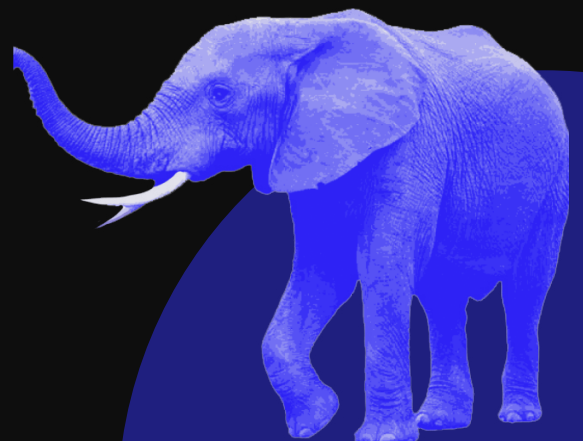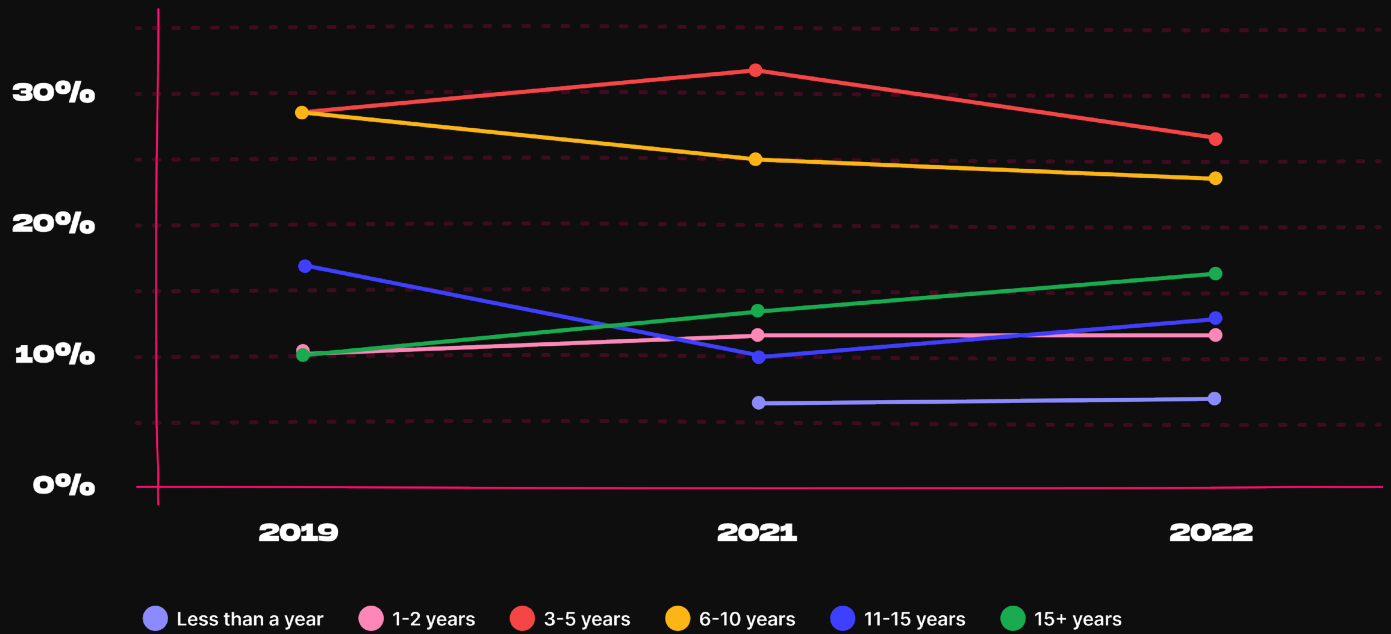
How did you first find out about PostgreSQL?

Consistent with the 2021 results, more than a third of respondents (37.4%) first learned about PostgreSQL at work or from a colleague.

WORK OR COLLEAGUE   **37.4%**

SEARCH ENGINE   **13.2%**

TECHNICAL BLOG   **11.7%**

TECHNICAL FORUM (E.G., STACK OVERFLOW, REDDIT, DBA EXCHANGE)   **8.4%**

FRIENDS   **8.1%**

SCHOOL   **8.1%**

MAILING LIST   **2.2%**

SOCIAL MEDIA   **1.5%**

VIDEO (E.G., YOUTUBE, TWITCH)   **1.3%**

CONFERENCE   **0.9%**

EVENT/MEETUP   **0.3%**
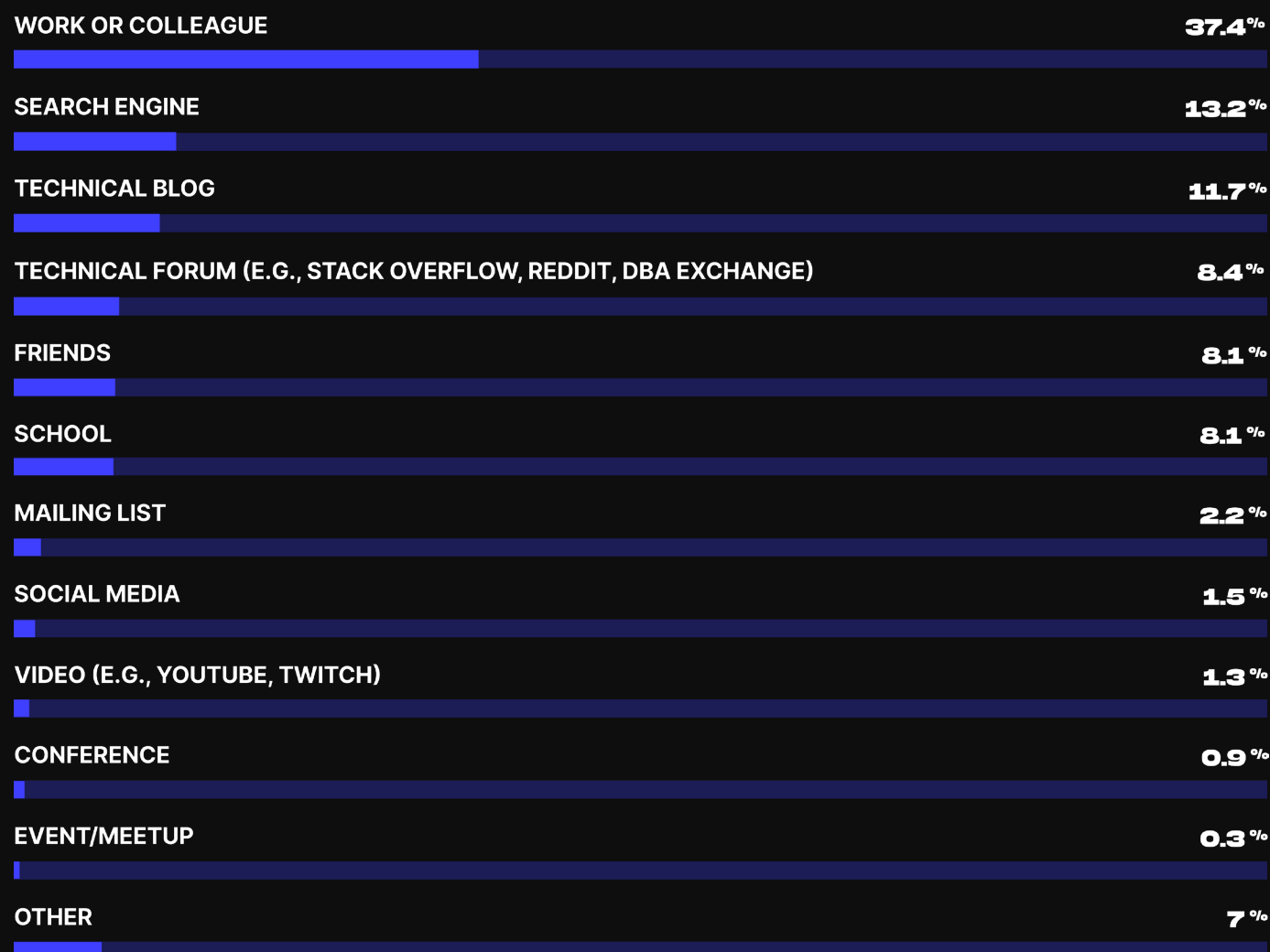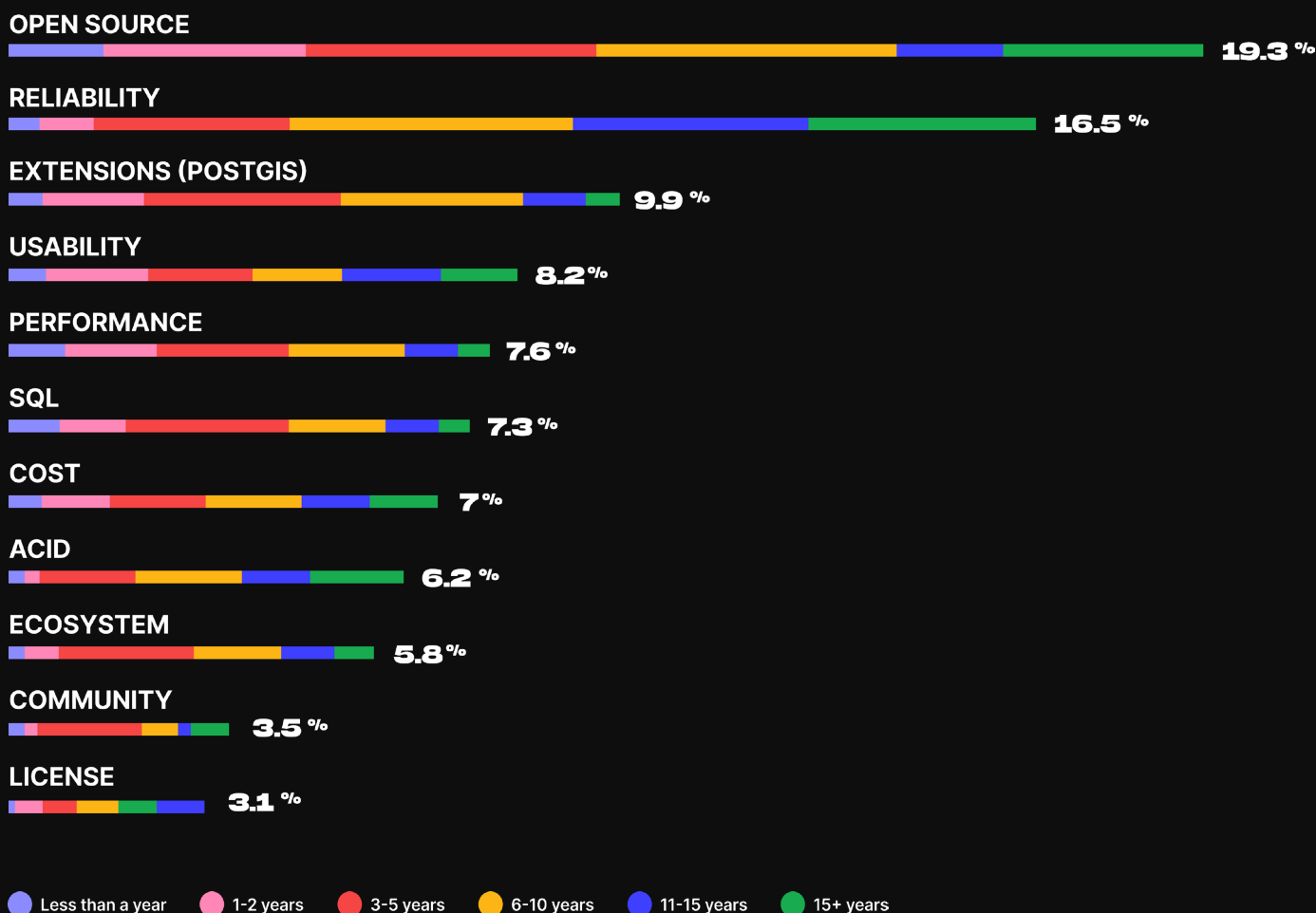
OTHER   **7%**

What is the main reason you chose to use PostgreSQL over other options?

We introduced more options in this year's survey, including open source which ranked as the top reason people choose PostgreSQL (19.3%), followed by reliability (16.5%), and extensions (9.9%).
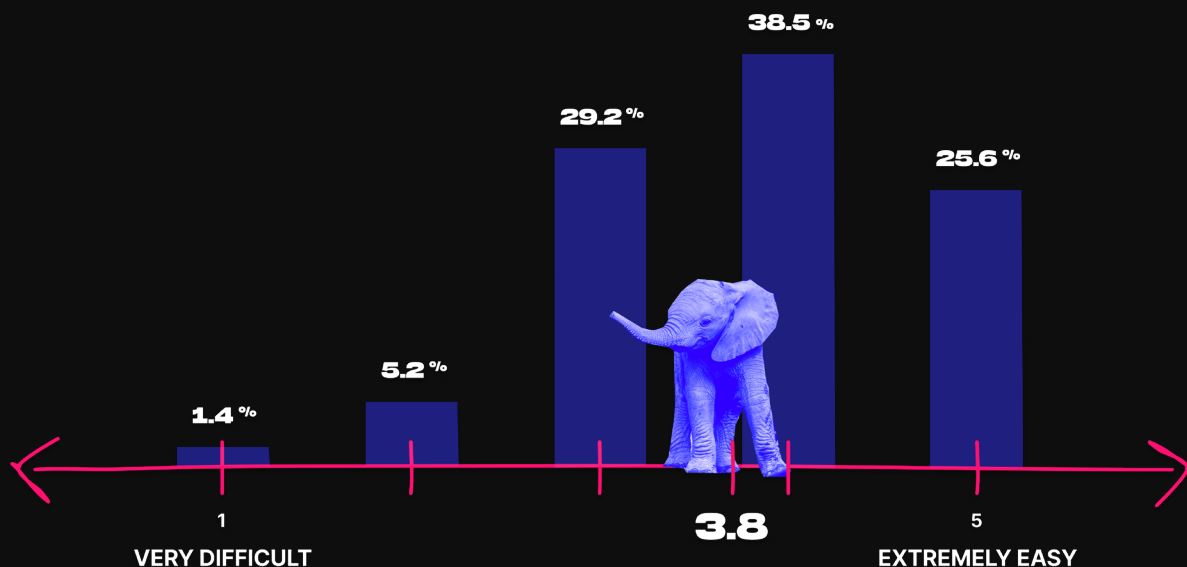
Interestingly, as their experience with PostgreSQL grows, the reasons that they choose the database change.

Open source is the most important factor for choosing PostgreSQL for those who started using PostgreSQL in the past 5 years.

Reliability and open source are important for those using PostgreSQL for 6-10 years. PostgreSQL users with 11-15 years of experience choose the database for its reliability.

OPEN SOURCE

19.3 %

RELIABILITY

16.5 %

EXTENSIONS (POSTGIS)

9.9 %

USABILITY

8.2 %

PERFORMANCE

7.6 %

SQL

7.3 %

COST

7 %

ACID

6.2 %

ECOSYSTEM

5.8 %

COMMUNITY

3.5 %

LICENSE

3.1 %

● Less than a year   ● 1-2 years   ● 3-5 years   ● 6-10 years   ● 11-15 years   ● 15+ years

How would you rate your first experience with PostgreSQL?

38.5 %

29.2 %

25.6 %

5.2 %

1.4 %

1
VERY DIFFICULT

3.8

5
EXTREMELY EASY

Have you ever contributed to PostgreSQL?

44% of PostgreSQL users with 15+ years of experience using the database have contributed to PostgreSQL as least once. In fact, regardless of their experience, users across the board have contributed to the PostgreSQL community.

Read more about how to contribute to PostgreSQL

LESS THAN 1 YEAR
63

1-2 YEARS
129

3-5 YEARS
264

6-10 YEARS
244

11-15 YEARS
138

15+ YEARS
154

Years of experience with PostgreSQL

● No   ● Yes, once/twice   ● Yes, several times
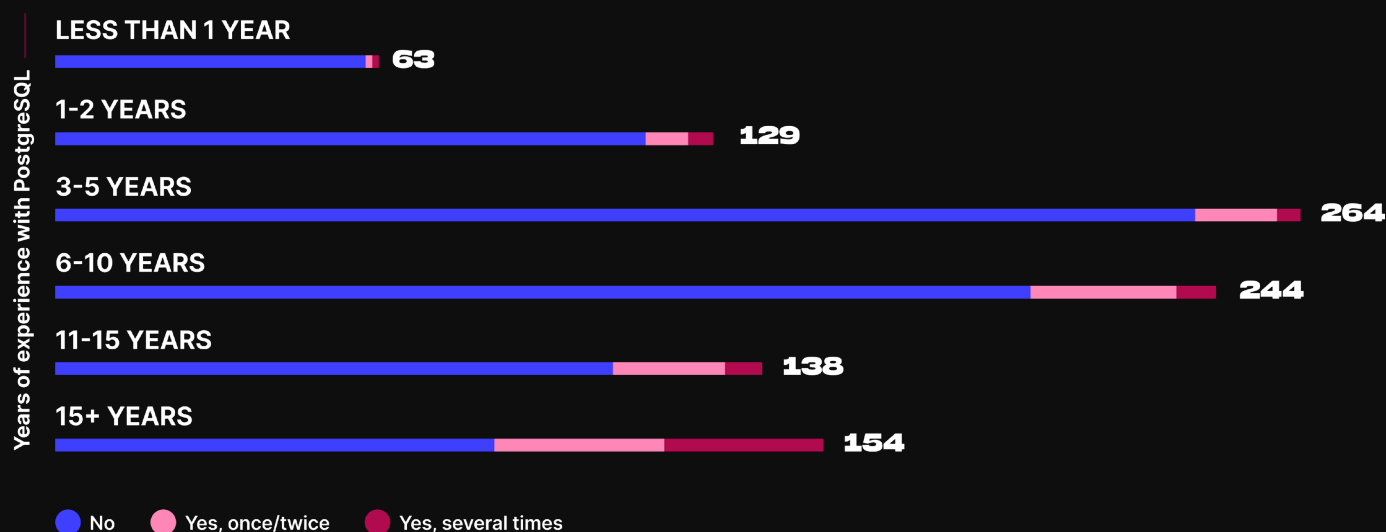
Suggestions From the Community

A few respondents shed light on what they like the most about the PostgreSQL community and where they see room for improvement to make it more welcoming for newcomers in the free-form bonus questions:

❝

Moving patch submissions off of mailing lists onto some sort of code forge.

Respondent quote

❝

It's a pretty ubiquitous system so the community is vast.

Respondent quote

❝

I feel welcome in the communities, and I also feel that I'm interacting with professionals who are willing to put time and effort into understanding everyone who asks for help, or pointers, or suggestions.

Respondent quote

❝

We need a get started with PostgreSQL doc. This will bring more users, and some will interact more with community.
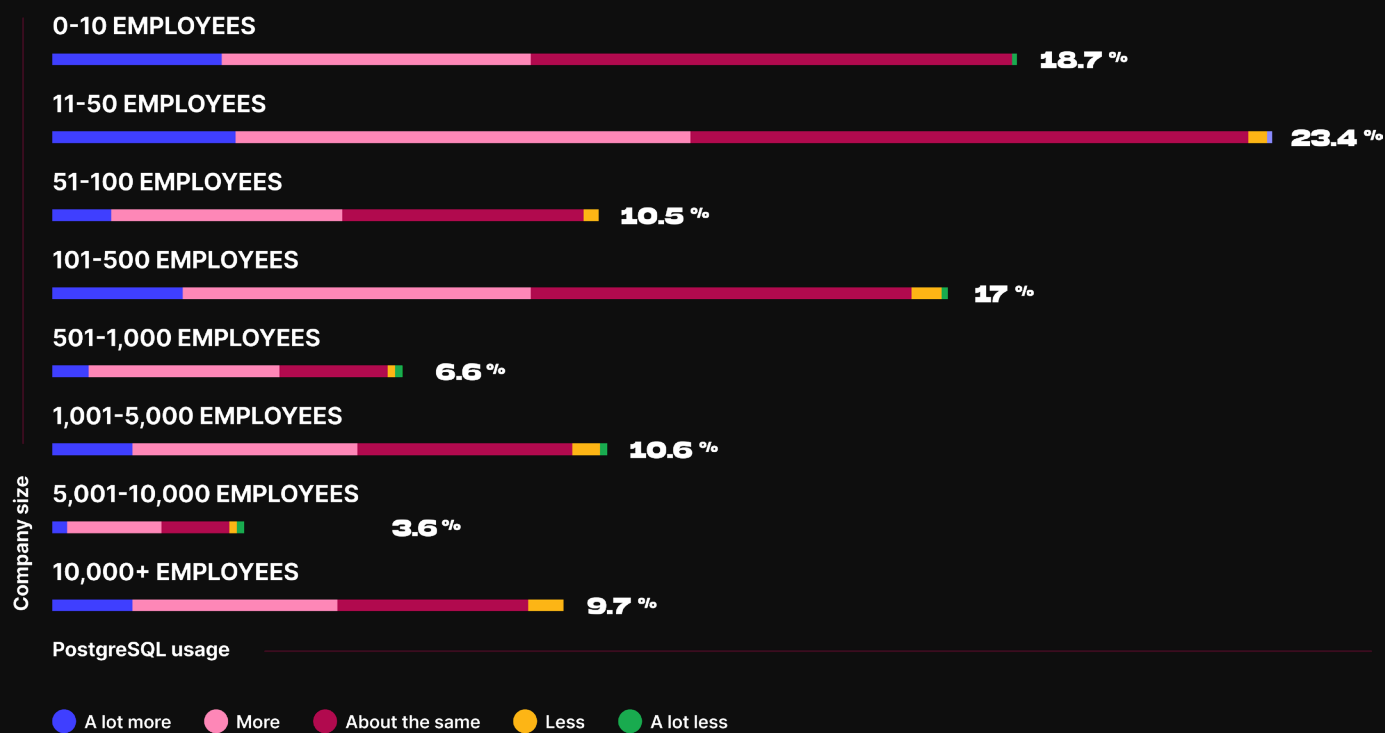
Respondent quote

Work

What is your current profession or job status?

Software developer or engineer (43.3%), software architect (13.2%), and database administrator (7.3%) were the top 3 job titles. That is consistent with the 2021 results.

SOFTWARE DEVELOPER / ENGINEER   **43.3 %**

SOFTWARE ARCHITECT   **13.2 %**

DATABASE ADMINISTRATOR   **7.3 %**

CONSULTANT   **5.8 %**

DATA ARCHITECT   **4.2 %**

DEVOPS ENGINEER   **4.2 %**

INFORMATION TECHNOLOGIES / SYSTEMS ENGINEER   **3.8 %**

RESEARCHER   **2.4 %**

PREFER NOT TO SAY   **2.3 %**

PRODUCT MANAGER   **2.1 %**

STUDENT   **1.5 %**

SYSTEM ADMINISTRATOR   **1.5 %**

PROFESSIONAL SERVICES SPECIALIST   **0.9 %**

OTHER   **7.3 %**

Compared to one year ago, is PostgreSQL being used more or less in your organization?

55% of respondents said that PostgreSQL is being used more or a lot more today than it was one year ago. Small and medium businesses (0-50 employees) use PostgreSQL more today than they did one year ago.

0-10 EMPLOYEES
18.7 %

11-50 EMPLOYEES
23.4 %

51-100 EMPLOYEES
10.5 %

101-500 EMPLOYEES
17 %

501-1,000 EMPLOYEES
6.6 %

1,001-5,000 EMPLOYEES
10.6 %

5,001-10,000 EMPLOYEES
3.6 %

10,000+ EMPLOYEES
9.7 %

Company size

PostgreSQL usage

● A lot more ● More ● About the same ● Less ● A lot less

How big is your team and your organization?

42.1% of respondents work in organizations with 50 or fewer employees. Regardless of the company's size, respondents reported usually working in a team of 2 to 10 people.
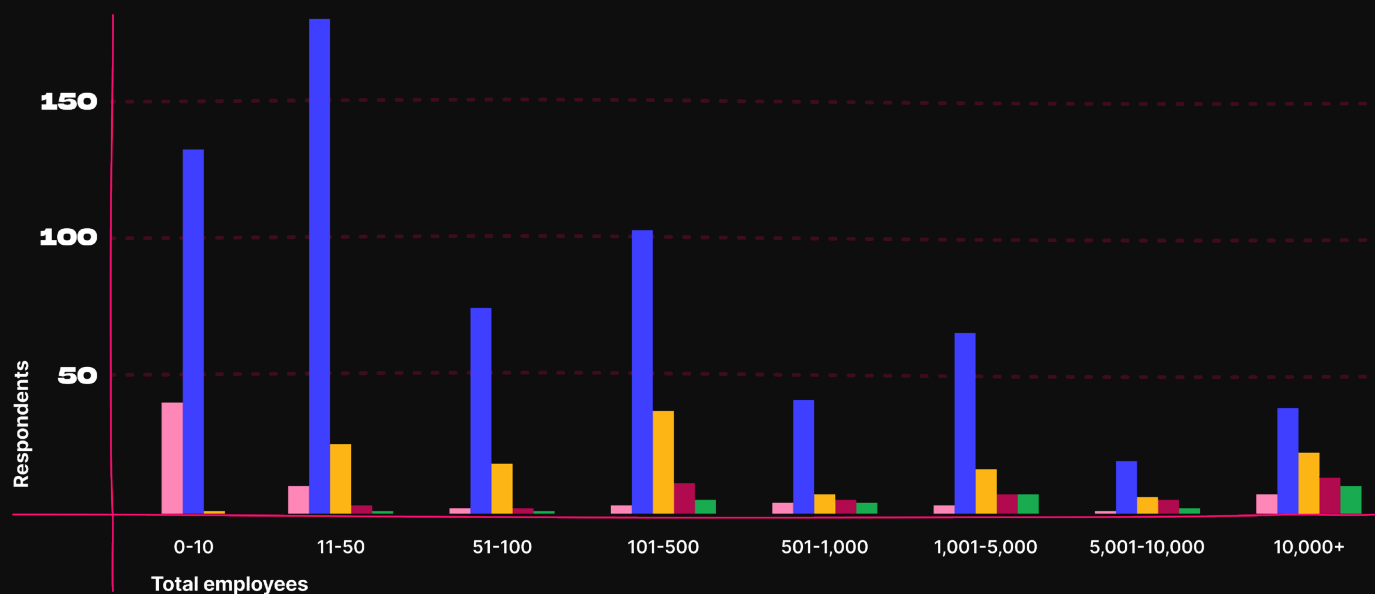
Size of the team: ● Just me ● 2-10 people ● 11-20 people ● 21-50 people ● 50+ people

Is PostgreSQL the main database you use for your current projects?

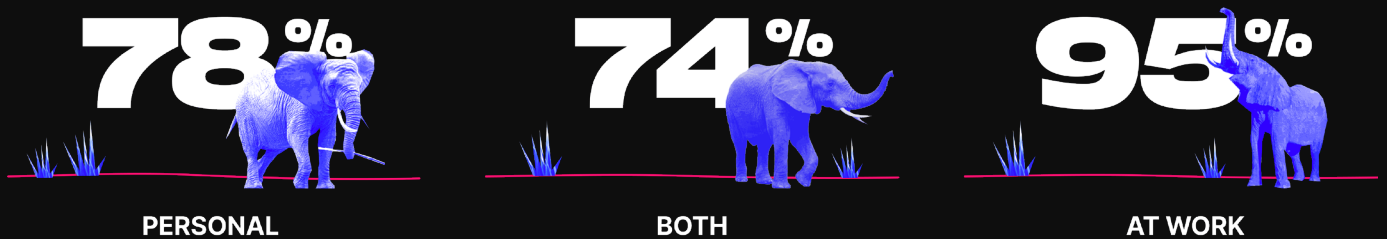**89.2%** YES

10.8% NO
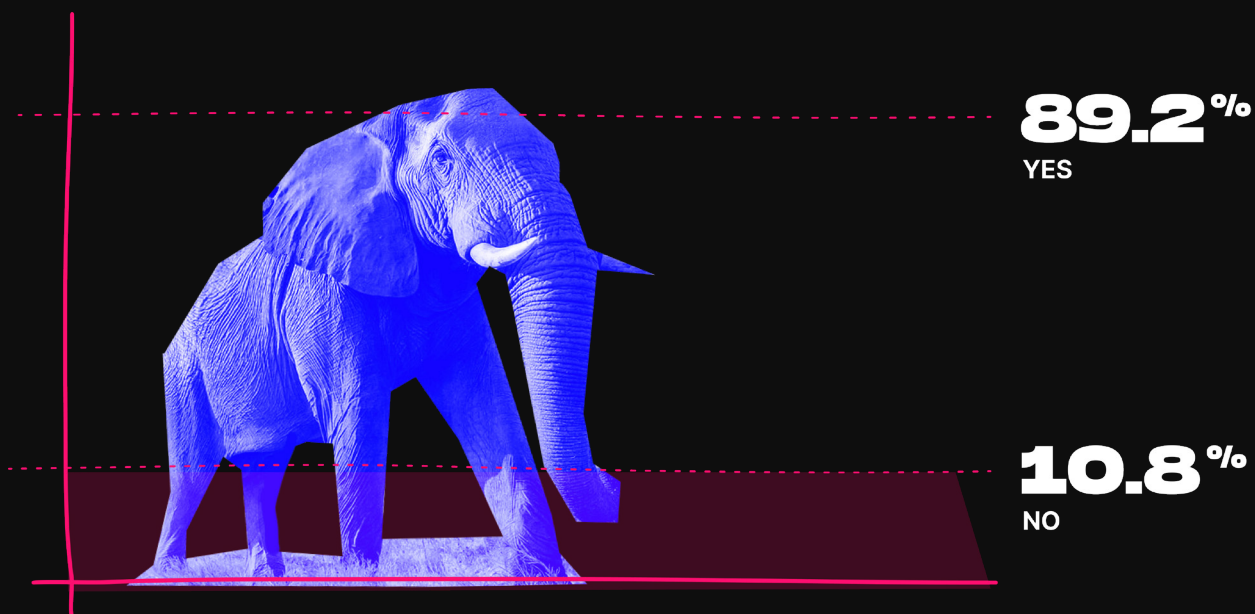
Use Cases

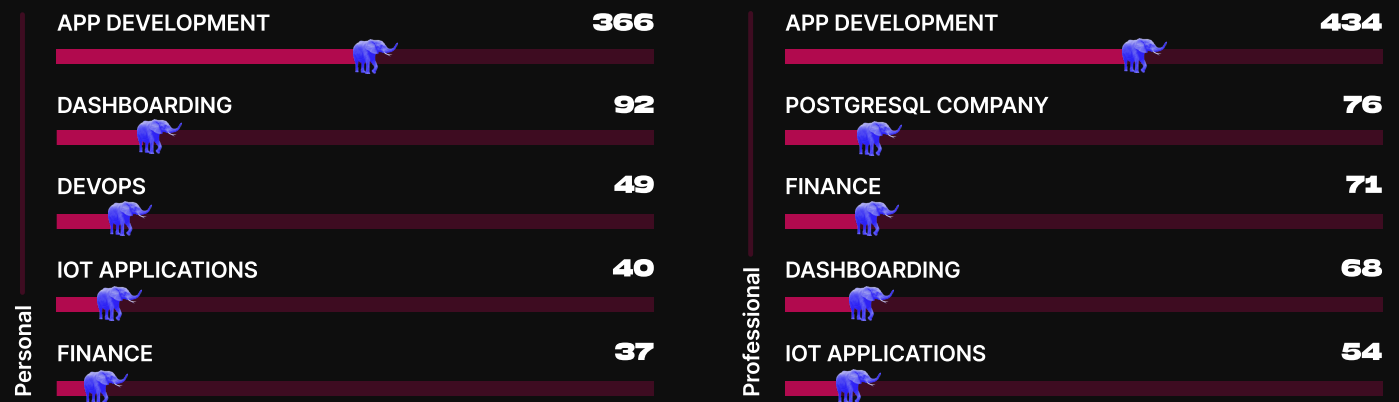# Do you use PostgreSQL for personal projects and at work?

Over ¾ of respondents report using PostgreSQL for personal projects. 95% of all respondents use PostgreSQL at work.

74% of respondents use PostgreSQL for both personal and professional projects.

78%
PERSONAL

74%
BOTH

95%
AT WORK

How would you classify your personal and professional use case?

Note: in 2022, we added open-source provider and PostgreSQL company use cases. We also allowed respondents to choose only one option.

Personal

Use case	Value
APP DEVELOPMENT	366
DASHBOARDING	92
DEVOPS	49
IOT APPLICATIONS	40
FINANCE	37

Professional

Use case	Value
APP DEVELOPMENT	434
POSTGRESQL COMPANY	76
FINANCE	71
DASHBOARDING	68
IOT APPLICATIONS	54

The top 5 personal use cases closely mirror the professional use cases in 2022, except PostgreSQL company replaces DevOps.

The 2022 top 5 results slightly differ from 2021's. This year, app development and dashboarding kept their spot in the top 5 of both personal and professional use cases.

Monitoring and "other" use cases—part of 2021's top 5 personal use cases—were pushed out of this year's list by the increasingly popular finance and IoT applications.
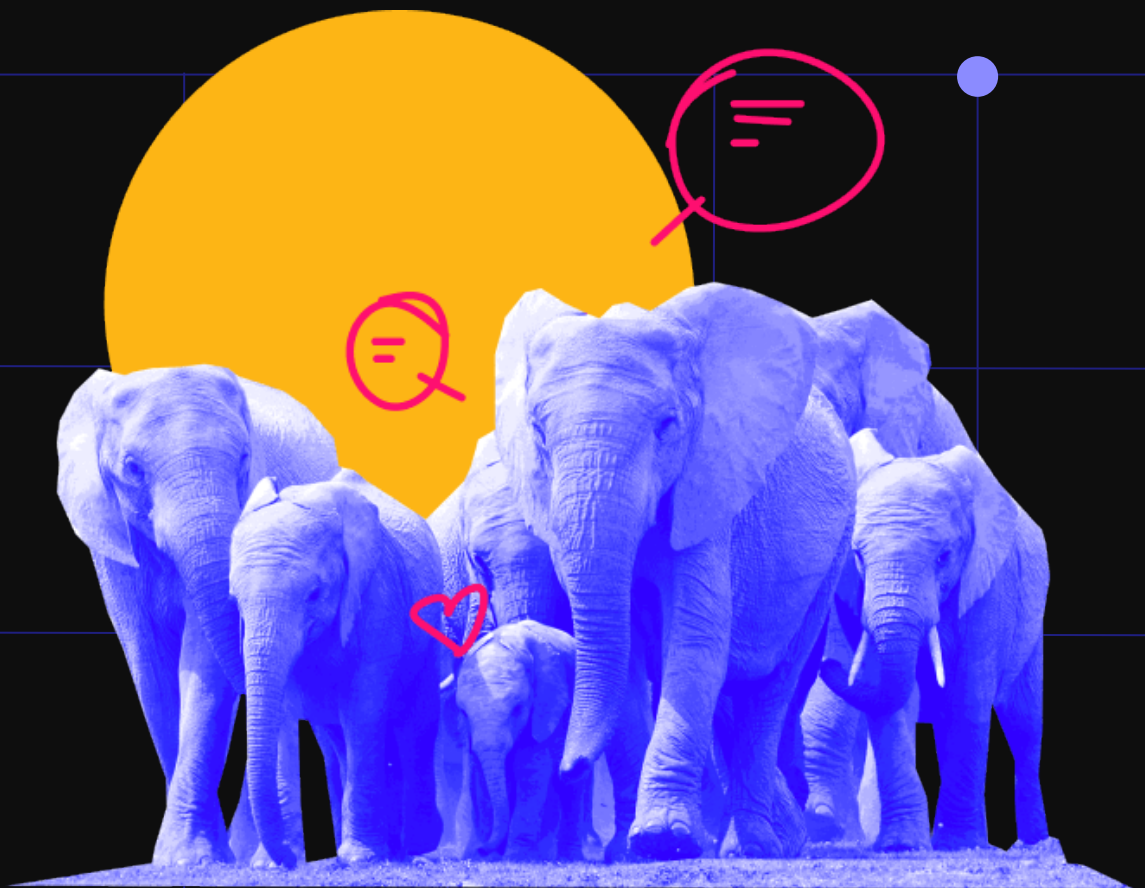
PostgreSQL company, finance, and IoT applications replaced monitoring, real-time analytics, and DevOps in the top 5 professional use cases.

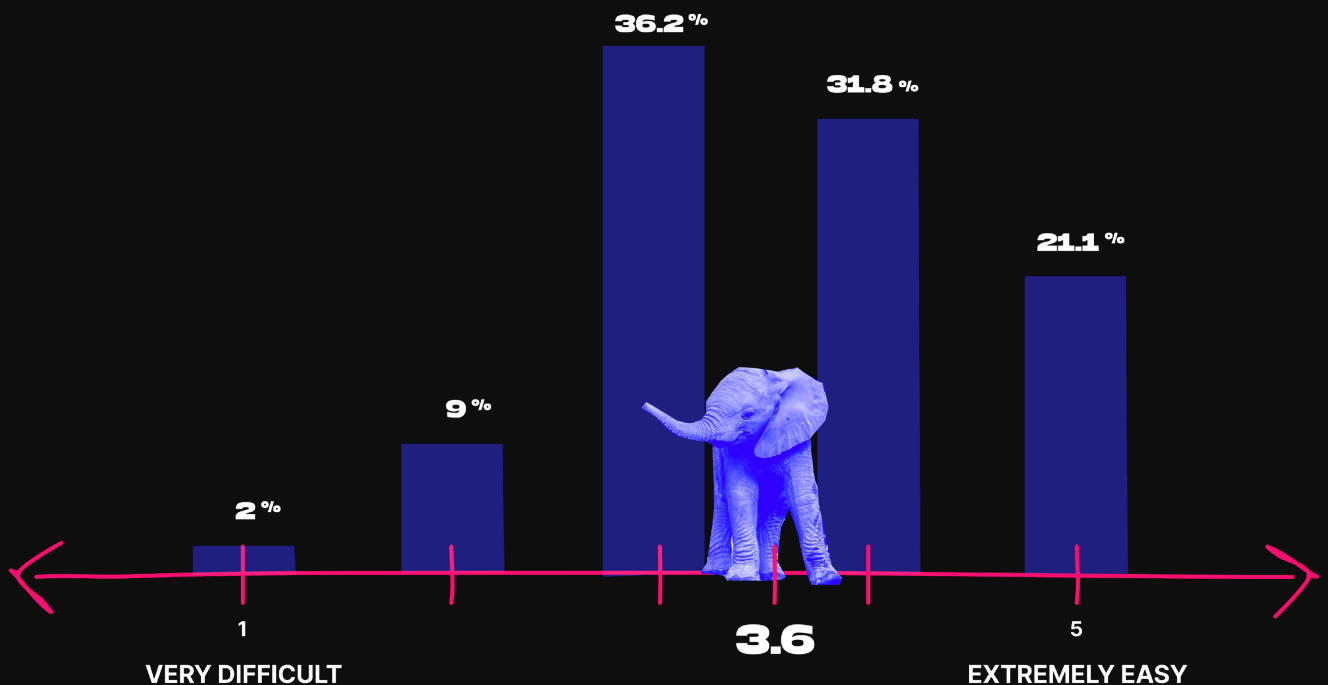# Which best describes the industry your organization is in?

01 Software, SaaS

02 Finance, FinTech

03 Education

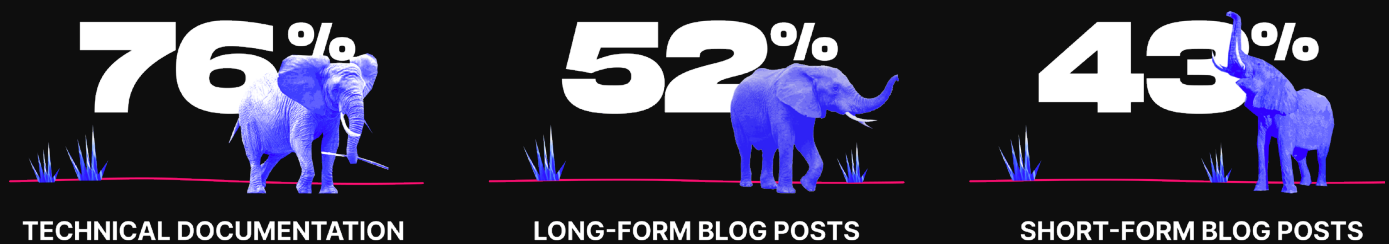**04** Healthcare, Pharmaceuticals

05 Manufacturing

community

How would you rate your ability to connect with the community?

36.2 %

31.8 %

21.1 %

9 %

2 %

1

3.6

5

VERY DIFFICULT

EXTREMELY EASY

How do you prefer to learn about PostgreSQL?

76%

52%

43%

TECHNICAL DOCUMENTATION

LONG-FORM BLOG POSTS

SHORT-FORM BLOG POSTS

The majority of respondents (76.2%) said that technical documentation is their preferred way of learning about PostgreSQL, followed by long-form blog posts (51.5%) and short-form blog posts (43.3%).
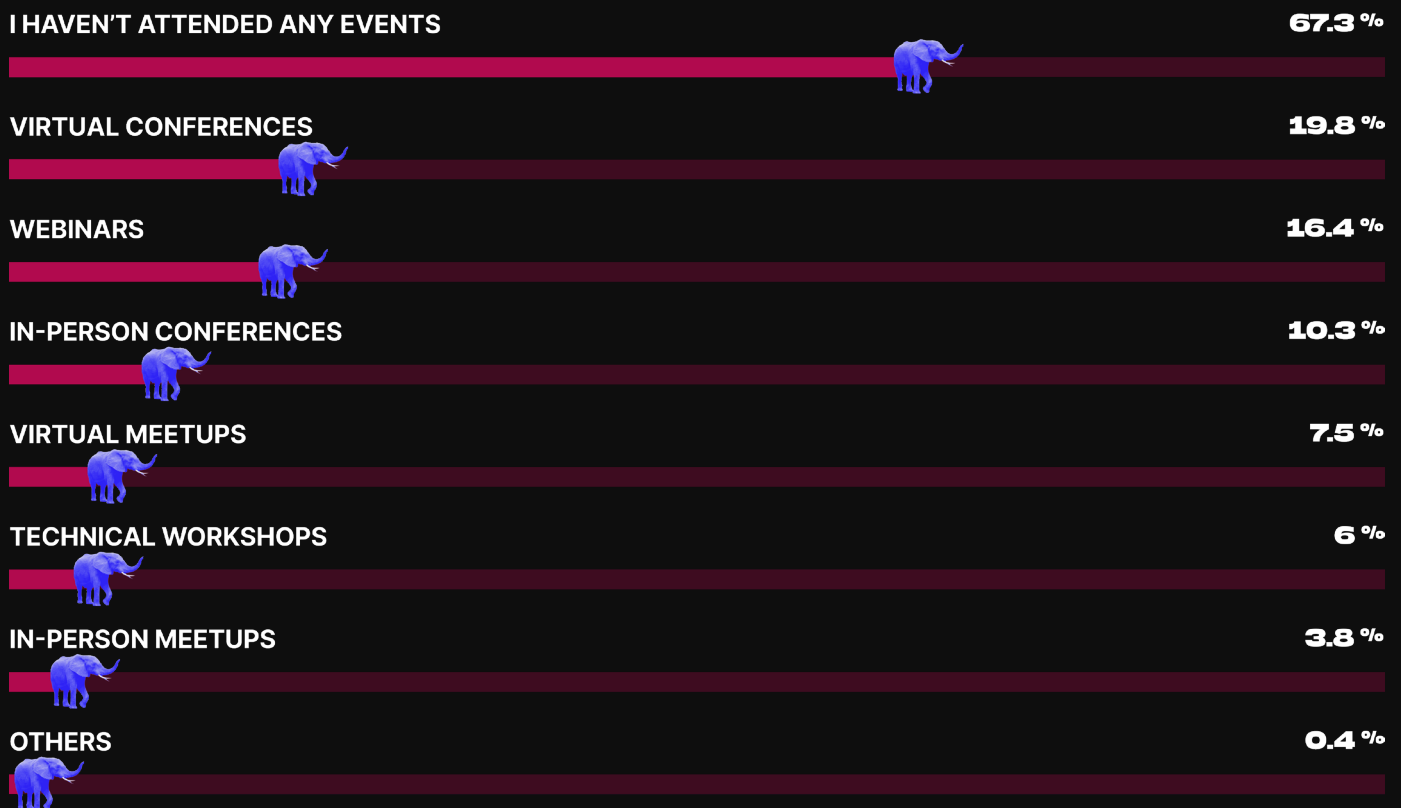
Respondents with less than 5 years of PostgreSQL experience prefer video over long-form and short-form blog posts.

Note: respondents could choose as many options as desired.

In the past year, what type of PostgreSQL events have you attended?

Mirroring the 2021 survey results, two-thirds of respondents said they have not attended any event in the past year. Virtual conferences and webinars remain the most popular events among PostgreSQL users.

Note: respondents could choose as many options as desired.

I HAVEN'T ATTENDED ANY EVENTS   **67.3 %**

VIRTUAL CONFERENCES   **19.8 %**

WEBINARS   **16.4 %**

IN-PERSON CONFERENCES   **10.3 %**

VIRTUAL MEETUPS   **7.5 %**

TECHNICAL WORKSHOPS   **6 %**

IN-PERSON MEETUPS   **3.8 %**

OTHERS   **0.4 %**

Which PostgreSQL events would you recommend friends and colleagues attend?

174 respondents shared their top recommended events (in order of frequency): PGConf Europe, PGCon, PGConf NYC, Citus Con, FOSDEM, PGConf Brasil, Postgres Vision, Postgres Conf Silicon Valley, Nordic PGDay, and TimescaleDB events.

Check out upcoming events

PGDay Belgium
PGDay Austria
PGCon
PG Sessions Paris
PGConf China
FOSDEM
PGConf Europe
EDB Conference
PGConf NYC
SCaLE
foss4g
PGDay events
Swiss PGDay
PGConf Russia
pganalyze webinars
Postgres Ibiza
Postgres Build
Citus Con
TimescaleDB events
PGDay Paris
PGConf Germany
Postgres Vision
PGConf Brasil
Nordic PGDay
Prague PostgreSQL Developer Days
PostgresConf
PDXPUG
Postgres London
PGDay France
Postgres Webinar Series
highload++ conference
PGConf events
All things open
Bangalore PostgreSQL Conference
**Postgres Conf Silicon Valley**
PGDay Turkey

Which PostgreSQL information sources do you value so highly that you'd recommend them to friends and colleagues?

Over half of the respondents (568) took the time and shared their favorite sources for getting information about PostgreSQL. PostgreSQL official documentation has been recommended by 21.5% of respondents.

Some of the other sources recommended by survey participants were the Postgres Weekly newsletter, mailing lists (hackers, general, postgres admin), Planet PostgreSQL blog aggregator, Stack Overflow, Twitter profiles (@postgreSQL and @raisepostgresql), Reddit (r/PostgreSQL, r/databases, r/database), blogs (Citus blog, Crunchy Data, Dimitri Fontaine, Depesz blog), Timescale Forum, newsletters (pgMustard, Citus, Timescale newsletter), YouTube (Scaling PostgreSQL, Socratica SQL tutorial), podcasts (Backend Engineering Show) and websites (postgrestutorial.com, use-the-index-luke.com, postgrescheatsheet.com).

View 2022's raw data

21.5%	11.6%	9.5%	7.9%	7.2%
DOCUMENTATION	POSTGRES WEEKLY	MAILING LISTS	PLANET POSTGRES BLOG AGGREGATOR	STACK OVERFLOW
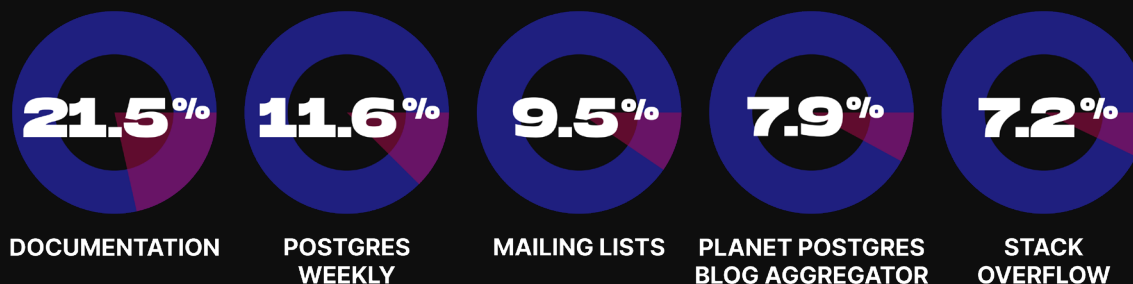
How do you engage/interact with the PostgreSQL community?

20%	10%	8%	8%	6%	6%
MAILING LIST	SLACK	STACK OVERFLOW	BLOGS	TWITTER	REDDIT
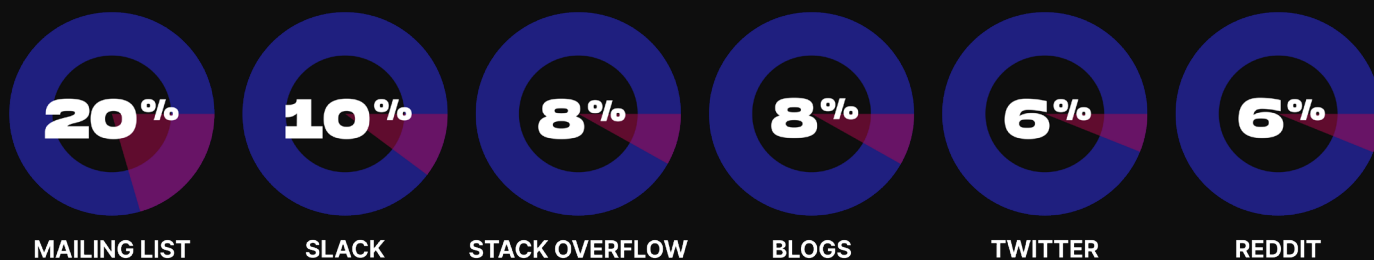
While some respondents reference difficulties using the PostgreSQL mailing lists as the primary way of interfacing with the core team and overall project, more than 20% of all respondents mentioned the mailing lists as one of the ways they keep engaged with the community. Other notable areas that people engage in include Slack (10%), Stack Overflow (8%), blogs (8%), Twitter (6%), and Reddit (6%).

In your experience, what's the best thing about the PostgreSQL community / what do you like the most?

Over 290 respondents shared one or more aspects of the community they like the most.
We have included a few responses below.

View 2022's raw data

> There's quality content being produced for beginners to use.
>
> **Respondent quote**

> The openness and very welcoming attitude to all in the community by most in the community.
>
> **Respondent quote**

> ❝
>
> We always help each other and
> have a high level of collaboration.
>
> **Respondent quote**

> ❝
>
> Excellent documentation
> supported by the community.
>
> **Respondent quote**

Where do you see room for improvement in the PostgreSQL community?

Over 135 respondents shared one or more aspects of the community where they see challenges and room for improvement. We have included an assortment of responses below.

View 2022's raw data

> ❝
>
> The community needs to
> be much more diverse.
>
> **Respondent quote**

> ❝
>
> Get more people involved.
> There are already plenty, and
> encouraging more newcomers
> is essential for ensuring the
> longevity of every community.
>
> **Respondent quote**

> ❝
>
> A lot of information is still hidden
> in mailing lists, which is hard to
> access for casual users.
>
> **Respondent quote**

What would make the PostgreSQL community better and/or more welcoming to newcomers? Why?

Over 160 respondents shed light on where they see room for improvement to make the community more welcoming for newcomers. Here are a few suggestions.

View 2022's raw data

> More modern communication channels, next to Slack, start moving away from email only.

Respondent quote

> More newcomer-friendly documentation on database design and events.

Respondent quote

> Make it easier to contribute to PostgreSQL code and docs. Mailing lists shouldn't be the only way. Every developer knows GitHub. There's no good reason why PostgreSQL shouldn't allow contributions using GitHub.
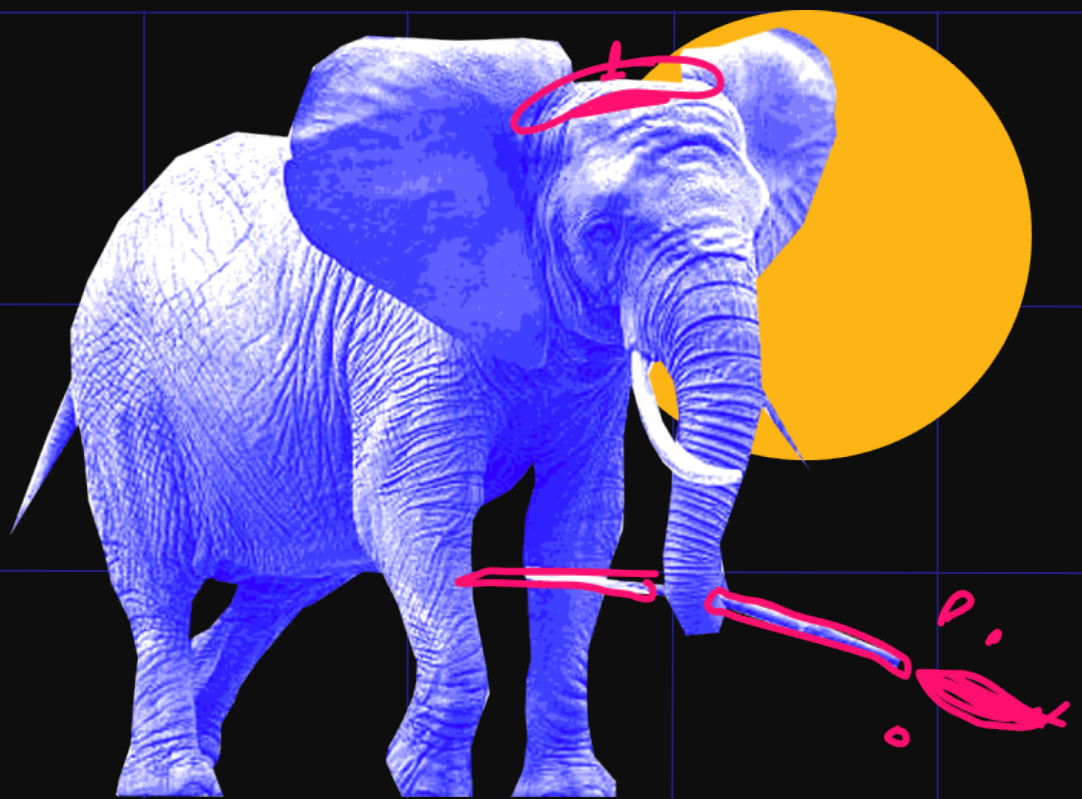
Respondent quote

> Create an online learning playground and new learning resources like cookbooks, tutorials, and checklists.

Respondent quote
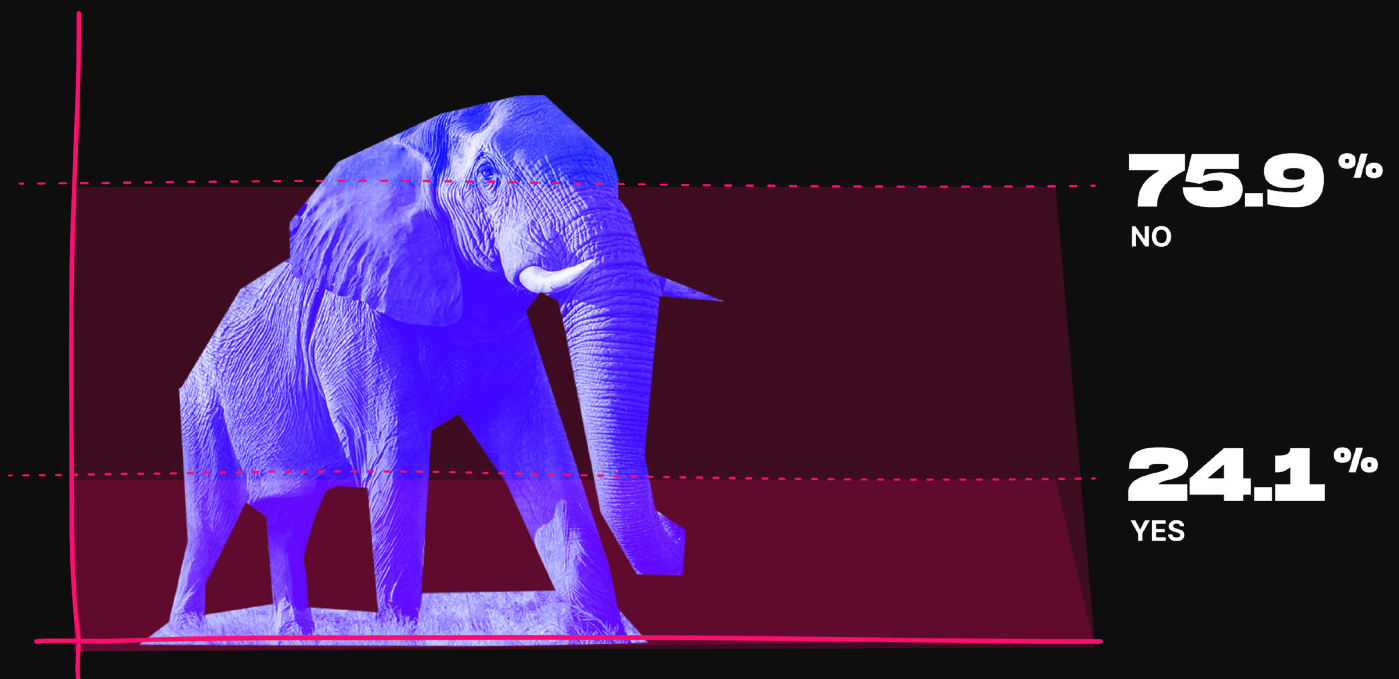
Ecosystem & Tools

What are your top 3 favorite or most frequently used PostgreSQL extensions?

In this free-form question, respondents shared their favorite PostgreSQL extensions. The 2022 top 10 responses mirror 2021's responses except for Citus pushing out pg_repack from the top 10.

View top 5 PostgreSQL extensions blog post

01 **PostGIS**

02 **TimescaleDB**

03 **pg_stat_statements**

04 **pgcrypto**

05 **pg_trgm**

06 **Citus**

07 **uuid-ossp**

08 **pg_cron**

09 **postgres_fdw**

10 **hstore**

Do you use TimescaleDB?

75.9 %
NO

24.1 %
YES

What languages do you most frequently use to access PostgreSQL?

Consistent with the 2021 survey, SQL, Python, Java, shell scripts, and JavaScript/TypeScript were cited as the most commonly used languages to access PostgreSQL.

PostgreSQL users with 0-5 years of experience are more likely to use JavaScript or TypeScript than Java.

Users with 6+ years of experience are more likely to use shell scripts to access the database than less experienced users.

Note: respondents could select as many options as desired.

SQL	558
PYTHON	417
JAVA	222
SHELL SCRIPTS	221
JAVASCRIPT / TYPESCRIPT	192
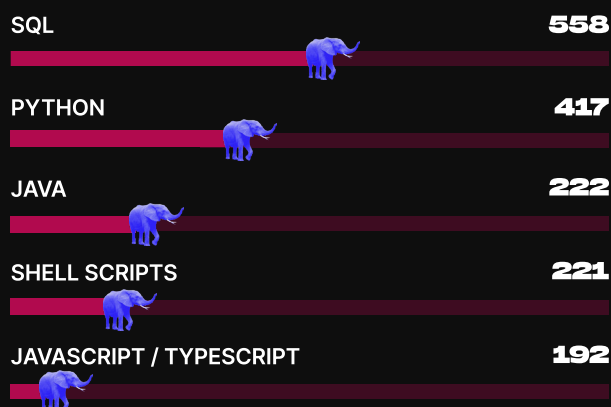
Which of the following tools do you use most often to connect to PostgreSQL for queries and administration tasks?

69% of respondents said they use psql to connect to the PostgreSQL database. Other top answers include pgAdmin, DBeaver, Datagrip, and IntelliJ.

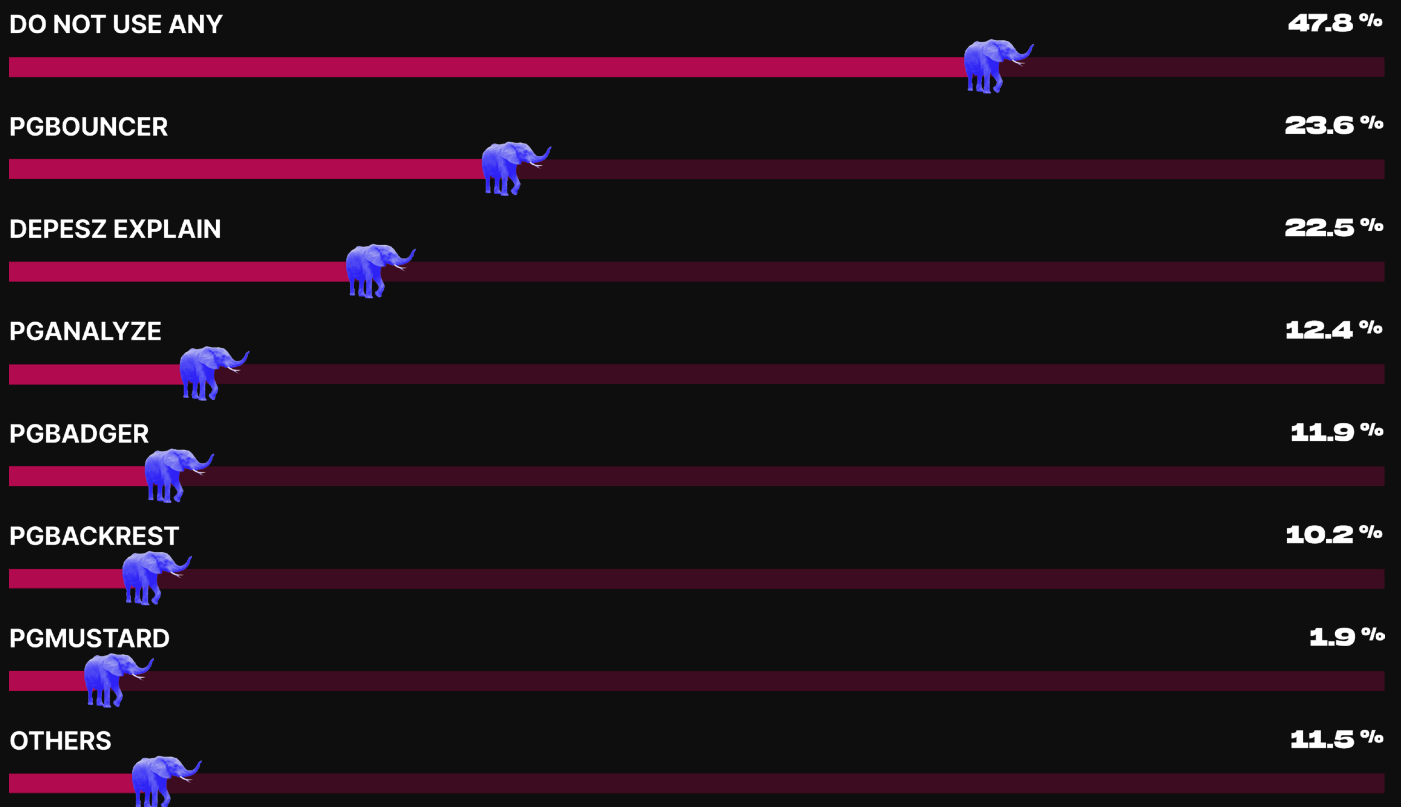Note: respondents could select as many options as desired.
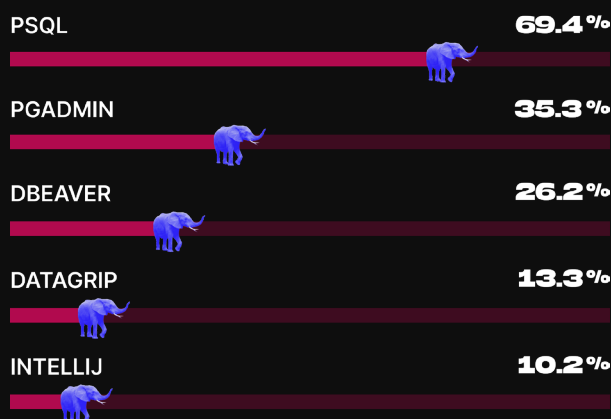
The top 13 tools that are not psql

PSQL	69.4%
PGADMIN	35.3%
DBEAVER	26.2%
DATAGRIP	13.3%
INTELLIJ	10.2%

What other third-party tools do you regularly use with PostgreSQL to assist with application development?

Almost half of the respondents (47.8%) said they do not use other third-party tools—but of those who use one, Depesz EXPLAIN and pgBouncer were the most common response.

Note: respondents could choose as many options as desired.

DO NOT USE ANY   **47.8 %**

PGBOUNCER   **23.6 %**

DEPESZ EXPLAIN   **22.5 %**

PGANALYZE   **12.4 %**

PGBADGER   **11.9 %**

PGBACKREST   **10.2 %**

PGMUSTARD   **1.9 %**

OTHERS   **11.5 %**

Which visualization tools do you use?

While 21% of respondents do not use visualization tools, of those who do, Grafana, pgAdmin, and DBeaver are the tools they most likely use. These results are consistent with the 2021 responses.
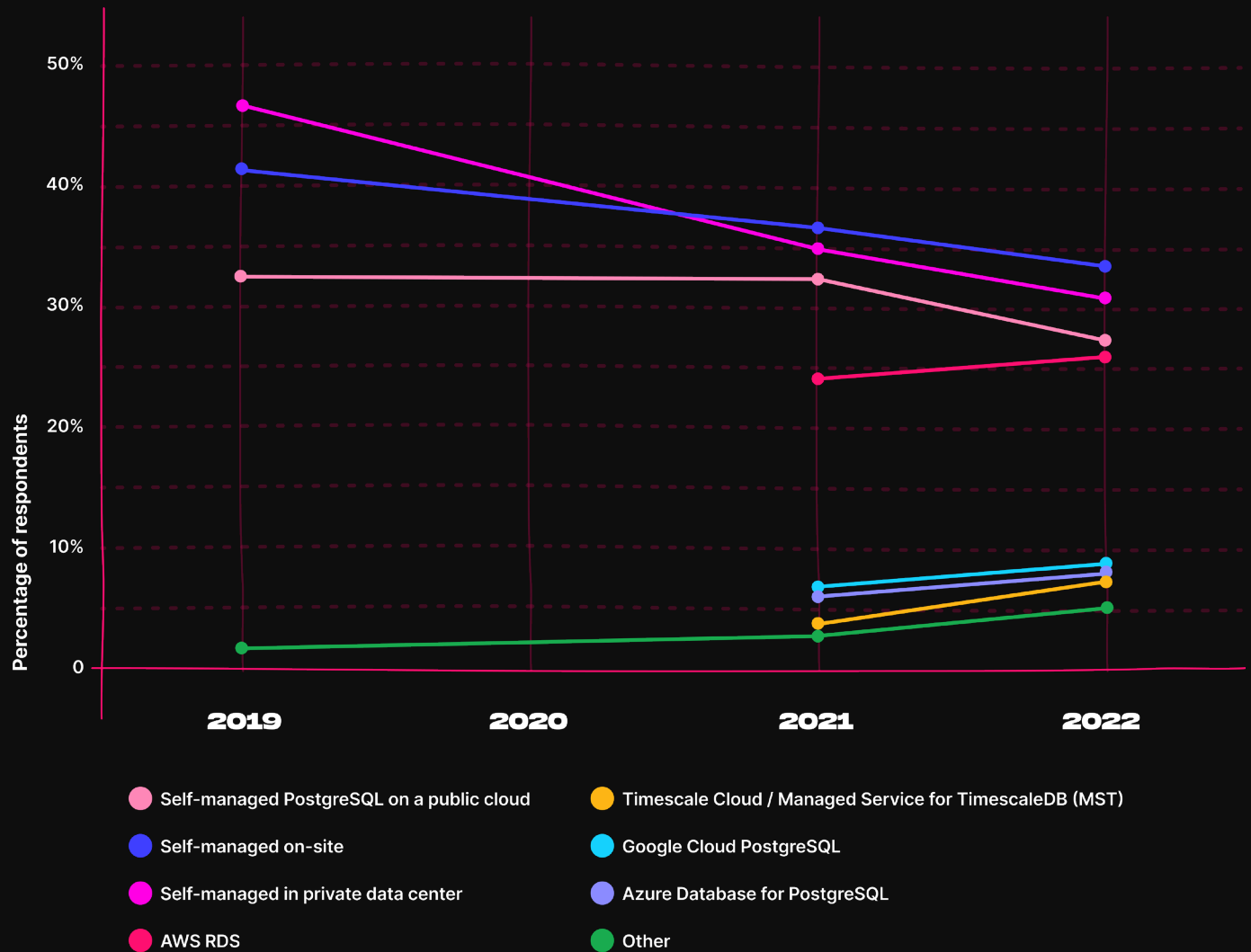
Get started with Grafana

Grafana   pgAdmin   DBeaver
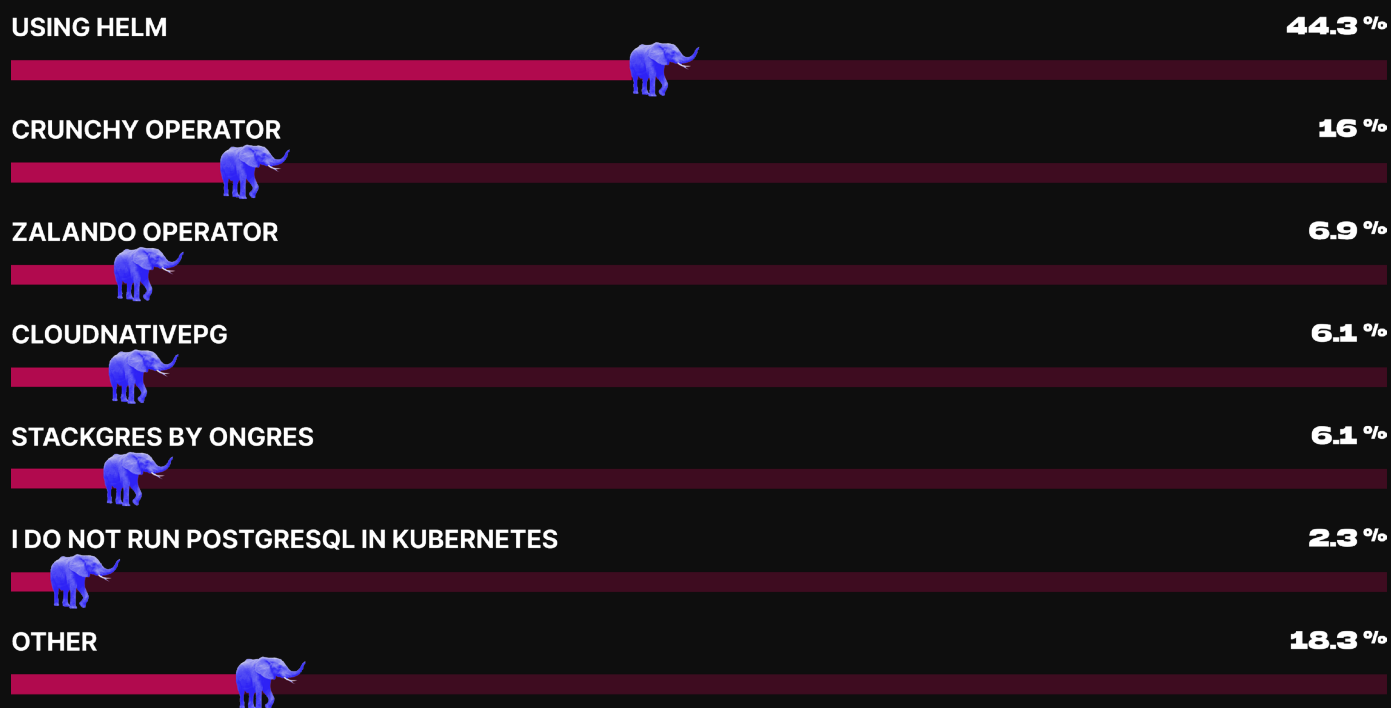
How do you deploy PostgreSQL?

Compared to 2019 and 2021, fewer respondents reported self-managing their PostgreSQL database. It appears that PostgreSQL users are increasingly using DBaaS providers to deploy PostgreSQL.

Note: respondents could choose as many options as desired.

Legend:

- Self-managed PostgreSQL on a public cloud
- Self-managed on-site
- Self-managed in private data center
- AWS RDS
- Timescale Cloud / Managed Service for TimescaleDB (MST)
- Google Cloud PostgreSQL
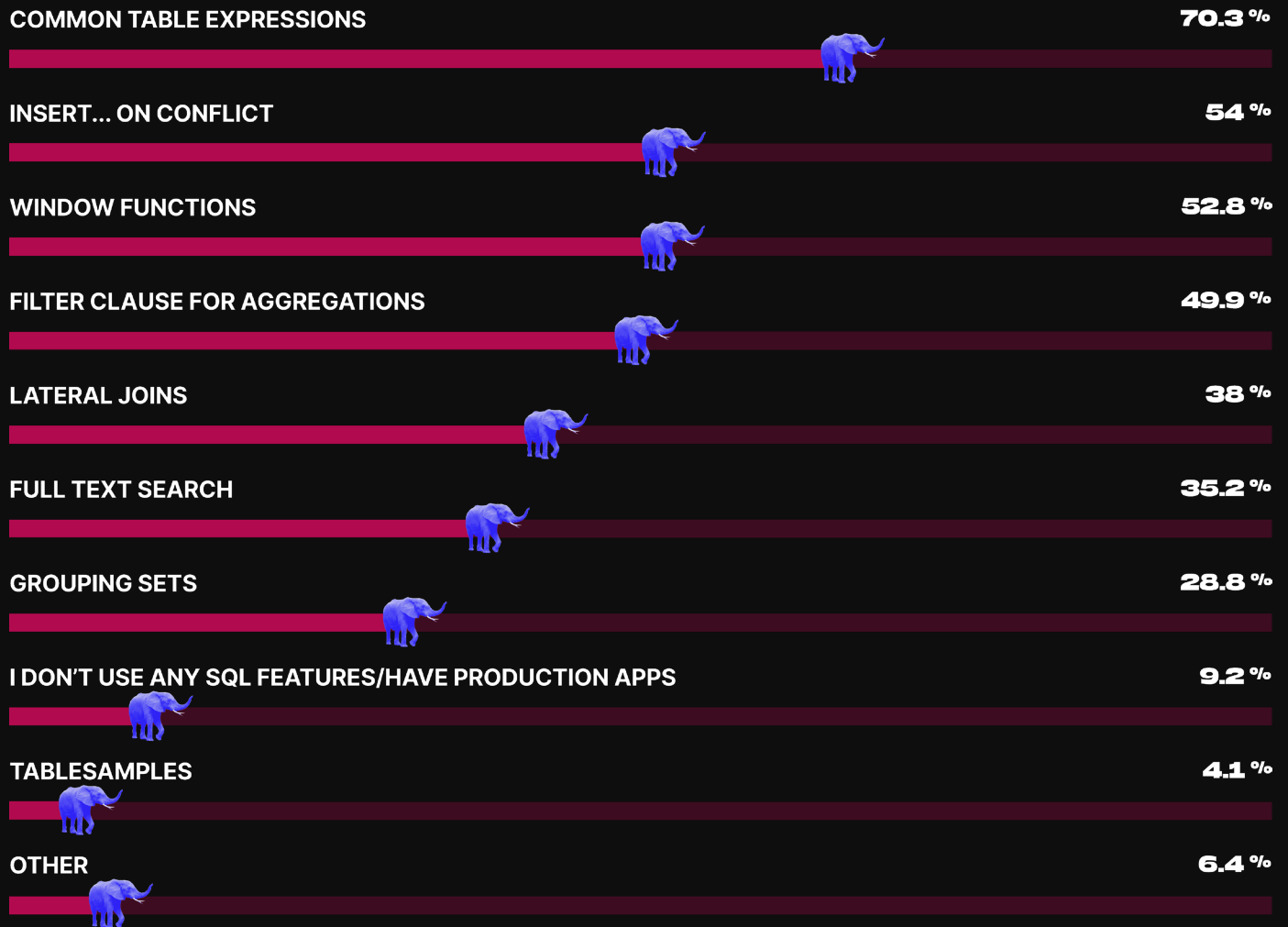- Azure Database for PostgreSQL
- Other

How do you run PostgreSQL in Kubernetes?

Of those who deploy PostgreSQL as a Kubernetes container, 44% use Helm, 16% use Crunchy Operator, 7% use Zalando Operator, 6% use CloudNativePG, and 6% use StackGres by OnGres.

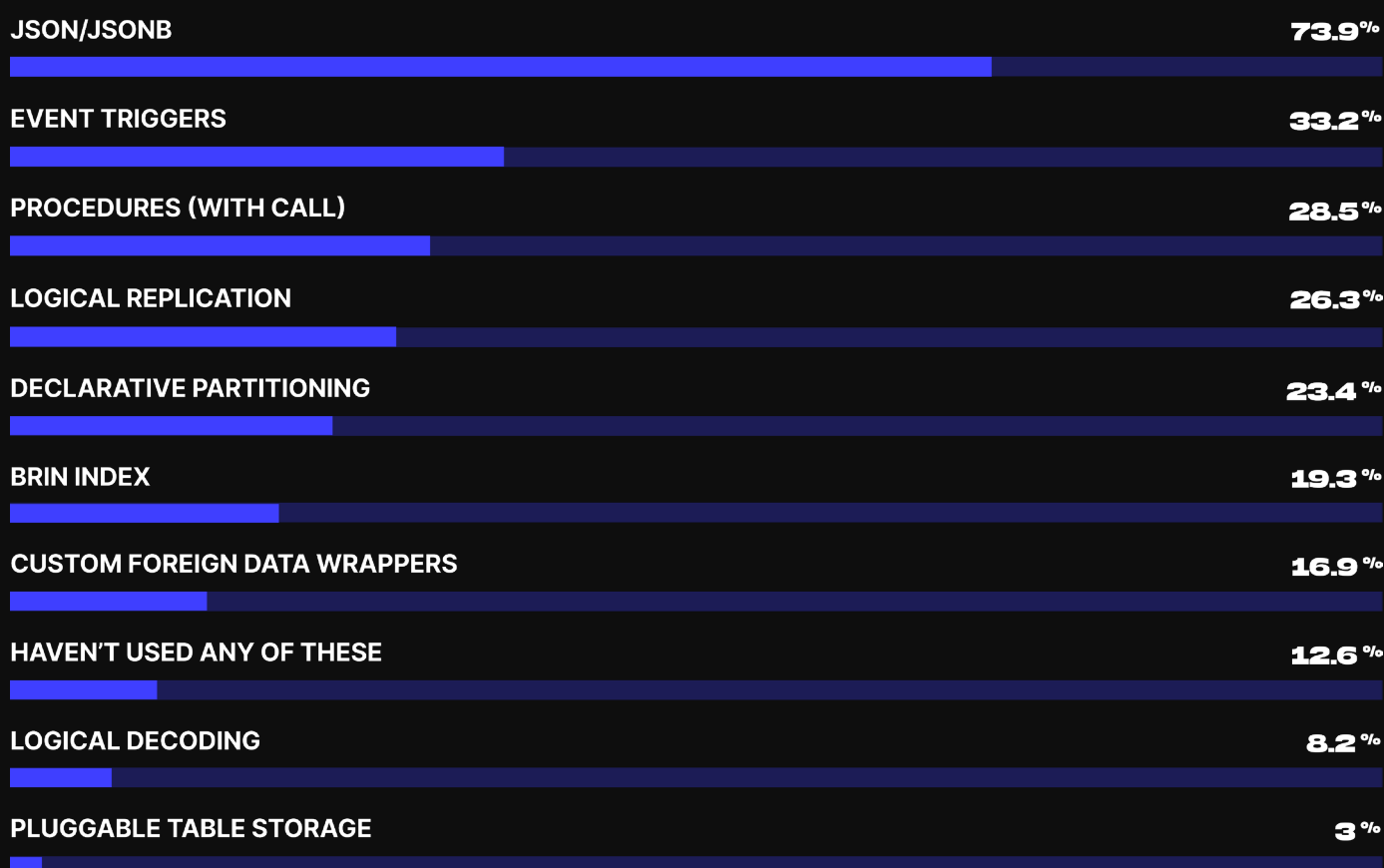**USING HELM**   **44.3 %**

CRUNCHY OPERATOR   **16 %**

ZALANDO OPERATOR   **6.9 %**

CLOUDNATIVEPG   **6.1 %**

STACKGRES BY ONGRES   **6.1 %**

I DO NOT RUN POSTGRESQL IN KUBERNETES   **2.3 %**

OTHER   **18.3 %**

Which of these SQL features do you use in your production apps?

Note: respondents could choose as many options as desired.

COMMON TABLE EXPRESSIONS   **70.3 %**

INSERT... ON CONFLICT   **54 %**

WINDOW FUNCTIONS   **52.8 %**

FILTER CLAUSE FOR AGGREGATIONS   **49.9 %**

LATERAL JOINS   **38 %**

FULL TEXT SEARCH   **35.2 %**

GROUPING SETS   **28.8 %**

I DON'T USE ANY SQL FEATURES/HAVE PRODUCTION APPS   **9.2 %**

TABLESAMPLES   **4.1 %**

OTHER   **6.4 %**

Which of these features have you used to organize and access data for your production apps?

Note: respondents could choose as many options as desired.

JSON/JSONB — 73.9%

EVENT TRIGGERS — 33.2%

PROCEDURES (WITH CALL) — 28.5%

LOGICAL REPLICATION — 26.3%

DECLARATIVE PARTITIONING — 23.4%

BRIN INDEX — 19.3%

CUSTOM FOREIGN DATA WRAPPERS — 16.9%

HAVEN'T USED ANY OF THESE — 12.6%

LOGICAL DECODING — 8.2%

PLUGGABLE TABLE STORAGE — 3%

What automated failover solutions do you use?

Consistent with 2021 survey results, the majority of respondents reported not using automated failover solutions—of those who use one, <u>Patroni</u> was the most common response.
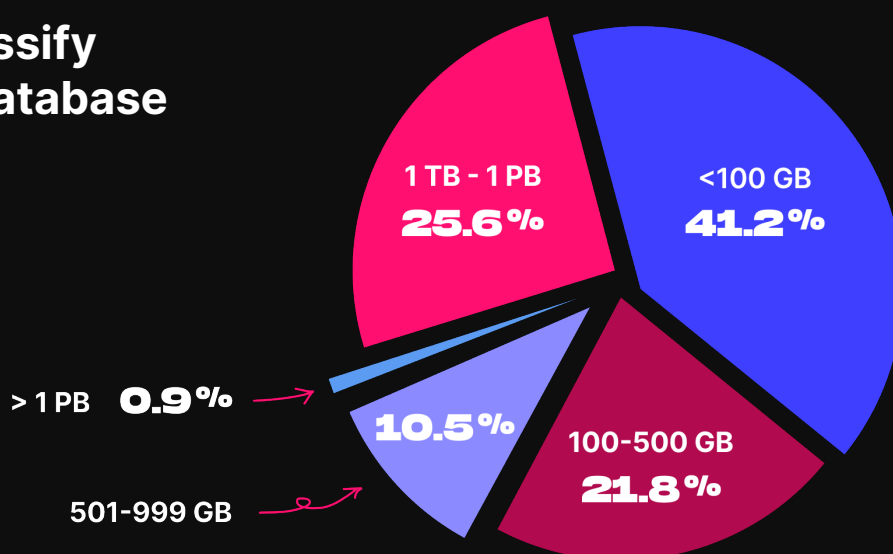
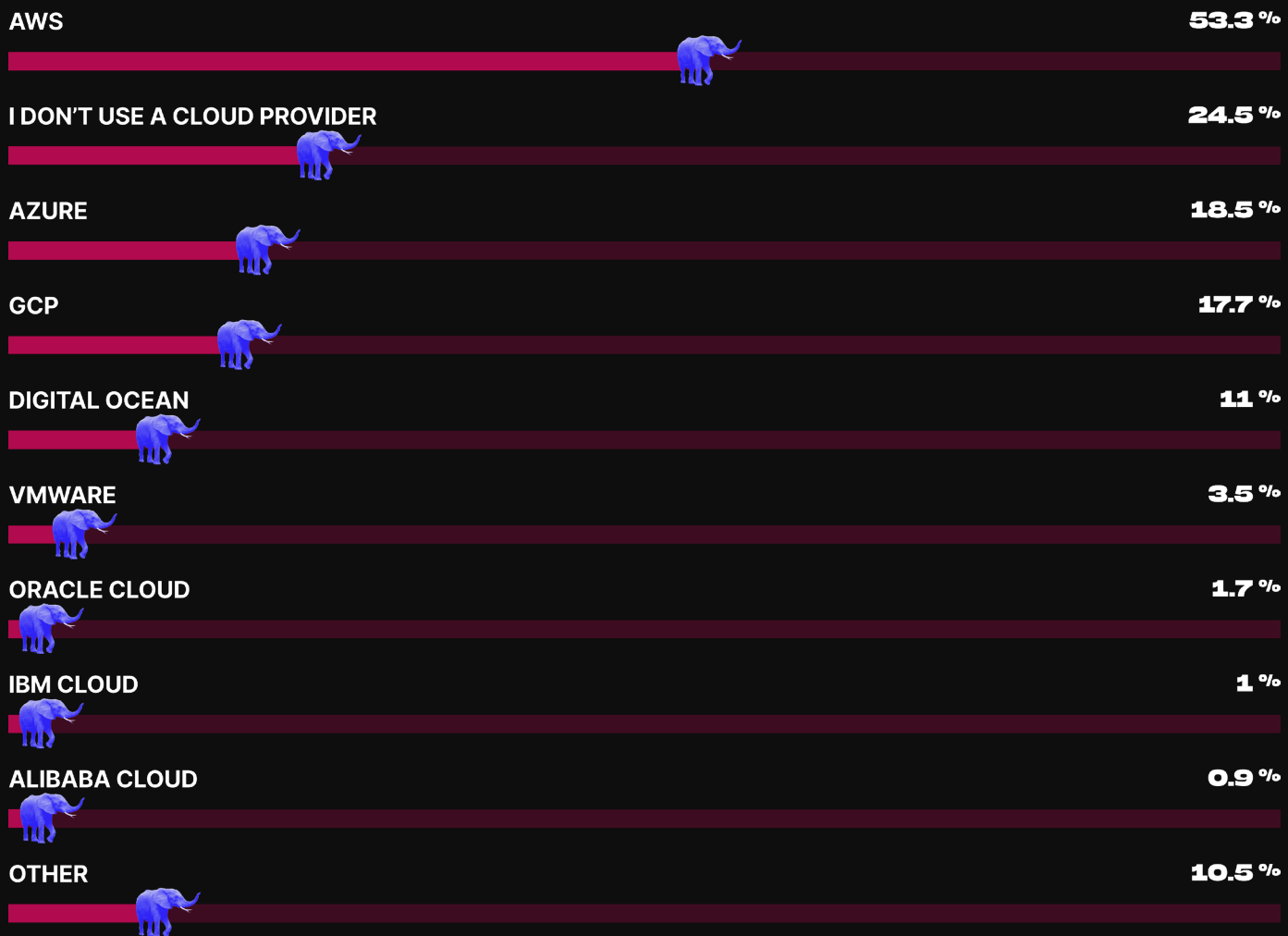Note: respondents could choose as many options as desired.

DON'T USE AN AUTOMATED FAILOVER SOLUTION   **67.4 %**

PATRONI   **13.6 %**

PG_AUTO_FAILOVER   **5.4 %**

REPMGR   **5.4 %**

STOLON   **0.9 %**

PAF   **0.8 %**

OTHER   **11.1 %**
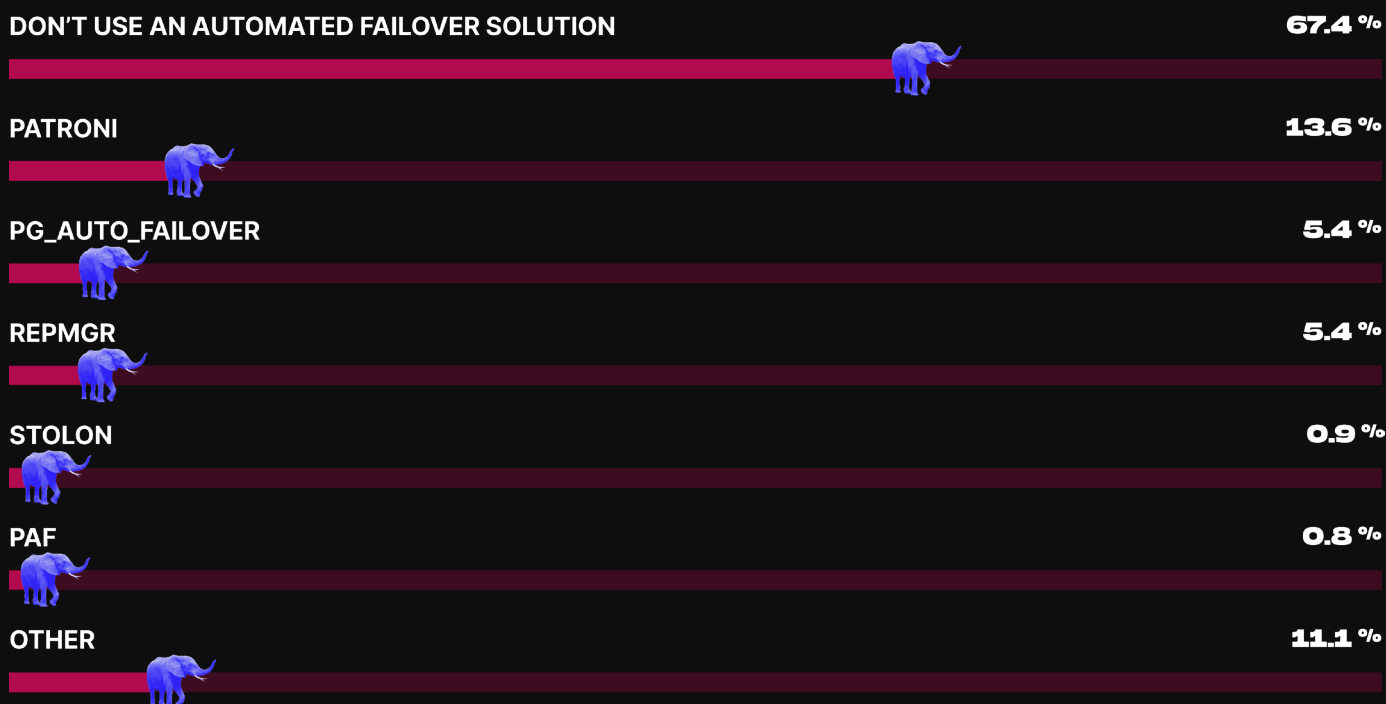
How would you classify your PostgreSQL database deployment size?

1 TB - 1 PB
25.6 %

<100 GB
41.2 %

> 1 PB 0.9 %

**10.5 %**

100-500 GB
21.8 %

501-999 GB

What cloud provider(s) do you currently use?

This year's results mirror the 2021 responses, except for Azure moving from fifth to third place and IBM Cloud moving up one spot.

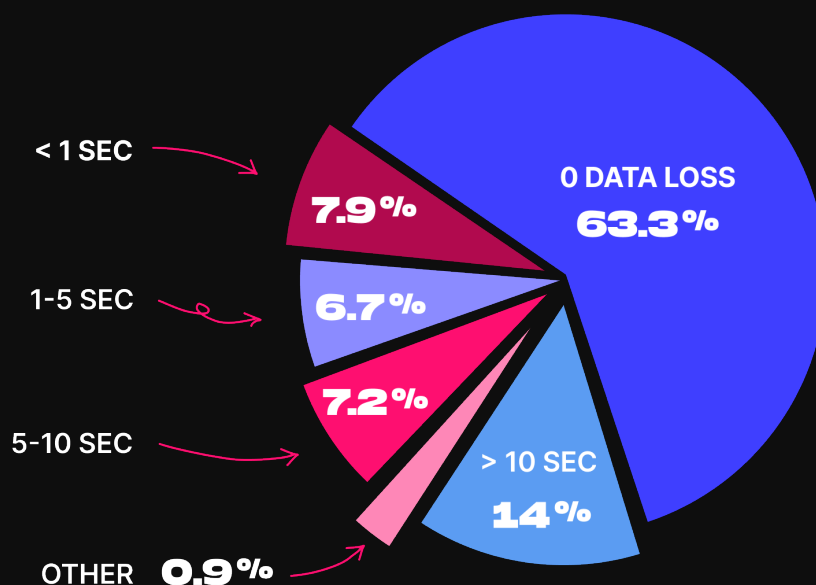Note: respondents could choose as many options as desired.

AWS   **53.3 %**

I DON'T USE A CLOUD PROVIDER   **24.5 %**

AZURE   **18.5 %**

GCP   **17.7 %**

DIGITAL OCEAN   **11 %**

VMWARE   **3.5 %**

ORACLE CLOUD   **1.7 %**

IBM CLOUD   **1 %**

ALIBABA CLOUD   **0.9 %**

OTHER   **10.5 %**

For your current production systems, how long is it acceptable to be down after a crash/incident?

OTHER
1.9%

> 10 MINS
22%

1-5 MINS
19.3%

5-10 MINS
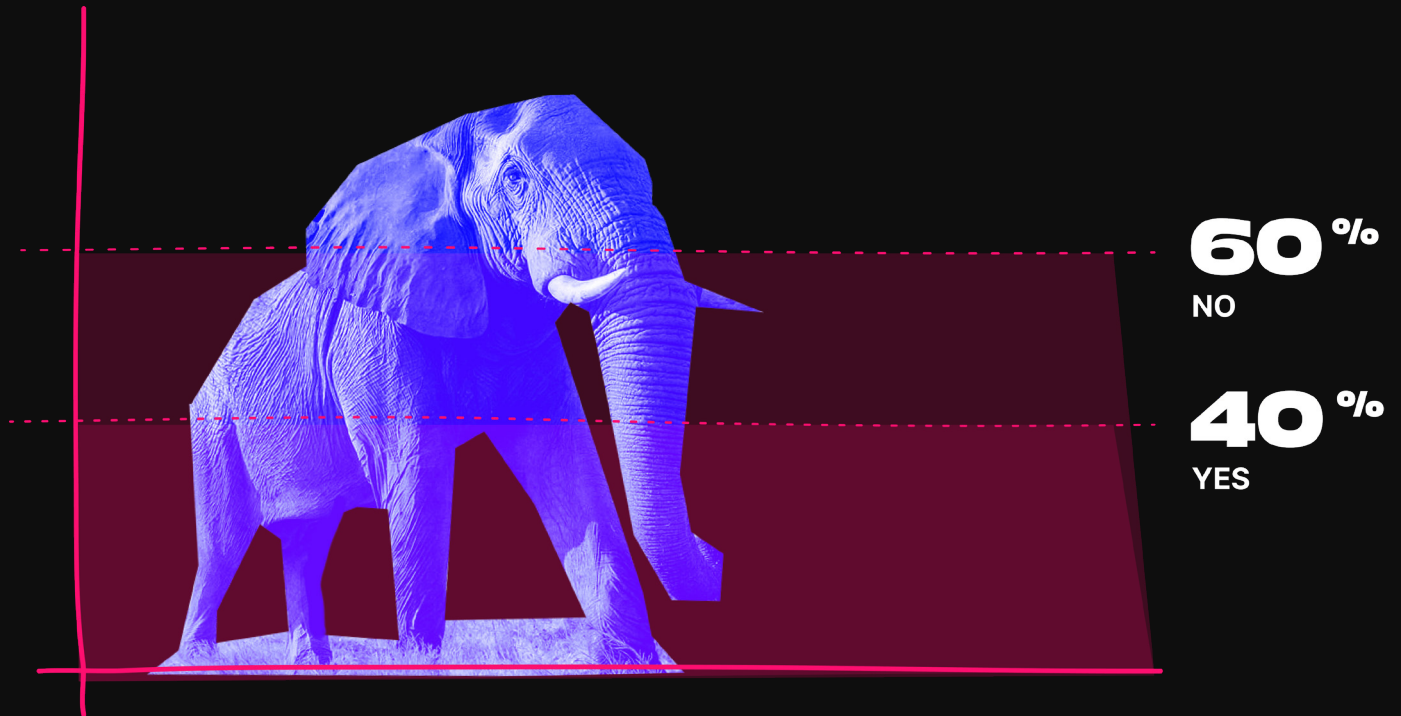**12%**

< 1 MIN
21.5%

0 DOWNTIME
23.3%
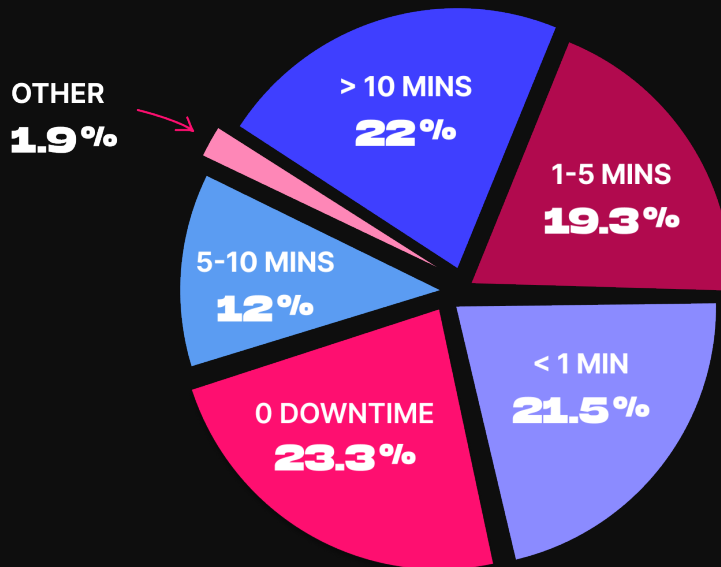
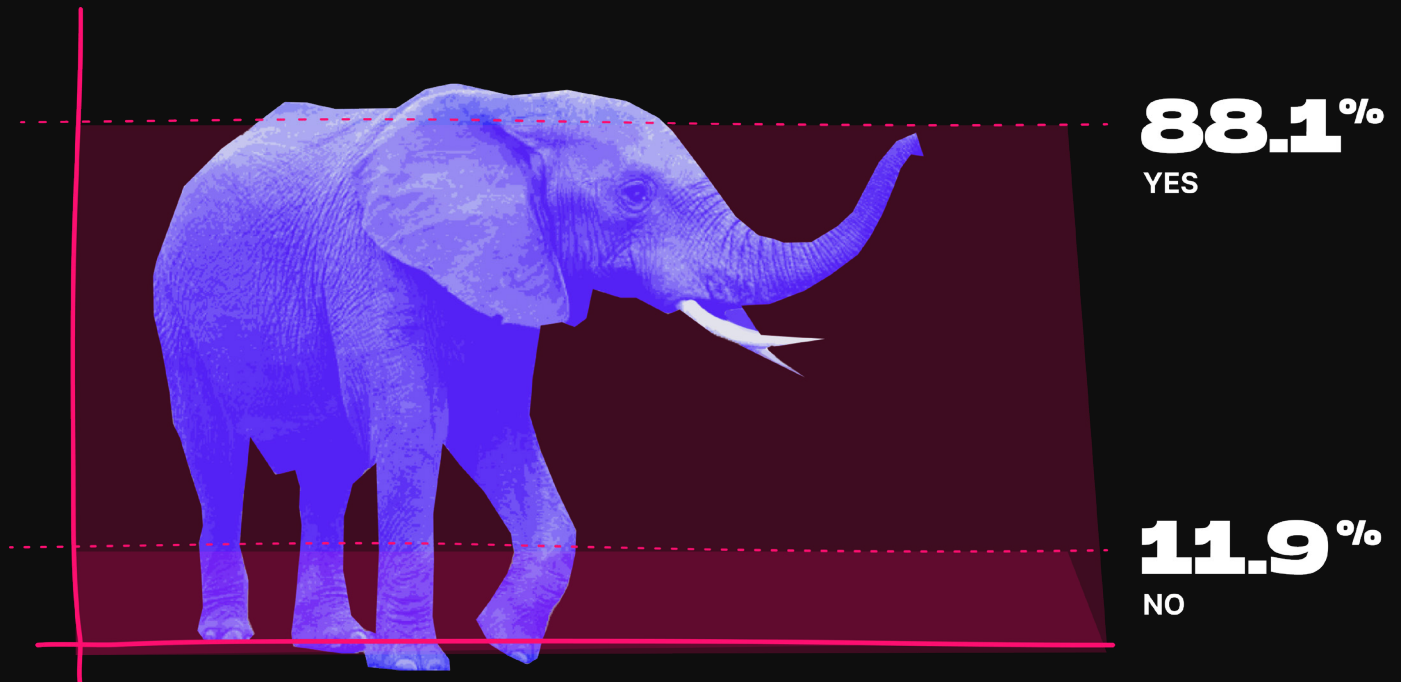# For your current production systems, how much data loss is acceptable to you?

Note: we realize that we could have worded the answers differently. In the future, we'll use different unit because data loss is not expressible in seconds.

< 1 SEC
7.9%

0 DATA LOSS
63.3%
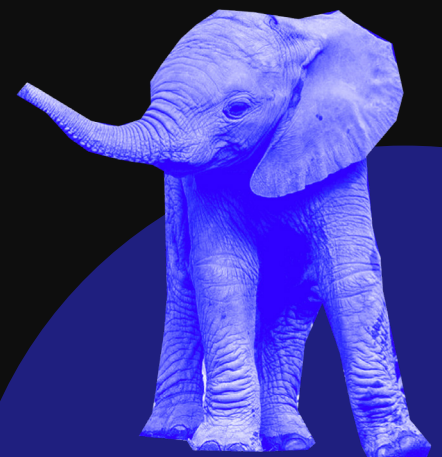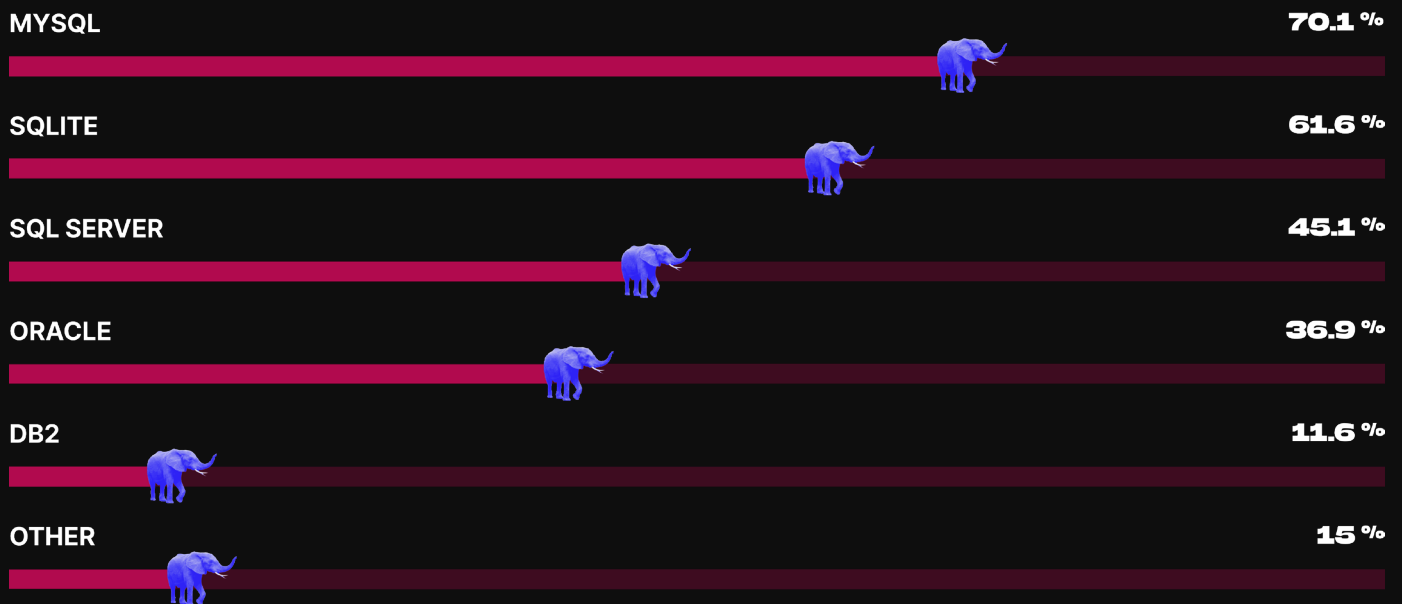
1-5 SEC
6.7%

5-10 SEC
7.2%

> 10 SEC
14%

OTHER **0.9%**

Have you ever needed to tune autovacuum?

60%
NO

40%
YES

Do you trust your production backups?

88.1%
YES

11.9%
NO

Do you currently use or have you used any of the following SQL databases?

Note: respondents could choose as many options as desired.

MYSQL **70.1** %

SQLITE **61.6** %

SQL SERVER **45.1** %

ORACLE **36.9** %

DB2 **11.6** %

OTHER **15** %

Have you migrated from another SQL database to PostgreSQL or from PostgreSQL to another SQL database?

More than half of nearly 670 people who answered this bonus question have migrated from another SQL database to PostgreSQL.

Many respondents cited that they migrated from MySQL and Oracle. The most commonly cited migration reasons were cost, ease of use, and previous experience with PostgreSQL.
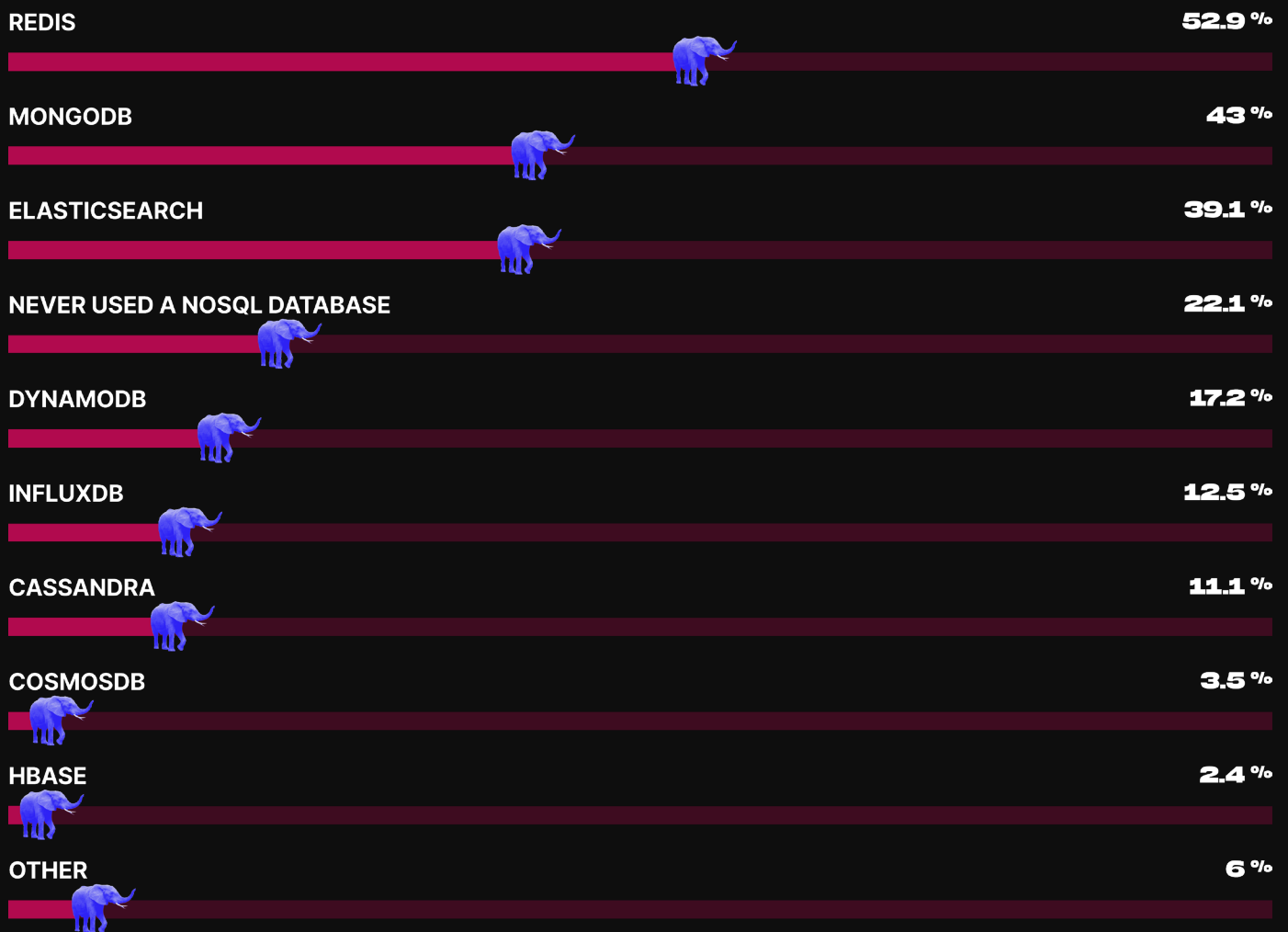
View 2022's raw data

57.8%
TO POSTGRESQL

40.4%
NO

1.8%
FROM POSTGRESQL
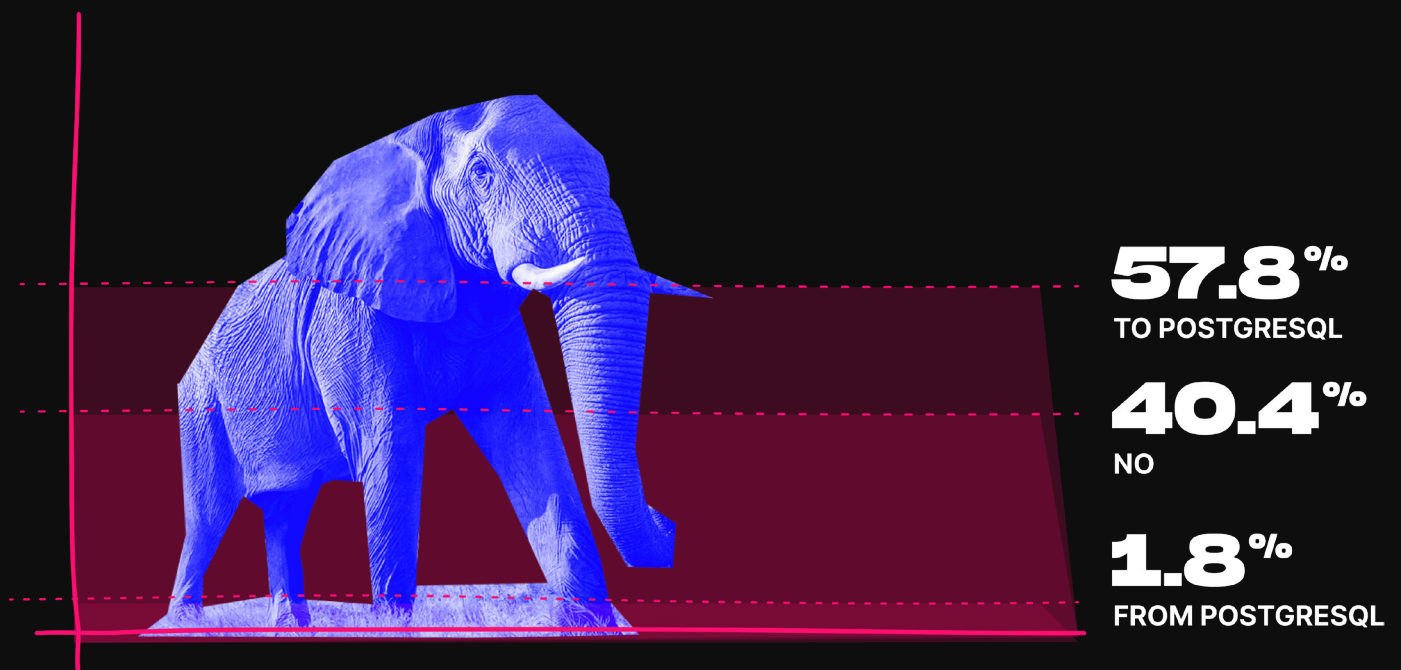
Do you currently use or have you used any of the following NoSQL databases?

Over half of the respondents reported using Redis, with MongoDB and Elasticsearch rounding out the top 3. MongoDB regained the #2 spot after being edged out by Elasticsearch in 2021.

Note: respondents could choose as many options as desired.

REDIS   **52.9 %**

MONGODB   **43 %**

ELASTICSEARCH   **39.1 %**

NEVER USED A NOSQL DATABASE   **22.1 %**

DYNAMODB   **17.2 %**

INFLUXDB   **12.5 %**

CASSANDRA   **11.1 %**

COSMOSDB   **3.5 %**

HBASE   **2.4 %**

OTHER   **6 %**

Have you migrated from a NoSQL database to PostgreSQL or from PostgreSQL to a NoSQL database?

Of 665 respondents who answered this bonus question, 22% have migrated from NoSQL database to PostgreSQL, and 5% from PostgreSQL to NoSQL database.

Respondents who migrated to PostgreSQL cited better query capabilities, data integrity, performance, ease of use, stability, and cost as the migration reason.

View 2022's raw data

72.8%
NO

22%
TO POSTGRESQL

5.3%
FROM POSTGRESQL
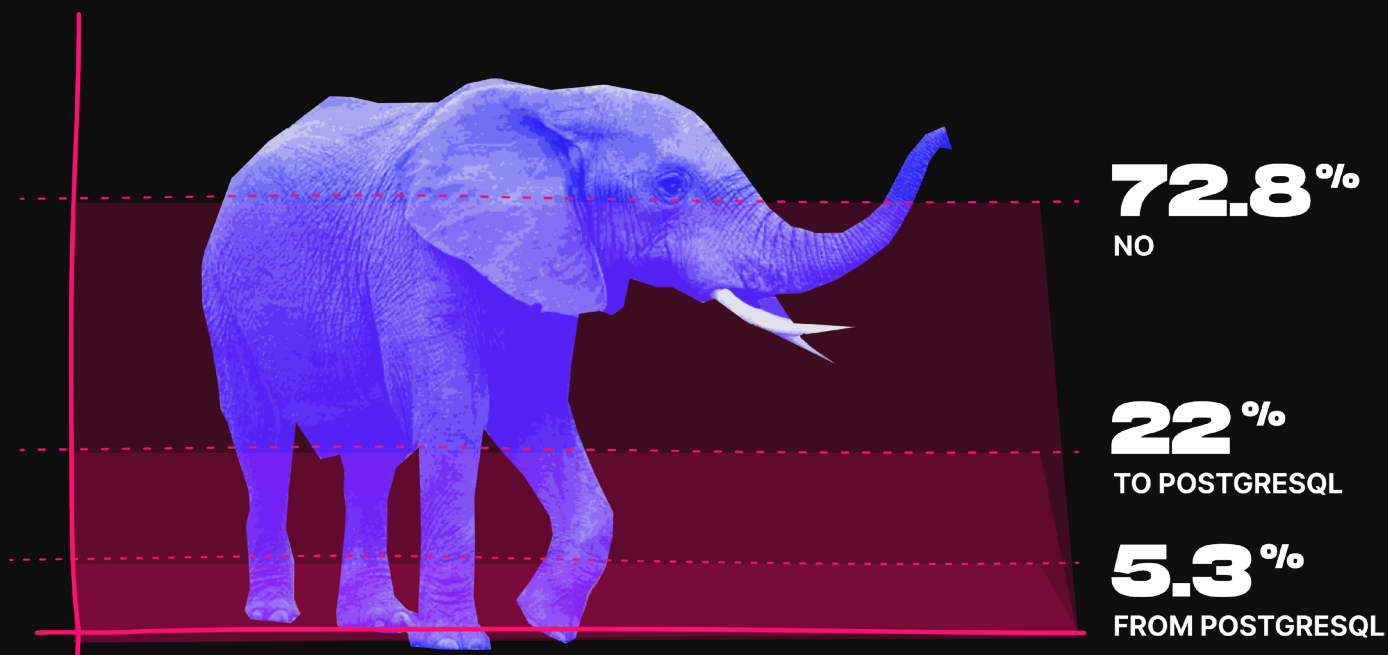
Thank you to everyone who promoted the State of PostgreSQL 2022 survey.

Depesz

SQL server and MySQL
Database Admins
and Developers

Software & Technology:
Metaverse | Web 3.0 |
Blockchain

PostgresWeekly

Rob Treat

PostgreSQL

PostgreSQL Users

DoKcommunity

Jan Karremans

Database Developers
& Architects Group

r/PostgreSQL

Yugabyte

PostgreSQL.org

PostgreSQL Server

Vusa Dube
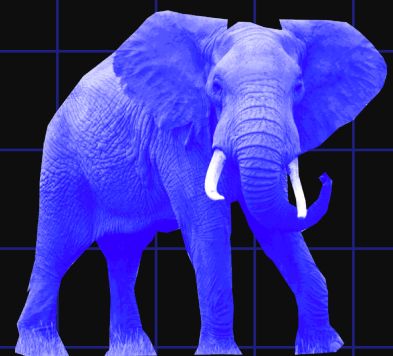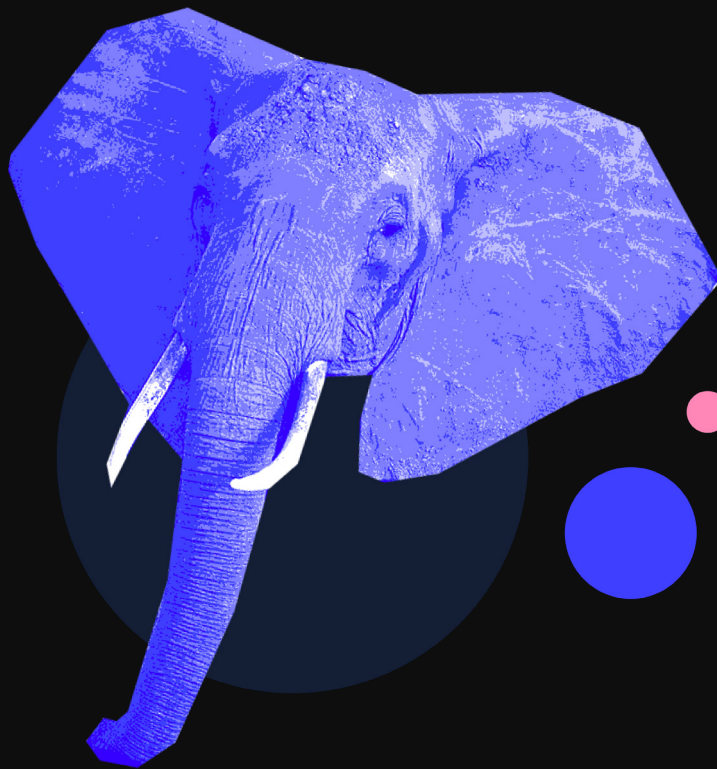
Thanks for reading!

[Sign up to get notified](#) to receive next year's State of PostgreSQL survey.

State Of
PostgreSQL 2022

Brought to you by Timescale