



Release Notes for Aurora PostgreSQL

Amazon Aurora



Amazon Aurora: Release Notes for Aurora PostgreSQL

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Release notes for Amazon Aurora PostgreSQL- Compatible Edition

The Amazon Aurora PostgreSQL-Compatible Edition release notes provide details about the Aurora PostgreSQL versions and extensions that are available for Amazon Aurora.

Aurora PostgreSQL releases are made available to all AWS Regions over the course of multiple days. Some Regions might temporarily show an engine version that isn't available in a different Region yet.

Topics

- [Release calendars for Aurora PostgreSQL](#)
- [Amazon Aurora PostgreSQL updates](#)
- [Babelfish for Aurora PostgreSQL updates](#)
- [Extension versions for Amazon Aurora PostgreSQL](#)

Release calendars for Aurora PostgreSQL

The release calendars on this page can help you plan your major and minor version upgrades. For more information on Amazon Aurora upgrades, versioning, and lifecycle, see [Amazon Aurora versions](#).

Topics

- [Release calendar for Aurora PostgreSQL major versions](#)
- [Release calendar for Aurora PostgreSQL minor versions](#)

Release calendar for Aurora PostgreSQL major versions

Aurora PostgreSQL major versions are available under standard support at least until community end of life for the corresponding community version. You can continue running a major version past its Aurora end of standard support date for a fee. For more information, see [Using Amazon RDS Extended support](#) and [Aurora pricing](#).

You can use the following dates to plan your testing and upgrade cycles.

Note

Dates with only a month and a year are approximate and are updated with an exact date when it's known.

PostgreSQL major version	Community release date	Community end of life date	Aurora major version	Aurora PostgreSQL LTS version	Aurora release date	Aurora end of standard support date	Start of RDS Extended Support year 1 pricing	Start of RDS Extended Support year 3 pricing	End of RDS Extended Support date	Minor versions eligible for RDS Extended Support
PostgreSQL 11	18 October 2018	November 2023	Aurora PostgreSQL 3. Applies to PostgreSQL 11.12 and older versions only. For version 11.13 and higher versions, the Aurora version is the same as the <i>major</i> version of the	Aurora PostgreSQL 11.9	26 November 2019	29 February 2024	1 April 2024	1 April 2026	31 March 2027	Aurora PostgreSQL 11.9 and 11.21

PostgreSQL major version	Community release date	Community end of life date	Aurora major version	Aurora PostgreSQL LTS version	Aurora release date	Aurora end of standard support date	Start of RDS Extended Support year 1 pricing	Start of RDS Extended Support year 3 pricing	End of RDS Extended Support date	Minor versions eligible for RDS Extended Support
			PostgreSQL community version, with a third digit in the <i>patch</i> location							

PostgreSQL major version	Community release date	Community end of life date	Aurora major version	Aurora PostgreSQL LTS version	Aurora release date	Aurora end of standard support date	Start of RDS Extended Support year 1 pricing	Start of RDS Extended Support year 3 pricing	End of RDS Extended Support date	Minor versions eligible for RDS Extended Support
PostgreSQL 12	14 November 2019	November 2024	Aurora PostgreSQL 4. Applies to PostgreSQL 12.7 and older versions only. For version 12.8 and higher versions, the Aurora version is the same as the <i>major</i> version of the PostgreSQL	Aurora PostgreSQL 12.9	23 December 2020	28 February 2025	1 March 2025	1 March 2027	29 February 2028	Aurora PostgreSQL 12.9 and to be determined

PostgreSQL major version	Community release date	Community end of life date	Aurora major version	Aurora PostgreSQL LTS version	Aurora release date	Aurora end of standard support date	Start of RDS Extended Support year 1 pricing	Start of RDS Extended Support year 3 pricing	End of RDS Extended Support date	Minor versions eligible for RDS Extended Support
			L community version, with a third digit in the <i>patch</i> location							

PostgreSQL major version	Community release date	Community end of life date	Aurora major version	Aurora PostgreSQL LTS version	Aurora release date	Aurora end of standard support date	Start of RDS Extended Support year 1 pricing	Start of RDS Extended Support year 3 pricing	End of RDS Extended Support date	Minor versions eligible for RDS Extended Support
PostgreSQL 13	September 24, 2020	November 2025	Aurora PostgreSQL 13. For version 13.3 and higher versions, the Aurora version is the same as the <i>major</i> version of the PostgreSQL community version, with a third digit in the <i>patch</i>	Aurora PostgreSQL 13.9	August 26, 2021	February 28, 2026	March 1, 2026	March 1, 2028	February 28, 2029	To be determined

PostgreSQL major version	Community release date	Community end of life date	Aurora major version	Aurora PostgreSQL LTS version	Aurora release date	Aurora end of standard support date	Start of RDS Extended Support year 1 pricing	Start of RDS Extended Support year 3 pricing	End of RDS Extended Support date	Minor versions eligible for RDS Extended Support
			location when patches to Aurora are released							

PostgreSQL major version	Community release date	Community end of life date	Aurora major version	Aurora PostgreSQL LTS version	Aurora release date	Aurora end of standard support date	Start of RDS Extended Support year 1 pricing	Start of RDS Extended Support year 3 pricing	End of RDS Extended Support date	Minor versions eligible for RDS Extended Support
PostgreSQL 14	30 September 2021	November 2026	Aurora PostgreSQL 14.3 and higher. The Aurora version is the same as the <i>major</i> version of the PostgreSQL community version, with a third digit in the <i>patch</i> location when patches to	Aurora PostgreSQL 14.6	10 March 2022	28 February 2027	1 March 2027	1 March 2029	28 February 2030	To be determined

PostgreSQL major version	Community release date	Community end of life date	Aurora major version	Aurora PostgreSQL LTS version	Aurora release date	Aurora end of standard support date	Start of RDS Extended Support year 1 pricing	Start of RDS Extended Support year 3 pricing	End of RDS Extended Support date	Minor versions eligible for RDS Extended Support
			Aurora are released							

PostgreSQL major version	Community release date	Community end of life date	Aurora major version	Aurora PostgreSQL LTS version	Aurora release date	Aurora end of standard support date	Start of RDS Extended Support year 1 pricing	Start of RDS Extended Support year 3 pricing	End of RDS Extended Support date	Minor versions eligible for RDS Extended Support
PostgreSQL 15	10 November 2022	November 2027	Aurora PostgreSQL 15.2 and higher. The Aurora version is the same as the <i>major</i> version of the PostgreSQL community version, with a third digit in the <i>patch</i> location when patches to	–	8 February 2023	29 February 2028	1 March 2028	1 March 2030	28 February 2031	To be determined

PostgreSQL major version	Community release date	Community end of life date	Aurora major version	Aurora PostgreSQL LTS version	Aurora release date	Aurora end of standard support date	Start of RDS Extended Support year 1 pricing	Start of RDS Extended Support year 3 pricing	End of RDS Extended Support date	Minor versions eligible for RDS Extended Support
			Aurora are released							

PostgreSQL major version	Community release date	Community end of life date	Aurora major version	Aurora PostgreSQL LTS version	Aurora release date	Aurora end of standard support date	Start of RDS Extended Support year 1 pricing	Start of RDS Extended Support year 3 pricing	End of RDS Extended Support date	Minor versions eligible for RDS Extended Support
PostgreSQL 16	14 September 2023	9 November 2028	Aurora PostgreSQL 16.1 and higher. The Aurora version is the same as the <i>major</i> version of the PostgreSQL community version, with a third digit in the <i>patch</i> location when patches to	–	31 January 2024	28 February 2029	1 March 2029	1 March 2031	28 February 2032	To be determined

PostgreSQL major version	Community release date	Community end of life date	Aurora major version	Aurora PostgreSQL LTS version	Aurora release date	Aurora end of standard support date	Start of RDS Extended Support year 1 pricing	Start of RDS Extended Support year 3 pricing	End of RDS Extended Support date	Minor versions eligible for RDS Extended Support
			Aurora are released							

Note

RDS Extended Support charges only apply after a major version reaches end of standard support. RDS Extended Support for PostgreSQL 11 starts on March 1, 2024, but will not be charged until April 1, 2024. Between March 1 and March 31, all PostgreSQL version 11 DB instances and clusters on RDS are covered under RDS Extended Support.

Release calendar for Aurora PostgreSQL minor versions

Aurora currently supports the following minor versions of PostgreSQL.

Note

Dates with only a month and a year are approximate, and will be updated with an exact date when it's known.

PostgreSQL minor engine version	Community release date	Aurora release date	Aurora end of standard support date			
16						
16.2	08 February 2024	29 April 2024	May 2025			
16.1	09 November 2023	31 January 2024	May 2025			
15						
15.6	08 February 2024	29 April 2024	May 2025			
15.5	09 November 2023	14 December 2023	February 2025			
15.4	10 August 2023	7 September 2023	February 2025			
15.3	11 May 2023	21 June 2023	February 2025			
15.2	9 February 2022	9 March 2023	September 2024			
15.1	10 November 2022	8 February 2023	September 2024			

PostgreSQL minor engine version	Community release date	Aurora release date	Aurora end of standard support date			
14						
14.11	08 February 2024	29 April 2024	May 2025			
14.10	09 November 2023	14 December 2023	February 2025			
14.9	10 August 2023	7 September 2023	February 2025			
14.8	11 May 2023	21 June 2023	February 2025			
14.7	9 February 2023	9 March 2023	September 2024			
14.6 (LTS)	10 November 2022	23 January 2023	28 February 2027			
14.5	11 August 2022	8 September 2023	September 2024			
14.4	12 May 2022	22 June 2022	September 2024			
14.3	12 May 2022	22 June 2022	September 2024			

PostgreSQL minor engine version	Community release date	Aurora release date	Aurora end of standard support date			
13						
13.14	08 February 2024	29 April 2024	February 2025			
13.13	09 November 2023	14 December 2023	February 2025			
13.12	10 August 2023	7 September 2023	February 2025			
13.11	11 May 2023	21 June 2023	February 2025			
13.10	9 February 2023	9 March 2023	September 2024			
13.9 (LTS)	10 November 2022	23 January 2023	28 February 2026			
13.8	11 August 2022	8 September 2022	September 2024			
13.7	12 May 2022	9 June 2022	September 2024			
12						

PostgreSQL minor engine version	Community release date	Aurora release date	Aurora end of standard support date			
12.18	08 February 2024	29 April 2024	February 2025			
12.17	09 November 2023	14 December 2023	February 2025			
12.16	10 August 2023	7 September 2023	February 2025			
12.15	11 May 2023	21 June 2023	February 2025			
12.14	09 February 2023	09 March 2023	September 2024			
12.13	10 November 2022	23 January 2023	September 2024			
12.12	11 August 2022	8 September 2022	September 2024			
12.11	12 May 2022	9 June 2022	September 2024			
12.9 (LTS)	11 November 2021	25 February 2022	28 February 2025			

PostgreSQL minor engine version	Community release date	Aurora release date	Aurora end of standard support date			
11						
11.21*	10 August 2023	7 September 2023	29 February 2024			
11.9 (LTS)	13 August 2020	13 November 2023	29 February 2024			

* Amazon RDS Extended Support eligible minor engine version. For more information, see [Using Amazon RDS Extended support](#).

LTS - Aurora PostgreSQL long-term support (LTS) releases. For more information see [Aurora PostgreSQL long-term support \(LTS\) releases](#).

Amazon Aurora PostgreSQL updates

Following, you can find information about versions of the Amazon Aurora PostgreSQL-Compatible Edition database engine that have been released for Amazon Aurora.

To determine the version number of your Aurora PostgreSQL database, see [Identifying versions of Amazon Aurora PostgreSQL](#) in the *Amazon Aurora User Guide*.

For information about extensions and modules, see [Extension versions for Amazon Aurora PostgreSQL](#).

For information about Amazon Aurora available releases, policies, and time lines, see [How long Amazon Aurora major versions remain available](#) in the *Amazon Aurora User Guide*. For more information about support and other policies for Amazon Aurora see [Amazon RDS FAQs](#).

To determine which Aurora PostgreSQL DB engine versions are available in an AWS Region, use the [describe-db-engine-versions](#) AWS CLI command as shown following.

```
aws rds describe-db-engine-versions --engine aurora-postgresql --query '*[].[EngineVersion]' --output text --region aws-region
```

For a list of AWS Regions, see [Aurora PostgreSQL Region availability](#) in the *Amazon Aurora User Guide*.

Topics

- [PostgreSQL 16.2](#)
- [PostgreSQL 16.1](#)
- [PostgreSQL 16.0](#)
- [PostgreSQL 15.6](#)
- [PostgreSQL 15.5](#)
- [PostgreSQL 15.4](#)
- [PostgreSQL 15.3](#)
- [PostgreSQL 15.2](#)
- [PostgreSQL 14.11](#)
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- [PostgreSQL 14.9](#)

- [PostgreSQL 14.8](#)
- [PostgreSQL 14.7](#)
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- [PostgreSQL 13.8](#)
- [PostgreSQL 13.7](#)
- [PostgreSQL 13.6 \(Deprecated\)](#)
- [PostgreSQL 13.5 \(Deprecated\)](#)
- [PostgreSQL 13.4 \(Deprecated\)](#)
- [PostgreSQL 13.3 \(Deprecated\)](#)
- [PostgreSQL 12.18](#)
- [PostgreSQL 12.17](#)
- [PostgreSQL 12.16](#)
- [PostgreSQL 12.15](#)
- [PostgreSQL 12.14](#)
- [PostgreSQL 12.13](#)
- [PostgreSQL 12.12](#)
- [PostgreSQL 12.11](#)
- [PostgreSQL 12.10 \(Deprecated\)](#)
- [PostgreSQL 12.9](#)
- [PostgreSQL 12.8 \(Deprecated\)](#)
- [PostgreSQL 12.7, Aurora PostgreSQL 4.2 \(Deprecated\)](#)

- [PostgreSQL 12.6, Aurora PostgreSQL 4.1 \(Deprecated\)](#)
- [PostgreSQL 12.4, Aurora PostgreSQL 4.0 \(Deprecated\)](#)
- [PostgreSQL 11.21](#)
- [PostgreSQL 11.20 \(Deprecated\)](#)
- [PostgreSQL 11.19 \(Deprecated\)](#)
- [PostgreSQL 11.18 \(Deprecated\)](#)
- [PostgreSQL 11.17 \(Deprecated\)](#)
- [PostgreSQL 11.16 \(Deprecated\)](#)
- [PostgreSQL 11.15 \(Deprecated\)](#)
- [PostgreSQL 11.14 \(Deprecated\)](#)
- [PostgreSQL 11.13 \(Deprecated\)](#)
- [PostgreSQL 11.12, Aurora PostgreSQL 3.6 \(Deprecated\)](#)
- [PostgreSQL 11.11, Aurora PostgreSQL 3.5 \(Deprecated\)](#)
- [PostgreSQL 11.9, Aurora PostgreSQL 3.4](#)
- [PostgreSQL 11.8, Aurora PostgreSQL 3.3 \(Deprecated\)](#)
- [PostgreSQL 11.7, Aurora PostgreSQL 3.2 \(Deprecated\)](#)
- [PostgreSQL 11.6, Aurora PostgreSQL 3.1 \(Deprecated\)](#)
- [PostgreSQL 11.4, Aurora PostgreSQL 3.0 \(Deprecated\)](#)
- [PostgreSQL 10.21 \(Deprecated\)](#)
- [PostgreSQL 10.20 \(Deprecated\)](#)
- [PostgreSQL 10.19 \(Deprecated\)](#)
- [PostgreSQL 10.18 \(Deprecated\)](#)
- [PostgreSQL 10.17, Aurora PostgreSQL 2.9 \(Deprecated\)](#)
- [PostgreSQL 10.16, Aurora PostgreSQL 2.8 \(Deprecated\)](#)
- [PostgreSQL 10.14, Aurora PostgreSQL 2.7 \(Deprecated\)](#)
- [PostgreSQL 10.13, Aurora PostgreSQL 2.6 \(Deprecated\)](#)
- [PostgreSQL 10.12, Aurora PostgreSQL 2.5 \(Deprecated\)](#)
- [PostgreSQL 10.11, Aurora PostgreSQL 2.4 \(Deprecated\)](#)
- [PostgreSQL 10.7, Aurora PostgreSQL 2.3 \(Deprecated\)](#)
- [PostgreSQL 10.6, Aurora PostgreSQL 2.2 \(Deprecated\)](#)

- [PostgreSQL 10.5, Aurora PostgreSQL 2.1 \(Deprecated\)](#)
- [PostgreSQL 10.4, Aurora PostgreSQL 2.0 \(Deprecated\)](#)
- [PostgreSQL 9.6.22, Aurora PostgreSQL 1.11 \(Deprecated\)](#)
- [PostgreSQL 9.6.21, Aurora PostgreSQL 1.10 \(Deprecated\)](#)
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- [PostgreSQL 9.6.18, Aurora PostgreSQL 1.8 \(Deprecated\)](#)
- [PostgreSQL 9.6.17, Aurora PostgreSQL 1.7 \(Deprecated\)](#)
- [PostgreSQL 9.6.16, Aurora PostgreSQL 1.6 \(Deprecated\)](#)
- [PostgreSQL 9.6.12, Aurora PostgreSQL 1.5 \(Deprecated\)](#)
- [PostgreSQL 9.6.11, Aurora PostgreSQL 1.4 \(Deprecated\)](#)
- [PostgreSQL 9.6.9, Aurora PostgreSQL 1.3 \(Deprecated\)](#)
- [PostgreSQL 9.6.8, Aurora PostgreSQL 1.2 \(Deprecated\)](#)
- [PostgreSQL 9.6.6 Aurora PostgreSQL 1.1 \(Deprecated\)](#)
- [PostgreSQL 9.6.3, Aurora PostgreSQL 1.0 \(Deprecated\)](#)

PostgreSQL 16.2

This release of Aurora PostgreSQL is compatible with PostgreSQL 16.2. For more information about the improvements in PostgreSQL 16.2, see [PostgreSQL release 16.2](#).

Releases and patches

- [Aurora PostgreSQL 16.2.2, June 20, 2024](#)
- [Aurora PostgreSQL 16.2.1, April 29, 2024](#)

Aurora PostgreSQL 16.2.2, June 20, 2024

General enhancements

- Fixed multiple issues where minor version upgrades with ZDP would fail resulting in longer upgrade times.

High priority enhancements

- Fixed a crash with execution of pltsql user defined functions.

- Fixed an issue which led to cancellation of long-running queries on Global Database replica instances.

Critical stability enhancements

- Fixed an issue where a change in memory requirements during a minor version upgrade can cause zero-downtime patching and engine startup to fail.
- Fixed an issue with background worker where it may crash when executed in parallel worker context.
- Fixed a `pg_repack` issue causing two vacuums to concurrently process the same table.
- Fixed issues in how two-phase commit files are handled.

Aurora PostgreSQL 16.2.1, April 29, 2024

New features

- Added resource usage summary to `pg_dump`.
- Added function overloading for `aurora_stat_statements(bool showtext)` and `aurora_stat_plans(bool showtext)`.

General enhancements

- Fixed multiple minor version upgrade issues to improve connection preservation with zero-downtime patching.
- Reduced database boot time due to improved initialization time for large volumes.
- Introduced faster COPY operations by reducing contention on the relation extension lock and proactively extending relations.
- Improvements to reduce replication lag by intelligently skipping the replay of certain log records, thereby reducing the replay load.
- Fixed an issue during recovery conflict on a read node which, in rare cases, could cause brief unavailability.
- Fixed an issue where a database would fail to startup during a major version upgrade patch, in rare scenarios.
- Improved availability of read replicas by allowing recovery from replication errors in more situations.

- Fixed an issue resulting in a deadlock when a logical replication table synchronization operation fails.
- Fixed a logical replication decoding issue that fails to process catalog modifying changes after spilling to storage if there was a concurrent aborted sub-transaction.
- Improved log record validation before it is written to storage.
- Fixed an issue that would result in sessions incorrectly reporting ClientRead wait events after a zero-downtime patching event.
- Fixed an ambiguous function definition of `aws_s3.query_export_to_s3` when upgrading the `aws_s3` extension from version 1.1 to 1.2.

High priority enhancements

- Fixed an issue related to resuming a logical replication slot where, in rare cases, it could cause the slot to become stuck.
- Fixed an issue that would result in a restart when creating a database in a tablespace.
- Fixed an issue related to incorrect logical replication error handling to improve DB stability.

Critical stability enhancements

- Fixed an issue related to replication origins that in rare cases might result in longer recovery time and impact availability.
- Fixed an issue that in rare cases may cause transactions to be partially replicated by newly created logical replication slots. For more information, see [Potential data loss due to race condition during logical replication slot creation](#).
- Fixed an issue where `pg_stat_statements` can cause zero-downtime patching to fail.
- Fixed an issue where a change in memory requirements during a minor version upgrade can cause zero-downtime patching and engine startup to fail.

Additional improvements and enhancements

- Updated the following extensions:
 - `pg_tle` extension to version 1.3.4.
 - PLV8 extension to version 3.1.10.
 - RDKit Cartridge to version `Release_2023_09_4`.

- New GUC Parameters has been added
 - `pgtle.clientauth_databases_to_skip`
 - `pgtle.clientauth_db_name`
 - `pgtle.clientauth_num_parallel_workers`
 - `pgtle.clientauth_users_to_skip`
 - `pgtle.enable_clientauth`
 - `pgtle.passcheck_db_name`

PostgreSQL 16.1

This release of Aurora PostgreSQL is compatible with PostgreSQL 16.1. For more information about the improvements in PostgreSQL 16.1, see [PostgreSQL release 16.1](#).

Releases and patches

- [Aurora PostgreSQL 16.1.4, June 24, 2024](#)
- [Aurora PostgreSQL 16.1.3, March 13, 2024](#)
- [Aurora PostgreSQL 16.1.2, February 22, 2024](#)
- [Aurora PostgreSQL 16.1, January 31, 2024](#)

Aurora PostgreSQL 16.1.4, June 24, 2024

General enhancements

- Fixed multiple issues where minor version upgrades with ZDP would fail resulting in longer upgrade times.

High priority enhancements

- Fixed an issue with Parallel query execution in which a backend may get into indefinite hang in certain cases.
- Fixed a crash with execution of plpgsql user defined functions.
- Fixed an issue which led to cancellation of long-running queries on Global Database replica instances.

Critical stability enhancements

- Fixed an issue where a change in memory requirements during a minor version upgrade can cause zero-downtime patching and engine startup to fail.
- Fixed a `pg_repack` issue causing two vacuums to concurrently process the same table.

Aurora PostgreSQL 16.1.3, March 13, 2024

General enhancements

- Fixed a performance degradation issue in PLV8 extension.

Aurora PostgreSQL 16.1.2, February 22, 2024

General enhancements

- Allow `rds_superuser` to terminate backends which are not explicitly associated with a role.

High priority enhancements

- Fixed an issue where `pg_stat_statements` can block minor version upgrade during ZDP.
- Fixed an issue where a logical replication slot would no longer emit changes due to an overly strict data consistency check.
- Backported fixes for the following PostgreSQL community security issue:
 - [CVE-2024-0985](#)

Critical stability enhancements

- Fixed an issue related to `apg_plan_mgmt`.
- Fixed a deadlock issue in Aurora Storage which can result in writer failover.
- Fixed an issue where active transactions during logical replication slot creation may be partially replicated by the slot.

Aurora PostgreSQL 16.1, January 31, 2024

New features

- Added support for the HypoPG extension at version 1.4.0.
- Added support for the h3-pg extension and the h3-postgis extension at version 4.1.3.
- Added support for `aurora_compute_plan_id` parameter which is turned on by default in an Aurora PostgreSQL DB Cluster and DB Parameter Group. For more information, see [Monitoring query execution plans for Aurora PostgreSQL](#).
- The `rds.rds_superuser_reserved_connections` parameter has been deprecated in Aurora PostgreSQL version 16. The `reserved_connections` parameter should be utilized to reserve the number of connection slots. The `reserved_connections` parameter sets the number of connection slots reserved for roles with the `pg_use_reserved_connections` privileges. `rds_superuser` is a member of the `pg_use_reserved_connections` role by default. For more information, see the PostgreSQL documentation [reserved connections](#).

General enhancements

- Deprecated support for ssl protocols: TLSv1.0 and TLSv1.1.

Additional improvements and enhancements

Updated the following extensions:

- `postgis` to version 3.4.0
- `PgLogical` to version 2.4.4
- `PgCron` to version 1.6
- `orafce` to version 4.6.0
- `pg_hint_plan` to version 1.6.0
- `plv8` to version 3.1.8
- `oracle_fdw` to version 2.6.0
- `MySQL_FDW` to version 2.9.1
- `Hll` to version 2.18
- `RDKit` to version 4.4

- `aws_s3` to version 1.2
- `prefix` to version 1.2.10
- `pg_similarity` to version 1.0
- `pgdam` to version 1.7
- `pg_proctab` to version 0.0.10
- `pg_tle` to version 1.2.0
- `pg_vector` to version 0.5.1
- `PgAudit` to version 16.0
- `plprofiler` to version 4.2.4
- `pg_partman` to version 4.7.3
- `pgTAP` to version 1.3.0

For information about extensions and modules, see [Extensions supported for Aurora PostgreSQL 16](#).

Migrating to Aurora PostgreSQL 16

The following minimum extension versions are required for major version upgrade to Aurora PostgreSQL 16:

- PostGIS version 3.1
- PgRouting version 3.0.5
- Rdkit version 4.2

For more information on migration, see [Migration to Version 16](#) and [Migration to Version 16.1](#).

For information about supported extensions versions for each Aurora PostgreSQL version, see [Extension versions for Amazon Aurora PostgreSQL](#).

To upgrade your Aurora PostgreSQL DB cluster including upgrading your extensions, see [Upgrading PostgreSQL extensions](#).

Unsupported Features

- Aurora PostgreSQL 16.1 doesn't currently support logical decoding on Aurora Read Replicas.

Differences between PostgreSQL 16 and Aurora PostgreSQL 16

In Aurora PostgreSQL 16.1, the newly introduced `pg_stat_io` view has two additional I/O contexts:

- `index`: I/O operations performed during index creation.
- `walreplay`: I/O operations performed by the wal replay process on Aurora read replicas.

The following backend types and I/O contexts are not applicable to Aurora read replicas:

- `autovacuum launcher`
- `autovacuum worker`
- `bulkwrite`
- `index`
- `vacuum`

In addition, Aurora PostgreSQL does not support writebacks and sync operations since data is persisted to Aurora storage.

PostgreSQL 16.0

This release of Aurora PostgreSQL is compatible with PostgreSQL 16.0. For more information about the improvements in PostgreSQL 16.0, see [PostgreSQL release 16.0](#).

Releases and patches

- [Aurora PostgreSQL 16.0 in the Amazon RDS Preview environment, November 15, 2023](#)

Aurora PostgreSQL 16.0 in the Amazon RDS Preview environment, November 15, 2023

⚠ This is preview documentation for Amazon Aurora PostgreSQL version 16.0. It is subject to change.

General enhancements

- Deprecated support for SSL protocols: TLS 1.0 and TLS 1.1

Additional improvements and enhancements

Updated the following extensions:

- `aws_s3` to version 1.2
- `oracle_fdw` to version 2.6.0
- `orafce` to version 4.6.0
- `pg_cron` to version 1.6.0
- `pg_hint` to version 1.6.0
- `pg_proctab` to version 0.0.10
- `pg_tle` to version 1.2.0
- `pglogical` to version 2.4.4
- `pgvector` to version 0.5.0
- `plv8` to version 3.1.7
- `PostGIS` to version 3.4.0
- `prefix` to version 1.2.0
- `RDKit` to version 4.3.0

The following extensions are not supported in the Preview version of Aurora PostgreSQL 16.0:

- `aws_lambda`
- `hll`
- `pg_bigm`
- `pgAudit`
- `plprofiler`
- `rds_activity_stream`

For information about extensions and modules, see [Extensions supported for Aurora PostgreSQL 16](#).

Unsupported Features

- Aurora PostgreSQL 16.0 does not currently support logical decoding on Aurora read replicas.
- Aurora PostgreSQL 16.0 does not currently support Aurora PostgreSQL Query Plan Management.

Differences between PostgreSQL 16 and Aurora PostgreSQL 16

In Aurora PostgreSQL 16.0, the newly introduced `pg_stat_io` view has two additional I/O contexts:

- `index`: I/O operations performed during index creation.
- `walreplay`: I/O operations performed by the wal replay process on Aurora read replicas.

The following backend types and I/O contexts are not applicable to Aurora read replicas:

- `autovacuum launcher`
- `autovacuum worker`
- `bulkwrite`
- `index`
- `vacuum`

In addition, Aurora PostgreSQL does not support writebacks and sync operations since data is persisted to Aurora storage.

PostgreSQL 15.6

This release of Aurora PostgreSQL is compatible with PostgreSQL 15.6. For more information about the improvements in PostgreSQL 15.6, see [PostgreSQL release 15.6](#).

Releases and patches

- [Aurora PostgreSQL 15.6.2, June 20, 2024](#)
- [Aurora PostgreSQL 15.6.1, April 29, 2024](#)

Aurora PostgreSQL 15.6.2, June 20, 2024

General enhancements

- Fixed multiple issues where minor version upgrades with ZDP would fail resulting in longer upgrade times.

High priority enhancements

- Fixed a crash with execution of plpgsql user defined functions.
- Fixed an issue which led to cancellation of long-running queries on Global Database replica instances.

Critical stability enhancements

- Fixed an issue where a change in memory requirements during a minor version upgrade can cause zero-downtime patching and engine startup to fail.
- Fixed an issue with background worker where it may crash when executed in parallel worker context.
- Fixed a pg_repack issue causing two vacuums to concurrently process the same table.
- Fixed issues in how two-phase commit files are handled.

Aurora PostgreSQL 15.6.1, April 29, 2024

New features

- Added resource usage summary to pg_dump.
- Added function overloading for `aurora_stat_statements(bool showtext)` and `aurora_stat_plans(bool showtext)`.

General enhancements

- Fixed multiple minor version upgrade issues to improve connection preservation with zero-downtime patching.
- Reduced database boot time due to improved initialization time for large volumes.

- Introduced faster COPY operations by reducing contention on the relation extension lock and proactively extending relations.
- Improvements to reduce replication lag by intelligently skipping the replay of certain log records, thereby reducing the replay load.
- Fixed an issue during recovery conflict on a read node which, in rare cases, could cause brief unavailability.
- Fixed an issue where a database would fail to startup during a major version upgrade patch, in rare scenarios.
- Improved availability of read replicas by allowing recovery from replication errors in more situations.
- Fixed an issue that would cause zero-downtime patching to timeout.
- Fixed an issue resulting in a deadlock when a logical replication table synchronization operation fails.
- Fixed a logical replication decoding issue that fails to process catalog modifying changes after spilling to storage if there was a concurrent aborted sub-transaction.
- Improved log record validation before it is written to storage.
- Fixed an issue that would result in sessions incorrectly reporting ClientRead wait events after a zero-downtime patching event.
- Fixed an ambiguous function definition of `aws_s3.query_export_to_s3` when upgrading the `aws_s3` extension from version 1.1 to 1.2.

High priority enhancements

- Fixed an issue related to resuming a logical replication slot where, in rare cases, it could cause the slot to become stuck.
- Fixed an issue that would result in a restart when creating a database in a tablespace.
- Fixed an issue related to incorrect logical replication error handling to improve DB stability.

Critical stability enhancements

- Fixed an issue related to replication origins that in rare cases might result in longer recovery time and impact availability.

- Fixed an issue that in rare cases may cause transactions to be partially replicated by newly created logical replication slots. For more information, see [Potential data loss due to race condition during logical replication slot creation](#).
- Fixed an issue where `pg_stat_statements` can cause zero-downtime patching to fail.
- Fixed an issue where a change in memory requirements during a minor version upgrade can cause zero-downtime patching and engine startup to fail.

Additional improvements and enhancements

- Updated the following extensions:
 - `pg_tle` extension to version 1.3.4.
 - PLV8 extension to version 3.1.10.
 - RDKit Cartridge to version `Release_2023_09_4`.
- New GUC Parameters has been added
 - `pgtle.clientauth_databases_to_skip`
 - `pgtle.clientauth_db_name`
 - `pgtle.clientauth_num_parallel_workers`
 - `pgtle.clientauth_users_to_skip`
 - `pgtle.enable_clientauth`
 - `pgtle.passcheck_db_name`

PostgreSQL 15.5

This release of Aurora PostgreSQL is compatible with PostgreSQL 15.5. For more information about the improvements in PostgreSQL 15.5, see [PostgreSQL release 15.5](#).

Releases and patches

- [Aurora PostgreSQL 15.5.4, June 24, 2024](#)
- [Aurora PostgreSQL 15.5.3, March 13, 2024](#)
- [Aurora PostgreSQL 15.5.2, February 22, 2024](#)
- [Aurora PostgreSQL 15.5.0, December 21, 2023](#)

Aurora PostgreSQL 15.5.4, June 24, 2024

General enhancements

- Fixed multiple issues where minor version upgrades with ZDP would fail resulting in longer upgrade times.

High priority enhancements

- Fixed an issue with Parallel query execution in which a backend may get into indefinite hang in certain cases.
- Fixed a crash with execution of plpgsql user defined functions.
- Fixed an issue which led to cancellation of long-running queries on Global Database replica instances.

Critical stability enhancements

- Fixed an issue where a change in memory requirements during a minor version upgrade can cause zero-downtime patching and engine startup to fail.
- Fixed a pg_repack issue causing two vacuums to concurrently process the same table.

Aurora PostgreSQL 15.5.3, March 13, 2024

General enhancements

- Fixed a performance degradation issue in PLV8 extension.

Aurora PostgreSQL 15.5.2, February 22, 2024

General enhancements

- Allow `rds_superuser` to terminate backends which are not explicitly associated with a role.

High priority enhancements

- Fixed an issue where `pg_stat_statements` can block minor version upgrade during ZDP.

- Fixed an issue where a logical replication slot would no longer emit changes due to an overly strict data consistency check.
- Backported fixes for the following PostgreSQL community security issue:
 - [CVE-2024-0985](#)

Critical stability enhancements

- Fixed an issue related to `apg_plan_mgmt`.
- Fixed a deadlock issue in Aurora Storage which can result in writer failover.
- Fixed an issue where active transactions during logical replication slot creation may be partially replicated by the slot.

Aurora PostgreSQL 15.5.0, December 21, 2023

Following the announcement of updates to the PostgreSQL database by the open source community, we have updated Amazon Aurora PostgreSQL-Compatible Edition to support PostgreSQL versions 15.5, 14.10, 13.13, and 12.17. These releases contain product improvements and bug fixes made by the PostgreSQL community, along with Aurora-specific improvements. New features and improvements for Babelfish for Aurora PostgreSQL version 3.4 are also included.

Refer to the Aurora version policy to help you to decide how often to upgrade and how to plan your upgrade process. As a reminder, if you are running any version of Amazon Aurora PostgreSQL version 11, you must upgrade to a newer major version by February 29, 2024.

New features

- Amazon Bedrock integration – By using the Amazon Aurora machine learning extension with your Aurora PostgreSQLDB cluster, you can now use Amazon Bedrock foundational AI models.
- Using Active Directory security groups for Aurora PostgreSQL access control – Add group role authentication support using AWS Directory Service for Microsoft Active Directory with the new `pg_ad_mapping` extension.
- Delegated Extension Support – This feature allows delegating extension management to lower privileged user with the new `rds_extension` role.
- Added support for `aurora_compute_plan_id` parameter which is turned on by default in an Aurora PostgreSQL DB Cluster and DB Parameter Group. For more information, see [Monitoring query execution plans for Aurora PostgreSQL](#).

- Query Plan Management (QPM) enhancements:
 - Plan outlines will be updated to the latest format version as part of the `update_plan_hash` action for `apg_plan_mgmt.validate_plans()`.
 - Support was added for parallel append enforcement as a part of parallel query enforcement.
- Added support for the HypoPG extension at version 1.4.0.
- Added support for the h3-pg extension and the h3-postgis extension at version 4.1.3.

High priority enhancements

- Fixed an issue which may cause a reboot when logically replicating changes in the presence of concurrently-running DDL or canceled sub-transactions
- Fixed an issue which may cause an Aurora replica to reboot when reading a page which was modified during WAL replay
- Fixed an issue where if a specific volume metadata is invalid on a source cluster, it will remain invalid on a cloned cluster. Since the clone cluster uses a new volume, the metadata will now be recreated.
- Fixed a bug that may cause an engine crash during zero-downtime patching (ZDP)
- Introduced a new parameter, `rds.enable_memory_management`, which is used to enable and disable the improved memory management feature.
- Improved index scan query performance by skipping unnecessary B-tree page reads when a composite index is used with large data sets.
- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-5870](#)
 - [CVE-2023-5869](#)
 - [CVE-2023-5868](#)

General enhancements

- Fixed an issue which caused the `AuroraGlobalDBRPOLag` metric to be zero when the `rds.global_db_rpo` parameter was not set.
- Fixed an issue which may cause an Aurora replica to reboot while reconnecting with the writer DB instance.
- Added support for the `rdkit.morgan_fp_size` parameter

- `rds_superuser` can now run the `pg_stat_reset_slru` function
- Fixed an issue where MultiXact SLRU accesses were not credited to the correct `pg_stat_slru` category.
- Fixed an issue which may cause unused WAL segments to not be properly removed
- Fixed an issue where `pglogical` does not correctly pass-through replication origin data when using the binary output format
- `rds_superuser` can now execute `ALTER COLLATION` to refresh the collation version of a locale in the catalog.
- Fixed a crash in `dblink` and `postgres_fdw` extensions due to invalid connections
- Fixed an issue where the `aws_s3` extension can import HTTP error responses into the table
- Fixed an issue which may cause an Aurora Replica instance with Optimized Reads to reboot while reconnecting with the writer DB instance.
- Fixed an issue which may cause an Aurora replica with Optimized Reads to reboot while caching a page to tiered cache.

Additional improvements and enhancements

- Updated the following extensions:
 - `mysql_fdw` to version 2.9.1
 - `Oracle_fdw` to version 2.6.0
 - `Oracle` to version 4.6.0
 - `pg_cron` to version 1.6.0
 - `pg_hint_plan` to version 1.5.1
 - `pg_proctab` to version 0.0.10
 - `pg_tle` to version 1.2.0
 - `plv8` to version 3.1.8
 - `PostGIS` to version 3.4.0
 - `prefix` to version 1.2.10
 - `RDKit` to version 4.4.0 (Release_2023_09_1)

For information about extensions and modules, see [Extensions supported for Aurora PostgreSQL 15](#).

PostgreSQL 15.4

This release of Aurora PostgreSQL is compatible with PostgreSQL 15.4. For more information about the improvements in PostgreSQL 15.4, see [PostgreSQL release 15.4](#).

Releases and patches

- [Aurora PostgreSQL 15.4.7, June 25, 2024](#)
- [Aurora PostgreSQL 15.4.6, March 13, 2024](#)
- [Aurora PostgreSQL 15.4.5, February 22, 2024](#)
- [Aurora PostgreSQL 15.4.3, December 15, 2023](#)
- [Aurora PostgreSQL 15.4.2, December 13, 2023](#)
- [Aurora PostgreSQL 15.4.1, November 09, 2023](#)
- [Aurora PostgreSQL 15.4.0, October 24, 2023](#)

Aurora PostgreSQL 15.4.7, June 25, 2024

General enhancements

- Fixed multiple issues where minor version upgrades with ZDP would fail resulting in longer upgrade times.

High priority enhancements

- Fixed an issue which led to cancellation of long-running queries on Global Database replica instances.

Critical stability enhancements

- Fixed an issue where a change in memory requirements during a minor version upgrade can cause zero-downtime patching and engine startup to fail.
- Fixed a `pg_repack` issue causing two vacuums to concurrently process the same table.

Aurora PostgreSQL 15.4.6, March 13, 2024

General enhancements

- Fixed a performance degradation issue in PLV8 extension.

Aurora PostgreSQL 15.4.5, February 22, 2024

General enhancements

- Allow `rds_superuser` to terminate backends which are not explicitly associated with a role.

High priority enhancements

- Fixed an issue where `pg_stat_statements` can block minor version upgrade during ZDP.
- Fixed an issue where a logical replication slot would no longer emit changes due to an overly strict data consistency check.
- Backported fixes for the following PostgreSQL community security issue:
 - [CVE-2024-0985](#)

Critical stability enhancements

- Fixed an issue related to `apg_plan_mgmt`.
- Fixed a deadlock issue in Aurora Storage which can result in writer failover.
- Fixed an issue where active transactions during logical replication slot creation may be partially replicated by the slot.

Aurora PostgreSQL 15.4.3, December 15, 2023

High priority enhancements

- Fixed an issue which may cause a reboot when logically replicating changes in the presence of concurrently-running DDL or canceled sub-transactions

Aurora PostgreSQL 15.4.2, December 13, 2023

Critical stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-5870](#)
 - [CVE-2023-5869](#)
 - [CVE-2023-5868](#)

High priority enhancements

- Improved the index scan query performance by skipping unnecessary B-tree page reads when a composite index is used with large data sets
- Fixed an issue with index scan queries that, in rare cases, could lead to database instance restarts

General stability enhancements

- Fixed an issue with logical replication actions being performed by someone other than the table owner

Aurora PostgreSQL 15.4.1, November 09, 2023

Critical stability enhancements

- Backported a fix for the following security issue:
 - [CVE-2023-38545](#)
- Fixed an issue related to `pg_cron` background worker processes

General enhancements

- Fixed an issue that could result in read replica lag due to stale metadata
- Fixed an issue related to buffer pin locking that in rare cases can result in a crash

Aurora PostgreSQL 15.4.0, October 24, 2023

New features

- Added support for `mysql_fdw` version 2.9.0
- Added support in the `aws_s3` extension for exporting to an S3 bucket encrypted with a customer managed KMS key
- Improved the availability of Aurora replicas in the global DB secondary clusters
- Added support for query plan capture on Aurora replicas
- Added support for query plan enforcement with materialize nodes
- Added support for query plan enforcement with parallel query operators
- Query plans under a given cost threshold will not be captured

High priority enhancements

- Fixed an issue which could cause the database to fail to start up during database recovery
- Included optimizations to improve the time to scale up in Aurora Serverless v2 instances

General enhancements

- Fixed an issue in the `aws_s3` extension where the number of rows exported is incorrectly reported when the total number exceeds 2 billion
- Provided options to configure timeouts in the `aws_s3` extension. By setting the following parameters (GUCs), customers will now be able to change the timeout thresholds for imports from S3:
 - `aws_s3.curlopt_low_speed_limit`
 - `aws_s3.curlopt_low_speed_time`
- Prevented instance creation failure in some edge cases
- Improved the performance of replay of commit transaction operations on Aurora replicas
- Fixed an issue where, in rare cases, an import from the `aws_s3` extension fails to complete
- Updated the GEOS library for PostGIS to version 3.12.0
- Improved Aurora Serverless v2 database memory scaling which reduces the overall database instance scale time

- Added the `WAIT_EVENT_Aurora_CLUSTER_CACHE_MANAGER_SENDER` wait event to denote wait times in the cluster cache manager sender
- Added the `WAIT_EVENT_Aurora_SERVERLESS_MONITORING_MAIN` wait event to denote wait times in Aurora Serverless resource monitoring
- Improved the handling of invalid non-persisted metadata during reads from storage on read replicas
- Fixed an issue where the database may crash during the start of a logical replication slot
- Increased the limit for `pg_cron cron.max_running_jobs` parameter from 100 to 1000
- The `pgAudit pgaudit.log_statement` parameter is now modifiable
- Fixed a bug in `CREATE TABLE` command to handle table name starting with '#' correctly.

Additional improvements and enhancements

- Updated the following extensions:
 - `orafce` to version 4.3.0
 - `pg_logical` to version 2.4.3
 - `pg_tle` to version 1.1.1
 - `pgvector` to version 0.5.0
 - `plv8` to version 3.1.6
 - `PostGIS` to version 3.3.3
 - `RDKit` to version 4.3

For information about extensions and modules, see [Extensions supported for Aurora PostgreSQL 15](#).

PostgreSQL 15.3

This release of Aurora PostgreSQL is compatible with PostgreSQL 15.3. For more information about the improvements in PostgreSQL 15.3, see [PostgreSQL release 15.3](#).

Releases and patches

- [Aurora PostgreSQL 15.3.5, March 13, 2024](#)
- [Aurora PostgreSQL 15.3.4, December 14, 2023](#)

- [Aurora PostgreSQL 15.3.3, November 14, 2023](#)
- [Aurora PostgreSQL 15.3.2, October 4, 2023](#)
- [Aurora PostgreSQL 15.3.0, July 13, 2023](#)

Aurora PostgreSQL 15.3.5, March 13, 2024

General enhancements

- Allow `rds_superuser` to terminate backends which are not explicitly associated with a role.

High priority enhancements

- Fixed an issue that would cause a logical replication slot to transiently error out in the presence of aborted subtransactions and DDL.
- Backported fixes for the following PostgreSQL community security issue:
 - [CVE-2024-0985](#)

Critical stability enhancements

- Fixed an issue related to `apg_plan_mgmt`.
- Fixed a deadlock issue in Aurora Storage which can result in writer failover.
- Fixed an issue where active transactions during logical replication slot creation may be partially replicated by the slot.

Aurora PostgreSQL 15.3.4, December 14, 2023

Critical stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-5870](#)
 - [CVE-2023-5869](#)
 - [CVE-2023-5868](#)

High priority enhancements

- Improved the index scan query performance by skipping unnecessary B-tree page reads when a composite index is used with large data sets
- Fixed an issue with index scan queries that, in rare cases, could lead to database instance restarts

General stability enhancements

- Fixed an issue with logical replication actions being performed by someone other than the table owner

Aurora PostgreSQL 15.3.3, November 14, 2023

Critical stability enhancements

- Backported a fix for the following security issue:
 - [CVE-2023-38545](#)
- Fixed an issue related to `pg_cron` background worker processes

General enhancements

- Fixed an issue that could result in read replica lag due to stale metadata
- Fixed an issue related to buffer pin locking that in rare cases can result in a crash

Aurora PostgreSQL 15.3.2, October 4, 2023

High priority stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-39418](#)
 - [CVE-2023-39417](#)

High priority enhancements

- Fixed an issue which can cause a database instance to restart while executing I/O intensive read workloads

- Fixed an issue which can cause vacuum operations to become blocked after the restart of an Aurora replica
- Fixed an issue that would cause a crash when executing the COPY FROM command
- Fixed an issue that would cause high CPU usage and prevent new connections
- Fixed an issue where UPDATE and DELETE from a table with foreign key could fail unexpectedly with "ERROR: 40001: could not serialize access due to concurrent update when using Serializable snapshot"

General enhancements

- Introduced diagnostics for the transient metadata used for I/O
- Fixed an issue that prevented the enablement of improved memory management in certain scenarios in Aurora PostgreSQL 15.3

Aurora PostgreSQL 15.3.0, July 13, 2023

Following the announcement of updates to the PostgreSQL database by the open source community, we have updated Amazon Aurora PostgreSQL-Compatible Edition to support PostgreSQL versions 15.3, 14.8, 13.11, 12.15, and 11.20. These releases contains product improvements and bug fixes made by the PostgreSQL community, along with Aurora-specific improvements. The releases also contain new features and improvements for [Babelfish for Aurora PostgreSQL version 3.2](#), and improved support for [AWS Database Migration Service](#). Refer to the [Amazon Aurora versions](#) to help you to decide how often to upgrade and how to plan your upgrade process. As a reminder, if you are running any version of Amazon Aurora PostgreSQL 11, you must upgrade to a newer major version by February 29, 2024.

New features

- This release contains memory management improvements which increase database stability and availability by proactively preventing issues caused by insufficient memory. For more information, see [Improved memory management in Aurora PostgreSQL](#).
- Added support for the `pgvector` extension version 0.4.1.

High priority enhancements

- Fixed an issue with the subtransaction metadata handling when performing a survivable reader reconnect
- Fixed an issue during ZDP which is related to the extension environment variables
- Addressed a transient error during logical replication that caused a process to incorrectly calculate that it had encountered an unexpected page
- Fixed an issue which causes a period of unavailability due to a partially created replication origin state file

General enhancements

- Addressed an issue where the computing query identifier displayed a warning, "WARNING: unrecognized node type: 378"
- Addressed an issue that caused the initial data sync of a relation to become blocked due to the premature removal of the logical replication slot on the publisher
- Added a new function, `aurora_stat_memctx_usage()`, to show backend memory use breakdown at a Postgres memory context level
- Provided options to configure the timeouts within the `aws_lambda` extension. By setting the following parameters (GUCs), customers will now be able to change the connect and request timeouts for AWS Lambda integration:
 - `aws_lambda.connect_timeout_ms`
 - `aws_lambda.request_timeout_ms`
- Fixed an issue with the calculation of the `AuroraReplicaLag` metric
- Fixed an issue where, in rare cases, the `aws_s3` extension could fail to import from an Amazon S3 bucket with a name containing dots
- Further reduced the database downtime during ZDP
- Fixed a bug which can cause unavailability during ZDP
- Fixed an issue which caused `pg_ls_waldir()` to return "ERROR: could not stat file"
- Added support for TLS 1.3 with ciphers `TLS_AES_128_GCM_SHA256` and `TLS_AES_256_GCM_SHA384`
- Addressed an issue that blocked a major version upgrade on the Aurora replica of an RDS for PostgreSQL DB instance
- Fixed an issue that could prevent scaling in Aurora Serverless v2 instances

- Fixed an issue in logical replication which, in rare cases, can cause a period of unavailability due to the incorrect subtransaction metadata
- Fixed an issue in the `pg_vector` extension where, in rare cases, infinite or NAN values caused a crash during the index creation
- Fixed an issue to improve the performance
- Upgraded GEOS to version 3.11.2
- Upgraded `pg_cron` to version 1.5
- Upgraded `pg_partman` to version 4.7.3
- Upgraded `pg_tle` to version 1.0.3
- Upgraded `plv8` to version 3.1.6

PostgreSQL 15.2

This release of Aurora PostgreSQL is compatible with PostgreSQL 15.2. For more information about the improvements in PostgreSQL 15.2, see [PostgreSQL release 15.2](#).

Releases and patches

- [Aurora PostgreSQL 15.2.7, March 13, 2024](#)
- [Aurora PostgreSQL 15.2.6, December 15, 2023](#)
- [Aurora PostgreSQL 15.2.5, November 14, 2023](#)
- [Aurora PostgreSQL 15.2.4, October 5, 2023](#)
- [Aurora PostgreSQL 15.2.3, July 25, 2023](#)
- [Aurora PostgreSQL 15.2.2, May 10, 2023](#)
- [Aurora PostgreSQL 15.2.1, April 5, 2023](#)

Aurora PostgreSQL 15.2.7, March 13, 2024

General enhancements

- Allow `rds_superuser` to terminate backends which are not explicitly associated with a role.

High priority enhancements

- Fixed an issue that would cause a logical replication slot to transiently error out in the presence of aborted subtransactions and DDL.
- Backported fixes for the following PostgreSQL community security issue:
 - [CVE-2024-0985](#)

Critical stability enhancements

- Fixed an issue related to `apg_plan_mgmt`.
- Fixed a deadlock issue in Aurora Storage which can result in writer failover.
- Fixed an issue where active transactions during logical replication slot creation may be partially replicated by the slot.

Aurora PostgreSQL 15.2.6, December 15, 2023

Critical stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-5870](#)
 - [CVE-2023-5869](#)
 - [CVE-2023-5868](#)

High priority enhancements

- Improved the index scan query performance by skipping unnecessary B-tree page reads when a composite index is used with large data sets
- Fixed an issue with index scan queries that, in rare cases, could lead to database instance restarts

General stability enhancements

- Fixed an issue with logical replication actions being performed by someone other than the table owner

Aurora PostgreSQL 15.2.5, November 14, 2023

Critical stability enhancements

- Backported a fix for the following security issue:
 - [CVE-2023-38545](#)
- Fixed an issue related to `pg_cron` background worker processes

General enhancements

- Fixed an issue that could result in read replica lag due to stale metadata
- Fixed an issue related to buffer pin locking that in rare cases can result in a crash

Aurora PostgreSQL 15.2.4, October 5, 2023

High priority stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-39418](#)
 - [CVE-2023-39417](#)

High priority enhancements

- Fixed an issue which can cause a database instance to restart while executing I/O intensive read workloads
- Fixed an issue which can cause vacuum operations to become blocked after the restart of an Aurora replica
- Fixed an issue that would cause high CPU usage and prevent new connections

General enhancements

- Introduced diagnostics for the transient metadata used for I/O

Aurora PostgreSQL 15.2.3, July 25, 2023

General enhancements

- Fixed an issue with the calculation of the `AuroraReplicaLag` metric
- Fixed a bug which can cause unavailability during ZDP
- Fixed an issue that prevented reclaiming storage on transaction commits
- Fixed an issue preventing `pglogical` from logging conflicting rows during the apply phase
- Added Aurora Serverless v2 scaling enhancements
- Fixed an issue where, in rare cases, the `aws_s3` extension could fail to import from an Amazon S3 bucket with a name containing dots
- Provided options to configure the timeouts within the `aws_lambda` extension. By setting the following parameters (GUCs), customers will now be able to change the connect and request timeouts for AWS Lambda integration:
 - `aws_lambda.connect_timeout_ms`
 - `aws_lambda.request_timeout_ms`
- Fixed multiple issues which can cause Aurora replicas with the improved read availability feature to restart when reconnecting with the writer instance
- Fixed an issue preventing a survivable reader reconnect

Aurora PostgreSQL 15.2.2, May 10, 2023

General enhancements

- Fixed an error when loading the `test_decoding` plugin in `pg_create_logical_replication_slot`
- Fixed an issue that causes logical replication to fail when using write-through cache
- Updated the Oracle client used by the `oracle_fdw` extension to version 21.9.0.0.0

Aurora PostgreSQL 15.2.1, April 5, 2023

New features

- Introduced a new Query Plan Management (QPM) plan hash calculation for multi-schema support. If users want to use QPM in multi-schema environments, they can set the

`apg_plan_mgmt.plan_hash` version to 2 and call `apg_plan_mgmt.validate_plans('update_plan_hash')`.

- Logical replication enhancements to improve memory and CPU usage during the processing of large transactions.
- The CloudWatch metric `ReplicationSlotDiskUsage` now tracks logical replication specific storage across Aurora storage and local storage.
- Starting with Aurora PostgreSQL versions 15.2 and 14.7, a user needs to be granted the `CONNECT` privilege on each database to connect even if the user is granted access to the `rds_superuser` role. Prior to Aurora PostgreSQL versions 15.2 and 14.7, a user was able to connect to any database and system table if the user was granted the `rds_superuser` role. Previous Aurora PostgreSQL versions are not impacted by this change, and users with access to the `rds_superuser` role do not require the `CONNECT` privilege to access databases in their Aurora PostgreSQL cluster.

General enhancements

- Upgraded PROJ support to version 9.1.0
- Upgraded the GDAL library in PostGIS to version 3.5.3
- Upgraded the `pg_hint_plan` to version 1.5.0
- Added support for the TCN and SEG extensions
- Improved performance of deletes from b-tree and hash indexes on Aurora replicas
- Includes Aurora Serverless v2 scaling enhancements
- Fixed issue in QPM that prevented the enforcement of approved plans when joining partitioned tables
- Improved engine startup time, particularly on large instances with many objects
- The Aurora function `aurora_stat_logical_wal_cache()` is now visible to all users
- Fixed an issue in QPM that could cause unavailability when enforcing plans from prepared statements

Additional improvements and enhancements

- Updated the following extensions:
 - `apg_plan_mgmt` to version 2.4

- `hll` to version 2.17
- `Oracle_fdw` to version 2.5.0
- `orafce` to version 4.0.0
- `pg_audit` to version 1.7.0
- `pg_cron` to version 1.4.2
- `pg_hint_plan` to version 1.5.0
- `pg_logical` to version 2.4.2
- `pg_repack` to version 1.4.8
- `pg_stat_statements` to version 1.10
- `pg_trgm` to version 1.4
- `pgrouting` to version 3.4.1
- `plv8` to version 3.1.4
- `PostGIS` to version 3.3.2
- `rds_activity_stream` to version 1.6
- `SEG` to version 1.0
- `TCN` to version 1.0
- `tds_fdw` to version 2.0.3
- `wal2json` to version 2.5

For information about extensions and modules, see [Extensions supported for Aurora PostgreSQL 15](#).

Differences between PostgreSQL 15 and Aurora PostgreSQL 15

Due to Aurora's unique distributed storage system, Amazon Aurora PostgreSQL version 15 does not support server-side compression with Gzip, LZ4, or Zstandard (zstd) using `pg_basebackup`, online backups using `pg_backup_start()` and `pg_backup_stop()`, and prefetching during WAL recovery. In addition, sequences can be specified as unlogged, but this has no performance improvements over normal sequences.

PostgreSQL 14.11

This release of Aurora PostgreSQL is compatible with PostgreSQL 14.11. For more information about the improvements in PostgreSQL 14.11, see [PostgreSQL release 14.11](#).

Releases and patches

- [Aurora PostgreSQL 14.11.2, June 20, 2024](#)
- [Aurora PostgreSQL 14.11.1, April 29, 2024](#)

Aurora PostgreSQL 14.11.2, June 20, 2024

General enhancements

- Fixed multiple issues where minor version upgrades with ZDP would fail resulting in longer upgrade times.

High priority enhancements

- Fixed a crash with execution of plpgsql user defined functions.
- Fixed an issue which led to cancellation of long-running queries on Global Database replica instances.

Critical stability enhancements

- Fixed an issue where a change in memory requirements during a minor version upgrade can cause zero-downtime patching and engine startup to fail.
- Fixed an issue with background worker where it may crash when executed in parallel worker context.
- Fixed a pg_repack issue causing two vacuums to concurrently process the same table.
- Fixed issues in how two-phase commit files are handled.

Aurora PostgreSQL 14.11.1, April 29, 2024

New features

- Added resource usage summary to pg_dump.

- Added function overloading for `aurora_stat_statements(bool showtext)` and `aurora_stat_plans(bool showtext)`.

General enhancements

- Fixed multiple minor version upgrade issues to improve connection preservation with zero-downtime patching.
- Reduced database boot time due to improved initialization time for large volumes.
- Introduced faster COPY operations by reducing contention on the relation extension lock and proactively extending relations.
- Improvements to reduce replication lag by intelligently skipping the replay of certain log records, thereby reducing the replay load.
- Fixed an issue during recovery conflict on a read node which, in rare cases, could cause brief unavailability.
- Fixed an issue where a database would fail to startup during a major version upgrade patch, in rare scenarios.
- Improved availability of read replicas by allowing recovery from replication errors in more situations.
- Fixed an issue that would cause zero-downtime patching to timeout.
- Fixed an issue resulting in a deadlock when a logical replication table synchronization operation fails.
- Fixed a logical replication decoding issue that fails to process catalog modifying changes after spilling to storage if there was a concurrent aborted sub-transaction.
- Improved log record validation before it is written to storage.
- Fixed an issue that would result in sessions incorrectly reporting ClientRead wait events after a zero-downtime patching event.
- Fixed an ambiguous function definition of `aws_s3.query_export_to_s3` when upgrading the `aws_s3` extension from version 1.1 to 1.2.

High priority enhancements

- Fixed an issue related to resuming a logical replication slot where, in rare cases, it could cause the slot to become stuck.
- Fixed an issue that would result in a restart when creating a database in a tablespace.

- Fixed an issue related to incorrect logical replication error handling to improve DB stability.

Critical stability enhancements

- Fixed an issue related to replication origins that in rare cases might result in longer recovery time and impact availability.
- Fixed an issue that in rare cases may cause transactions to be partially replicated by newly created logical replication slots. For more information, see [Potential data loss due to race condition during logical replication slot creation](#).
- Fixed an issue where `pg_stat_statements` can cause zero-downtime patching to fail.
- Fixed an issue where a change in memory requirements during a minor version upgrade can cause zero-downtime patching and engine startup to fail.

Additional improvements and enhancements

- Updated the following extensions:
 - `pg_tle` extension to version 1.3.4.
 - PLV8 extension to version 3.1.10.
 - RDKit Cartridge to version `Release_2023_09_4`.
- New GUC Parameters has been added
 - `pgtle.clientauth_databases_to_skip`
 - `pgtle.clientauth_db_name`
 - `pgtle.clientauth_num_parallel_workers`
 - `pgtle.clientauth_users_to_skip`
 - `pgtle.enable_clientauth`
 - `pgtle.passcheck_db_name`

PostgreSQL 14.10

This release of Aurora PostgreSQL is compatible with PostgreSQL 14.10. For more information about the improvements in PostgreSQL 14.10, see [PostgreSQL release 14.10](#).

Releases and patches

- [Aurora PostgreSQL 14.10.4, June 24, 2024](#)

- [Aurora PostgreSQL 14.10.3, March 13, 2024](#)
- [Aurora PostgreSQL 14.10.2, February 22, 2024](#)
- [Aurora PostgreSQL 14.10.0, December 21, 2023](#)

Aurora PostgreSQL 14.10.4, June 24, 2024

General enhancements

- Fixed multiple issues where minor version upgrades with ZDP would fail resulting in longer upgrade times.

High priority enhancements

- Fixed an issue with Parallel query execution in which a backend may get into indefinite hang in certain cases.
- Fixed a crash with execution of plpgsql user defined functions.
- Fixed an issue which led to cancellation of long-running queries on Global Database replica instances.

Critical stability enhancements

- Fixed an issue where a change in memory requirements during a minor version upgrade can cause zero-downtime patching and engine startup to fail.
- Fixed a pg_repack issue causing two vacuums to concurrently process the same table.

Aurora PostgreSQL 14.10.3, March 13, 2024

General enhancements

- Fixed a performance degradation issue in PLV8 extension.

Aurora PostgreSQL 14.10.2, February 22, 2024

General enhancements

- Allow `rds_superuser` to terminate backends which are not explicitly associated with a role.

High priority enhancements

- Fixed an issue where `pg_stat_statements` can block minor version upgrade during ZDP.
- Fixed an issue where a logical replication slot would no longer emit changes due to an overly strict data consistency check.
- Backported fixes for the following PostgreSQL community security issue:
 - [CVE-2024-0985](#)

Critical stability enhancements

- Fixed an issue related to `apg_plan_mgmt`.
- Fixed a deadlock issue in Aurora Storage which can result in writer failover.
- Fixed an issue where active transactions during logical replication slot creation may be partially replicated by the slot.

Aurora PostgreSQL 14.10.0, December 21, 2023

Following the announcement of updates to the PostgreSQL database by the open source community, we have updated Amazon Aurora PostgreSQL-Compatible Edition to support PostgreSQL versions 15.5, 14.10, 13.13, and 12.17. These releases contain product improvements and bug fixes made by the PostgreSQL community, along with Aurora-specific improvements. New features and improvements for Babelfish for Aurora PostgreSQL version 3.4 are also included.

Refer to the Aurora version policy to help you to decide how often to upgrade and how to plan your upgrade process. As a reminder, if you are running any version of Amazon Aurora PostgreSQL version 11, you must upgrade to a newer major version by February 29, 2024.

New features

- Amazon Bedrock integration – By using the Amazon Aurora machine learning extension with your Aurora PostgreSQLDB cluster, you can now use Amazon Bedrock foundational AI models.
- Using Active Directory security groups for Aurora PostgreSQL access control – Add group role authentication support using AWS Directory Service for Microsoft Active Directory with the new `pg_ad_mapping` extension.
- Delegated Extension Support – This feature allows delegating extension management to lower privileged user with the new `rds_extension` role.

- Added support for `aurora_compute_plan_id` parameter which is turned on by default in an Aurora PostgreSQL DB Cluster and DB Parameter Group. For more information, see [Monitoring query execution plans for Aurora PostgreSQL](#).
- Query Plan Management (QPM) enhancements:
 - Plan outlines will be updated to the latest format version as part of the `update_plan_hash` action for `apg_plan_mgmt.validate_plans()`.
 - Support was added for parallel append enforcement as a part of parallel query enforcement.
- Added support for the HypoPG extension at version 1.4.0.
- Added support for the `h3-pg` extension and the `h3-postgis` extension at version 4.1.3.

High priority enhancements

- Fixed an issue which may cause a reboot when logically replicating changes in the presence of concurrently-running DDL or canceled sub-transactions
- Fixed an issue which may cause an Aurora replica to reboot when reading a page which was modified during WAL replay
- Fixed an issue where if a specific volume metadata is invalid on a source cluster, it will remain invalid on a cloned cluster. Since the clone cluster uses a new volume, the metadata will now be recreated.
- Fixed a bug that may cause an engine crash during zero-downtime patching (ZDP)
- Introduced a new parameter, `rds.enable_memory_management`, which is used to enable and disable the improved memory management feature.
- Improved index scan query performance by skipping unnecessary B-tree page reads when a composite index is used with large data sets.
- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-5870](#)
 - [CVE-2023-5869](#)
 - [CVE-2023-5868](#)

General enhancements

- Fixed an issue which may cause an Aurora replica to reboot while reconnecting with the writer DB instance.

- Added support for the `rdkit.morgan_fp_size` parameter
- `rds-superuser` can now run the `pg_stat_reset_slru` function
- Fixed an issue where MultiXact SLRU accesses were not credited to the correct `pg_stat_slru` category.
- Fixed an issue which may cause unused WAL segments to not be properly removed
- Fixed an issue where `pglogical` does not correctly pass-through replication origin data when using the binary output format
- `rds_superuser` can now execute `ALTER COLLATION` to refresh the collation version of a locale in the catalog.
- Fixed a crash in `dblink` and `postgres_fdw` extensions due to invalid connections
- Fixed an issue where the `aws_s3` extension can import HTTP error responses into the table
- Fixed an issue which may cause an Aurora Replica instance with Optimized Reads to reboot while reconnecting with the writer DB instance.
- Fixed an issue which may cause an Aurora replica with Optimized Reads to reboot while caching a page to tiered cache.
- Record the version of the AWS independent default collation library version in `pg_collation` catalog.

Additional improvements and enhancements

- Updated the following extensions:
 - `mysql_fdw` to version 2.9.1
 - `Oracle_fdw` to version 2.6.0
 - `Oracle` to version 4.6.0
 - `pg_cron` to version 1.6.0
 - `pg_proctab` to version 0.0.10
 - `pg_tle` to version 1.2.0
 - `plv8` to version 3.1.8
 - `PostGIS` to version 3.4.0
 - `prefix` to version 1.2.10
 - `RDKit` to version 4.4.0 (Release_2023_09_1)

For information about extensions and modules, see [Extensions supported for Aurora PostgreSQL 14](#).

PostgreSQL 14.9

This release of Aurora PostgreSQL is compatible with PostgreSQL 14.9. For more information about the improvements in PostgreSQL 14.9, see [PostgreSQL release 14.9](#).

Releases and patches

- [Aurora PostgreSQL 14.9.7, June 25, 2024](#)
- [Aurora PostgreSQL 14.9.6, March 13, 2024](#)
- [Aurora PostgreSQL 14.9.5, February 22, 2024](#)
- [Aurora PostgreSQL 14.9.3, December 15, 2023](#)
- [Aurora PostgreSQL 14.9.2, December 13, 2023](#)
- [Aurora PostgreSQL 14.9.1, November 09, 2023](#)
- [Aurora PostgreSQL 14.9.0, October 24, 2023](#)

Aurora PostgreSQL 14.9.7, June 25, 2024

General enhancements

- Fixed multiple issues where minor version upgrades with ZDP would fail resulting in longer upgrade times.

High priority enhancements

- Fixed an issue which led to cancellation of long-running queries on Global Database replica instances.

Critical stability enhancements

- Fixed an issue where a change in memory requirements during a minor version upgrade can cause zero-downtime patching and engine startup to fail.
- Fixed a `pg_repack` issue causing two vacuums to concurrently process the same table.

Aurora PostgreSQL 14.9.6, March 13, 2024

General enhancements

- Fixed a performance degradation issue in PLV8 extension.

Aurora PostgreSQL 14.9.5, February 22, 2024

General enhancements

- Allow `rds_superuser` to terminate backends which are not explicitly associated with a role.

High priority enhancements

- Fixed an issue where `pg_stat_statements` can block minor version upgrade during ZDP.
- Fixed an issue where a logical replication slot would no longer emit changes due to an overly strict data consistency check.
- Backported fixes for the following PostgreSQL community security issue:
 - [CVE-2024-0985](#)

Critical stability enhancements

- Fixed an issue related to `apg_plan_mgmt`.
- Fixed a deadlock issue in Aurora Storage which can result in writer failover.
- Fixed an issue where active transactions during logical replication slot creation may be partially replicated by the slot.

Aurora PostgreSQL 14.9.3, December 15, 2023

High priority enhancements

- Fixed an issue which may cause a reboot when logically replicating changes in the presence of concurrent canceled subtransactions and DDL

Aurora PostgreSQL 14.9.2, December 13, 2023

Critical stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-5870](#)
 - [CVE-2023-5869](#)
 - [CVE-2023-5868](#)

High priority enhancements

- Improved the index scan query performance by skipping unnecessary B-tree page reads when a composite index is used with large data sets
- Fixed an issue with index scan queries that, in rare cases, could lead to database instance restarts

General stability enhancements

- Fixed an issue with logical replication actions being performed by someone other than the table owner

Aurora PostgreSQL 14.9.1, November 09, 2023

Critical stability enhancements

- Backported a fix for the following security issue:
 - [CVE-2023-38545](#)
- Fixed an issue related to `pg_cron` background worker processes

General enhancements

- Fixed an issue related to buffer pin locking that in rare cases can result in a crash

Aurora PostgreSQL 14.9.0, October 24, 2023

New features

- Added support for `mysql_fdw` version 2.9.0
- Added support in the `aws_s3` extension for exporting to an S3 bucket encrypted with a customer managed KMS key
- Improved the availability of Aurora replicas in the global DB secondary clusters
- Added support for query plan capture on Aurora replicas
- Added support for query plan enforcement with materialize nodes
- Added support for query plan enforcement with parallel query operators
- Allowed query plans under a given cost threshold to not be captured

High priority enhancements

- Included optimizations to improve the time to scale up in Aurora Serverless instances

General enhancements

- Fixed an issue in the `aws_s3` extension where the number of rows exported is incorrectly reported when the total number exceeds 2 billion
- Provided options to configure timeouts in the `aws_s3` extension. By setting the following parameters (GUCs), customers will now be able to change the timeout thresholds for imports from S3:
 - `aws_s3.curlopt_low_speed_limit`
 - `aws_s3.curlopt_low_speed_time`
- Prevented instance creation failure in some edge cases
- Improved the performance of replay of commit transaction operations on Aurora replicas
- Fixed an issue where, in rare cases, an import from the `aws_s3` extension fails to complete
- Updated the GEOS library for PostGIS to version 3.12.0
- Improved Aurora Serverless v2 database memory scaling which reduces the overall database instance scale time
- Added the `WAIT_EVENT_Aurora_CLUSTER_CACHE_MANAGER_SENDER` wait event to denote wait times in the cluster cache manager sender

- Added the `WAIT_EVENT_Aurora_SERVERLESS_MONITORING_MAIN` wait event to denote wait times in Aurora Serverless resource monitoring
- Improved the handling of invalid non-persisted metadata during reads from storage on read replicas
- Fixed an issue where the database may crash during the start of a logical replication slot
- Increased the limit for `pg_cron cron.max_running_jobs` parameter from 100 to 1000
- The `pgAudit pgaudit.log_statement` parameter is now modifiable
- Introduced diagnostics for transient metadata used for I/O
- Fixed a bug in `CREATE TABLE` command to handle table name starting with '#' correctly

Additional improvements and enhancements

- Updated the following extensions:
 - `orafce` to version 4.3.0
 - `pg_logical` to version 2.4.3
 - `pg_tle` to version 1.1.1
 - `pgvector` to version 0.5.0
 - `PostGIS` to version 3.3.3
 - `RDKit` to version 4.3

For information about extensions and modules, see [Extensions supported for Aurora PostgreSQL 14](#).

PostgreSQL 14.8

This release of Aurora PostgreSQL is compatible with PostgreSQL 14.8. For more information about the improvements in PostgreSQL 14.8, see [PostgreSQL release 14.8](#).

Releases and patches

- [Aurora PostgreSQL 14.8.5, March 13, 2024](#)
- [Aurora PostgreSQL 14.8.4, December 14, 2023](#)
- [Aurora PostgreSQL 14.8.3, November 14, 2023](#)
- [Aurora PostgreSQL 14.8.2, October 4, 2023](#)

- [Aurora PostgreSQL 14.8.0, July 13, 2023](#)

Aurora PostgreSQL 14.8.5, March 13, 2024

General enhancements

- Allow `rds_superuser` to terminate backends which are not explicitly associated with a role.

High priority enhancements

- Fixed an issue that would cause a logical replication slot to transiently error out in the presence of aborted subtransactions and DDL.
- Backported fixes for the following PostgreSQL community security issue:
 - [CVE-2024-0985](#)

Critical stability enhancements

- Fixed an issue related to `apg_plan_mgmt`.
- Fixed a deadlock issue in Aurora Storage which can result in writer failover.
- Fixed an issue where active transactions during logical replication slot creation may be partially replicated by the slot.

Aurora PostgreSQL 14.8.4, December 14, 2023

Critical stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-5870](#)
 - [CVE-2023-5869](#)
 - [CVE-2023-5868](#)

High priority enhancements

- Improved the index scan query performance by skipping unnecessary B-tree page reads when a composite index is used with large data sets

- Fixed an issue with index scan queries that, in rare cases, could lead to database instance restarts

General stability enhancements

- Fixed an issue with logical replication actions being performed by someone other than the table owner

Aurora PostgreSQL 14.8.3, November 14, 2023

Critical stability enhancements

- Backported a fix for the following security issue:
 - [CVE-2023-38545](#)
- Fixed an issue related to `pg_cron` background worker processes

General enhancements

- Fixed an issue that could result in read replica lag due to stale metadata
- Fixed an issue related to buffer pin locking that in rare cases can result in a crash

Aurora PostgreSQL 14.8.2, October 4, 2023

High priority stability enhancements

- Backported a fix for the following PostgreSQL community security issue:
 - [CVE-2023-39417](#)

High priority enhancements

- Fixed an issue which can cause a database instance to restart while executing I/O intensive read workloads
- Fixed an issue which can cause vacuum operations to become blocked after the restart of an Aurora replica
- Fixed an issue that would cause a crash when executing the `COPY FROM` command
- Fixed an issue that would cause high CPU usage and prevent new connections

- Fixed an issue where UPDATE and DELETE from a table with foreign key could fail unexpectedly with "ERROR: 40001: could not serialize access due to concurrent update when using Serializable snapshot"

General enhancements

- Introduced diagnostics for the transient metadata used for I/O
- Fixed an issue that prevented the enablement of improved memory management in certain scenarios in Aurora PostgreSQL 15.3

Aurora PostgreSQL 14.8.0, July 13, 2023

Following the announcement of updates to the PostgreSQL database by the open source community, we have updated Amazon Aurora PostgreSQL-Compatible Edition to support PostgreSQL versions 15.3, 14.8, 13.11, 12.15, and 11.20. These releases contains product improvements and bug fixes made by the PostgreSQL community, along with Aurora-specific improvements. The releases also contain new features and improvements for [Babelfish for Aurora PostgreSQL version 3.2](#), and improved support for [AWS Database Migration Service](#). Refer to the [Amazon Aurora versions](#) to help you to decide how often to upgrade and how to plan your upgrade process. As a reminder, if you are running any version of Amazon Aurora PostgreSQL 11, you must upgrade to a newer major version by February 29, 2024.

New features

- This release contains memory management improvements which increase database stability and availability by proactively preventing issues caused by insufficient memory. For more information, see [Improved memory management in Aurora PostgreSQL](#).
- Added support for pgvector extension version 0.4.1

High priority enhancements

- Fixed an issue with the subtransaction metadata handling when performing a survivable reader reconnect
- Fixed an issue during ZDP which is related to the extension environment variables
- Addressed a transient error during logical replication that caused a process to incorrectly calculate that it had encountered an unexpected page

- Fixed an issue which causes a period of unavailability due to a partially created replication origin state file

General enhancements

- Addressed an issue where the computing query identifier displayed a warning, "WARNING: unrecognized node type: 378"
- Addressed an issue that caused the initial data sync of a relation to become blocked due to the premature removal of the logical replication slot on the publisher
- Added a new function, `aurora_stat_memctx_usage()`, to show backend memory use breakdown at a Postgres memory context level
- Provided options to configure the timeouts within the `aws_lambda` extension. By setting the following parameters (GUCs), customers will now be able to change the connect and request timeouts for AWS Lambda integration:
 - `aws_lambda.connect_timeout_ms`
 - `aws_lambda.request_timeout_ms`
- Fixed an issue with the calculation of the `AuroraReplicaLag` metric
- Fixed an issue where, in rare cases, the `aws_s3` extension could fail to import from an Amazon S3 bucket with a name containing dots
- Further reduced the database downtime during ZDP
- Fixed a bug which can cause unavailability during ZDP
- Fixed an issue which caused `pg_ls_waldir()` to return "ERROR: could not stat file"
- Added support for TLS 1.3 with ciphers `TLS_AES_128_GCM_SHA256` and `TLS_AES_256_GCM_SHA384`
- Addressed an issue that blocked a major version upgrade on the Aurora replica of an RDS for PostgreSQL DB instance
- Fixed an issue that could prevent scaling in Aurora Serverless v2 instances
- Fixed an issue in logical replication which, in rare cases, can cause a period of unavailability due to the incorrect subtransaction metadata
- Fixed an issue in the `pg_vector` extension where, in rare cases, infinite or NAN values caused a crash during the index creation
- Upgraded GEOS to version 3.11.2
- Upgraded `pg_cron` to version 1.5

- Upgraded `pg_partman` to version 4.7.3
- Upgraded `pg_tle` to version 1.0.3
- Upgraded `plv8` to version 3.1.6
- Upgraded `tds_fdw` to 2.0.3

PostgreSQL 14.7

This release of Aurora PostgreSQL is compatible with PostgreSQL 14.7. For more information about the improvements in PostgreSQL 14.7, see [PostgreSQL release 14.7](#).

Releases and patches

- [Aurora PostgreSQL 14.7.7, March 13, 2024](#)
- [Aurora PostgreSQL 14.7.6, December 15, 2023](#)
- [Aurora PostgreSQL 14.7.5, November 14, 2023](#)
- [Aurora PostgreSQL 14.7.4, October 5, 2023](#)
- [Aurora PostgreSQL 14.7.3, July 24, 2023](#)
- [Aurora PostgreSQL 14.7.2, May 10, 2023](#)
- [Aurora PostgreSQL 14.7.1, April 5, 2023](#)

Aurora PostgreSQL 14.7.7, March 13, 2024

General enhancements

- Allow `rds_superuser` to terminate backends which are not explicitly associated with a role.

High priority enhancements

- Fixed an issue that would cause a logical replication slot to transiently error out in the presence of aborted subtransactions and DDL.
- Backported fixes for the following PostgreSQL community security issue:
 - [CVE-2024-0985](#)

Critical stability enhancements

- Fixed an issue related to `apg_plan_mgmt`.
- Fixed a deadlock issue in Aurora Storage which can result in writer failover.
- Fixed an issue where active transactions during logical replication slot creation may be partially replicated by the slot.

Aurora PostgreSQL 14.7.6, December 15, 2023

Critical stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-5870](#)
 - [CVE-2023-5869](#)
 - [CVE-2023-5868](#)

High priority enhancements

- Improved the index scan query performance by skipping unnecessary B-tree page reads when a composite index is used with large data sets
- Fixed an issue with index scan queries that, in rare cases, could lead to database instance restarts

General stability enhancements

- Fixed an issue with logical replication actions being performed by someone other than the table owner

Aurora PostgreSQL 14.7.5, November 14, 2023

Critical stability enhancements

- Backported a fix for the following security issue:
 - [CVE-2023-38545](#)
- Fixed an issue related to `pg_cron` background worker processes

General enhancements

- Fixed an issue that could result in read replica lag due to stale metadata
- Fixed an issue related to buffer pin locking that in rare cases can result in a crash

Aurora PostgreSQL 14.7.4, October 5, 2023

High priority stability enhancements

- Backported a fix for the following PostgreSQL community security issue:
 - [CVE-2023-39417](#)
 - [CVE-2023-2454](#)

High priority enhancements

- Fixed an issue which can cause a database instance to restart while executing I/O intensive read workloads
- Fixed an issue which can cause vacuum operations to become blocked after the restart of an Aurora replica
- Fixed an issue that would cause high CPU usage and prevent new connections

General enhancements

- Introduced diagnostics for the transient metadata used for I/O

Aurora PostgreSQL 14.7.3, July 24, 2023

General enhancements

- Fixed an issue with the calculation of the `AuroraReplicaLag` metric
- Fixed a bug which can cause unavailability during ZDP
- Fixed an issue that prevented reclaiming storage on transaction commits
- Fixed an issue preventing `pglogical` from logging conflicting rows during the apply phase
- Added Aurora Serverless v2 scaling enhancements

- Fixed an issue where, in rare cases, the `aws_s3` extension could fail to import from an Amazon S3 bucket with a name containing dots
- Provided options to configure the timeouts within the `aws_lambda` extension. By setting the following parameters (GUCs), customers will now be able to change the connect and request timeouts for AWS Lambda integration:
 - `aws_lambda.connect_timeout_ms`
 - `aws_lambda.request_timeout_ms`
- Fixed multiple issues which can cause Aurora replicas with the improved read availability feature to restart when reconnecting with the writer instance
- Fixed an issue preventing a survivable reader reconnect

Aurora PostgreSQL 14.7.2, May 10, 2023

General enhancements

- Fixed an error when loading the `test_decoding` plugin in `pg_create_logical_replication_slot`
- Fixed an issue that causes logical replication to fail when using write-through cache
- Updated the Oracle client used by the `oracle_fdw` extension to version 21.9.0.0.0

Aurora PostgreSQL 14.7.1, April 5, 2023

New features

- Introduced a new QPM plan hash calculation for multi-schema support. If users want to use QPM in multi-schema environments, they can set the `apg_plan_mgmt.plan_hash` version to 2 and call `apg_plan_mgmt.validate_plans('update_plan_hash')`.
- Logical replication enhancements to improve memory and CPU usage during the processing of large transactions.
- The CloudWatch metric `ReplicationSlotDiskUsage` now tracks logical replication specific storage across Aurora storage and local storage.
- Starting with Aurora PostgreSQL versions 15.2 and 14.7, a user needs to be granted the `CONNECT` privilege on each database to connect even if the user is granted access to the `rds_superuser` role. Prior to Aurora PostgreSQL versions 15.2 and 14.7, a user was able to

connect to any database and system table if the user was granted the `rds_superuser` role. Previous Aurora PostgreSQL versions are not impacted by this change, and users with access to the `rds_superuser` role do not require the `CONNECT` privilege to access databases in their Aurora PostgreSQL cluster.

High priority stability enhancements

- Fixed an issue where the commit latency metrics weren't updated

General enhancements

- Upgraded PROJ support to version 9.1.0
- Upgraded the GDAL library in PostGIS to version 3.5.3
- Fixed the upgrade paths from `pg_hint_plan` 1.3x to 1.4
- Added support for the TCN and SEG extensions
- Improved performance of deletes from b-tree and hash indexes on Aurora replicas
- Includes Aurora Serverless v2 scaling enhancements
- Fixed an issue in QPM that prevented the enforcement of approved plans when joining partitioned tables
- Fixed an issue that caused incorrect buffer hit counts in EXPLAIN
- Improved the engine startup time, particularly on large instances with many objects
- The Aurora function `aurora_stat_logical_wal_cache()` is now visible to all users
- Fixed an issue in QPM that could cause unavailability when enforcing plans from prepared statements

Additional improvements and enhancements

- Updated the following extensions:
 - `hll` to version 2.17
 - `Oracle_fdw` to version 2.5.0
 - `orafce` to version 4.0.0
 - `pg_cron` to version 1.4.2
 - `pg_hint_plan` to version 1.4.1

- `pg_logical` to version 2.4.2
- `pg_trgm` to version 1.4
- `pgrouting` to version 3.4.1
- `plv8` to version 3.1.4
- PostGIS to version 3.3.2
- SEG to version 1.0
- TCN to version 1.0
- `wal2json` to version 2.5

For information about extensions and modules, see [Extensions supported for Aurora PostgreSQL 14](#).

PostgreSQL 14.6

This release of Aurora PostgreSQL is compatible with PostgreSQL 14.6. For more information about the improvements in PostgreSQL 14.6, see [PostgreSQL release 14.6](#).

Releases and patches

- [Aurora PostgreSQL 14.6.8, March 13, 2024](#)
- [Aurora PostgreSQL 14.6.7, December 15, 2023](#)
- [Aurora PostgreSQL 14.6.6, November 17, 2023](#)
- [Aurora PostgreSQL 14.6.5, October 04, 2023](#)
- [Aurora PostgreSQL 14.6.4, September 13, 2023](#)
- [Aurora PostgreSQL 14.6.2, March 3, 2023](#)
- [Aurora PostgreSQL 14.6.1, February 17, 2023](#)
- [Aurora PostgreSQL 14.6.0, January 20, 2023](#)

Aurora PostgreSQL 14.6.8, March 13, 2024

General enhancements

- Allow `rds_superuser` to terminate backends which are not explicitly associated with a role.

High priority enhancements

- Backported fixes for the following PostgreSQL community security issue:
 - [CVE-2024-0985](#)

Critical stability enhancements

- Fixed an issue related to `apg_plan_mgmt`.
- Fixed a deadlock issue in Aurora Storage which can result in writer failover.
- Fixed an issue where active transactions during logical replication slot creation may be partially replicated by the slot.

Aurora PostgreSQL 14.6.7, December 15, 2023

Critical stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-5870](#)
 - [CVE-2023-5869](#)
 - [CVE-2023-5868](#)

General stability enhancements

- Fixed an issue with logical replication actions being performed by someone other than the table owner

Aurora PostgreSQL 14.6.6, November 17, 2023

Critical stability enhancements

- Backported a fix for the following security issue:
 - [CVE-2023-38545](#)
- Fixed an issue related to `pg_cron` background worker processes

Aurora PostgreSQL 14.6.5, October 04, 2023

Critical stability enhancements

- Backported a fix for the following PostgreSQL community security issue:
 - [CVE-2023-2455](#)
 - [CVE-2023-2454](#)

High priority stability enhancements

- Fixed an issue which can cause a database instance to restart while executing IO intensive read workloads
- Fixed an issue that would cause high CPU usage and prevent new connections

General enhancements

- Introduced diagnostics for the transient metadata used for I/O

Aurora PostgreSQL 14.6.4, September 13, 2023

General enhancements

- Added Aurora Serverless v2 scaling enhancements
- Fixed an issue in `pg_cron` which can prevent scaling in Aurora Serverless v2
- Fixed an issue with the calculation of the `AuroraReplicaLag` metric
- Fixed a bug which can cause unavailability during ZDP
- Fixed an issue preventing `pglogical` from logging conflicting rows during the apply phase
- Fixed an issue where, in rare cases, the `aws_s3` extension could fail to import from an Amazon S3 bucket with a name containing dots
- Provided options to configure the timeouts within the `aws_lambda` extension. By setting the following parameters, customers will now be able to change the connect and request timeouts for AWS Lambda integration:
 - `aws_lambda.connect_timeout_ms`
 - `aws_lambda.request_timeout_ms`

Aurora PostgreSQL 14.6.2, March 3, 2023

Critical stability enhancements

- Backported a fix for the following PostgreSQL community security issue:
 - [CVE-2022-41862](#)

General stability enhancements

- Fixed an issue where the approved plans for joins with partitioned tables weren't being enforced
- Fixed an issue in PostGIS where the GDAL data wasn't loading
- Fixed an issue that increased the amount of recovery work during startup if logical replication is enabled
- Fixed an issue with the `aws_s3` extension where loading a large number of records can time out
- Fixed an issue that causes logical replication to fail when using write-through cache

Aurora PostgreSQL 14.6.1, February 17, 2023

Critical stability enhancements

- Fixed a critical stability issue.

Aurora PostgreSQL 14.6.0, January 20, 2023

High priority stability enhancements

- Fixed an issue where an upgrade fails because the oldest `MultiXactId` is updated incorrectly.
- Fixed an issue that could lead to a brief period of unavailability.

General stability enhancements

- Fixed an issue that caused DB instance migration failures.
- Fixed an issue where the DB fails to start because of an inconsistency in the metadata.
- Improved the error handling and diagnosability.
- Upgraded the `RDKit` extension to version 4.2.

- Upgraded the GDAL library to version 3.4.3.
- Fixed an issue where the cluster cache management process doesn't shutdown gracefully.
- Fixed an issue that can cause certain processes to linger in an inconsistent state during a clean shutdown.
- Fixed an issue with the `pg_repack` extension.
- Improved the collation library, `glibc`, handling with a new independent default collation library.

PostgreSQL 14.5

This release of Aurora PostgreSQL is compatible with PostgreSQL 14.5. For more information about the improvements in PostgreSQL 14.5, see [PostgreSQL release 14.5](#).

Releases and patches

- [Aurora PostgreSQL 14.5.6, March 13, 2024](#)
- [Aurora PostgreSQL 14.5.5, December 18, 2023](#)
- [Aurora PostgreSQL 14.5.4, November 17, 2023](#)
- [Aurora PostgreSQL 14.5.3, October 17, 2023](#)
- [Aurora PostgreSQL 14.5.2, March 2, 2023](#)
- [Aurora PostgreSQL 14.5.1, December 13, 2022](#)
- [Aurora PostgreSQL 14.5.0, November 09, 2022](#)

Aurora PostgreSQL 14.5.6, March 13, 2024

General enhancements

- Allow `rds_superuser` to terminate backends which are not explicitly associated with a role.

High priority enhancements

- Backported fixes for the following PostgreSQL community security issue:
 - [CVE-2024-0985](#)

Critical stability enhancements

- Fixed an issue related to `apg_plan_mgmt`.
- Fixed a deadlock issue in Aurora Storage which can result in writer failover.
- Fixed an issue where active transactions during logical replication slot creation may be partially replicated by the slot.

Aurora PostgreSQL 14.5.5, December 18, 2023

Critical stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-5870](#)
 - [CVE-2023-5869](#)
 - [CVE-2023-5868](#)

General stability enhancements

- Fixed an issue with logical replication actions being performed by someone other than the table owner.

Aurora PostgreSQL 14.5.4, November 17, 2023

Critical stability enhancements

- Backported a fix for the following security issue:
 - [CVE-2023-38545](#)
- Fixed an issue related to `pg_cron` background worker processes.

Aurora PostgreSQL 14.5.3, October 17, 2023

High priority stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-39417](#)

- [CVE-2023-2455](#)
- [CVE-2023-2454](#)
- [CVE-2022-41862](#)

High priority enhancements

- Fixed an issue which blocked vacuum operations after the restart of an Aurora replica.
- Fixed an issue that would cause high CPU usage and prevent new connections.

General stability enhancements

- Fixed an issue which causes the stats collector process to repeatedly restart.
- Improved the scale times for Aurora Serverless v2
- Fix a bug which can cause unavailability during ZDP.
- Fixed an issue preventing `pglogical` from logging conflicting rows during the apply phase.
- Fixed an issue where, in rare cases, the `aws_s3` extension could fail to import from an S3 bucket with a name containing dots.
- Provided options to configure the timeouts within the `aws_lambda` extension. By setting the following parameters, customers will now be able to change the connect and request timeouts for AWS Lambda integration:
 - `aws_lambda.connect_timeout_ms`
 - `aws_lambda.request_timeout_ms`
- Fixed an issue which can cause a database instance to restart while executing I/O intensive read workloads.
- Fixed an issue that causes logical replication to fail when using write-through cache.

Aurora PostgreSQL 14.5.2, March 2, 2023

General stability enhancements

- Fixed an issue where the approved plans for joins with partitioned tables weren't being enforced.
- Fixed an issue that could cause the unavailability of query plan management (QPM)
- Fixed an issue that increased the amount of recovery work during startup if logical replication is enabled.

- Fixed an issue with the `aws_s3` extension where loading a large number of records can time out.
- Fixed an issue with the `pg_cron` parallel running of tasks.

Aurora PostgreSQL 14.5.1, December 13, 2022

General stability enhancements

- Fixed an issue that can cause increased network traffic when a writer instance transmits logs to a replica instance.
- Fixed an issue where the engine experiences stability issues during database minor and patch release upgrades.
- Fixed an issue that could cause unavailability during replication.
- Fixed an issue that could cause data inconsistency during replication.

Aurora PostgreSQL 14.5.0, November 09, 2022

High priority stability enhancements

- Fixed an Aurora Serverless v2 scaling issue.
- Fixed an issue which caused Aurora Serverless v2 shrink failure.

General stability enhancements

- Improved buffer cache scavenging when the buffer cache is in duress.
- Fixed an issue in database activity streams that leads to high memory consumption.
- Fixed an issue where DB instances could restart when applying changes from a logical replication subscription.
- Fixed an issue that caused DB instance restarts.
- Fixed an issue where a DB instance restarts recursively while generating monitoring metrics during a crash.
- Fixed an issue where a DB instance restarted during performance metric collection.
- Fixed an issue where an attempt to connect to the database would fail with `SSLV3_ALERT_CERTIFICATE_UNKNOWN`.
- Improved the error reporting in case of an inconsistent B-tree index.

- Improved the diagnostic logging around setting invalid hint bits.
- Fixed an issue where autovacuum would incorrectly skip tables.
- Improved the logical replication prefetching.
- Fixed a durability issue in the GIN indexes
- Provided options to configure MultiXact SLRU cache. By setting the following parameters (GUCs), customers will now be able to change the MultiXact SLRU cache sizes:
 - `multixact_members_cache_size`
 - `multixact_offsets_cache_size`
- Fixed an issue to detect and cancel stuck major version upgrades.
- Fixed an issue in hash join that could lead to increased memory consumption.
- Improved the logical replication performance.
- Fixed an issue that causes database activity stream inconsistency when the monitoring agent is unavailable.
- Upgraded the GEOS version to 3.10.3.
- Updated the PLV8 version to 3.0.0.
- Updated the PostGIS extension to version 3.2.3.
- Fixed an issue with `st_orientedenvelope` that caused it to loop with a 1-D input to return 0.
- Fixed an issue where the connection to SQL Server using `tds_fdw` fails.

PostgreSQL 14.4

This release of Aurora PostgreSQL is compatible with PostgreSQL 14.4. For more information about the improvements in PostgreSQL 14.4, see [PostgreSQL release 14.4](#).

Releases and patches

- [Aurora PostgreSQL 14.4.9, March 13, 2024](#)
- [Aurora PostgreSQL 14.4.8, December 22, 2023](#)
- [Aurora PostgreSQL 14.4.7, November 17, 2023](#)
- [Aurora PostgreSQL 14.4.6, October 19, 2023](#)
- [Aurora PostgreSQL 14.4.5, December 14, 2022](#)
- [Aurora PostgreSQL 14.4.4, November 17, 2022](#)
- [Aurora PostgreSQL 14.4.0, October 13, 2022](#)

Aurora PostgreSQL 14.4.9, March 13, 2024

General enhancements

- Allow `rds_superuser` to terminate backends which are not explicitly associated with a role.

High priority enhancements

- Backported fixes for the following PostgreSQL community security issue:
 - [CVE-2024-0985](#)

Critical stability enhancements

- Fixed an issue related to `apg_plan_mgmt`.
- Fixed a deadlock issue in Aurora Storage which can result in writer failover.
- Fixed an issue where active transactions during logical replication slot creation may be partially replicated by the slot.

Aurora PostgreSQL 14.4.8, December 22, 2023

Critical stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-5870](#)
 - [CVE-2023-5869](#)
 - [CVE-2023-5868](#)

General stability enhancements

- Fixed an issue with logical replication actions being performed by someone other than the table owner.

Aurora PostgreSQL 14.4.7, November 17, 2023

Critical stability enhancements

- Backported a fix for the following security issue:
 - [CVE-2023-38545](#)
- Fixed an issue related to `pg_cron` background worker processes.

Aurora PostgreSQL 14.4.6, October 19, 2023

High priority stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-39417](#)
 - [CVE-2023-2455](#)
 - [CVE-2023-2454](#)
 - [CVE-2022-41862](#)
 - [CVE-2022-2625](#)

High priority enhancements

- Fixed an issue which blocked vacuum operations after the restart of an Aurora replica.
- Fixed an issue that would cause high CPU usage and prevent new connections.

General stability enhancements

- Fixed an issue which causes the stats collector process to repeatedly restart.
- Improved the scale times for Aurora Serverless v2
- Fix a bug which can cause unavailability during ZDP.
- Fixed an issue preventing `pglogical` from logging conflicting rows during the apply phase.
- Fixed an issue where, in rare cases, the `aws_s3` extension could fail to import from an S3 bucket with a name containing dots.

- Provided options to configure the timeouts within the `aws_lambda` extension. By setting the following parameters, customers will now be able to change the connect and request timeouts for AWS Lambda integration:
 - `aws_lambda.connect_timeout_ms`
 - `aws_lambda.request_timeout_ms`

Aurora PostgreSQL 14.4.5, December 14, 2022

General stability enhancements

- Fixed an issue where the engine experiences stability issues during database minor and patch release upgrades
- Fixed an issue that could cause unavailability during replication
- Fixed an issue that causes database activity stream inconsistency when the monitoring agent is unavailable
- Fixed an issue that could cause data inconsistency during replication

Aurora PostgreSQL 14.4.4, November 17, 2022

High priority stability enhancements

- Fixed an issue that can cause increased network traffic when a writer instance transmits logs to a replica instance

Aurora PostgreSQL 14.4.0, October 13, 2022

High priority stability enhancements

- Fixed an issue where PLV8 crashed during a JavaScript error scenario
- Fixed an issue where PLV8 crashed when trying to acquire a semaphore to execute the next task
- Fixed an issue where scaling an Aurora Serverless v2 instance gets stuck if VACUUM is running

General stability enhancements

- Fixed a bug where Aurora PostgreSQL can't file the `relfilenode`

- Fixed a database restart issue when a plan gets invalidated but the engine still checks if it is valid
- Fixed a stuck scaling issue when the current scaling event times out
- Upgraded the plv8 extension to version 3.0.0
- Upgraded the PostGIS extension to version 3.2.3
- Fixed an issue where extended query messages might be lost during zero-downtime patching (ZDP) causing the extended query to hang after the ZDP completion

PostgreSQL 14.3

This release of Aurora PostgreSQL is compatible with PostgreSQL 14.3. For more information about the improvements in PostgreSQL 14.3, see [PostgreSQL release 14.3](#).

Releases and patches

- [Aurora PostgreSQL 14.3.9, March 13, 2024](#)
- [Aurora PostgreSQL 14.3.8, December 22, 2023](#)
- [Aurora PostgreSQL 14.3.7, November 17, 2023](#)
- [Aurora PostgreSQL 14.3.6, October 19, 2023](#)
- [Aurora PostgreSQL 14.3.5, December 14, 2022](#)
- [Aurora PostgreSQL 14.3.4, November 17, 2022](#)
- [Aurora PostgreSQL 14.3.3, October 13, 2022](#)
- [Aurora PostgreSQL 14.3.1, July 6, 2022](#)
- [Aurora PostgreSQL 14.3.0, June 21, 2022](#)

Aurora PostgreSQL 14.3.9, March 13, 2024

General enhancements

- Allow `rds_superuser` to terminate backends which are not explicitly associated with a role.

High priority enhancements

- Backported fixes for the following PostgreSQL community security issue:
 - [CVE-2024-0985](#)

Critical stability enhancements

- Fixed an issue related to `apg_plan_mgmt`.
- Fixed a deadlock issue in Aurora Storage which can result in writer failover.
- Fixed an issue where active transactions during logical replication slot creation may be partially replicated by the slot.

Aurora PostgreSQL 14.3.8, December 22, 2023

Critical stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-5870](#)
 - [CVE-2023-5869](#)
 - [CVE-2023-5868](#)

General stability enhancements

- Fixed an issue with logical replication actions being performed by someone other than the table owner

Aurora PostgreSQL 14.3.7, November 17, 2023

Critical stability enhancements

- Backported a fix for the following security issue:
 - [CVE-2023-38545](#)
- Fixed an issue related to `pg_cron` background worker processes

Aurora PostgreSQL 14.3.6, October 19, 2023

High priority stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-39417](#)

- [CVE-2023-2455](#)
- [CVE-2023-2454](#)
- [CVE-2022-41862](#)
- [CVE-2022-2625](#)

High priority enhancements

- Fixed an issue which blocked vacuum operations after the restart of an Aurora replica
- Fixed an issue that would cause high CPU usage and prevent new connections

General stability enhancements

- Fixed an issue which causes the stats collector process to repeatedly restart
- Improved the scale times for Aurora Serverless v2
- Fix a bug which can cause unavailability during ZDP
- Fixed an issue preventing `pglogical` from logging conflicting rows during the apply phase
- Fixed an issue where, in rare cases, the `aws_s3` extension could fail to import from an S3 bucket with a name containing dots
- Provided options to configure the timeouts within the `aws_lambda` extension. By setting the following parameters, customers will now be able to change the connect and request timeouts for AWS Lambda integration:
 - `aws_lambda.connect_timeout_ms`
 - `aws_lambda.request_timeout_ms`

Aurora PostgreSQL 14.3.5, December 14, 2022

General stability enhancements

- Fixed an issue where the engine experiences stability issues during database minor and patch release upgrades
- Fixed an issue that could cause unavailability during replication
- Fixed an issue that causes database activity stream inconsistency when the monitoring agent is unavailable
- Fixed an issue that could cause data inconsistency during replication

Aurora PostgreSQL 14.3.4, November 17, 2022

High priority stability enhancements

- Fixed an issue that can cause increased network traffic when a writer instance transmits logs to a replica instance

Aurora PostgreSQL 14.3.3, October 13, 2022

High priority stability enhancements

- Fixed a PLV8 issue where the base parameter doesn't get loaded properly into the memory
- Fixed an issue where scaling an Aurora Serverless v2 instance gets stuck if VACUUM is running

General stability enhancements

- Fixed a bug where Aurora PostgreSQL can't file the relfilenode
- Fixed a database restart issue when a plan gets invalidated but the engine still checks if it is valid
- Fixed a stuck scaling issue when the current scaling event times out
- Upgraded the PostGIS extension to version 3.1.7
- Fixed an issue where extended query messages might be lost during zero-downtime patching (ZDP) causing the extended query to hang after the ZDP completion

Aurora PostgreSQL 14.3.1, July 6, 2022

Critical stability enhancements

- Fixed an issue that could cause periods of unavailability during a storage node restart

High priority stability enhancements

- Fixed an error handling issue related to out-of-memory conditions which could result in brief periods of unavailability
- Fixed an issue when the connection to SQL Server fails using the TDS_FDW extension to query a foreign table
- Fixed an issue that caused connections using the provided root certificate to fail

- Improved the diagnostic and supportability information in case of inconsistent B-tree index entries

Aurora PostgreSQL 14.3.0, June 21, 2022

New features

- Supports SCRAM password encryption method. For more information, see [Using SCRAM for PostgreSQL password encryption](#).

Additional improvements and enhancements

- Contains all of the fixes, features, and improvements present in [Aurora PostgreSQL 13.7](#).
- Backported the following bug fix from the PostgreSQL 14.4 release: [Reverted changes to CONCURRENTLY that "sped up" Xmin advance](#) to prevent Index Corruption with the CREATE INDEX CONCURRENTLY / REINDEX CONCURRENTLY commands.
- This release supports [lo](#) extension version 1.1.
- This release supports [old_snapshot](#) extension version 1.0.
- This release supports EBCDIC collations for the mainframe modernization efforts. For more information, see [Aurora PostgreSQL collations for EBCDIC and other mainframe migrations](#) in the *Amazon Aurora User Guide*.
- Updated the following extensions:
 - amcheck to version 1.3
 - btree_gist to version 1.6
 - cube to version 1.5
 - hll to version 2.16
 - hstore to version 1.8
 - intarray to version 1.5
 - log_fdw to version 1.3
 - oracle_fdw to version 2.4.0
 - pg_hint_plan to version 1.4
 - pg_partman to version 4.6.0
 - pg_repack to version 1.4.7

- `pg_stat_statements` to version 1.9
- `pg_trgm` to version 1.6
- `pgaudit` to version 1.6.1
- `pgrouting` to version 3.2.0
- `pgtap` to version 1.2.0
- `postgres_fdw` to version 1.1

PostgreSQL 13.14

This release of Aurora PostgreSQL is compatible with PostgreSQL 13.14. For more information about the improvements in PostgreSQL 13.14, see [PostgreSQL release 13.14](#).

Releases and patches

- [Aurora PostgreSQL 13.14.2, June 20, 2024](#)
- [Aurora PostgreSQL 13.14.1, April 29, 2024](#)

Aurora PostgreSQL 13.14.2, June 20, 2024

General enhancements

- Fixed multiple issues where minor version upgrades with ZDP would fail resulting in longer upgrade times.

High priority enhancements

- Fixed a crash with execution of `plpgsql` user defined functions.
- Fixed an issue which led to cancellation of long-running queries on Global Database replica instances.

Critical stability enhancements

- Fixed an issue where a change in memory requirements during a minor version upgrade can cause zero-downtime patching and engine startup to fail.

- Fixed an issue with background worker where it may crash when executed in parallel worker context.
- Fixed a `pg_repack` issue causing two vacuums to concurrently process the same table.
- Fixed issues in how two-phase commit files are handled.

Aurora PostgreSQL 13.14.1, April 29, 2024

New features

- Added resource usage summary to `pg_dump`.

General enhancements

- Fixed multiple minor version upgrade issues to improve connection preservation with zero-downtime patching.
- Reduced database boot time due to improved initialization time for large volumes.
- Introduced faster COPY operations by reducing contention on the relation extension lock and proactively extending relations.
- Improvements to reduce replication lag by intelligently skipping the replay of certain log records, thereby reducing the replay load.
- Fixed an issue during recovery conflict on a read node which, in rare cases, could cause brief unavailability.
- Fixed an issue where a database would fail to startup during a major version upgrade patch, in rare scenarios.
- Improved availability of read replicas by allowing recovery from replication errors in more situations.
- Fixed an issue that would cause zero-downtime patching to timeout.
- Fixed a logical replication decoding issue that fails to process catalog modifying changes after spilling to storage if there was a concurrent aborted sub-transaction.
- Improved log record validation before it is written to storage.
- Fixed an issue that would result in sessions incorrectly reporting ClientRead wait events after a zero-downtime patching event.
- Fixed an ambiguous function definition of `aws_s3.query_export_to_s3` when upgrading the `aws_s3` extension from version 1.1 to 1.2.

High priority enhancements

- Fixed an issue related to resuming a logical replication slot where, in rare cases, it could cause the slot to become stuck.
- Fixed an issue that would result in a restart when creating a database in a tablespace.
- Fixed an issue related to incorrect logical replication error handling to improve DB stability.

Critical stability enhancements

- Fixed an issue related to replication origins that in rare cases might result in longer recovery time and impact availability.
- Fixed an issue that in rare cases may cause transactions to be partially replicated by newly created logical replication slots. For more information, see [Potential data loss due to race condition during logical replication slot creation](#).
- Fixed an issue where a change in memory requirements during a minor version upgrade can cause zero-downtime patching and engine startup to fail.

Additional improvements and enhancements

- Updated the following extensions:
 - `pg_tle` extension to version 1.3.4.
 - `PLV8` extension to version 3.1.10.
 - `RDKit Cartridge` to version `Release_2023_09_4`.
- New GUC Parameters has been added
 - `pgtle.clientauth_databases_to_skip`
 - `pgtle.clientauth_db_name`
 - `pgtle.clientauth_num_parallel_workers`
 - `pgtle.clientauth_users_to_skip`
 - `pgtle.enable_clientauth`
 - `pgtle.passcheck_db_name`

PostgreSQL 13.13

This release of Aurora PostgreSQL is compatible with PostgreSQL 13.13. For more information about the improvements in PostgreSQL 13.13, see [PostgreSQL release 13.13](#).

Releases and patches

- [Aurora PostgreSQL 13.13.4, June 24, 2024](#)
- [Aurora PostgreSQL 13.13.3, March 13, 2024](#)
- [Aurora PostgreSQL 13.13.2, February 22, 2024](#)
- [Aurora PostgreSQL 13.13.0, December 21, 2023](#)

Aurora PostgreSQL 13.13.4, June 24, 2024

General enhancements

- Fixed multiple issues where minor version upgrades with ZDP would fail resulting in longer upgrade times.

High priority enhancements

- Fixed an issue with Parallel query execution in which a backend may get into indefinite hang in certain cases.
- Fixed a crash with execution of pltsql user defined functions.
- Fixed an issue which led to cancellation of long-running queries on Global Database replica instances.

Critical stability enhancements

- Fixed an issue where a change in memory requirements during a minor version upgrade can cause zero-downtime patching and engine startup to fail.
- Fixed a pg_repack issue causing two vacuums to concurrently process the same table.

Aurora PostgreSQL 13.13.3, March 13, 2024

General enhancements

- Fixed a performance degradation issue in PLV8 extension.

Aurora PostgreSQL 13.13.2, February 22, 2024

General enhancements

- Allow `rds_superuser` to terminate backends which are not explicitly associated with a role.

High priority enhancements

- Fixed an issue where `pg_stat_statements` can block minor version upgrade during ZDP.
- Fixed an issue where a logical replication slot would no longer emit changes due to an overly strict data consistency check.
- Backported fixes for the following PostgreSQL community security issue:
 - [CVE-2024-0985](#)

Critical stability enhancements

- Fixed an issue related to `apg_plan_mgmt`.
- Fixed a deadlock issue in Aurora Storage which can result in writer failover.
- Fixed an issue where active transactions during logical replication slot creation may be partially replicated by the slot.

Aurora PostgreSQL 13.13.0, December 21, 2023

Following the announcement of updates to the PostgreSQL database by the open source community, we have updated Amazon Aurora PostgreSQL-Compatible Edition to support PostgreSQL versions 15.5, 14.10, 13.13, and 12.17. These releases contain product improvements and bug fixes made by the PostgreSQL community, along with Aurora-specific improvements. New features and improvements for BabelFish for Aurora PostgreSQL version 3.4 are also included.

Refer to the Aurora version policy to help you to decide how often to upgrade and how to plan your upgrade process. As a reminder, if you are running any version of Amazon Aurora PostgreSQL version 11, you must upgrade to a newer major version by February 29, 2024.

New features

- Amazon Bedrock integration – By using the Amazon Aurora machine learning extension with your Aurora PostgreSQLDB cluster, you can now use Amazon Bedrock foundational AI models.
- Delegated Extension Support – This feature allows delegating extension management to lower privileged user with the new `rds_extension` role.
- Query Plan Management (QPM) enhancements:
 - Plan outlines will be updated to the latest format version as part of the `update_plan_hash` action for `apg_plan_mgmt.validate_plans()`.
 - Support was added for parallel append enforcement as a part of parallel query enforcement.
- Added support for the HypoPG extension at version 1.4.0.
- Added support for the `h3-pg` extension and the `h3-postgis` extension at version 4.1.3.

High priority enhancements

- Fixed an issue which may cause an Aurora replica to reboot when reading a page which was modified during WAL replay
- Fixed an issue where if a specific volume metadata is invalid on a source cluster, it will remain invalid on a cloned cluster. Since the clone cluster uses a new volume, the metadata will now be recreated.
- Fixed an issue which could, in rare cases, lead to an engine unavailable condition following a minor or patch version upgrade
- Fixed a bug that may cause an engine crash during zero-downtime patching (ZDP)
- Introduced a new parameter, `rds.enable_memory_management`, which is used to enable and disable the improved memory management feature.
- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-5870](#)
 - [CVE-2023-5869](#)
 - [CVE-2023-5868](#)

General enhancements

- Fixed an issue which may cause an Aurora replica to reboot while reconnecting with the writer DB instance.
- Added support for the `rdkit.morgan_fp_size` parameter
- `rds_superuser` can now run the `pg_stat_reset_slru` function
- Fixed an issue where MultiXact SLRU accesses were not credited to the correct `pg_stat_slru` category.
- Fixed an issue which may cause unused WAL segments to not be properly removed
- Fixed an issue where `pglogical` does not correctly pass-through replication origin data when using the binary output format
- `rds_superuser` can now execute `ALTER COLLATION` to refresh the collation version of a locale in the catalog.
- Fixed a crash in `dblink` and `postgres_fdw` extensions due to invalid connections
- Fixed an issue where the `aws_s3` extension can import HTTP error responses into the table
- Record the version of the AWS independent default collation library version in `pg_collation` catalog.

Additional improvements and enhancements

- Updated the following extensions:
 - `mysql_fdw` to version 2.9.1
 - `Oracle_fdw` to version 2.6.0
 - `Oracle` to version 4.6.0
 - `pg_cron` to version 1.6.0
 - `pg_hint_plan` to version 1.3.9
 - `pg_proctab` to version 0.0.10
 - `plv8` to version 3.1.8
 - `PostGIS` to version 3.4.0
 - `prefix` to version 1.2.10
 - `RDKit` to version 4.4.0 (Release_2023_09_1)

For information about extensions and modules, see [Extensions supported for Aurora PostgreSQL 13](#).

PostgreSQL 13.12

This release of Aurora PostgreSQL is compatible with PostgreSQL 13.12. For more information about the improvements in PostgreSQL 13.12, see [PostgreSQL release 13.12](#).

Releases and patches

- [Aurora PostgreSQL 13.12.7, June 25, 2024](#)
- [Aurora PostgreSQL 13.12.6, March 13, 2024](#)
- [Aurora PostgreSQL 13.12.5, February 22, 2024](#)
- [Aurora PostgreSQL 13.12.2, December 13, 2023](#)
- [Aurora PostgreSQL 13.12.1, November 09, 2023](#)
- [Aurora PostgreSQL 13.12.0, October 24, 2023](#)

Aurora PostgreSQL 13.12.7, June 25, 2024

General enhancements

- Fixed multiple issues where minor version upgrades with ZDP would fail resulting in longer upgrade times.

High priority enhancements

- Fixed an issue which led to cancellation of long-running queries on Global Database replica instances.

Critical stability enhancements

- Fixed an issue where a change in memory requirements during a minor version upgrade can cause zero-downtime patching and engine startup to fail.
- Fixed a `pg_repack` issue causing two vacuums to concurrently process the same table.

Aurora PostgreSQL 13.12.6, March 13, 2024

General enhancements

- Fixed a performance degradation issue in PLV8 extension.

Aurora PostgreSQL 13.12.5, February 22, 2024

General enhancements

- Allow `rds_superuser` to terminate backends which are not explicitly associated with a role.

High priority enhancements

- Fixed an issue where `pg_stat_statements` can block minor version upgrade during ZDP.
- Fixed an issue where a logical replication slot would no longer emit changes due to an overly strict data consistency check.
- Backported fixes for the following PostgreSQL community security issue:
 - [CVE-2024-0985](#)

Critical stability enhancements

- Fixed an issue related to `apg_plan_mgmt`.
- Fixed a deadlock issue in Aurora Storage which can result in writer failover.
- Fixed an issue where active transactions during logical replication slot creation may be partially replicated by the slot.

Aurora PostgreSQL 13.12.2, December 13, 2023

Critical stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-5870](#)
 - [CVE-2023-5869](#)
 - [CVE-2023-5868](#)

General stability enhancements

- Fixed an issue with logical replication actions being performed by someone other than the table owner

Aurora PostgreSQL 13.12.1, November 09, 2023

Critical stability enhancements

- Backported a fix for the following security issue:
 - [CVE-2023-38545](#)
- Fixed an issue related to `pg_cron` background worker processes

General enhancements

- Fixed an issue related to buffer pin locking that in rare cases can result in a crash

Aurora PostgreSQL 13.12.0, October 24, 2023

New features

- Added support for `mysql_fdw` version 2.9.0
- Added support in the `aws_s3` extension for exporting to an S3 bucket encrypted with a customer managed KMS key
- Improved the availability of Aurora replicas in the global DB secondary clusters
- Added support for query plan capture on Aurora replicas
- Added support for query plan enforcement with parallel query operators
- Allowed query plans under a given cost threshold to not be captured

High priority enhancements

- Included optimizations to improve the time to scale up in Aurora Serverless instances

General enhancements

- Fixed an issue in the `aws_s3` extension where the number of rows exported is incorrectly reported when the total number exceeds 2 billion
- Provided options to configure timeouts in the `aws_s3` extension. By setting the following parameters (GUCs), customers will now be able to change the timeout thresholds for imports from S3:
 - `aws_s3.curlopt_low_speed_limit`
 - `aws_s3.curlopt_low_speed_time`
- Prevented instance creation failure in some edge cases
- Improved the performance of replay of commit transaction operations on Aurora replicas
- Fixed an issue where, in rare cases, an import from the `aws_s3` extension fails to complete
- Updated the GEOS library for PostGIS to version 3.12.0
- Improved Aurora Serverless v2 database memory scaling which reduces the overall database instance scale time
- Added the `WAIT_EVENT_Aurora_CLUSTER_CACHE_MANAGER_SENDER` wait event to denote wait times in the cluster cache manager sender
- Added the `WAIT_EVENT_Aurora_SERVERLESS_MONITORING_MAIN` wait event to denote wait times in Aurora Serverless resource monitoring
- Fixed an issue where the database may crash during the start of a logical replication slot
- Increased the limit for `pg_cron cron.max_running_jobs` parameter from 100 to 1000
- Fixed a bug in `CREATE TABLE` command to handle table name starting with '#' correctly.

Additional improvements and enhancements

- Updated the following extensions:
 - `orafce` to version 4.3.0
 - `pg_logical` to version 2.4.3
 - `pgvector` to version 0.5.0
 - PostGIS to version 3.3.3
 - `RDKit` to version 4.3

For information about extensions and modules, see [Extensions supported for Aurora PostgreSQL 13](#).

PostgreSQL 13.11

This release of Aurora PostgreSQL is compatible with PostgreSQL 13.11. For more information about the improvements in PostgreSQL 13.11, see [PostgreSQL release 13.11](#).

Releases and patches

- [Aurora PostgreSQL 13.11.5, March 13, 2024](#)
- [Aurora PostgreSQL 13.11.4, December 14, 2023](#)
- [Aurora PostgreSQL 13.11.3, November 14, 2023](#)
- [Aurora PostgreSQL 13.11.2, October 4, 2023](#)
- [Aurora PostgreSQL 13.11.0, July 13, 2023](#)

Aurora PostgreSQL 13.11.5, March 13, 2024

General enhancements

- Allow `rds_superuser` to terminate backends which are not explicitly associated with a role.

High priority enhancements

- Fixed an issue that would cause a logical replication slot to transiently error out in the presence of aborted subtransactions and DDL.
- Backported fixes for the following PostgreSQL community security issue:
 - [CVE-2024-0985](#)

Critical stability enhancements

- Fixed an issue related to `apg_plan_mgmt`.
- Fixed a deadlock issue in Aurora Storage which can result in writer failover.
- Fixed an issue where active transactions during logical replication slot creation may be partially replicated by the slot.

Aurora PostgreSQL 13.11.4, December 14, 2023

Critical stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-5870](#)
 - [CVE-2023-5869](#)
 - [CVE-2023-5868](#)

General stability enhancements

- Fixed an issue with logical replication actions being performed by someone other than the table owner

Aurora PostgreSQL 13.11.3, November 14, 2023

Critical stability enhancements

- Backported a fix for the following security issue:
 - [CVE-2023-38545](#)
- Fixed an issue related to `pg_cron` background worker processes

General enhancements

- Fixed an issue that could result in read replica lag due to stale metadata
- Fixed an issue related to buffer pin locking that in rare cases can result in a crash

Aurora PostgreSQL 13.11.2, October 4, 2023

High priority stability enhancements

- Backported a fix for the following PostgreSQL community security issue:
 - [CVE-2023-39417](#)

High priority enhancements

- Fixed an issue which can cause a database instance to restart while executing I/O intensive read workloads.
- Fixed an issue which can cause vacuum operations to become blocked after the restart of an Aurora replica.
- Fixed an issue that would cause a crash when executing the COPY FROM command.
- Fixed an issue that would cause high CPU usage and prevent new connections.
- Fixed an issue where UPDATE and DELETE from a table with foreign key could fail unexpectedly with "ERROR: 40001: could not serialize access due to concurrent update when using Serializable snapshot".

General enhancements

- Introduced diagnostics for the transient metadata used for I/O.
- Fixed an issue that prevented the enablement of improved memory management in certain scenarios in Aurora PostgreSQL 15.3.

Aurora PostgreSQL 13.11.0, July 13, 2023

Following the announcement of updates to the PostgreSQL database by the open source community, we have updated Amazon Aurora PostgreSQL-Compatible Edition to support PostgreSQL versions 15.3, 14.8, 13.11, 12.15, and 11.20. These releases contains product improvements and bug fixes made by the PostgreSQL community, along with Aurora-specific improvements. The releases also contain new features and improvements for [Babelfish for Aurora PostgreSQL version 3.2](#), and improved support for [AWS Database Migration Service](#). Refer to the [Amazon Aurora versions](#) to help you to decide how often to upgrade and how to plan your upgrade process. As a reminder, if you are running any version of Amazon Aurora PostgreSQL 11, you must upgrade to a newer major version by February 29, 2024.

New features

- This release contains memory management improvements which increase database stability and availability by proactively preventing issues caused by insufficient memory. For more information, see [Improved memory management in Aurora PostgreSQL](#).
- Added support for the `pgvector` extension version 0.4.1.

High priority enhancements

- Fixed an issue with the subtransaction metadata handling when performing a survivable reader reconnect.
- Fixed an issue during ZDP which is related to the extension environment variables.
- Addressed a transient error during logical replication that caused a process to incorrectly calculate that it had encountered an unexpected page.
- Fixed an issue which causes a period of unavailability due to a partially created replication origin state file.

General enhancements

- Added a new function, `aurora_stat_memctx_usage()`, to show backend memory use breakdown at a Postgres memory context level.
- Provided options to configure the timeouts within the `aws_lambda` extension. By setting the following parameters (GUCs), customers will now be able to change the connect and request timeouts for AWS Lambda integration:
 - `aws_lambda.connect_timeout_ms`.
 - `aws_lambda.request_timeout_ms`.
- Fixed an issue with the calculation of the `AuroraReplicaLag` metric.
- Fixed an issue where, in rare cases, the `aws_s3` extension could fail to import from an Amazon S3 bucket with a name containing dots.
- Further reduced the database downtime during ZDP.
- Fixed a bug which can cause unavailability during ZDP.
- Fixed an issue which caused `pg_ls_waldir()` to return "ERROR: could not stat file".
- Added support for TLS 1.3 with ciphers `TLS_AES_128_GCM_SHA256` and `TLS_AES_256_GCM_SHA384`.
- Addressed an issue that blocked a major version upgrade on the Aurora replica of an RDS for PostgreSQL DB instance.
- Fixed an issue that could prevent scaling in Aurora Serverless v2 instances.
- Fixed an issue in the `pg_vector` extension where, in rare cases, infinite or NAN values caused a crash during the index creation.
- Fixed an issue to improve the performance.

- Upgraded GEOS to version 3.11.2.
- Upgraded pg_cron to version 1.5.
- Upgraded pg_partman to version 4.7.3.
- Upgraded plv8 to version 3.1.6.
- Upgraded tds_fdw to 2.0.3.

PostgreSQL 13.10

This release of Aurora PostgreSQL is compatible with PostgreSQL 13.10. For more information about the improvements in PostgreSQL 13.10, see [PostgreSQL release 13.10](#).

Releases and patches

- [Aurora PostgreSQL 13.10.7, March 13, 2024](#)
- [Aurora PostgreSQL 13.10.6, December 15, 2023](#)
- [Aurora PostgreSQL 13.10.5, November 14, 2023](#)
- [Aurora PostgreSQL 13.10.4, October 5, 2023](#)
- [Aurora PostgreSQL 13.10.3, July 24, 2023](#)
- [Aurora PostgreSQL 13.10.2, May 10, 2023](#)
- [Aurora PostgreSQL 13.10.1, April 5, 2023](#)

Aurora PostgreSQL 13.10.7, March 13, 2024

General enhancements

- Allow `rds_superuser` to terminate backends which are not explicitly associated with a role.

High priority enhancements

- Fixed an issue that would cause a logical replication slot to transiently error out in the presence of aborted subtransactions and DDL.
- Backported fixes for the following PostgreSQL community security issue:
 - [CVE-2024-0985](#)

Critical stability enhancements

- Fixed an issue related to `apg_plan_mgmt`.
- Fixed a deadlock issue in Aurora Storage which can result in writer failover.
- Fixed an issue where active transactions during logical replication slot creation may be partially replicated by the slot.

Aurora PostgreSQL 13.10.6, December 15, 2023

Critical stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-5870](#)
 - [CVE-2023-5869](#)
 - [CVE-2023-5868](#)

General stability enhancements

- Fixed an issue with logical replication actions being performed by someone other than the table owner

Aurora PostgreSQL 13.10.5, November 14, 2023

Critical stability enhancements

- Backported a fix for the following security issue:
 - [CVE-2023-38545](#)
- Fixed an issue related to `pg_cron` background worker processes

General enhancements

- Fixed an issue that could result in read replica lag due to stale metadata
- Fixed an issue related to buffer pin locking that in rare cases can result in a crash

Aurora PostgreSQL 13.10.4, October 5, 2023

High priority stability enhancements

- Backported a fix for the following PostgreSQL community security issue:
 - [CVE-2023-39417](#)

High priority enhancements

- Fixed an issue which can cause a database instance to restart while executing I/O intensive read workloads.
- Fixed an issue which can cause vacuum operations to become blocked after the restart of an Aurora replica.
- Fixed an issue that would cause high CPU usage and prevent new connections.

General enhancements

- Introduced diagnostics for the transient metadata used for I/O.

Aurora PostgreSQL 13.10.3, July 24, 2023

General enhancements

- Fixed an issue with the calculation of the `AuroraReplicaLag` metric.
- Fixed a bug which can cause unavailability during ZDP.
- Fixed an issue that prevented reclaiming storage on transaction commits.
- Fixed an issue preventing `pglogical` from logging conflicting rows during the apply phase.
- Added Aurora Serverless v2 scaling enhancements.
- Fixed an issue where, in rare cases, the `aws_s3` extension could fail to import from an Amazon S3 bucket with a name containing dots.
- Provided options to configure the timeouts within the `aws_lambda` extension. By setting the following parameters (GUCs), customers will now be able to change the connect and request timeouts for AWS Lambda integration:
 - `aws_lambda.connect_timeout_ms`.

- `aws_lambda.request_timeout_ms`.
- Fixed multiple issues which can cause Aurora replicas with the improved read availability feature to restart when reconnecting with the writer instance.
- Fixed an issue preventing a survivable reader reconnect.

Aurora PostgreSQL 13.10.2, May 10, 2023

General enhancements

- Fixed an error when loading the `test_decoding` plugin in `pg_create_logical_replication_slot`.
- Fixed an issue that causes logical replication to fail when using write-through cache.
- Updated the Oracle client used by the `oracle_fdw` extension to version 21.9.0.0.0.

Aurora PostgreSQL 13.10.1, April 5, 2023

New features

- Introduced a new QPM plan hash calculation for multi-schema support. If users want to use QPM in multi-schema environments, they can set the `apg_plan_mgmt.plan_hash` version to 2 and call `apg_plan_mgmt.validate_plans('update_plan_hash')`.

General enhancements

- Upgraded PROJ support to version 9.1.0.
- Upgraded the GDAL library in PostGIS to version 3.5.3.
- Added support for the TCN and SEG extensions.
- Improved performance of deletes from b-tree and hash indexes on Aurora replicas.
- Includes Aurora Serverless v2 scaling enhancements.
- Fixed an issue in QPM that prevented the enforcement of approved plans when joining partitioned tables.
- Fixed an issue that caused incorrect buffer hit counts in EXPLAIN.
- Improved the engine startup time, particularly on large instances with many objects.
- The Aurora function `aurora_stat_logical_wal_cache()` is now visible to all users.

- Fixed an issue in QPM that could cause unavailability when enforcing plans from prepared statements.

Additional improvements and enhancements

- Updated the following extensions:
 - `hll` to version 2.17
 - `Oracle_fdw` to version 2.5.0
 - `orafce` to version 4.0.0
 - `pg_cron` to version 1.4.2
 - `pg_hint_plan` to version 1.3.8
 - `pg_logical` to version 2.4.2
 - `pg_trgm` to version 1.4
 - `pgrouting` to version 3.4.1
 - `PostGIS` to version 3.3.2
 - `SEG` to version 1.0
 - `TCN` to version 1.0
 - `wal2json` to version 2.5

PostgreSQL 13.9

This release of Aurora PostgreSQL is compatible with PostgreSQL 13.9. For more information about the improvements in PostgreSQL 13.9, see [PostgreSQL release 13.9](#).

Releases and patches

- [Aurora PostgreSQL 13.9.8, March 13, 2024](#)
- [Aurora PostgreSQL 13.9.7, December 15, 2023](#)
- [Aurora PostgreSQL 13.9.6, November 17, 2023](#)
- [Aurora PostgreSQL 13.9.5, October 04, 2023](#)
- [Aurora PostgreSQL 13.9.4, September 13, 2023](#)
- [Aurora PostgreSQL 13.9.2, March 3, 2023](#)
- [Aurora PostgreSQL 13.9.0, January 20, 2023](#)

Aurora PostgreSQL 13.9.8, March 13, 2024

General enhancements

- Allow `rds_superuser` to terminate backends which are not explicitly associated with a role.

High priority enhancements

- Backported fixes for the following PostgreSQL community security issue:
 - [CVE-2024-0985](#)

Critical stability enhancements

- Fixed an issue related to `apg_plan_mgmt`.
- Fixed a deadlock issue in Aurora Storage which can result in writer failover.
- Fixed an issue where active transactions during logical replication slot creation may be partially replicated by the slot.

Aurora PostgreSQL 13.9.7, December 15, 2023

Critical stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-5870](#)
 - [CVE-2023-5869](#)
 - [CVE-2023-5868](#)

General stability enhancements

- Fixed an issue with logical replication actions being performed by someone other than the table owner

Aurora PostgreSQL 13.9.6, November 17, 2023

Critical stability enhancements

- Backported a fix for the following security issue:
 - [CVE-2023-38545](#)
- Fixed an issue related to `pg_cron` background worker processes

Aurora PostgreSQL 13.9.5, October 04, 2023

Critical stability enhancements

- Backported a fix for the following PostgreSQL community security issue:
 - [CVE-2023-2455](#)
 - [CVE-2023-2454](#)

High priority stability enhancements

- Fixed an issue which can cause a database instance to restart while executing IO intensive read workloads.
- Fixed an issue that would cause high CPU usage and prevent new connections.

General enhancements

- Introduced diagnostics for the transient metadata used for I/O.

Aurora PostgreSQL 13.9.4, September 13, 2023

General enhancements

- Added Aurora Serverless v2 scaling enhancements.
- Fixed an issue in `pg_cron` which can prevent scaling in Aurora Serverless v2.
- Fixed an issue with the calculation of the `AuroraReplicaLag` metric.
- Fixed a bug which can cause unavailability during ZDP.
- Fixed an issue preventing `pglogical` from logging conflicting rows during the apply phase.

- Fixed an issue where, in rare cases, the `aws_s3` extension could fail to import from an Amazon S3 bucket with a name containing dots.
- Provided options to configure the timeouts within the `aws_lambda` extension. By setting the following parameters, customers will now be able to change the connect and request timeouts for AWS Lambda integration:
 - `aws_lambda.connect_timeout_ms`.
 - `aws_lambda.request_timeout_ms`.

Aurora PostgreSQL 13.9.2, March 3, 2023

Critical stability enhancements

- Backported a fix for the following PostgreSQL community security issue:
 - [CVE-2022-41862](#)

General stability enhancements

- Fixed an issue where the approved plans for joins with partitioned tables weren't being enforced.
- Fixed an issue in PostGIS where the GDAL data wasn't loading.
- Fixed an issue that increased the amount of recovery work during startup if logical replication is enabled.
- Fixed an issue with the `aws_s3` extension where loading a large number of records can time out.
- Fixed an issue that causes logical replication to fail when using write-through cache

Aurora PostgreSQL 13.9.0, January 20, 2023

High priority stability enhancements

- Fixed an issue where an upgrade fails because the oldest `MultiXactId` is updated incorrectly.
- Fixed an issue where the commit latency metrics weren't updated.
- Fixed an issue that could lead to a brief period of unavailability.

General stability enhancements

- Fixed an issue that caused DB instance migration failures.

- Fixed an issue where the DB fails to start because of an inconsistency in the metadata.
- Improved the error handling and diagnosability.
- Upgraded the RDKit extension to version 4.2.
- Upgraded the GDAL library to version 3.4.3.
- Fixed an issue where the cluster cache management process doesn't shutdown gracefully.
- Fixed an issue that can cause certain processes to linger in an inconsistent state during a clean shutdown.
- Fixed an issue with the pg_repack extension.
- Improved the collation library (glibc) handling with a new independent default collation library.

PostgreSQL 13.8

This release of Aurora PostgreSQL is compatible with PostgreSQL 13.8. For more information about the improvements in PostgreSQL 13.8, see [PostgreSQL release 13.8](#).

Releases and patches

- [Aurora PostgreSQL 13.8.6, March 13, 2024](#)
- [Aurora PostgreSQL 13.8.5, December 18, 2023](#)
- [Aurora PostgreSQL 13.8.4, November 17, 2023](#)
- [Aurora PostgreSQL 13.8.3, October 17, 2023](#)
- [Aurora PostgreSQL 13.8.2, March 2, 2023](#)
- [Aurora PostgreSQL 13.8.1, December 13, 2022](#)
- [Aurora PostgreSQL 13.8.0, November 09, 2022](#)

Aurora PostgreSQL 13.8.6, March 13, 2024

General enhancements

- Allow `rds_superuser` to terminate backends which are not explicitly associated with a role.

High priority enhancements

- Backported fixes for the following PostgreSQL community security issue:
 - [CVE-2024-0985](#)

Critical stability enhancements

- Fixed an issue related to `apg_plan_mgmt`.
- Fixed a deadlock issue in Aurora Storage which can result in writer failover.
- Fixed an issue where active transactions during logical replication slot creation may be partially replicated by the slot.

Aurora PostgreSQL 13.8.5, December 18, 2023

Critical stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-5870](#)
 - [CVE-2023-5869](#)
 - [CVE-2023-5868](#)

General stability enhancements

- Fixed an issue with logical replication actions being performed by someone other than the table owner

Aurora PostgreSQL 13.8.4, November 17, 2023

Critical stability enhancements

- Backported a fix for the following security issue:
 - [CVE-2023-38545](#)
- Fixed an issue related to `pg_cron` background worker processes

Aurora PostgreSQL 13.8.3, October 17, 2023

High priority stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-39417](#)

- [CVE-2023-2455](#)
- [CVE-2023-2454](#)
- [CVE-2022-41862](#)

High priority enhancements

- Fixed an issue which blocked vacuum operations after the restart of an Aurora replica.
- Fixed an issue that would cause high CPU usage and prevent new connections.

General stability enhancements

- Fixed an issue which causes the stats collector process to repeatedly restart.
- Improved the scale times for Aurora Serverless v2.
- Fix a bug which can cause unavailability during ZDP.
- Fixed an issue preventing `pglogical` from logging conflicting rows during the apply phase.
- Fixed an issue where, in rare cases, the `aws_s3` extension could fail to import from an S3 bucket with a name containing dots.
- Provided options to configure the timeouts within the `aws_lambda` extension. By setting the following parameters, customers will now be able to change the connect and request timeouts for AWS Lambda integration:
 - `aws_lambda.connect_timeout_ms`.
 - `aws_lambda.request_timeout_ms`.
- Fixed an issue which can cause a database instance to restart while executing I/O intensive read workloads.
- Fixed an issue that causes logical replication to fail when using write-through cache

Aurora PostgreSQL 13.8.2, March 2, 2023

General stability enhancements

- Fixed an issue where the approved plans for joins with partitioned tables weren't being enforced.
- Fixed an issue that increased the amount of recovery work during startup if logical replication is enabled.

- Fixed an issue with the `aws_s3` extension where loading a large number of records can time out.
- Fixed an issue with the `pg_cron` parallel running of tasks.

Aurora PostgreSQL 13.8.1, December 13, 2022

General stability enhancements

- Fixed an issue that can cause increased network traffic when a writer instance transmits logs to a replica instance.
- Fixed an issue where the engine experiences stability issues during database minor and patch release upgrades.
- Fixed an issue that could cause data inconsistency during replication.

Aurora PostgreSQL 13.8.0, November 09, 2022

High priority stability enhancements

- Fixed an Aurora Serverless v2 scaling issue.
- Fixed an issue which caused Aurora Serverless v2 shrink failure.

General stability enhancements

- Improved buffer cache scavenging when the buffer cache is in duress.
- Fixed an issue in Database Activity Streams that leads to high memory consumption.
- Fixed an issue that caused DB instance restarts.
- Fixed an issue where a DB instance restarts recursively while generating monitoring metrics during a crash.
- Fixed an issue where a DB instance restarted during performance metric collection.
- Fixed an issue where an attempt to connect to the database would fail with `SSLV3_ALERT_CERTIFICATE_UNKNOWN`.
- Improved the error reporting in case of an inconsistent B-tree index.
- Improved the diagnostic logging around setting invalid hint bits.
- Fixed an issue where autovacuum would incorrectly skip tables.
- Improved the logical replication prefetching.

- Fixed a durability issue in the GIN indexes.
- Provided options to configure MultiXact SLRU cache. By setting the following parameters (GUCs), customers will now be able to change the MultiXact SLRU cache sizes:
 - `multixact_members_cache_size`
 - `multixact_offsets_cache_size`
- Fixed an issue to detect and cancel stuck major version upgrades.
- Fixed an issue in hash join that could lead to increased memory consumption.
- Improved the logical replication performance.
- Fixed an issue that causes database activity stream inconsistency when the monitoring agent is unavailable.
- Upgraded the GEOS version to 3.10.3.
- Updated the PLV8 version to 3.0.0.
- Updated the PostGIS extension to version 3.2.3.
- Fixed an issue with `st_orientedenvelope` that caused it to loop with a 1-D input to return 0.
- Fixed an issue where the connection to SQL Server using `tds_fdw` fails.

PostgreSQL 13.7

This release of Aurora PostgreSQL is compatible with PostgreSQL 13.7. For more information about the improvements in PostgreSQL 13.7, see [PostgreSQL 13.7](#).

Releases and patches

- [Aurora PostgreSQL 13.7.9, March 13, 2024](#)
- [Aurora PostgreSQL 13.7.8, December 22, 2023](#)
- [Aurora PostgreSQL 13.7.7, November 17, 2023](#)
- [Aurora PostgreSQL 13.7.6, October 19, 2023](#)
- [Aurora PostgreSQL 13.7.5, December 14, 2022](#)
- [Aurora PostgreSQL 13.7.4, November 17, 2022](#)
- [Aurora PostgreSQL 13.7.3, October 13, 2022](#)
- [Aurora PostgreSQL 13.7.1, July 6, 2022](#)
- [Aurora PostgreSQL 13.7.0, June 9, 2022](#)

Aurora PostgreSQL 13.7.9, March 13, 2024

General enhancements

- Allow `rds_superuser` to terminate backends which are not explicitly associated with a role.

High priority enhancements

- Backported fixes for the following PostgreSQL community security issue:
 - [CVE-2024-0985](#)

Critical stability enhancements

- Fixed an issue related to `apg_plan_mgmt`.
- Fixed a deadlock issue in Aurora Storage which can result in writer failover.
- Fixed an issue where active transactions during logical replication slot creation may be partially replicated by the slot.

Aurora PostgreSQL 13.7.8, December 22, 2023

Critical stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-5870](#)
 - [CVE-2023-5869](#)
 - [CVE-2023-5868](#)

General stability enhancements

- Fixed an issue with logical replication actions being performed by someone other than the table owner

Aurora PostgreSQL 13.7.7, November 17, 2023

Critical stability enhancements

- Backported a fix for the following security issue:
 - [CVE-2023-38545](#)
- Fixed an issue related to `pg_cron` background worker processes

Aurora PostgreSQL 13.7.6, October 19, 2023

High priority stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-39417](#)
 - [CVE-2023-2455](#)
 - [CVE-2023-2454](#)
 - [CVE-2022-41862](#)
 - [CVE-2022-2625](#)

High priority enhancements

- Fixed an issue which blocked vacuum operations after the restart of an Aurora replica.
- Fixed an issue that would cause high CPU usage and prevent new connections.

General stability enhancements

- Fixed an issue which causes the stats collector process to repeatedly restart.
- Improved the scale times for Aurora Serverless v2.
- Fix a bug which can cause unavailability during ZDP.
- Fixed an issue preventing `pglogical` from logging conflicting rows during the apply phase.
- Fixed an issue where, in rare cases, the `aws_s3` extension could fail to import from an S3 bucket with a name containing dots.

- Provided options to configure the timeouts within the `aws_lambda` extension. By setting the following parameters, customers will now be able to change the connect and request timeouts for AWS Lambda integration:
 - `aws_lambda.connect_timeout_ms`.
 - `aws_lambda.request_timeout_ms`.

Aurora PostgreSQL 13.7.5, December 14, 2022

General stability enhancements

- Fixed an issue where the engine experiences stability issues during database minor and patch release upgrades.
- Fixed an issue that causes database activity stream inconsistency when the monitoring agent is unavailable.
- Fixed an issue that could cause data inconsistency during replication.

Aurora PostgreSQL 13.7.4, November 17, 2022

High priority stability enhancements

- Fixed an issue that can cause increased network traffic when a writer instance transmits logs to a replica instance.

Aurora PostgreSQL 13.7.3, October 13, 2022

High priority stability enhancements

- Fixed a PLV8 issue where the base parameter doesn't get loaded properly into the memory.
- Fixed an issue where scaling an Aurora Serverless v2 instance gets stuck if `VACUUM` is running.

General stability enhancements

- Fixed a bug where Aurora PostgreSQL can't file the `relfilenode`.
- Fixed a database restart issue when a plan gets invalidated but the engine still checks if it is valid.
- Fixed a stuck scaling issue when the current scaling events time out.

- Upgraded the PostGIS extension to version 3.1.7.
- Fixed an issue where extended query messages might be lost during zero-downtime patching (ZDP) causing the extended query to hang after the ZDP completion.

Aurora PostgreSQL 13.7.1, July 6, 2022

Critical stability enhancements

- Fixed an issue that could cause periods of unavailability during a storage node restart.

High priority stability enhancements

- Fixed an error handling issue related to out-of-memory conditions which could result in brief periods of unavailability.
- Fixed an issue when the connection to SQL Server fails using the TDS_FDW extension to query a foreign table.
- Fixed an issue that caused connections using the provided root certificate to fail.
- Improved the diagnostic and supportability information in case of inconsistent B-tree index entries.

Aurora PostgreSQL 13.7.0, June 9, 2022

New features

- Added support for the `large object` module (extension). For more information, see [Managing large objects with the lo module](#).
- Added support for zero-downtime patching (ZDP) for minor version upgrades and patches. For more information, see [Minor release upgrades and zero-downtime patching](#) in the *Amazon Aurora User Guide*.

Critical updates

- Fixed a replay crash due to an LSN mismatch
- Fixed the `aws_s3` extension to prevent invalid region injection

High stability updates

- Fixed multiple issues related to out-of-memory conditions which could result in brief periods of unavailability
- Fixed an Aurora Serverless v2 scaling issue.

General enhancements

- Fixed a lock contention crash during an Aurora Serverless v1 scaling event.
- Fixed an issue where logical replication becomes stuck after a restart.
- Fixed multiple issues that could lead to brief periods of unavailability.
- Fixed a crash in `pg_cron` due to a task still running but being unscheduled.
- Fixed, during redo, an invalid page hit on the Generic Redo for `GENERIC_XLOG_FULL_PAGE_DATA`. This happens due to a timing hole between generating the log record and then writing the metadata for the record on the RW node and the RO node replays between those operations.
- Improved the query performance by supporting parallel workers.
- Upgraded the plugin `wal2json` version to 2.4.
- Upgraded the `pglogical` extension to version 2.4.1.

PostgreSQL 13.6 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 13.6. For more information about the improvements in PostgreSQL 13.6, see [PostgreSQL release 13.6](#).

Releases and patches

- [Aurora PostgreSQL 13.6.6, December 16, 2022](#)
- [Aurora PostgreSQL 13.6.5, October 18, 2022](#)
- [Aurora PostgreSQL 13.6.4, July 18, 2022](#)
- [Aurora PostgreSQL 13.6.3, June 2, 2022](#)
- [Aurora PostgreSQL 13.6.2, May 12, 2022](#)
- [Aurora PostgreSQL 13.6.1, April 27, 2022](#)
- [Aurora PostgreSQL 13.6.0, March 29, 2022](#)

Aurora PostgreSQL 13.6.6, December 16, 2022

General enhancements

- Fixed an issue that can cause increased network traffic when a writer instance transmits logs to a replica instance.
- Fixed an issue that causes database activity stream inconsistency when the monitoring agent is unavailable.

Aurora PostgreSQL 13.6.5, October 18, 2022

High priority enhancements

- Fixed an issue where Amazon Aurora Serverless v2 scaling may get blocked if VACUUM is running.
- Fixed an issue where Amazon Aurora Serverless v2 scaling may get blocked on Aurora replicas.

General enhancements

- Improved the diagnostic and supportability information in case of inconsistent B-tree index entries.
- Updated the PostGIS extension to version 3.1.7.

Aurora PostgreSQL 13.6.4, July 18, 2022

Security enhancements

- Backpatched the PostgreSQL community fix for CVE-2022-1552: Autovacuum, REINDEX, and others omit "security restricted operation". For more information, see [CVE-2022-1552](#).

Critical enhancements

- Fixed an issue during a storage node restart that could result in periods of unavailability.

High priority stability enhancements

- Fixed an error handling issue related to out-of-memory conditions that could result in brief periods of unavailability.
- Fixed an issue related to the existence of duplicate relation files that could result in periods of unavailability.
- Fixed a defect where the validation of cached plans may lead to a database restart when the plan was previously invalidated.

Aurora PostgreSQL 13.6.3, June 2, 2022

Security enhancements

- Backpatched the PostgreSQL community fix for CVE-2022-1552: Autovacuum, REINDEX, and others omit "security restricted operation". For more information, see [CVE-2022-1552](#).

High priority stability updates

- Fixed an issue that can lead to a blocked scale operation when a COPY command is in progress in Amazon Aurora Serverless v2.
- Fixed an issue that can cause a restart of the database when dropping or truncating tables in Amazon Aurora Serverless v2.
- Fixed an issue in the `apg_prewarm` extension that can lead to a blocked scale operation in Amazon Aurora Serverless v2.
- Fixed an issue in the dynamic shared memory allocation that can lead to a blocked scale operation in Amazon Aurora Serverless v2.
- Fixed an issue that can cause a restart of the postmaster process in Amazon Aurora Serverless v2.
- Fixed an issue where a minor version upgrade may get blocked when there is a SQL view that refers to the `checksum()` function in BabelFish for Aurora PostgreSQL.
- Fixed an issue in `apg_plan_mgmt` that can cause a restart when Query Plan Management (QPM) is enabled.

Aurora PostgreSQL 13.6.2, May 12, 2022

High priority stability enhancements

- Fixed an issue that causes upgrades to fail when Babelfish for Aurora PostgreSQL is enabled.
- Fixed an issue that causes scaling in Aurora Serverless v2 to fail.

General enhancements

- Fixed an issue that could cause unavailability due to improper locking of shared memory.

Aurora PostgreSQL 13.6.1, April 27, 2022

High priority stability enhancements

- Fixed an issue that could cause incorrect WriteIOPS reporting in the AWS console.
- Fixed an issue that could cause unavailability after removal of a read node from a cluster.

General enhancements

- Fixed an issue that could cause an engine restart during periods of low free memory.

Aurora PostgreSQL 13.6.0, March 29, 2022

New features

- Added support for the `tds_fdw` extension version 2.0.2.

High priority stability enhancements

- Fixed multiple issues that may result in unavailability of a read node.
- Fixed an issue that may result in a read node being unable to replay WAL requiring the replication slot to be dropped and resynchronized.
- Fixed an issue that could cause excess storage use due to files not being properly closed.

General enhancements

- Fixed a small memory leak on read nodes when `commit_ts` is set.
- Fixed an issue that caused Performance Insights to show "Unknown wait event".
- Fixed an issue that could cause an import from Amazon S3 to fail when using the `aws_s3` extension
- Fixed multiple issues that could result in periods of unavailability when using `apg_plan_mgmt`
- Fixed multiple issues that could result in periods of unavailability when QPM is enabled

PostgreSQL 13.5 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 13.5. For more information about the improvements in PostgreSQL 13.5, see [PostgreSQL release 13.5](#).

Releases and patches

- [Aurora PostgreSQL 13.5.7, August 24, 2023](#)
- [Aurora PostgreSQL 13.5.6, December 16, 2022](#)
- [Aurora PostgreSQL 13.5.5, October 18, 2022](#)
- [Aurora PostgreSQL 13.5.4, July 20, 2022](#)
- [Aurora PostgreSQL 13.5.3, April 13, 2022](#)
- [Aurora PostgreSQL 13.5.1, March 3, 2022](#)
- [Aurora PostgreSQL 13.5.0, February 25, 2022](#)

Aurora PostgreSQL 13.5.7, August 24, 2023

General enhancements

- Fixed an issue which causes the stats collector process to repeatedly restart.
- Fixed an issue preventing `pglogical` from logging conflicting rows during the apply phase.

Aurora PostgreSQL 13.5.6, December 16, 2022

General enhancements

- Fixed an issue that can cause increased network traffic when a writer instance transmits logs to a replica instance.
- Fixed an issue that causes database activity stream inconsistency when the monitoring agent is unavailable.

Aurora PostgreSQL 13.5.5, October 18, 2022

General enhancements

- Improved the diagnostic and supportability information in case of inconsistent B-tree index entries.
- Updated the PostGIS extension to version 3.1.7.

Aurora PostgreSQL 13.5.4, July 20, 2022

Security enhancements

- Backpatched the PostgreSQL community fix for CVE-2022-1552: Autovacuum, REINDEX, and others omit "security restricted operation". For more information, see [CVE-2022-1552](#).

Critical enhancements

- Fixed an issue during a storage node restart that could result in periods of unavailability.

High stability enhancements

- Fixed an error handling issue related to out-of-memory conditions that could result in brief periods of unavailability.
- Fixed an issue related to the existence of duplicate relation files that could result in periods of unavailability.
- Fixed an issue that could cause excess storage use due to files not being properly closed.
- Fixed an issue that can cause a restart of the postmaster process in Amazon Aurora Serverless v2.

- Fixed an issue that caused Performance Insights to show "Unknown wait event".

Aurora PostgreSQL 13.5.3, April 13, 2022

Security enhancements

- Additional modifications to the `pg_cron` extension to mitigate a security issue during create extension. The issue was addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).

General enhancements

- Fixed a bug that could cause an engine restart during periods of low free memory.

Aurora PostgreSQL 13.5.1, March 3, 2022

Security enhancements

- Updated the PostGIS extension from version 3.1.4 to 3.1.5. This update contains a PostGIS fix for the vulnerability addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Modified the `ip4r` extension to mitigate a security issue during create extension. The issue was originally disclosed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Modified the `pg_bigm` extension to mitigate a security issue during create extension. The issue was addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Modified the `pg_cron` extension to mitigate a security issue during create extension. The issue was addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).

Aurora PostgreSQL 13.5.0, February 25, 2022

High priority stability enhancements

- Fixed a bug where logical replication may hang resulting in the replay falling behind on the read node. The instance may eventually restart.

Additional improvements and enhancements

- Added the `Buffers: shared hit` metric to the Explain output.
- Fixed a buffer cache bug that could cause brief periods of unavailability.
- Fixed a bug in the `apg_plan_mgmt` extension where an index based plan was not being enforced.
- Fixed a bug in the `pg_logical` extension that could cause brief periods of unavailability due to improper handling of NULL arguments.
- Fixed a bug that could cause brief periods of unavailability due to reading uninitialized pages.
- Fixed an issue where orphaned files caused major version upgrades to fail.
- Fixed incorrect Aurora Storage Daemon log write metrics.
- Fixed multiple bugs that could result in WAL replay falling behind and eventually causing the reader instances to restart.
- Improved the Aurora buffer cache page validation on reads.
- Improved the Aurora storage metadata validation.

This version also includes the following change:

- The [pg_cron](#) extension is updated to 1.4.1

For information about extensions and modules, see [Extensions supported for Aurora PostgreSQL 13](#).

PostgreSQL 13.4 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 13.4. For more information about the improvements in PostgreSQL 13.4, see [PostgreSQL release 13.4](#).

Releases and patches

- [Aurora PostgreSQL 13.4.6, December 19, 2022](#)
- [Aurora PostgreSQL 13.4.5, October 18, 2022](#)
- [Aurora PostgreSQL 13.4.4, July 6, 2022](#)
- [Aurora PostgreSQL 13.4.2, April 12, 2022](#)
- [Aurora PostgreSQL 13.4.1](#)
- [Aurora PostgreSQL 13.4.0](#)

Aurora PostgreSQL 13.4.6, December 19, 2022

General enhancements

- Fixed an issue that causes database activity stream inconsistency when the monitoring agent is unavailable.

Aurora PostgreSQL 13.4.5, October 18, 2022

General enhancements

- Improved the diagnostic and supportability information in case of inconsistent B-tree index entries.
- Updated the PostGIS extension to version 3.1.7.

Aurora PostgreSQL 13.4.4, July 6, 2022

Security enhancements

- Backpatched the PostgreSQL community fix for CVE-2022-1552: Autovacuum, REINDEX, and others omit "security restricted operation". For more information, see [CVE-2022-1552](#).

General enhancements

- Fixed an error handling issue related to out-of-memory conditions which could result in brief periods of unavailability.
- Fixed an issue that could cause excess storage use due to files not being properly closed.

- Fixed an issue that could cause a restart of the postmaster process in Amazon Aurora Serverless v2.
- Fixed an issue that could cause Performance Insights to display "Unknown wait event".
- Fixed an issue that could result in periods of unavailability due to the existence of duplicate relation files.

Aurora PostgreSQL 13.4.2, April 12, 2022

Security enhancements

- Additional modifications to the `pg_cron` extension to mitigate a security issue during create extension. The issue was addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).

General enhancements

- Fixed a buffer cache bug that could cause brief periods of unavailability.

Aurora PostgreSQL 13.4.1

Security enhancements

- Updated the PostGIS extension from version 3.1.4 to 3.1.5. This update contains a PostGIS fix for the vulnerability addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Modified the `ip4r` extension to mitigate a security issue during create extension. The issue was originally disclosed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Modified the `pg_bigm` extension to mitigate a security issue during create extension. The issue was addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Modified the `pg_cron` extension to mitigate a security issue during create extension. The issue was addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).

Aurora PostgreSQL 13.4.0

New features

- This version supports Babelfish 1.0.0 which extends your Amazon Aurora PostgreSQL database with the ability to accept database connections from Microsoft SQL Server clients. For more information, see [Working with Babelfish for Aurora PostgreSQL](#).

Critical stability enhancements

- Fixed an issue where, in rare circumstances, a data cache of a read node may be inconsistent following a restart of that node.

High priority stability enhancements

- Fixed an issue where queries may become unresponsive due to I/O resource exhaustion triggered by prefetch.
- Fixed an issue where Aurora may flag an issue following a major version update with the message: "PANIC: could not access status of next transaction id xxxxxxxx".

Additional improvements and enhancements

- Fixed an issue where read nodes restart due to a replication origin cache lookup failure.
- Fixed an issue where read queries may time out on read nodes during the replay of lazy truncation triggered by vacuum on the write node.
- Fixed an issue that causes Performance Insights to incorrectly set the backend type of a database connection.
- Fixed an issue where the `aurora_postgres_replica_status()` function returned stale or lagging CPU stats.
- Fixed an issue where the role `rds_superuser` did not have permission to execute the `pg_stat_statements_reset()` function.
- Fixed an issue with the `apg_plan_mgmt` extension where the planning and execution times were reported as 0.
- Removed support for the DES, 3DES, and RC4 cipher suites.
- Updated the PostGIS extension to version 3.1.4.

- Updated the `pgrouting` extension to 3.1.3.
- Updated the `pglogical` extension to 2.4.0.
- Added support for the following SPI module extensions:
 - `autoinc` version 1.0
 - `insert_username` version 1.0
 - `moddatetime` version 1.0
 - `refint` version 1.0
- Fixed multiple issues in the Aurora storage daemon that could lead to brief periods of unavailability when specific network configurations are used.
- Fixed an out-of-memory crash issue with Aurora storage daemon that leads to writer node restart. This also reduces the overall system memory consumption.

PostgreSQL 13.3 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 13.3. For more information about the improvements in PostgreSQL 13.3, see [PostgreSQL release 13.3](#).

Releases and patches

- [Aurora PostgreSQL 13.3.5, December 30, 2022](#)
- [Aurora PostgreSQL 13.3.4, July 14, 2022](#)
- [Aurora PostgreSQL 13.3.3, April 7, 2022](#)
- [Aurora PostgreSQL 13.3.2](#)
- [Aurora PostgreSQL 13.3.1](#)
- [Aurora PostgreSQL 13.3.0](#)

Aurora PostgreSQL 13.3.5, December 30, 2022

General enhancements

- Fixed an issue that causes database activity stream inconsistency when the monitoring agent is unavailable.

Aurora PostgreSQL 13.3.4, July 14, 2022

Security enhancements

- Backpatched the PostgreSQL community fix for CVE-2022-1552: Autovacuum, REINDEX, and others omit "security restricted operation". For more information, see [CVE-2022-1552](#).

High priority stability enhancements

- Fixed an error handling issue related to out-of-memory conditions which could result in brief periods of unavailability.
- Fixed an issue that could cause excess storage use due to files not being properly closed.
- Fixed an issue that caused Performance Insights to show "Unknown wait event".

Aurora PostgreSQL 13.3.3, April 7, 2022

Security enhancements

- Includes additional modifications to the `pg_cron` extension to mitigate a security issue during create extension. The issue was addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).

Aurora PostgreSQL 13.3.2

Security enhancements

- Modified the `pg_cron` extension to mitigate a security issue during create extension. The issue was addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Modified the `ip4r` extension to mitigate a security issue during create extension. The issue was originally disclosed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Backpatched [postgis](#) to PostGIS 3.0.3. This is a PostGIS fix for the vulnerability addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).

Aurora PostgreSQL 13.3.1

Security enhancements

- Modified the `pg_bigm` extension to mitigate a security issue during create extension. The issue was addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).

Critical stability enhancements

- Fixed an issue where, in rare circumstances, a data cache of a read node may be inconsistent following a restart of that node.

High priority stability enhancements

- Fixed an issue where queries may become unresponsive due to I/O resource exhaustion triggered by prefetch.
- Fixed an issue where Aurora may flag an issue following a major version update with the message: "PANIC: could not access status of next transaction id xxxxxxxx".

Additional improvements and enhancements

- Fixed an issue where read nodes restart due to a replication origin cache lookup failure.
- Fixed an issue with the `apg_plan_mgmt` extension where the planning and execution times were reported as 0.
- Fixed an issue that causes Performance Insights to incorrectly set the backend type of a database connection.
- Fixed an issue with the `apg_plan_mgmt` extension where plan outline on a partitioned table did not enforce an index-based plan.
- Fixed an issue where orphaned files caused failed translations in read codepaths during or after a major version upgrade.
- Fixed multiple issues in the Aurora storage daemon that could lead to brief periods of unavailability when specific network configurations are used.
- Fixed an out-of-memory crash issue with Aurora storage daemon that leads to writer node restart. This also reduces the overall system memory consumption.

Aurora PostgreSQL 13.3.0

New features

- Supports a major version upgrade from [PostgreSQL 12.4, Aurora PostgreSQL 4.0 \(Deprecated\)](#) and later versions
- Supports `bool_plperl` version 1.0
- Supports `rds_tools` version 1.0

Critical stability enhancements

- Fixed an issue where, in rare circumstances, a data cache of a read node may be inconsistent following a restart of that node.

Additional improvements and enhancements

- Contains several improvements that were announced for PostgreSQL releases [13.0](#), [13.1](#), [13.2](#) and [13.3](#)
- Instance type R4 was deprecated.
- Updated the following extensions:
 - `hll` to version 2.15.
 - `hstore` to version 1.7.
 - `intarray` to version 1.3.
 - `log_fdw` to version 1.2.
 - `ltree` to version 1.2.
 - `pg_hint_plan` to version 1.3.7.
 - `pg_repack` to version 1.4.6.
 - `pg_stat_statements` to version 1.8.
 - `pg_trgm` to version 1.5.
 - `pgaudit` to version 1.5.
 - `pglogical` to version 2.3.3.
 - `pgrouting` to version 3.1.0
 - `plcoftee` to version 2.3.15.

- pl1s to version 2.3.15.
- plv8 to version 2.3.15.

PostgreSQL 12.18

This release of Aurora PostgreSQL is compatible with PostgreSQL 12.18. For more information about the improvements in PostgreSQL 12.18, see [PostgreSQL release 12.18](#).

Releases and patches

- [Aurora PostgreSQL 12.18.2, June 20, 2024](#)
- [Aurora PostgreSQL 12.18.1, April 29, 2024](#)

Aurora PostgreSQL 12.18.2, June 20, 2024

General enhancements

- Fixed multiple issues where minor version upgrades with ZDP would fail resulting in longer upgrade times.

High priority enhancements

- Fixed a crash with execution of pltsql user defined functions.
- Fixed an issue which led to cancellation of long-running queries on Global Database replica instances.

Critical stability enhancements

- Fixed an issue where a change in memory requirements during a minor version upgrade can cause zero-downtime patching and engine startup to fail.
- Fixed an issue with background worker where it may crash when executed in parallel worker context.
- Fixed a pg_repack issue causing two vacuums to concurrently process the same table.
- Fixed issues in how two-phase commit files are handled.

Aurora PostgreSQL 12.18.1, April 29, 2024

New features

- Added resource usage summary to `pg_dump`.

General enhancements

- Fixed multiple minor version upgrade issues to improve connection preservation with zero-downtime patching.
- Reduced database boot time due to improved initialization time for large volumes.
- Introduced faster COPY operations by reducing contention on the relation extension lock and proactively extending relations.
- Improvements to reduce replication lag by intelligently skipping the replay of certain log records, thereby reducing the replay load.
- Fixed an issue during recovery conflict on a read node which, in rare cases, could cause brief unavailability.
- Fixed an issue where a database would fail to startup during a major version upgrade patch, in rare scenarios.
- Improved availability of read replicas by allowing recovery from replication errors in more situations.
- Fixed an issue that would cause zero-downtime patching to timeout.
- Fixed a logical replication decoding issue that fails to process catalog modifying changes after spilling to storage if there was a concurrent aborted sub-transaction.
- Improved log record validation before it is written to storage.
- Fixed an issue that would result in sessions incorrectly reporting ClientRead wait events after a zero-downtime patching event.
- Fixed an ambiguous function definition of `aws_s3.query_export_to_s3` when upgrading the `aws_s3` extension from version 1.1 to 1.2.

High priority enhancements

- Fixed an issue related to resuming a logical replication slot where, in rare cases, it could cause the slot to become stuck.

- Fixed an issue that would result in a restart when creating a database in a tablespace.
- Fixed an issue related to incorrect logical replication error handling to improve DB stability.

Critical stability enhancements

- Fixed an issue related to replication origins that in rare cases might result in longer recovery time and impact availability.
- Fixed an issue that in rare cases may cause transactions to be partially replicated by newly created logical replication slots. For more information, see [Potential data loss due to race condition during logical replication slot creation](#).
- Fixed an issue where a change in memory requirements during a minor version upgrade can cause zero-downtime patching and engine startup to fail.

Additional improvements and enhancements

- Updated the following extensions:
 - pg_tle extension to version 1.3.4.
 - PLV8 extension to version 3.1.10.
 - RDKit Cartridge to version Release_2023_09_4.
- New GUC Parameters has been added
 - pgtle.clientauth_databases_to_skip
 - pgtle.clientauth_db_name
 - pgtle.clientauth_num_parallel_workers
 - pgtle.clientauth_users_to_skip
 - pgtle.enable_clientauth
 - pgtle.passcheck_db_name

PostgreSQL 12.17

This release of Aurora PostgreSQL is compatible with PostgreSQL 12.17. For more information about the improvements in PostgreSQL 12.17, see [PostgreSQL release 12.17](#).

Releases and patches

- [Aurora PostgreSQL 12.17.4, June 24, 2024](#)

- [Aurora PostgreSQL 12.17.3, March 13, 2024](#)
- [Aurora PostgreSQL 12.17.2, February 22, 2024](#)
- [Aurora PostgreSQL 12.17.0, December 21, 2023](#)

Aurora PostgreSQL 12.17.4, June 24, 2024

General enhancements

- Fixed multiple issues where minor version upgrades with ZDP would fail resulting in longer upgrade times.

High priority enhancements

- Fixed an issue with Parallel query execution in which a backend may get into indefinite hang in certain cases.
- Fixed a crash with execution of plpgsql user defined functions.
- Fixed an issue which led to cancellation of long-running queries on Global Database replica instances.

Critical stability enhancements

- Fixed an issue where a change in memory requirements during a minor version upgrade can cause zero-downtime patching and engine startup to fail.
- Fixed a pg_repack issue causing two vacuums to concurrently process the same table.

Aurora PostgreSQL 12.17.3, March 13, 2024

General enhancements

- Fixed a performance degradation issue in PLV8 extension.

Aurora PostgreSQL 12.17.2, February 22, 2024

General enhancements

- Allow `rds_superuser` to terminate backends which are not explicitly associated with a role.

High priority enhancements

- Fixed an issue where `pg_stat_statements` can block minor version upgrade during ZDP.
- Fixed an issue where a logical replication slot would no longer emit changes due to an overly strict data consistency check.
- Backported fixes for the following PostgreSQL community security issue:
 - [CVE-2024-0985](#)

Critical stability enhancements

- Fixed an issue related to `apg_plan_mgmt`.
- Fixed a deadlock issue in Aurora Storage which can result in writer failover.
- Fixed an issue where active transactions during logical replication slot creation may be partially replicated by the slot.

Aurora PostgreSQL 12.17.0, December 21, 2023

Following the announcement of updates to the PostgreSQL database by the open source community, we have updated Amazon Aurora PostgreSQL-Compatible Edition to support PostgreSQL versions 15.5, 14.10, 13.13, and 12.17. These releases contain product improvements and bug fixes made by the PostgreSQL community, along with Aurora-specific improvements. New features and improvements for BabelFish for Aurora PostgreSQL version 3.4 are also included.

Refer to the Aurora version policy to help you to decide how often to upgrade and how to plan your upgrade process. As a reminder, if you are running any version of Amazon Aurora PostgreSQL version 11, you must upgrade to a newer major version by February 29, 2024.

New features

- Amazon Bedrock integration – By using the Amazon Aurora machine learning extension with your Aurora PostgreSQLDB cluster, you can now use Amazon Bedrock foundational AI models.
- Delegated Extension Support – This feature allows delegating extension management to lower privileged user with the new `rds_extension` role.
- Query Plan Management (QPM) enhancements – Plan outlines will be updated to the latest format version as part of the `update_plan_hash` action for `apg_plan_mgmt.validate_plans()`.

- Added support for the HypoPG extension at version 1.4.0.
- Added support for the h3-pg extension and the h3-postgis extension at version 4.1.3.

High priority enhancements

- Fixed an issue which may cause an Aurora replica to reboot when reading a page which was modified during WAL replay
- Fixed an issue where if a specific volume metadata is invalid on a source cluster, it will remain invalid on a cloned cluster. Since the clone cluster uses a new volume, the metadata will now be recreated.
- Fixed an issue which could, in rare cases, lead to an engine unavailable condition following a minor or patch version upgrade
- Fixed a bug that may cause an engine crash during zero-downtime patching (ZDP)
- Introduced a new parameter, `rds.enable_memory_management`, which is used to enable and disable the improved memory management feature.
- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-5870](#)
 - [CVE-2023-5869](#)
 - [CVE-2023-5868](#)

General enhancements

- Fixed an issue which may cause an Aurora replica to reboot while reconnecting with the writer DB instance.
- Added support for the `rdkit.morgan_fp_size` parameter
- Fixed an issue which may cause unused WAL segments to not be properly removed
- Fixed an issue where `pglogical` does not correctly pass-through replication origin data when using the binary output format
- Fixed a crash in `dblink` and `postgres_fdw` extensions due to invalid connections
- Fixed an issue where the `aws_s3` extension can import HTTP error responses into the table

Additional improvements and enhancements

- Updated the following extensions:

- `mysql_fdw` to version 2.9.1
- `Oracle_fdw` to version 2.6.0
- `Oracle` to version 4.6.0
- `pg_cron` to version 1.6.0
- `pg_hint_plan` to version 1.3.9
- `pg_proctab` to version 0.0.10
- `plv8` to version 3.1.8
- PostGIS to version 3.4.0
- `prefix` to version 1.2.10
- RDKit to version 4.4.0 (Release_2023_09_1)

For information about extensions and modules, see [Extensions supported for Aurora PostgreSQL 12](#).

PostgreSQL 12.16

This release of Aurora PostgreSQL is compatible with PostgreSQL 12.16. For more information about the improvements in PostgreSQL 12.16, see [PostgreSQL release 12.16](#).

Releases and patches

- [Aurora PostgreSQL 12.16.7, June 25, 2024](#)
- [Aurora PostgreSQL 12.16.6, March 13, 2024](#)
- [Aurora PostgreSQL 12.16.5, February 22, 2024](#)
- [Aurora PostgreSQL 12.16.2, December 13, 2023](#)
- [Aurora PostgreSQL 12.16.1, November 09, 2023](#)
- [Aurora PostgreSQL 12.16.0, October 24, 2023](#)

Aurora PostgreSQL 12.16.7, June 25, 2024

General enhancements

- Fixed multiple issues where minor version upgrades with ZDP would fail resulting in longer upgrade times.

High priority enhancements

- Fixed an issue which led to cancellation of long-running queries on Global Database replica instances.

Critical stability enhancements

- Fixed an issue where a change in memory requirements during a minor version upgrade can cause zero-downtime patching and engine startup to fail.
- Fixed a `pg_repack` issue causing two vacuums to concurrently process the same table.

Aurora PostgreSQL 12.16.6, March 13, 2024

General enhancements

- Fixed a performance degradation issue in PLV8 extension.

Aurora PostgreSQL 12.16.5, February 22, 2024

General enhancements

- Allow `rds_superuser` to terminate backends which are not explicitly associated with a role.

High priority enhancements

- Fixed an issue where `pg_stat_statements` can block minor version upgrade during ZDP.
- Fixed an issue where a logical replication slot would no longer emit changes due to an overly strict data consistency check.
- Backported fixes for the following PostgreSQL community security issue:
 - [CVE-2024-0985](#)

Critical stability enhancements

- Fixed an issue related to `apg_plan_mgmt`.
- Fixed a deadlock issue in Aurora Storage which can result in writer failover.

- Fixed an issue where active transactions during logical replication slot creation may be partially replicated by the slot.

Aurora PostgreSQL 12.16.2, December 13, 2023

Critical stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-5870](#)
 - [CVE-2023-5869](#)
 - [CVE-2023-5868](#)

General stability enhancements

- Fixed an issue with logical replication actions being performed by someone other than the table owner

Aurora PostgreSQL 12.16.1, November 09, 2023

Critical stability enhancements

- Backported a fix for the following security issue:
 - [CVE-2023-38545](#)
- Fixed an issue related to `pg_cron` background worker processes

General enhancements

- Fixed an issue related to buffer pin locking that in rare cases can result in a crash

Aurora PostgreSQL 12.16.0, October 24, 2023

New features

- Added support for `mysql_fdw` version 2.9.0
- Added support in the `aws_s3` extension for exporting to an S3 bucket encrypted with a customer managed KMS key

- Improved the availability of Aurora replicas in the global DB secondary clusters
- Added support for query plan capture on Aurora replicas
- Allowed query plans under a given cost threshold to not be captured

General enhancements

- Fixed an issue in the `aws_s3` extension where the number of rows exported is incorrectly reported when the total number exceeds 2 billion
- Provided options to configure timeouts in the `aws_s3` extension. By setting the following parameters (GUCs), customers will now be able to change the timeout thresholds for imports from S3:
 - `aws_s3.curlopt_low_speed_limit`
 - `aws_s3.curlopt_low_speed_time`
- Improved the performance of replay of commit transaction operations on Aurora replicas
- Fixed an issue where, in rare cases, an import from the `aws_s3` extension fails to complete
- Updated the GEOS library for PostGIS to version 3.12.0
- Added the `WAIT_EVENT_Aurora_CLUSTER_CACHE_MANAGER_SENDER` wait event to denote wait times in the cluster cache manager sender
- Added the `WAIT_EVENT_Aurora_SERVERLESS_MONITORING_MAIN` wait event to denote wait times in Aurora Serverless resource monitoring
- Fixed an issue where the database may crash during the start of a logical replication slot
- Increased the limit for `pg_cron cron.max_running_jobs` parameter from 100 to 1000

Additional improvements and enhancements

- Updated the following extensions:
 - `orafce` to version 4.3.0
 - `pg_logical` to version 2.4.3
 - `pgvector` to version 0.5.0
 - `plv8` to version 3.1.6
 - PostGIS to version 3.3.3
 - `RDKit` to version 4.3

For information about extensions and modules, see [Extensions supported for Aurora PostgreSQL 12](#).

PostgreSQL 12.15

This release of Aurora PostgreSQL is compatible with PostgreSQL 12.15. For more information about the improvements in PostgreSQL 12.15, see [PostgreSQL release 12.15](#).

Releases and patches

- [Aurora PostgreSQL 12.15.5, March 13, 2024](#)
- [Aurora PostgreSQL 12.15.4, December 14, 2023](#)
- [Aurora PostgreSQL 12.15.3, November 14, 2023](#)
- [Aurora PostgreSQL 12.15.2, October 4, 2023](#)
- [Aurora PostgreSQL 12.15.0, July 13, 2023](#)

Aurora PostgreSQL 12.15.5, March 13, 2024

General enhancements

- Allow `rds_superuser` to terminate backends which are not explicitly associated with a role.

High priority enhancements

- Fixed an issue that would cause a logical replication slot to transiently error out in the presence of aborted subtransactions and DDL.
- Backported fixes for the following PostgreSQL community security issue:
 - [CVE-2024-0985](#)

Critical stability enhancements

- Fixed an issue related to `apg_plan_mgmt`.
- Fixed a deadlock issue in Aurora Storage which can result in writer failover.
- Fixed an issue where active transactions during logical replication slot creation may be partially replicated by the slot.

Aurora PostgreSQL 12.15.4, December 14, 2023

Critical stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-5870](#)
 - [CVE-2023-5869](#)
 - [CVE-2023-5868](#)

General stability enhancements

- Fixed an issue with logical replication actions being performed by someone other than the table owner

Aurora PostgreSQL 12.15.3, November 14, 2023

Critical stability enhancements

- Backported a fix for the following security issue:
 - [CVE-2023-38545](#)
- Fixed an issue related to `pg_cron` background worker processes

General enhancements

- Fixed an issue that could result in read replica lag due to stale metadata
- Fixed an issue related to buffer pin locking that in rare cases can result in a crash

Aurora PostgreSQL 12.15.2, October 4, 2023

High priority stability enhancements

- Backported a fix for the following PostgreSQL community security issue:
 - [CVE-2023-39417](#)

High priority enhancements

- Fixed an issue which can cause a database instance to restart while executing I/O intensive read workloads.
- Fixed an issue which can cause vacuum operations to become blocked after the restart of an Aurora replica.
- Fixed an issue that would cause a crash when executing the COPY FROM command.
- Fixed an issue that would cause high CPU usage and prevent new connections.
- Fixed an issue where UPDATE and DELETE from a table with foreign key could fail unexpectedly with "ERROR: 40001: could not serialize access due to concurrent update when using Serializable snapshot".

General enhancements

- Introduced diagnostics for the transient metadata used for I/O.
- Updated the plv8, pl11, and plcoffee extensions to version 2.3.15.
- Fixed an issue that prevented the enablement of improved memory management in certain scenarios in Aurora PostgreSQL 15.3.

Aurora PostgreSQL 12.15.0, July 13, 2023

Following the announcement of updates to the PostgreSQL database by the open source community, we have updated Amazon Aurora PostgreSQL-Compatible Edition to support PostgreSQL versions 15.3, 14.8, 13.11, 12.15, and 11.20. These releases contains product improvements and bug fixes made by the PostgreSQL community, along with Aurora-specific improvements. The releases also contain new features and improvements for [Babelfish for Aurora PostgreSQL version 3.2](#), and improved support for [AWS Database Migration Service](#). Refer to the [Amazon Aurora versions](#) to help you to decide how often to upgrade and how to plan your upgrade process. As a reminder, if you are running any version of Amazon Aurora PostgreSQL 11, you must upgrade to a newer major version by February 29, 2024.

New features

- This release contains memory management improvements which increase database stability and availability by proactively preventing issues caused by insufficient memory. For more information, see [Improved memory management in Aurora PostgreSQL](#).

- Added support for the `pgvector` extension version 0.4.1.

High priority enhancements

- Fixed an issue with the subtransaction metadata handling when performing a survivable reader reconnect.
- Fixed an issue during ZDP which is related to the extension environment variables.
- Addressed a transient error during logical replication that caused a process to incorrectly calculate that it had encountered an unexpected page.
- Fixed an issue which causes a period of unavailability due to a partially created replication origin state file.

General enhancements

- Added a new function, `aurora_stat_memctx_usage()`, to show backend memory use breakdown at a Postgres memory context level.
- Provided options to configure the timeouts within the `aws_lambda` extension. By setting the following parameters (GUCs), customers will now be able to change the connect and request timeouts for AWS Lambda integration:
 - `aws_lambda.connect_timeout_ms`.
 - `aws_lambda.request_timeout_ms`.
- Fixed an issue with the calculation of the `AuroraReplicaLag` metric.
- Fixed an issue where, in rare cases, the `aws_s3` extension could fail to import from an Amazon S3 bucket with a name containing dots.
- Further reduced the database downtime during ZDP.
- Fixed a bug which can cause unavailability during ZDP.
- Fixed an issue which caused `pg_ls_waldir()` to return "ERROR: could not stat file".
- Added support for TLS 1.3 with ciphers `TLS_AES_128_GCM_SHA256` and `TLS_AES_256_GCM_SHA384`.
- Addressed an issue that blocked a major version upgrade on the Aurora replica of an RDS for PostgreSQL DB instance.
- Fixed an issue in the `pg_vector` extension where, in rare cases, infinite or NAN values caused a crash during the index creation

- Upgraded GEOS to version 3.11.2.
- Upgraded pg_cron to version 1.5.
- Upgraded pg_partman to version 4.7.3.
- Upgraded tds_fdw to 2.0.3.

PostgreSQL 12.14

This release of Aurora PostgreSQL is compatible with PostgreSQL 12.14. For more information about the improvements in PostgreSQL 12.14, see [PostgreSQL release 12.14](#).

Releases and patches

- [Aurora PostgreSQL 12.14.7, March 13, 2024](#)
- [Aurora PostgreSQL 12.14.6, December 15, 2023](#)
- [Aurora PostgreSQL 12.14.5, November 14, 2023](#)
- [Aurora PostgreSQL 12.14.4, October 5, 2023](#)
- [Aurora PostgreSQL 12.14.3, July 24, 2023](#)
- [Aurora PostgreSQL 12.14.2, May 10, 2023](#)
- [Aurora PostgreSQL 12.14.1, April 5, 2023](#)

Aurora PostgreSQL 12.14.7, March 13, 2024

General enhancements

- Allow `rds_superuser` to terminate backends which are not explicitly associated with a role.

High priority enhancements

- Fixed an issue that would cause a logical replication slot to transiently error out in the presence of aborted subtransactions and DDL.
- Backported fixes for the following PostgreSQL community security issue:
 - [CVE-2024-0985](#)

Critical stability enhancements

- Fixed an issue related to `apg_plan_mgmt`.
- Fixed a deadlock issue in Aurora Storage which can result in writer failover.
- Fixed an issue where active transactions during logical replication slot creation may be partially replicated by the slot.

Aurora PostgreSQL 12.14.6, December 15, 2023

Critical stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-5870](#)
 - [CVE-2023-5869](#)
 - [CVE-2023-5868](#)

General stability enhancements

- Fixed an issue with logical replication actions being performed by someone other than the table owner

Aurora PostgreSQL 12.14.5, November 14, 2023

Critical stability enhancements

- Backported a fix for the following security issue:
 - [CVE-2023-38545](#)
- Fixed an issue related to `pg_cron` background worker processes

General enhancements

- Fixed an issue that could result in read replica lag due to stale metadata
- Fixed an issue related to buffer pin locking that in rare cases can result in a crash

Aurora PostgreSQL 12.14.4, October 5, 2023

High priority stability enhancements

- Backported a fix for the following PostgreSQL community security issue:
 - [CVE-2023-39417](#)

High priority enhancements

- Fixed an issue which can cause a database instance to restart while executing I/O intensive read workloads.
- Fixed an issue which can cause vacuum operations to become blocked after the restart of an Aurora replica.
- Fixed an issue that would cause high CPU usage and prevent new connections.

General enhancements

- Introduced diagnostics for the transient metadata used for I/O.
- Updated the plv8, pl1, and plcoffee extensions to version 2.3.15.

Aurora PostgreSQL 12.14.3, July 24, 2023

General enhancements

- Fixed an issue with the calculation of the AuroraReplicaLag metric
- Fixed a bug which can cause unavailability during ZDP
- Fixed an issue that prevented reclaiming storage on transaction commits
- Fixed an issue preventing pglogical from logging conflicting rows during the apply phase
- Added Aurora Serverless v2 scaling enhancements
- Fixed an issue where, in rare cases, the aws_s3 extension could fail to import from an Amazon S3 bucket with a name containing dots.
- Provided options to configure the timeouts within the aws_lambda extension. By setting the following parameters (GUCs), customers will now be able to change the connect and request timeouts for AWS Lambda integration:
 - `aws_lambda.connect_timeout_ms`.

- `aws_lambda.request_timeout_ms`.
- Fixed multiple issues which can cause Aurora replicas with the improved read availability feature to restart when reconnecting with the writer instance.
- Fixed an issue preventing a survivable reader reconnect

Aurora PostgreSQL 12.14.2, May 10, 2023

General enhancements

- Fixed an error when loading the `test_decoding` plugin in `pg_create_logical_replication_slot`.
- Updated the Oracle client used by the `oracle_fdw` extension to version 21.9.0.0.0.

Aurora PostgreSQL 12.14.1, April 5, 2023

New features

- Introduced a new QPM plan hash calculation for multi-schema support. If users want to use QPM in multi-schema environments, they can set the `apg_plan_mgmt.plan_hash` version to 2 and call `apg_plan_mgmt.validate_plans('update_plan_hash')`.

General enhancements

- Upgraded PROJ support to version 9.1.0
- Upgraded the GDAL library in PostGIS to version 3.5.3
- Added support for the TCN and SEG extensions
- Fixed an issue which may increase the amount of recovery work the database does to startup with logical replication enabled
- Improved performance of deletes from b-tree and hash indexes on Aurora replicas
- Fixed issues that caused incorrect I/O timing metrics in EXPLAIN
- Fixed an issue that caused incorrect buffer hit counts in EXPLAIN
- Improved the engine startup time, particularly on large instances with many objects
- The Aurora function `aurora_stat_logical_wal_cache()` is now visible to all users

- Fixed an issue in QPM that could cause unavailability when enforcing plans from prepared statements

Additional improvements and enhancements

- Updated the following extensions:
 - `hll` to version 2.17
 - `Oracle_fdw` to version 2.5.0
 - `orafce` to version 4.0.0
 - `pg_cron` to version 1.4.2
 - `pg_hint_plan` to version 1.3.8
 - `pg_logical` to version 2.4.2
 - `pg_trgm` to version 1.4
 - `pgrouting` to version 3.4.1
 - PostGIS to version 3.3.2
 - SEG to version 1.0
 - TCN to version 1.0
 - `wal2json` to version 2.5

PostgreSQL 12.13

This release of Aurora PostgreSQL is compatible with PostgreSQL 12.13. For more information about the improvements in PostgreSQL 12.13, see [PostgreSQL release 12.13](#).

Releases and patches

- [Aurora PostgreSQL 12.13.8, March 13, 2024](#)
- [Aurora PostgreSQL 12.13.7, December 15, 2023](#)
- [Aurora PostgreSQL 12.13.6, November 17, 2023](#)
- [Aurora PostgreSQL 12.13.5, October 04, 2023](#)
- [Aurora PostgreSQL 12.13.4, September 13, 2023](#)
- [Aurora PostgreSQL 12.13.2, March 3, 2023](#)
- [Aurora PostgreSQL 12.13.0, January 20, 2023](#)

Aurora PostgreSQL 12.13.8, March 13, 2024

General enhancements

- Allow `rds_superuser` to terminate backends which are not explicitly associated with a role.

High priority enhancements

- Backported fixes for the following PostgreSQL community security issue:
 - [CVE-2024-0985](#)

Critical stability enhancements

- Fixed an issue related to `apg_plan_mgmt`.
- Fixed a deadlock issue in Aurora Storage which can result in writer failover.
- Fixed an issue where active transactions during logical replication slot creation may be partially replicated by the slot.

Aurora PostgreSQL 12.13.7, December 15, 2023

Critical stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-5870](#)
 - [CVE-2023-5869](#)
 - [CVE-2023-5868](#)

General stability enhancements

- Fixed an issue with logical replication actions being performed by someone other than the table owner

Aurora PostgreSQL 12.13.6, November 17, 2023

Critical stability enhancements

- Backported a fix for the following security issue:
 - [CVE-2023-38545](#)
- Fixed an issue related to `pg_cron` background worker processes

Aurora PostgreSQL 12.13.5, October 04, 2023

High priority stability enhancements

- Fixed an issue which can cause a database instance to restart while executing IO intensive read workloads.
- Fixed an issue that would cause high CPU usage and prevent new connections.

General enhancements

- Introduced diagnostics for the transient metadata used for I/O.

Aurora PostgreSQL 12.13.4, September 13, 2023

General enhancements

- Added Aurora Serverless v2 scaling enhancements
- Fixed an issue in `pg_cron` which can prevent scaling in Aurora Serverless v2
- Fixed an issue with the calculation of the `AuroraReplicaLag` metric
- Fixed a bug which can cause unavailability during ZDP
- Fixed an issue preventing `pglogical` from logging conflicting rows during the apply phase
- Fixed an issue where, in rare cases, the `aws_s3` extension could fail to import from an Amazon S3 bucket with a name containing dots.
- Provided options to configure the timeouts within the `aws_lambda` extension. By setting the following parameters, customers will now be able to change the connect and request timeouts for AWS Lambda integration:
 - `aws_lambda.connect_timeout_ms`.

- `aws_lambda.request_timeout_ms`.
- Updated the `plv8`, `plls`, and `plcoffee` extensions to version 2.3.15.

Aurora PostgreSQL 12.13.2, March 3, 2023

General stability enhancements

- Fixed an issue in PostGIS where the GDAL data wasn't loading.
- Fixed an issue that increased the amount of recovery work during startup if logical replication is enabled.
- Fixed an issue for the better error handling of procedures with large numbers of parameters.
- Fixed an issue with the `aws_s3` extension where loading a large number of records can time out.

Aurora PostgreSQL 12.13.0, January 20, 2023

High priority stability enhancements

- Fixed an issue where an upgrade fails because the oldest `MultiXactId` is updated incorrectly.
- Fixed an issue where the commit latency metrics weren't updated.
- Fixed an issue that could lead to a brief period of unavailability.

General stability enhancements

- Fixed an issue that caused DB instance migration failures.
- Fixed an issue where the DB fails to start because of an inconsistency in the metadata.
- Improved the error handling and diagnosability.
- Upgraded the RDKit extension to version 4.2.
- Upgraded the GDAL library to version 3.4.3.
- The `apg_plan_mgmt.copy_outline` function now copies `environment_variables`.
- Fixed an issue that can cause certain processes to linger in an inconsistent state during a clean shutdown.
- Fixed an issue with the `pg_repack` extension.
- Improved the collation library (glibc) handling with a new independent default collation library.

PostgreSQL 12.12

This release of Aurora PostgreSQL is compatible with PostgreSQL 12.12. For more information about the improvements in PostgreSQL 12.12, see [PostgreSQL release 12.12](#).

Releases and patches

- [Aurora PostgreSQL 12.12.6, March 13, 2024](#)
- [Aurora PostgreSQL 12.12.5, December 18, 2023](#)
- [Aurora PostgreSQL 12.12.4, November 17, 2023](#)
- [Aurora PostgreSQL 12.12.3, October 17, 2023](#)
- [Aurora PostgreSQL 12.12.2, March 2, 2023](#)
- [Aurora PostgreSQL 12.12.1, December 13, 2022](#)
- [Aurora PostgreSQL 12.12.0, November 09, 2022](#)

Aurora PostgreSQL 12.12.6, March 13, 2024

General enhancements

- Allow `rds_superuser` to terminate backends which are not explicitly associated with a role.

High priority enhancements

- Backported fixes for the following PostgreSQL community security issue:
 - [CVE-2024-0985](#)

Critical stability enhancements

- Fixed an issue related to `apg_plan_mgmt`.
- Fixed a deadlock issue in Aurora Storage which can result in writer failover.
- Fixed an issue where active transactions during logical replication slot creation may be partially replicated by the slot.

Aurora PostgreSQL 12.12.5, December 18, 2023

Critical stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-5870](#)
 - [CVE-2023-5869](#)
 - [CVE-2023-5868](#)

General stability enhancements

- Fixed an issue with logical replication actions being performed by someone other than the table owner

Aurora PostgreSQL 12.12.4, November 17, 2023

Critical stability enhancements

- Backported a fix for the following security issue:
 - [CVE-2023-38545](#)
- Fixed an issue related to `pg_cron` background worker processes

Aurora PostgreSQL 12.12.3, October 17, 2023

High priority stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-39417](#)
 - [CVE-2023-2455](#)
 - [CVE-2023-2454](#)
 - [CVE-2022-41862](#)

High priority enhancements

- Fixed an issue which blocked vacuum operations after the restart of an Aurora replica.

- Fixed an issue that would cause high CPU usage and prevent new connections.

General stability enhancements

- Fixed an issue which causes the stats collector process to repeatedly restart.
- Improved the scale times for Aurora Serverless v2.
- Fix a bug which can cause unavailability during ZDP.
- Fixed an issue preventing `pglogical` from logging conflicting rows during the apply phase.
- Fixed an issue where, in rare cases, the `aws_s3` extension could fail to import from an S3 bucket with a name containing dots.
- Provided options to configure the timeouts within the `aws_lambda` extension. By setting the following parameters, customers will now be able to change the connect and request timeouts for AWS Lambda integration:
 - `aws_lambda.connect_timeout_ms`.
 - `aws_lambda.request_timeout_ms`.
- Fixed an issue which can cause a database instance to restart while executing I/O intensive read workloads.
- Updated the `plv8`, `pl11`, and `plcoffee` extensions to version 2.3.15.

Aurora PostgreSQL 12.12.2, March 2, 2023

General stability enhancements

- Fixed an issue that increased the amount of recovery work during startup if logical replication is enabled.
- Fixed an issue for better error handling of procedures with large numbers of parameters.
- Fixed an issue with the `aws_s3` extension where loading a large number of records can time out.
- Fixed an issue with the `pg_cron` parallel running of tasks.

Aurora PostgreSQL 12.12.1, December 13, 2022

General stability enhancements

- Fixed an issue that can cause increased network traffic when a writer instance transmits logs to a replica instance.
- Fixed an issue where the engine experiences stability issues during database minor and patch release upgrades.
- Fixed an issue that could cause data inconsistency during replication.

Aurora PostgreSQL 12.12.0, November 09, 2022

General stability enhancements

- Added support for the `rds_superuser` role to execute `CREATE OPERATOR CLASS`, `CREATE OPERATOR FAMILY`, and `ALTER OPERATOR FAMILY`, which are available in the higher versions.
- Improved buffer cache scavenging when the buffer cache is in duress.
- Fixed an issue in database activity streams that leads to high memory consumption.
- Fixed an issue that caused DB instance restarts.
- Fixed an issue where a DB instance restarts recursively while generating monitoring metrics during a crash.
- Fixed an issue where a DB instance restarted during performance metric collection.
- Fixed an issue where an attempt to connect to the database would fail with `SSLV3_ALERT_CERTIFICATE_UNKNOWN`.
- Improved the diagnostic logging around setting invalid hint bits.
- Fixed an issue where autovacuum would incorrectly skip tables.
- Improved the logical replication prefetching.
- Fixed a durability issue in the GIN indexes.
- Fixed an issue to detect and cancel stuck major version upgrades.
- Fixed an issue in hash join that could lead to increased memory consumption.
- Improved the logical replication performance.
- Fixed an issue that causes database activity stream inconsistency when the monitoring agent is unavailable.
- Upgraded the GEOS version to 3.10.3.

- Updated the PostGIS extension to version 3.2.3.
- Fixed an issue with `st_orientedenvlope` that caused it to loop with a 1-D input to return 0.
- Fixed an issue where the connection to SQL Server using `tds_fdw` fails.

PostgreSQL 12.11

This release of Aurora PostgreSQL is compatible with PostgreSQL 12.11. For more information about the improvements in PostgreSQL 12.11, see [PostgreSQL release 12.11](#).

Releases and patches

- [Aurora PostgreSQL 12.11.9, March 13, 2024](#)
- [Aurora PostgreSQL 12.11.8, December 22, 2023](#)
- [Aurora PostgreSQL 12.11.7, November 17, 2023](#)
- [Aurora PostgreSQL 12.11.6, October 19, 2023](#)
- [Aurora PostgreSQL 12.11.5, December 14, 2022](#)
- [Aurora PostgreSQL 12.11.4, November 17, 2022](#)
- [Aurora PostgreSQL 12.11.3, October 13, 2022](#)
- [Aurora PostgreSQL 12.11.1, July 6, 2022](#)
- [Aurora PostgreSQL 12.11.0, June 9, 2022](#)

Aurora PostgreSQL 12.11.9, March 13, 2024

General enhancements

- Allow `rds_superuser` to terminate backends which are not explicitly associated with a role.

High priority enhancements

- Backported fixes for the following PostgreSQL community security issue:
 - [CVE-2024-0985](#)

Critical stability enhancements

- Fixed an issue related to `apg_plan_mgmt`.

- Fixed a deadlock issue in Aurora Storage which can result in writer failover.
- Fixed an issue where active transactions during logical replication slot creation may be partially replicated by the slot.

Aurora PostgreSQL 12.11.8, December 22, 2023

Critical stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-5870](#)
 - [CVE-2023-5869](#)
 - [CVE-2023-5868](#)

General stability enhancements

- Fixed an issue with logical replication actions being performed by someone other than the table owner

Aurora PostgreSQL 12.11.7, November 17, 2023

Critical stability enhancements

- Backported a fix for the following security issue:
 - [CVE-2023-38545](#)
- Fixed an issue related to `pg_cron` background worker processes

Aurora PostgreSQL 12.11.6, October 19, 2023

High priority stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-39417](#)
 - [CVE-2023-2455](#)
 - [CVE-2023-2454](#)
 - [CVE-2022-41862](#)

- [CVE-2022-2625](#)

High priority enhancements

- Fixed an issue which blocked vacuum operations after the restart of an Aurora replica.
- Fixed an issue that would cause high CPU usage and prevent new connections.

General stability enhancements

- Fixed an issue which causes the stats collector process to repeatedly restart.
- Improved the scale times for Aurora Serverless v2.
- Fix a bug which can cause unavailability during ZDP.
- Fixed an issue preventing `pglogical` from logging conflicting rows during the apply phase.
- Fixed an issue where, in rare cases, the `aws_s3` extension could fail to import from an S3 bucket with a name containing dots.
- Provided options to configure the timeouts within the `aws_lambda` extension. By setting the following parameters, customers will now be able to change the connect and request timeouts for AWS Lambda integration:
 - `aws_lambda.connect_timeout_ms`.
 - `aws_lambda.request_timeout_ms`.
- Updated the `plv8`, `pl11`, and `plcoffee` extensions to version 2.3.15.

Aurora PostgreSQL 12.11.5, December 14, 2022

General stability enhancements

- Fixed an issue where the engine experiences stability issues during database minor and patch release upgrades.
- Fixed an issue that causes database activity stream inconsistency when the monitoring agent is unavailable.
- Fixed an issue that could cause data inconsistency during replication.

Aurora PostgreSQL 12.11.4, November 17, 2022

High priority stability enhancements

- Fixed an issue that can cause increased network traffic when a writer instance transmits logs to a replica instance.

Aurora PostgreSQL 12.11.3, October 13, 2022

High priority stability enhancements

- Fixed a PLV8 issue where the base parameter doesn't get loaded properly into the memory.

General stability enhancements

- Fixed a bug where Aurora PostgreSQL can't file the relfilenode.
- Fixed a stuck scaling issue when the current scaling event times out.
- Upgraded the PostGIS extension to version 3.1.7.
- Fixed an issue where extended query messages might be lost during zero-downtime patching (ZDP) causing the extended query to hang after the ZDP completion.

Aurora PostgreSQL 12.11.1, July 6, 2022

Critical stability enhancements

- Fixed an issue that could cause periods of unavailability during a storage node restart.

High priority stability enhancements

- Fixed an error handling issue related to out-of-memory conditions which could result in brief periods of unavailability.
- Fixed an issue when the connection to SQL Server fails using the TDS_FDW extension to query a foreign table.
- Fixed an issue that caused connections using the provided root certificate to fail.
- Improved the diagnostic and supportability information in case of inconsistent B-tree index entries.

Aurora PostgreSQL 12.11.0, June 9, 2022

New features

- Added support for the `large_object` module (extension). For more information, see [Managing large objects with the `lo` module](#).
- Added support for zero-downtime patching (ZDP) for minor version upgrades and patches. For more information, see [Minor release upgrades and zero-downtime patching](#) in the *Amazon Aurora User Guide*.

Critical updates

- Fixed a replay crash due to an LSN mismatch.
- Fixed the `aws_s3` extension to prevent invalid region injection.

High stability updates

- Fixed multiple issues related to out-of-memory conditions which could result in brief periods of unavailability.

General stability updates

- Fixed a lock contention crash during an Aurora Serverless v1 scaling event.
- Fixed an issue where logical replication becomes stuck after a restart.
- Fixed multiple issues that could lead to brief periods of unavailability.
- Fixed a crash in `pg_cron` due to a task still running but being unscheduled.
- Fixed, during redo, an invalid page hit on the Generic Redo for `GENERIC_XLOG_FULL_PAGE_DATA`. This happens due to a timing hole between generating the log record and then writing the metadata for the record on the RW node and the RO node replays between those operations.
- Improved the query performance by supporting parallel workers.
- Upgraded the plugin `wal2json` version to 2.4.
- Upgraded the `pglogical` extension to version 2.4.1.

PostgreSQL 12.10 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 12.10. For more information about the improvements in PostgreSQL 12.10, see [PostgreSQL release 12.10](#).

Releases and patches

- [Aurora PostgreSQL 12.10.6, December 16, 2022](#)
- [Aurora PostgreSQL 12.10.4, July 18, 2022](#)
- [Aurora PostgreSQL 12.10.1, April 27, 2022](#)
- [Aurora PostgreSQL 12.10.0, March 29, 2022](#)

Aurora PostgreSQL 12.10.6, December 16, 2022

General enhancements

- Fixed an issue that can cause increased network traffic when a writer instance transmits logs to a replica instance.
- Fixed an issue that causes database activity stream inconsistency when the monitoring agent is unavailable.
- Updated the PostGIS extension to version 3.1.7.

Aurora PostgreSQL 12.10.4, July 18, 2022

Security enhancements

- Backpatched the PostgreSQL community fix for CVE-2022-1552: Autovacuum, REINDEX, and others omit "security restricted operation". For more information, see [CVE-2022-1552](#).

Critical enhancements

- Fixed an issue during a storage node restart that could result in periods of unavailability.

High stability enhancements

- Fixed an error handling issue related to out-of-memory conditions that could result in brief periods of unavailability.

- Fixed an issue related to the existence of duplicate relation files that could result in periods of unavailability.
- Fixed a defect where the validation of cached plans may lead to a database restart when the plan was previously invalidated.

Aurora PostgreSQL 12.10.1, April 27, 2022

High priority stability enhancements

- Fixed an issue that could cause incorrect `WriteIOPS` reporting in the AWS console.
- Fixed an issue that could cause unavailability after removal of a read node from a cluster.

General enhancements

- Fixed an issue that could cause an engine restart during periods of low free memory.

Aurora PostgreSQL 12.10.0, March 29, 2022

High priority stability enhancements

- Fixed multiple issues that may result in unavailability of a read node.
- Fixed an issue that may result in a read node being unable to replay WAL requiring the replication slot to be dropped and resynchronized.
- Fixed an issue that could cause excess storage use due to files not being properly closed.

General enhancements

- Fixed a small memory leak on read nodes when `commit_ts` is set.
- Fixed an issue that caused Performance Insights to show "Unknown wait event".
- Fixed an issue that could cause an import from Amazon S3 to fail when using the `aws_s3` extension.
- Fixed multiple issues that could result in periods of unavailability when using `apg_plan_mgmt`.
- Fixed multiple issues that could result in periods of unavailability when QPM is enabled.

PostgreSQL 12.9

This release of Aurora PostgreSQL is compatible with PostgreSQL 12.9. For more information about the improvements in PostgreSQL 12.9, see [PostgreSQL release 12.9](#).

Releases and patches

- [Aurora PostgreSQL 12.9.11, March 13, 2024](#)
- [Aurora PostgreSQL 12.9.10, December 27, 2023](#)
- [Aurora PostgreSQL 12.9.9, November 17, 2023](#)
- [Aurora PostgreSQL 12.9.8, October 19, 2023](#)
- [Aurora PostgreSQL 12.9.7, August 24, 2023](#)
- [Aurora PostgreSQL 12.9.6, December 16, 2022](#)
- [Aurora PostgreSQL 12.9.4, July 20, 2022](#)
- [Aurora PostgreSQL 12.9.3, April 13, 2022](#)
- [Aurora PostgreSQL 12.9.1](#)
- [Aurora PostgreSQL 12.9.0](#)

Aurora PostgreSQL 12.9.11, March 13, 2024

General stability enhancements

- Allow `rds_superuser` to terminate backends which are not explicitly associated with a role.
- Upgraded PLV8 extension to version 2.3.15.

High priority stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2024-0985](#)

Critical stability enhancements

- Fixed an issue related to `apg_plan_mgmt`.
- Fixed an issue where active transactions during slot creation may be partially replicated by the slot.

- Fixed a deadlock issue in Aurora storage which can result in writer failover.

Aurora PostgreSQL 12.9.10, December 27, 2023

Critical stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-5870](#)
 - [CVE-2023-5869](#)
 - [CVE-2023-5868](#)

General stability enhancements

- Fixed an issue with logical replication actions being performed by someone other than the table owner

Aurora PostgreSQL 12.9.9, November 17, 2023

Critical stability enhancements

- Backported a fix for the following security issue:
 - [CVE-2023-38545](#)
- Fixed an issue related to `pg_cron` background worker processes

Aurora PostgreSQL 12.9.8, October 19, 2023

High priority stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-39417](#)
 - [CVE-2023-2455](#)
 - [CVE-2023-2454](#)
 - [CVE-2022-41862](#)

Aurora PostgreSQL 12.9.7, August 24, 2023

General enhancements

- Fixed an issue which causes the stats collector process to repeatedly restart.
- Fixed an issue preventing `pglogical` from logging conflicting rows during the apply phase.

Aurora PostgreSQL 12.9.6, December 16, 2022

General enhancements

- Fixed an issue that can cause increased network traffic when a writer instance transmits logs to a replica instance.
- Fixed an issue that causes database activity stream inconsistency when the monitoring agent is unavailable.
- Updated the PostGIS extension to version 3.1.7.

Aurora PostgreSQL 12.9.4, July 20, 2022

Security enhancements

- Backpatched the PostgreSQL community fix for CVE-2022-1552: Autovacuum, REINDEX, and others omit "security restricted operation". For more information, see [CVE-2022-1552](#).

Critical enhancements

- Fixed an issue during a storage node restart that could result in periods of unavailability.

High stability enhancements

- Fixed an error handling issue related to out-of-memory conditions that could result in brief periods of unavailability.
- Fixed an issue related to the existence of duplicate relation files that could result in periods of unavailability.
- Fixed an issue that could cause excess storage use due to files not being properly closed.
- Fixed an issue that caused Performance Insights to show "Unknown wait event".

Aurora PostgreSQL 12.9.3, April 13, 2022

Security enhancements

- Additional modifications to the `pg_cron` extension to mitigate a security issue during create extension. The issue was addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).

General enhancements

- Fixed a bug that could cause an engine restart during periods of low free memory.

Aurora PostgreSQL 12.9.1

Security enhancements

- Updated the PostGIS extension from version 3.1.4 to 3.1.5. This update contains a PostGIS fix for the vulnerability addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Modified the `ip4r` extension to mitigate a security issue during create extension. The issue was originally disclosed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Modified the `pg_bigm` extension to mitigate a security issue during create extension. The issue was addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Modified the `pg_cron` extension to mitigate a security issue during create extension. The issue was addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).

Aurora PostgreSQL 12.9.0

Critical stability enhancements

- Fixed a bug where logical replication may hang resulting in the replay falling behind on the read node. The instance may eventually restart.

Additional improvements and enhancements

- Fixed a buffer cache bug that could cause brief periods of unavailability.
- Fixed a bug in the `apg_plan_mgmt` extension where an index based plan was not being enforced.
- Fixed a bug in the `pg_logical` extension that could cause brief periods of unavailability due to improper handling of NULL arguments.
- Fixed an issue where orphaned files caused major version upgrades to fail.
- Fixed incorrect Aurora Storage Daemon log write metrics.
- Fixed multiple bugs that could result in WAL replay falling behind and eventually causing the reader instances to restart.
- Improved the Aurora buffer cache page validation on reads.
- Improved the Aurora storage metadata validation.
- Updated the `pg_cron` extension to v1.4.
- Updated the `pg_hint_plan` extension to v1.3.7.
- For information about extensions and modules, see [Extensions supported for Aurora PostgreSQL 12](#).

PostgreSQL 12.8 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 12.8. For more information about the improvements in PostgreSQL 12.8, see [PostgreSQL release 12.8](#).

Releases and patches

- [Aurora PostgreSQL 12.8.6, December 19, 2022](#)
- [Aurora PostgreSQL 12.8.4, July 6, 2022](#)
- [Aurora PostgreSQL 12.8.2, April 12, 2022](#)
- [Aurora PostgreSQL 12.8.1](#)
- [Aurora PostgreSQL 12.8.0](#)

Aurora PostgreSQL 12.8.6, December 19, 2022

General enhancements

- Fixed an issue that causes database activity stream inconsistency when the monitoring agent is unavailable.

Aurora PostgreSQL 12.8.4, July 6, 2022

Security enhancements

- Backpatched the PostgreSQL community fix for CVE-2022-1552: Autovacuum, REINDEX, and others omit "security restricted operation". For more information, see [CVE-2022-1552](#).

General enhancements

- Fixed an error handling issue related to out-of-memory conditions which could result in brief periods of unavailability.
- Fixed an issue that could cause excess storage use due to files not being properly closed.
- Fixed an issue that could cause Performance Insights to display "Unknown wait event".
- Fixed an issue that could result in periods of unavailability due to the existence of duplicate relation files.

Aurora PostgreSQL 12.8.2, April 12, 2022

Security enhancements

- Additional modifications to the pg_cron extension to mitigate a security issue during create extension. The issue was addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).

General enhancements

- Fixed a buffer cache bug that could cause brief periods of unavailability.

Aurora PostgreSQL 12.8.1

Security enhancements

- Updated the PostGIS extension from version 3.1.4 to 3.1.5. This update contains a PostGIS fix for the vulnerability addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Modified the ip4r extension to mitigate a security issue during create extension. The issue was originally disclosed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Modified the pg_bigm extension to mitigate a security issue during create extension. The issue was addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Modified the pg_cron extension to mitigate a security issue during create extension. The issue was addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).

Aurora PostgreSQL 12.8.0

Critical stability enhancements

- Fixed an issue where, in rare circumstances, a data cache of a read node may be inconsistent following a restart of that node.

High priority stability enhancements

- Fixed an issue where queries may become unresponsive due to I/O resource exhaustion triggered by prefetch.
- Fixed an issue where Aurora may flag an issue following a major version update with the message: "PANIC: could not access status of next transaction id xxxxxxxx".

Additional improvements and enhancements

- Fixed an issue where read nodes restart due to a replication origin cache lookup failure.
- Fixed an issue where read queries may time out on read nodes during the replay of lazy truncation triggered by vacuum on the write node.

- Fixed an issue that causes Performance Insights to incorrectly set the backend type of a database connection.
- Fixed an issue where the `aurora_postgres_replica_status()` function returned stale or lagging CPU stats.
- Fixed an issue where the role `rds_superuser` did not have permission to execute the `pg_stat_statements_reset()` function.
- Fixed an issue with the `apg_plan_mgmt` extension where the planning and execution times were reported as 0.
- Removed support for the DES, 3DES, and RC4 cipher suites.
- Updated PostGIS extension to version 3.1.4.

PostgreSQL 12.7, Aurora PostgreSQL 4.2 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 12.7. For more information about the improvements in PostgreSQL 12.7, see [PostgreSQL release 12.7](#).

Releases and patches

- [Aurora PostgreSQL 12.7.5, December 30, 2022](#)
- [Aurora PostgreSQL 12.7.4, July 14, 2022](#)
- [Aurora PostgreSQL 4.2.3, April 7, 2022](#)
- [Aurora PostgreSQL 4.2.2](#)
- [Aurora PostgreSQL 4.2.1](#)
- [Aurora PostgreSQL 4.2.0](#)

Aurora PostgreSQL 12.7.5, December 30, 2022

General enhancements

- Fixed an issue that causes database activity stream inconsistency when the monitoring agent is unavailable.

Aurora PostgreSQL 12.7.4, July 14, 2022

Security enhancements

- Backpatched the PostgreSQL community fix for CVE-2022-1552: Autovacuum, REINDEX, and others omit "security restricted operation". For more information, see [CVE-2022-1552](#).

High priority stability enhancements

- Fixed an error handling issue related to out-of-memory conditions which could result in brief periods of unavailability.
- Fixed an issue that could cause excess storage use due to files not being properly closed.
- Fixed an issue that caused Performance Insights to show "Unknown wait event".

Aurora PostgreSQL 4.2.3, April 7, 2022

Security enhancements

- Additional modifications to the `pg_cron` extension to mitigate a security issue during create extension. The issue was addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).

Aurora PostgreSQL 4.2.2

Security enhancements

- Modified the `pg_cron` extension to mitigate a security issue during create extension. The issue was addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Modified the `pg_bigm` extension to mitigate a security issue during create extension. The issue was addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Modified the `ip4r` extension to mitigate a security issue during create extension. The issue was originally disclosed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).

- Backpatched the PostgreSQL community fix for CVE-2021-3677: “Memory disclosure in certain queries”. For more information, see [CVE-2021-3677](#)
- Backpatched [postgis](#) to PostGIS 3.0.3. This is a PostGIS fix for the vulnerability addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).

Aurora PostgreSQL 4.2.1

Critical stability enhancements

- Fixed an issue where, in rare circumstances, a data cache of a read node may be inconsistent following a restart of that node.

High priority stability enhancements

- Fixed an issue where queries may become unresponsive due to I/O resource exhaustion triggered by prefetch.
- Fixed an issue where Aurora may flag an issue following a major version update with the message: "PANIC: could not access status of next transaction id xxxxxxxx".

Additional improvements and enhancements

- Fixed an issue where read nodes restart due to a replication origin cache lookup failure.
- Fixed an issue with the `apg_plan_mgmt` extension where planning and execution time were reported as 0.
- Fixed an issue that causes Performance Insights to incorrectly set the backend type of a database connection.
- Fixed an issue with the `apg_plan_mgmt` extension where plan outline on a partitioned table did not enforce an index-based plan.
- Fixed an issue where orphaned files caused failed translations in read codepaths during or after major version upgrade.
- Fixed multiple issues in the Aurora storage daemon that could lead to brief periods of unavailability when specific network configurations are used.
- Fixed an out-of-memory crash issue with Aurora storage daemon that leads to writer node restart. This also reduces the overall system memory consumption.

Aurora PostgreSQL 4.2.0

New features

- Added support for the `oracle_fdw` extension version 2.3.0.

High priority stability enhancements

- Fixed an issue where creating a database from an existing template database with tablespace resulted in an error with the message `ERROR: could not open file pg_tblspc/...: No such file or directory`.
- Fixed an issue where, in rare cases, an Aurora replica may be unable to start when a large number of PostgreSQL subtransactions (i.e. SQL savepoints) have been used.
- Fixed an issue where, in rare circumstances, read results may be inconsistent for repeated read requests on replica nodes.

Additional improvements and enhancements

- Upgraded OpenSSL to 1.1.1k.
- Reduced CPU usage and memory consumption of the WAL apply process on Aurora replicas for some workloads.
- Improved safety checks in the write path to detect incorrect writes to metadata.
- Improved security by removing 3DES and other older ciphers for SSL/TLS connections.
- Fixed an issue where a duplicate file entry can prevent the Aurora PostgreSQL engine from starting up.
- Fixed an issue that could cause temporary unavailability under heavy workloads.
- Added back ability to use a leading forward slash in the Amazon S3 path during S3 import.
- Added Graviton support for `oracle_fdw` extension version 2.3.0.
- Changed the following extensions:
 - Updated the `orafce` extension to version 3.16.
 - Updated the `pg_partman` extension to version 4.5.1.
 - Updated the `pg_cron` extension to version 1.3.1.
 - Updated the `postgis` extension to version 3.0.3.

PostgreSQL 12.6, Aurora PostgreSQL 4.1 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 12.6. For more information about the improvements in PostgreSQL 12.6, see [PostgreSQL release 12.6](#).

Releases and patches

- [Aurora PostgreSQL 4.1.2, April 7, 2022](#)
- [Aurora PostgreSQL 4.1.1](#)
- [Aurora PostgreSQL 4.1.0](#)

Aurora PostgreSQL 4.1.2, April 7, 2022

Security enhancements

- Additional modifications to the `pg_cron` extension to mitigate a security issue during create extension. The issue was addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).

Aurora PostgreSQL 4.1.1

Security enhancements

- Modified the `pg_cron` extension to mitigate a security issue during create extension. The issue was addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Modified the `pg_bigm` extension to mitigate a security issue during create extension. The issue was addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Modified the `ip4r` extension to mitigate a security issue during create extension. The issue was originally disclosed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Backpatched the PostgreSQL community fix for CVE-2021-3677: "Memory disclosure in certain queries". For more information, see [CVE-2021-3677](#)
- Backpatched `pg_partman` to 4.4.0. This is a `pg_partman` fix for the vulnerability addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).

- Backpatched [postgis](#) to PostGIS 3.0.2. This is a PostGIS fix for the vulnerability addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Backpatched an input validation error in the `log_fdw` extension function parameters.

Aurora PostgreSQL 4.1.0

New features

- Added support for the following extensions:
 - The `pg_proctab` extension version 0.0.9
 - The `pg_partman` extension version 4.4.0. For more information, see [Managing PostgreSQL partitions with the `pg_partman` extension](#) in the *Amazon Aurora User Guide*.
 - The `pg_cron` extension version 1.3.0. For more information, see [Scheduling maintenance with the PostgreSQL `pg_cron` extension](#) in the *Amazon Aurora User Guide*.
 - The `pg_bigm` extension version 1.2

High priority stability enhancements

- Fixed a bug in the `pglogical` extension that could lead to data inconsistency for inbound replication.
- Fixed a bug where in rare cases a reader had inconsistent results when it restarted while a transaction with more than 64 subtransactions was being processed.
- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2021-32027](#)
 - [CVE-2021-32028](#)
 - [CVE-2021-32029](#)

Additional improvements and enhancements

- Fixed a bug where the database could not be started when there were many relations in memory-constrained environments.
- Fixed a bug in the `apg_plan_mgmt` extension that could cause brief periods of unavailability due to an internal buffer overflow.
- Fixed a bug on reader nodes that could cause brief periods of unavailability during WAL replay.

- Fixed a bug in the `rds_activity_stream` extension that caused an error during startup when attempting to log audit events.
- Fixed bugs in the `aurora_replica_status` function where rows were sometimes partially populated and some values such as Replay Latency, and CPU usage were always 0.
- Fixed a bug where the database engine would attempt to create shared memory segments larger than the instance total memory and fail repeatedly. For example, attempts to create 128 GiB shared buffers on a `db.r5.large` instance would fail. With this change, requests for total shared memory allocations larger than the instance memory allow setting the instance to incompatible parameters.
- Added logic to clean up unnecessary `pg_wal` temporary files on a database startup.
- Fixed a bug that could lead to outbound replication synchronization errors after a major version upgrade.
- Fixed a bug that reported `ERROR: rds_activity_stream stack item 2 not found on top - cannot pop` when attempting to create the `rds_activity_stream` extension.
- Fixed a bug that could cause the error failed to build any 3-way joins in a correlated IN subquery under an EXISTS subquery.
- Backported the following performance improvement from the PostgreSQL community: [pg_stat_statements: add missing check for pgss_enabled\(\)](#).
- Fixed a bug that could cause upgrades to Aurora PostgreSQL 12.x to fail due to the inability to open the `pg_control` file.
- Fixed a bug that could cause brief periods of unavailability due to running out of memory when creating the `postgis` extension with `pgAudit` enabled.
- Backported the following bug fix from the PostgreSQL community: [Fix use-after-free bug with AfterTriggersTableData.storeslot](#).
- Fixed a bug when using outbound logical replication to synchronize changes to another database that could fail with an error message like `ERROR: could not map filenode "base/16395/228486645" to relation OID`.
- Fixed a bug that could cause a brief period of unavailability when canceling a transaction.
- Fixed a bug that caused no ICU collations to be shown in the `pg_collation` catalog table after creating a new Aurora PostgreSQL 12.x instance. This issue does not affect upgrading from an older version.
- Fixed a bug where the `rds_ad` role wasn't created after upgrading from a version of Aurora PostgreSQL that doesn't support Microsoft Active Directory authentication.

- Added btree page checks to detect tuple metadata inconsistency.
- Fixed a bug in asynchronous buffer reads that could cause brief periods of unavailability on reader nodes during WAL replay.
- Fixed a bug where reading a TOAST value from disk could cause a brief period of unavailability.
- Fixed a bug that caused brief periods of unavailability when attempting to fetch a tuple from and index scan.

PostgreSQL 12.4, Aurora PostgreSQL 4.0 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 12.4. For more information about the improvements in PostgreSQL 12.4, see [PostgreSQL release 12.4](#).

Releases and patches

- [Aurora PostgreSQL 4.0.5](#)
- [Aurora PostgreSQL 4.0.2](#)
- [Aurora PostgreSQL 4.0.1](#)
- [Aurora PostgreSQL 4.0.0](#)

Aurora PostgreSQL 4.0.5

- Modified the `ip4r` extension to mitigate a security issue during create extension. The issue was originally disclosed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Backpatched the PostgreSQL community fix for CVE-2021-3677: “Memory disclosure in certain queries”. For more information, see [CVE-2021-3677](#)
- Backpatched [postgis](#) to PostGIS 3.0.2. This is a PostGIS fix for the vulnerability addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Backpatched an input validation error in the `log_fdw` extension function parameters.

Aurora PostgreSQL 4.0.2

High priority stability enhancements

- Fixed a bug where a reader node might render an extra or missing row if the reader restarted while the writer node is processing a long transaction with more than 64 subtransactions.
- Fixed a bug that can cause vacuum to block on GiST indexes.
- Fixed a bug where after upgrade to PostgreSQL 12, vacuum can fail on the system table `pg_catalog.pg_shdescription` with the following error. ERROR: found xmin 484 from before relfrozenxid

Additional improvements and enhancements

- Fixed a bug that could lead to intermittent unavailability due to a race condition when handling responses from storage nodes.
- Fixed a bug that could lead to intermittent unavailability due to the rotation of network encryption keys.
- Fixed a bug that could lead to intermittent unavailability due to heat management of the underlying storage segments.
- Fixed a bug where a large Amazon S3 import with thousands of clients can cause one or more of the import clients to stop responding.
- Removed a restriction that prevented setting configuration variable strings that contained `brazil`.
- Fixed a bug that could lead to intermittent unavailability if a reader node runs a query that access many tables while the writer node is acquiring exclusive locks on all of the same tables.

Aurora PostgreSQL 4.0.1

New features

- This release adds support for the Graviton2 db.r6g instance classes to the PostgreSQL engine version 12.4. For more information, see [Supported DB engines for DB instance classes](#) in the *Amazon Aurora User Guide*.

Critical stability enhancements

- Fixed a bug that caused a read replica to unsuccessfully restart repeatedly in rare cases.
- Fixed a bug where a cluster became unavailable when attempting to create more than 16 read replicas or Aurora global database secondary AWS Regions. The cluster became available again when the new read replica or secondary AWS Region was removed.

Additional improvements and enhancements

- Fixed a bug that when under heavy load, snapshot import, COPY import, or Amazon S3 import stopped responding in rare cases.
- Fixed a bug where a read replica might not join the cluster when the writer was very busy with a write-intensive workload.
- Fixed a bug where a cluster could be unavailable briefly when a high-volume Amazon S3 import was running.
- Fixed a bug that caused a cluster to take several minutes to restart if a logical replication stream was terminated while handling many complex transactions.
- Fixed the Just-in-Time (JIT) compilation, which was incorrectly enabled by default in Aurora PostgreSQL 4.0.0.
- Disallowed the use of both AWS Identity and Access Management (IAM) and Kerberos authentication for the same user.

Aurora PostgreSQL 4.0.0

New features

- This version supports a major version upgrade from [PostgreSQL 11.7, Aurora PostgreSQL 3.2 \(Deprecated\)](#) and later versions.

Additional improvements and enhancements

- Contains several improvements that were announced for PostgreSQL releases [12.0](#), [12.1](#), [12.2](#), [12.3](#), and [12.4](#).
- Contains all fixes, features, and improvements present in [PostgreSQL 11.9, Aurora PostgreSQL 3.4](#).

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2020-25694](#)
 - [CVE-2020-25695](#)
 - [CVE-2020-25696](#)
- Updated the following extensions:
 - `address_standardizer` to version 3.0.2
 - `address_standardizer_data_us` to version 3.0.2
 - `amcheck` to version 1.2
 - `citext` to version 1.6
 - `hll` to version 2.14
 - `hstore` to version 1.6
 - `ip4r` to version 2.4
 - `pg_repack` to version 1.4.5
 - `pg_stat_statements` to version 1.7
 - `pgaudit` to version 1.4
 - `pglogical` to version 2.3.2
 - `pgrouting` to version 3.0.3
 - `plv8` to version 2.3.14
 - `postGIS` to version 3.0.2
 - `postgis_tiger_geocoder` to version 3.0.2
 - `postgis_topology` to version 3.0.2

PostgreSQL 11.21

This release of Aurora PostgreSQL is compatible with PostgreSQL 11.21. For more information about the improvements in PostgreSQL 11.21, see [PostgreSQL release 11.21](#).

Releases and patches

- [Aurora PostgreSQL 11.21.7, June 25, 2024](#)
- [Aurora PostgreSQL 11.21.6, March 13, 2024](#)
- [Aurora PostgreSQL 11.21.5, February 22, 2024](#)

- [Aurora PostgreSQL 11.21.2, December 13, 2023](#)
- [Aurora PostgreSQL 11.21.1, November 09, 2023](#)
- [Aurora PostgreSQL 11.21.0, October 24, 2023](#)

Aurora PostgreSQL 11.21.7, June 25, 2024

General enhancements

- Fixed multiple issues where minor version upgrades with ZDP would fail resulting in longer upgrade times.
- Fixed an issue which prevented upgrading older PostGIS 2.4 installations to version 3.3.3.

Critical stability enhancements

- Fixed an issue where a change in memory requirements during a minor version upgrade can cause zero-downtime patching and engine startup to fail.
- Fixed a `pg_repack` issue causing two vacuums to concurrently process the same table.

Aurora PostgreSQL 11.21.6, March 13, 2024

General enhancements

- Fixed a performance degradation issue in PLV8 extension.

Aurora PostgreSQL 11.21.5, February 22, 2024

General enhancements

- Allow `rds_superuser` to terminate backends which are not explicitly associated with a role.

High priority enhancements

- Fixed an issue where `pg_stat_statements` can block minor version upgrade during ZDP.
- Fixed an issue where a logical replication slot would no longer emit changes due to an overly strict data consistency check.

- Backported fixes for the following PostgreSQL community security issue:
 - [CVE-2024-0985](#)

Critical stability enhancements

- Fixed an issue related to `apg_plan_mgmt`.
- Fixed a deadlock issue in Aurora Storage which can result in writer failover.
- Fixed an issue where active transactions during logical replication slot creation may be partially replicated by the slot.

Aurora PostgreSQL 11.21.2, December 13, 2023

Critical stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-5870](#)
 - [CVE-2023-5869](#)
 - [CVE-2023-5868](#)

General stability enhancements

- Fixed an issue with logical replication actions being performed by someone other than the table owner

Aurora PostgreSQL 11.21.1, November 09, 2023

Critical stability enhancements

- Backported a fix for the following security issue:
 - [CVE-2023-38545](#)

Aurora PostgreSQL 11.21.0, October 24, 2023

New features

- Added support in the `aws_s3` extension for exporting to an S3 bucket encrypted with a customer managed KMS key

General enhancements

- Fixed an issue in the `aws_s3` extension where the number of rows exported is incorrectly reported when the total number exceeds 2 billion
- Provided options to configure timeouts in the `aws_s3` extension. By setting the following parameters (GUCs), customers will now be able to change the timeout thresholds for imports from S3:
 - `aws_s3.curlopt_low_speed_limit`
 - `aws_s3.curlopt_low_speed_time`
- Improved the performance of replay of commit transaction operations on Aurora replicas
- Fixed an issue where, in rare cases, an import from the `aws_s3` extension fails to complete
- Updated the GEOS library for PostGIS to version 3.12.0
- Added the `WAIT_EVENT_Aurora_CLUSTER_CACHE_MANAGER_SENDER` wait event to denote wait times in the cluster cache manager sender
- Added the `WAIT_EVENT_Aurora_SERVERLESS_MONITORING_MAIN` wait event to denote wait times in Aurora Serverless resource monitoring
- Fixed an issue where the database may crash during the start of a logical replication slot

Additional improvements and enhancements

- Updated the following extensions:
 - `orafce` to version 4.3.0
 - `pg_logical` to version 2.4.3
 - `plv8` to version 3.1.6
 - PostGIS to version 3.3.3
 - RDKit to version 4.3

For information about extensions and modules, see [Extensions supported for Aurora PostgreSQL 11](#).

PostgreSQL 11.20 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 11.20. For more information about the improvements in PostgreSQL 11.20, see [PostgreSQL release 11.20](#).

Releases and patches

- [Aurora PostgreSQL 11.20.2, October 4, 2023](#)
- [Aurora PostgreSQL 11.20.0, July 13, 2023](#)

Aurora PostgreSQL 11.20.2, October 4, 2023

High priority stability enhancements

- Backported a fix for the following PostgreSQL community security issue:
 - [CVE-2023-39417](#)

High priority enhancements

- Fixed an issue which can cause a database instance to restart while executing I/O intensive read workloads.
- Fixed an issue which can cause vacuum operations to become blocked after the restart of an Aurora replica.
- Fixed an issue that would cause a crash when executing the COPY FROM command.
- Fixed an issue that would cause high CPU usage and prevent new connections.
- Fixed an issue where UPDATE and DELETE from a table with foreign key could fail unexpectedly with "ERROR: 40001: could not serialize access due to concurrent update when using Serializable snapshot".

General enhancements

- Introduced diagnostics for the transient metadata used for I/O.
- Updated the plv8, pl11, and plcoffee extensions to version 2.3.15.

- Fixed an issue that prevented the enablement of improved memory management in certain scenarios in Aurora PostgreSQL 15.3.

Aurora PostgreSQL 11.20.0, July 13, 2023

Following the announcement of updates to the PostgreSQL database by the open source community, we have updated Amazon Aurora PostgreSQL-Compatible Edition to support PostgreSQL versions 15.3, 14.8, 13.11, 12.15, and 11.20. These releases contains product improvements and bug fixes made by the PostgreSQL community, along with Aurora-specific improvements. The releases also contain new features and improvements for [Babelfish for Aurora PostgreSQL version 3.2](#), and improved support for [AWS Database Migration Service](#). Refer to the [Amazon Aurora versions](#) to help you to decide how often to upgrade and how to plan your upgrade process. As a reminder, if you are running any version of Amazon Aurora PostgreSQL 11, you must upgrade to a newer major version by February 29, 2024.

New features

- This release contains memory management improvements which increase database stability and availability by proactively preventing issues caused by insufficient memory. For more information, see [Improved memory management in Aurora PostgreSQL](#).

High priority enhancements

- Fixed an issue during ZDP which is related to the extension environment variables.
- Addressed a transient error during logical replication that caused a process to incorrectly calculate that it had encountered an unexpected page.
- Fixed an issue which causes a period of unavailability due to a partially created replication origin state file.

General enhancements

- Added a new function, `aurora_stat_memctx_usage()`, to show backend memory use breakdown at a Postgres memory context level.
- Provided options to configure the timeouts within the `aws_lambda` extension. By setting the following parameters (GUCs), customers will now be able to change the connect and request timeouts for AWS Lambda integration:

- `aws_lambda.connect_timeout_ms`.
- `aws_lambda.request_timeout_ms`.
- Fixed an issue with the calculation of the `AuroraReplicaLag` metric.
- Fixed an issue where, in rare cases, the `aws_s3` extension could fail to import from an Amazon S3 bucket with a name containing dots.
- Further reduced the database downtime during ZDP.
- Fixed a bug which can cause unavailability during ZDP.
- Fixed an issue which caused `pg_ls_waldir()` to return "ERROR: could not stat file".
- Added support for TLS 1.3 with ciphers `TLS_AES_128_GCM_SHA256` and `TLS_AES_256_GCM_SHA384`.
- Addressed an issue that blocked a major version upgrade on the Aurora replica of an RDS for PostgreSQL DB instance.
- Upgraded GEOS to version 3.11.2.
- Upgraded `tds_fdw` to 2.0.3.

PostgreSQL 11.19 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 11.19. For more information about the improvements in PostgreSQL 11.19, see [PostgreSQL release 11.19](#).

Releases and patches

- [Aurora PostgreSQL 11.19.4, October 5, 2023](#)
- [Aurora PostgreSQL 11.19.3, July 24, 2023](#)
- [Aurora PostgreSQL 11.19.2, May 10, 2023](#)
- [Aurora PostgreSQL 11.19.1, April 5, 2023](#)

Aurora PostgreSQL 11.19.4, October 5, 2023

High priority stability enhancements

- Backported a fix for the following PostgreSQL community security issue:
 - [CVE-2023-39417](#)

High priority enhancements

- Fixed an issue which can cause a database instance to restart while executing I/O intensive read workloads.
- Fixed an issue which can cause vacuum operations to become blocked after the restart of an Aurora replica.
- Fixed an issue that would cause high CPU usage and prevent new connections.

General enhancements

- Introduced diagnostics for the transient metadata used for I/O.
- Updated the plv8, pl1, and plcoffee extensions to version 2.3.15.

Aurora PostgreSQL 11.19.3, July 24, 2023

General enhancements

- Fixed an issue with the calculation of the AuroraReplicaLag metric
- Fixed a bug which can cause unavailability during ZDP
- Fixed an issue that prevented reclaiming storage on transaction commits
- Fixed an issue preventing pglogical from logging conflicting rows during the apply phase
- Added Aurora Serverless v2 scaling enhancements
- Fixed an issue where, in rare cases, the aws_s3 extension could fail to import from an Amazon S3 bucket with a name containing dots.
- Provided options to configure the timeouts within the aws_lambda extension. By setting the following parameters (GUCs), customers will now be able to change the connect and request timeouts for AWS Lambda integration:
 - `aws_lambda.connect_timeout_ms`.
 - `aws_lambda.request_timeout_ms`.
- Fixed multiple issues which can cause Aurora replicas with the improved read availability feature to restart when reconnecting with the writer instance.
- Fixed an issue preventing a survivable reader reconnect.

Aurora PostgreSQL 11.19.2, May 10, 2023

General enhancements

- Fixed an error when loading the `test_decoding` plugin in `pg_create_logical_replication_slot`.

Aurora PostgreSQL 11.19.1, April 5, 2023

General enhancements

- Upgraded PROJ support to version 9.1.0
- Upgraded the GDAL library in PostGIS to version 3.5.3
- Added support for the TCN and SEG extensions
- Fixed an issue which may increase the amount of recovery work the database does to startup with logical replication enabled
- Fixed issues that caused incorrect I/O timing metrics in EXPLAIN
- Fixed an issue that caused incorrect buffer hit counts in EXPLAIN
- Improved the engine startup time, particularly on large instances with many objects
- The Aurora function `aurora_stat_logical_wal_cache()` is now visible to all users

Additional improvements and enhancements

- Updated the following extensions:
 - `hll` to version 2.17
 - `orafce` to version 4.0.0
 - `pg_hint_plan` to version 1.3.8
 - `pg_logical` to version 2.4.2
 - `pg_trgm` to version 1.4
 - `pgrouting` to version 3.4.1
 - PostGIS to version 3.3.2
 - SEG to version 1.0
 - TCN to version 1.0

- wal2json to version 2.5

PostgreSQL 11.18 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 11.18. For more information about the improvements in PostgreSQL 11.18, see [PostgreSQL release 11.18](#).

Releases and patches

- [Aurora PostgreSQL 11.18.5, October 04, 2023](#)
- [Aurora PostgreSQL 11.18.4, September 13, 2023](#)
- [Aurora PostgreSQL 11.18.2, March 3, 2023](#)
- [Aurora PostgreSQL 11.18.0, January 20, 2023](#)

Aurora PostgreSQL 11.18.5, October 04, 2023

High priority stability enhancements

- Fixed an issue which can cause a database instance to restart while executing IO intensive read workloads.
- Fixed an issue that would cause high CPU usage and prevent new connections.

General enhancements

- Introduced diagnostics for the transient metadata used for I/O.

Aurora PostgreSQL 11.18.4, September 13, 2023

General enhancements

- Added Aurora Serverless v2 scaling enhancements
- Fixed an issue with the calculation of the AuroraReplicaLag metric
- Fixed a bug which can cause unavailability during ZDP
- Fixed an issue preventing pglogical from logging conflicting rows during the apply phase
- Fixed an issue where, in rare cases, the aws_s3 extension could fail to import from an Amazon S3 bucket with a name containing dots.

- Provided options to configure the timeouts within the `aws_lambda` extension. By setting the following parameters, customers will now be able to change the connect and request timeouts for AWS Lambda integration:
 - `aws_lambda.connect_timeout_ms`.
 - `aws_lambda.request_timeout_ms`.
- Updated the `plv8`, `plls`, and `plcoffee` extensions to version 2.3.15.

Aurora PostgreSQL 11.18.2, March 3, 2023

General stability enhancements

- Fixed an issue in PostGIS where the GDAL data wasn't loading.
- Fixed an issue that increased the amount of recovery work during startup if logical replication is enabled.
- Fixed an issue for the better error handling of procedures with large numbers of parameters.
- Fixed an issue with the `aws_s3` extension where loading a large number of records can time out.

Aurora PostgreSQL 11.18.0, January 20, 2023

High priority stability enhancements

- Fixed an issue where an upgrade fails because the oldest `MultiXactId` is updated incorrectly.
- Fixed an issue where the commit latency metrics weren't updated.
- Fixed an issue that could lead to a brief period of unavailability.

General stability enhancements

- Fixed an issue that caused DB instance migration failures.
- Fixed an issue where the DB fails to start because of an inconsistency in the metadata.
- Improved the error handling and diagnosability.
- Upgraded the RDKit extension to version 4.2.
- Upgraded the GDAL library to version 3.4.3.
- Fixed an issue with the `pg_repack` extension.
- Improved the collation library (glibc) handling with a new independent default collation library.

PostgreSQL 11.17 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 11.17. For more information about the improvements in PostgreSQL 11.17, see [PostgreSQL release 11.17](#).

Releases and patches

- [Aurora PostgreSQL 11.17.3, October 17, 2023](#)
- [Aurora PostgreSQL 11.17.2, March 2, 2023](#)
- [Aurora PostgreSQL 11.17.1, December 13, 2022](#)
- [Aurora PostgreSQL 11.17.0, November 09, 2022](#)

Aurora PostgreSQL 11.17.3, October 17, 2023

High priority stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-39417](#)
 - [CVE-2023-2455](#)
 - [CVE-2023-2454](#)

High priority enhancements

- Fixed an issue which blocked vacuum operations after the restart of an Aurora replica.
- Fixed an issue that would cause high CPU usage and prevent new connections.

General stability enhancements

- Fixed an issue which causes the stats collector process to repeatedly restart.
- Improved the scale times for Aurora Serverless v2.
- Fix a bug which can cause unavailability during ZDP.
- Fixed an issue preventing `pglogical` from logging conflicting rows during the apply phase.
- Fixed an issue where, in rare cases, the `aws_s3` extension could fail to import from an S3 bucket with a name containing dots.

- Provided options to configure the timeouts within the `aws_lambda` extension. By setting the following parameters, customers will now be able to change the connect and request timeouts for AWS Lambda integration:
 - `aws_lambda.connect_timeout_ms`.
 - `aws_lambda.request_timeout_ms`.
- Fixed an issue which can cause a database instance to restart while executing I/O intensive read workloads.
- Updated the `plv8`, `pl11`, and `plcoffee` extensions to version 2.3.15.

Aurora PostgreSQL 11.17.2, March 2, 2023

General stability enhancements

- Fixed an issue that increased the amount of recovery work during startup if logical replication is enabled.
- Fixed an issue for better error handling of procedures with large numbers of parameters.
- Fixed an issue with the `aws_s3` extension where loading a large number of records can time out.

Aurora PostgreSQL 11.17.1, December 13, 2022

General stability enhancements

- Fixed an issue that can cause increased network traffic when a writer instance transmits logs to a replica instance.
- Fixed an issue where the engine experiences stability issues during database minor and patch release upgrades.
- Fixed an issue that could cause data inconsistency during replication.

Aurora PostgreSQL 11.17.0, November 09, 2022

General stability enhancements

- Improved buffer cache scavenging when the buffer cache is in duress.
- Fixed an issue in Database Activity Streams that leads to high memory consumption.
- Fixed an issue that caused DB instance restarts.

- Fixed an issue where a DB instance restarts recursively while generating monitoring metrics during a crash.
- Fixed an issue where a DB instance restarted during performance metric collection.
- Fixed an issue where an attempt to connect to the database would fail with `SSLV3_ALERT_CERTIFICATE_UNKNOWN`.
- Improved the diagnostic logging around setting invalid hint bits.
- Fixed an issue where autovacuum would incorrectly skip tables.
- Improved the logical replication prefetching.
- Fixed a durability issue in the GIN indexes.
- Fixed an issue to detect and cancel stuck major version upgrades.
- Fixed an issue in hash join that could lead to increased memory consumption.
- Improved the logical replication performance.
- Fixed an issue that causes database activity stream inconsistency when the monitoring agent is unavailable.
- Upgraded the GEOS version to 3.10.3.
- Updated the PostGIS extension to version 3.2.3.
- Fixed an issue with `st_orientedenvelope` that caused it to loop with a 1-D input to return 0.
- Fixed an issue where the connection to SQL Server using `tds_fdw` fails.

PostgreSQL 11.16 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 11.16. For more information about the improvements in PostgreSQL 11.16, see [PostgreSQL release 11.16](#).

Releases and patches

- [Aurora PostgreSQL 11.16.6, October 19, 2023](#)
- [Aurora PostgreSQL 11.16.5, December 14, 2022](#)
- [Aurora PostgreSQL 11.16.4, November 17, 2022](#)
- [Aurora PostgreSQL 11.16.3, October 13, 2022](#)
- [Aurora PostgreSQL 11.16.1, July 6, 2022](#)
- [Aurora PostgreSQL 11.16.0, June 9, 2022](#)

Aurora PostgreSQL 11.16.6, October 19, 2023

High priority stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-39417](#)
 - [CVE-2023-2455](#)
 - [CVE-2023-2454](#)
 - [CVE-2022-2625](#)

High priority enhancements

- Fixed an issue which blocked vacuum operations after the restart of an Aurora replica.
- Fixed an issue that would cause high CPU usage and prevent new connections.

General stability enhancements

- Fixed an issue which causes the stats collector process to repeatedly restart.
- Improved the scale times for Aurora Serverless v2.
- Fix a bug which can cause unavailability during ZDP.
- Fixed an issue preventing `pglogical` from logging conflicting rows during the apply phase.
- Fixed an issue where, in rare cases, the `aws_s3` extension could fail to import from an S3 bucket with a name containing dots.
- Provided options to configure the timeouts within the `aws_lambda` extension. By setting the following parameters, customers will now be able to change the connect and request timeouts for AWS Lambda integration:
 - `aws_lambda.connect_timeout_ms`.
 - `aws_lambda.request_timeout_ms`.
- Updated the `plv8`, `pl11`, and `plcoffee` extensions to version 2.3.15.
- Introduced diagnostics for transient metadata used for I/O.

Aurora PostgreSQL 11.16.5, December 14, 2022

General stability enhancements

- Fixed an issue where the engine experiences stability issues during database minor and patch release upgrades.
- Fixed an issue that causes database activity stream inconsistency when the monitoring agent is unavailable.
- Fixed an issue that could cause data inconsistency during replication.

Aurora PostgreSQL 11.16.4, November 17, 2022

High priority stability enhancements

- Fixed an issue that can cause increased network traffic when a writer instance transmits logs to a replica instance.

Aurora PostgreSQL 11.16.3, October 13, 2022

High priority stability enhancements

- Fixed a PLV8 issue where the base parameter doesn't get loaded properly into the memory.

General stability enhancements

- Fixed a bug where Aurora PostgreSQL can't file the relfilenode.
- Fixed a stuck scaling issue when the current scaling event times out.
- Upgraded the PostGIS extension to version 3.1.7.
- Fixed an issue where extended query messages might be lost during zero-downtime patching (ZDP) causing the extended query to hang after the ZDP completion.

Aurora PostgreSQL 11.16.1, July 6, 2022

Critical stability enhancements

- Fixed an issue that could cause periods of unavailability during a storage node restart.

High priority stability enhancements

- Fixed an error handling issue related to out-of-memory conditions which could result in brief periods of unavailability.
- Fixed an issue when the connection to SQL Server fails using the TDS_FDW extension to query a foreign table.
- Fixed an issue that caused connections using the provided root certificate to fail.
- Improved the diagnostic and supportability information in case of inconsistent B-tree index entries.

Aurora PostgreSQL 11.16.0, June 9, 2022

New features

- Added support for the `large object` module (extension). For more information, see [Managing large objects with the lo module](#).
- Added support for zero-downtime patching (ZDP) for minor version upgrades and patches. For more information, see [Minor release upgrades and zero-downtime patching](#) in the *Amazon Aurora User Guide*.

Critical updates

- Fixed a replay crash due to an LSN mismatch.
- Fixed the `aws_s3` extension to prevent invalid region injection.

High stability updates

- Fixed multiple issues related to out-of-memory conditions which could result in brief periods of unavailability.

General stability updates

- Fixed a lock contention crash during an Aurora Serverless v1 scaling event.
- Fixed an issue where logical replication becomes stuck after a restart.
- Fixed multiple issues that could lead to brief periods of unavailability.

- Fixed, during redo, an invalid page hit on the Generic Redo for `GENERIC_XLOG_FULL_PAGE_DATA`. This happens due to a timing hole between generating the log record and then writing the metadata for the record on the RW node and the RO node replays between those operations.
- Improved the query performance by supporting parallel workers.
- Upgraded the plugin `wal2json` version to 2.4.
- Upgraded the `pglogical` extension to version 2.4.1.

PostgreSQL 11.15 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 11.15. For more information about the improvements in PostgreSQL 11.15, see [PostgreSQL release 11.15](#).

Releases and patches

- [Aurora PostgreSQL 11.15.6, December 16, 2022](#)
- [Aurora PostgreSQL 11.15.4, July 18, 2022](#)
- [Aurora PostgreSQL 11.15.1, April 27, 2022](#)
- [Aurora PostgreSQL 11.15.0, March 29, 2022](#)

Aurora PostgreSQL 11.15.6, December 16, 2022

General enhancements

- Fixed an issue that can cause increased network traffic when a writer instance transmits logs to a replica instance.
- Fixed an issue that causes database activity stream inconsistency when the monitoring agent is unavailable.
- Updated the PostGIS extension to version 3.1.7.

Aurora PostgreSQL 11.15.4, July 18, 2022

Security enhancements

- Backpatched the PostgreSQL community fix for CVE-2022-1552: Autovacuum, REINDEX, and others omit "security restricted operation". For more information, see [CVE-2022-1552](#).

Critical enhancements

- Fixed an issue during a storage node restart that could result in periods of unavailability.

High stability enhancements

- Fixed an error handling issue related to out-of-memory conditions that could result in brief periods of unavailability.
- Fixed an issue related to the existence of duplicate relation files that could result in periods of unavailability.
- Fixed a defect where the validation of cached plans may lead to a database restart when the plan was previously invalidated.

Aurora PostgreSQL 11.15.1, April 27, 2022

High priority stability enhancements

- Fixed an issue that could cause incorrect WriteIOPS reporting in the AWS console.
- Fixed an issue that could cause unavailability after removal of a read node from a cluster.

General enhancements

- Fixed an issue that could cause an engine restart during periods of low free memory.

Aurora PostgreSQL 11.15.0, March 29, 2022

High priority stability enhancements

- Fixed multiple issues that may result in unavailability of a read node.
- Fixed an issue that may result in a read node being unable to replay WAL requiring the replication slot to be dropped and resynchronized.
- Fixed an issue that could cause excess storage use due to files not being properly closed.

General enhancements

- Fixed a small memory leak on read nodes when `commit_ts` is set.

- Fixed an issue that caused Performance Insights to show "Unknown wait event".
- Fixed an issue that could cause an import from Amazon S3 to fail when using the `aws_s3` extension.
- Fixed multiple issues that could result in periods of unavailability when using `apg_plan_mgmt`.
- Fixed multiple issues that could result in periods of unavailability when QPM is enabled.

PostgreSQL 11.14 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 11.14. For more information about the improvements in PostgreSQL 11.14, see [PostgreSQL release 11.14](#).

Releases and patches

- [Aurora PostgreSQL 11.14.7, August 24, 2023](#)
- [Aurora PostgreSQL 11.14.6, December 16, 2022](#)
- [Aurora PostgreSQL 11.14.4, July 20, 2022](#)
- [Aurora PostgreSQL 11.14.3, April 13, 2022](#)
- [Aurora PostgreSQL 11.14.1](#)
- [Aurora PostgreSQL 11.14.0](#)

Aurora PostgreSQL 11.14.7, August 24, 2023

General enhancements

- Fixed an issue which causes the stats collector process to repeatedly restart.
- Fixed an issue preventing `pglogical` from logging conflicting rows during the apply phase.

Aurora PostgreSQL 11.14.6, December 16, 2022

General enhancements

- Fixed an issue that can cause increased network traffic when a writer instance transmits logs to a replica instance.
- Fixed an issue that causes database activity stream inconsistency when the monitoring agent is unavailable.

- Updated the PostGIS extension to version 3.1.7.

Aurora PostgreSQL 11.14.4, July 20, 2022

Security enhancements

- Backpatched the PostgreSQL community fix for CVE-2022-1552: Autovacuum, REINDEX, and others omit "security restricted operation". For more information, see [CVE-2022-1552](#).

Critical enhancements

- Fixed an issue during a storage node restart that could result in periods of unavailability.

High stability enhancements

- Fixed an error handling issue related to out-of-memory conditions that could result in brief periods of unavailability.
- Fixed an issue related to the existence of duplicate relation files that could result in periods of unavailability.
- Fixed an issue that could cause excess storage use due to files not being properly closed.
- Fixed an issue that caused Performance Insights to show "Unknown wait event".

Aurora PostgreSQL 11.14.3, April 13, 2022

General enhancements

- Fixed a bug that could cause an engine restart during periods of low free memory.

Aurora PostgreSQL 11.14.1

Security enhancements

- Updated the PostGIS extension from version 3.1.4 to 3.1.5. This update contains a PostGIS fix for the vulnerability addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).

- Modified the `ip4r` extension to mitigate a security issue during create extension. The issue was originally disclosed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Modified the `pg_bigm` extension to mitigate a security issue during create extension. The issue was addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).

Aurora PostgreSQL 11.14.0

Critical stability enhancements

- Fixed a bug where logical replication may hang resulting in the replay falling behind on the read node. The instance may eventually restart.

Additional improvements and enhancements

- Fixed a buffer cache bug that could cause brief periods of unavailability.
- Fixed a bug in the `apg_plan_mgmt` extension where an index based plan was not being enforced.
- Fixed a bug in the `pg_logical` extension that could cause brief periods of unavailability due to improper handling of NULL arguments.
- Fixed an issue where orphaned files caused major version upgrades to fail.
- Fixed incorrect Aurora Storage Daemon log write metrics.
- Fixed multiple bugs that could result in WAL replay falling behind and eventually causing the reader instances to restart.
- Improved the Aurora buffer cache page validation on reads.
- Improved the Aurora storage metadata validation.
- Updated the `pg_hint_plan` extension to v1.3.7.
- For information about extensions and modules, see [Extensions supported for Aurora PostgreSQL 11](#).

PostgreSQL 11.13 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 11.13. For more information about the improvements in PostgreSQL 11.13, see [PostgreSQL release 11.13](#).

Releases and patches

- [Aurora PostgreSQL 11.13.6, December 19, 2022](#)
- [Aurora PostgreSQL 11.13.4, July 6, 2022](#)
- [Aurora PostgreSQL 11.13.3, June 6, 2022](#)
- [Aurora PostgreSQL 11.13.2, April 12, 2022](#)
- [Aurora PostgreSQL 11.13.1](#)
- [Aurora PostgreSQL 11.13.0](#)

Aurora PostgreSQL 11.13.6, December 19, 2022

General enhancements

- Fixed an issue that causes database activity stream inconsistency when the monitoring agent is unavailable.

Aurora PostgreSQL 11.13.4, July 6, 2022

Security enhancements

- Backpatched the PostgreSQL community fix for CVE-2022-1552: Autovacuum, REINDEX, and others omit "security restricted operation". For more information, see [CVE-2022-1552](#).

General enhancements

- Fixed an error handling issue related to out-of-memory conditions which could result in brief periods of unavailability.
- Fixed an issue that could cause excess storage use due to files not being properly closed.
- Fixed an issue that could cause Performance Insights to display "Unknown wait event".
- Fixed an issue that could result in periods of unavailability due to the existence of duplicate relation files.

Aurora PostgreSQL 11.13.3, June 6, 2022

Security enhancements

- Backpatched the PostgreSQL community fix for CVE-2022-1552: Autovacuum, REINDEX, and others omit "security restricted operation". For more information, see [CVE-2022-1552](#).

High priority stability updates

- Fixed an issue that can cause a restart of the postmaster process in Amazon Aurora Serverless v1.
- Fixed an issue that can cause a restart of the Aurora Runtime process in Amazon Aurora Serverless v1.

General enhancements

- Fixed a memory leak in the Aurora Runtime that could lead to an out-of-memory condition.

Aurora PostgreSQL 11.13.2, April 12, 2022

General enhancements

- Fixed a buffer cache bug that could cause brief periods of unavailability.

Aurora PostgreSQL 11.13.1

Security enhancements

- Updated the PostGIS extension from version 3.1.4 to 3.1.5. This update contains a PostGIS fix for the vulnerability addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Modified the ip4r extension to mitigate a security issue during create extension. The issue was originally disclosed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Modified the pg_bigm extension to mitigate a security issue during create extension. The issue was addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).

Aurora PostgreSQL 11.13.0

Critical stability enhancements

- Fixed an issue where, in rare circumstances, a data cache of a read node may be inconsistent following a restart of that node.

High priority stability enhancements

- Fixed an issue where queries may become unresponsive due to I/O resource exhaustion triggered by prefetch.
- Fixed an issue where Aurora may flag an issue following a major version update with the message: "PANIC: could not access status of next transaction id xxxxxxxx".

Additional improvements and enhancements

- Fixed an issue where read nodes restart due to a replication origin cache lookup failure.
- Fixed an issue where read queries may time out on read nodes during the replay of lazy truncation triggered by vacuum on the write node.
- Fixed an issue that causes Performance Insights to incorrectly set the backend type of a database connection.
- Fixed an issue where the `aurora_postgres_replica_status` function returned stale or lagging CPU stats.
- Fixed an issue where, in rare cases, an Aurora Global Database secondary mirror cluster may restart due to a stall in the log apply process.
- Fixed an issue with the `apg_plan_mgmt` extension where the planning and execution times were reported as 0.
- Removed support for the DES, 3DES, and RC4 cipher suites.
- Updated PostGIS extension to version 3.1.4.
- Added support for `postgis_raster` extension version 3.1.4.

PostgreSQL 11.12, Aurora PostgreSQL 3.6 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 11.12. For more information about the improvements in PostgreSQL 11.12, see [PostgreSQL release 11.12](#).

Releases and patches

- [Aurora PostgreSQL 11.12.5, December 30, 2022](#)
- [Aurora PostgreSQL 11.12.4, July 14, 2022](#)
- [Aurora PostgreSQL 3.6.2](#)
- [Aurora PostgreSQL 3.6.1](#)
- [Aurora PostgreSQL 3.6.0](#)

Aurora PostgreSQL 11.12.5, December 30, 2022

General enhancements

- Fixed an issue that causes database activity stream inconsistency when the monitoring agent is unavailable.

Aurora PostgreSQL 11.12.4, July 14, 2022

Security enhancements

- Backpatched the PostgreSQL community fix for CVE-2022-1552: Autovacuum, REINDEX, and others omit "security restricted operation". For more information, see [CVE-2022-1552](#).

High priority stability enhancements

- Fixed an error handling issue related to out-of-memory conditions which could result in brief periods of unavailability.
- Fixed an issue that could cause excess storage use due to files not being properly closed.
- Fixed an issue that caused Performance Insights to show "Unknown wait event".

Aurora PostgreSQL 3.6.2

Security enhancements

- Modified the pg_bigm extension to mitigate a security issue during create extension. The issue was addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).

- Modified the `ip4r` extension to mitigate a security issue during create extension. The issue was originally disclosed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Backpatched the PostgreSQL community fix for CVE-2021-3677: "Memory disclosure in certain queries". [CVE-2020-14350](#)
- Backpatched `postgis` to PostGIS 2.5.2. This is a PostGIS fix for the vulnerability addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).

Aurora PostgreSQL 3.6.1

Critical stability enhancements

- Fixed an issue where, in rare circumstances, a data cache of a read node may be inconsistent following a restart of that node.

High priority stability enhancements

- Fixed an issue where queries may become unresponsive due to I/O resource exhaustion triggered by prefetch.
- Fixed an issue where Aurora may flag an issue following a major version update with the message: "PANIC: could not access status of next transaction id xxxxxxxx".
- Fixed multiple issues in the Aurora storage daemon that could lead to brief periods of unavailability when specific network configurations are used.
- Fixed an out-of-memory crash issue with Aurora storage daemon that leads to writer node restart. This also reduces the overall system memory consumption.

Additional improvements and enhancements

- Fixed an issue where read nodes restart due to a replication origin cache lookup failure.
- Fixed an issue with the `apg_plan_mgmt` extension where planning and execution time were reported as 0.
- Fixed an issue that causes Performance Insights to incorrectly set the backend type of a database connection.
- Fixed an issue where in rare cases, an Aurora Global Database secondary mirror cluster may restart due to a stall in the log apply process.

- Fixed an issue where orphaned files caused failed translations in read codepaths during or after major version upgrade.
- Fixed multiple issues in the Aurora storage daemon that could lead to brief periods of unavailability when specific network configurations are used.
- Fixed an out-of-memory crash issue with Aurora storage daemon that leads to writer node restart. This also reduces the overall system memory consumption.

Aurora PostgreSQL 3.6.0

High priority stability enhancements

- Fixed an issue where creating a database from an existing template database with tablespace resulted in an error with the message `ERROR: could not open file pg_tblspc/...: No such file or directory`.
- Fixed an issue where, in rare cases, an Aurora replica may be unable to start when a large number of PostgreSQL subtransactions (i.e. SQL savepoints) have been used.
- Fixed an issue where, in rare circumstances, read results may be inconsistent for repeated read requests on replica nodes.

Additional improvements and enhancements

- Upgraded OpenSSL to 1.1.1k.
- Reduced CPU usage and memory consumption of the WAL apply process on Aurora replicas for some workloads.
- Improved metadata protection from accidental erasure.
- Improved safety checks in the write path to detect incorrect writes to metadata.
- Improved security by removing 3DES and other older ciphers for SSL/TLS connections.
- Fixed an issue where a duplicate file entry can prevent the Aurora PostgreSQL engine from starting up.
- Fixed an issue that could cause temporary unavailability under heavy workloads.
- Added back ability to use a leading forward slash in the Amazon S3 path during S3 import.
- Updated the `orafce` extension to version 3.16.

PostgreSQL 11.11, Aurora PostgreSQL 3.5 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 11.11. For more information about the improvements in PostgreSQL 11.11, see [PostgreSQL release 11.11](#).

Releases and patches

- [Aurora PostgreSQL 3.5.1](#)
- [Aurora PostgreSQL 3.5.0](#)

Aurora PostgreSQL 3.5.1

Security enhancements

- Modified the `pg_bigm` extension to mitigate a security issue during create extension. The issue was addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Modified the `ip4x` extension to mitigate a security issue during create extension. The issue was originally disclosed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Backpatched the PostgreSQL community fix for CVE-2021-3677: “Memory disclosure in certain queries”. For more information, see [CVE-2021-3677](#)
- Backpatched [postgis](#) to PostGIS 2.5.2. This is a PostGIS fix for the vulnerability addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Backpatched an input validation error in the `log_fdw` extension function parameters.

Aurora PostgreSQL 3.5.0

New features

- Added support for the following extensions:
 - The `pg_proctab` extension version 0.0.9
 - The `pg_bigm` extension version 1.2

High priority stability enhancements

- Fixed a bug where in rare cases a reader had inconsistent results when it restarted while a transaction with more than 64 subtransactions was being processed.
- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2021-32027](#)
 - [CVE-2021-32028](#)
 - [CVE-2021-32029](#)

Additional improvements and enhancements

- Fixed a bug where the database could not be started when there were many relations in memory-constrained environments.
- Fixed a bug in the `apg_plan_mgmt` extension that could cause brief periods of unavailability due to an internal buffer overflow.
- Fixed a bug on reader nodes that could cause brief periods of unavailability during WAL replay.
- Fixed a bug in the `rds_activity_stream` extension that caused an error during startup when attempting to log audit events.
- Fixed bugs in the `aurora_replica_status` function where rows were sometimes partially populated and some values such as Replay Latency, and CPU usage were always 0.
- Fixed a bug where the database engine would attempt to create shared memory segments larger than the instance total memory and fail repeatedly. For example, attempts to create 128 GiB shared buffers on a `db.r5.large` instance would fail. With this change, requests for total shared memory allocations larger than the instance memory allow setting the instance to incompatible parameters.
- Added logic to clean up unnecessary `pg_wal` temporary files on a database startup.
- Fixed a bug that reported `ERROR: rds_activity_stream stack item 2 not found on top - cannot pop` when attempting to create the `rds_activity_stream` extension.
- Fixed a bug that could cause the error failed to build any 3-way joins in a correlated IN subquery under an EXISTS subquery.
- Backported the following performance improvement from the PostgreSQL community: [pg_stat_statements: add missing check for pgss_enabled\(\)](#).
- Fixed a bug that could cause brief periods of unavailability due to running out of memory when creating the `postgis` extension with `pgAudit` enabled.

- Fixed a bug when using outbound logical replication to synchronize changes to another database that could fail with an error message like ERROR: could not map filenode "base/16395/228486645" to relation OID.
- Fixed a bug that could cause a brief period of unavailability when canceling a transaction.
- Fixed a bug where the `rds_ad` role wasn't created after upgrading from a version of Aurora PostgreSQL that doesn't support Microsoft Active Directory authentication.
- Added btree page checks to detect tuple metadata inconsistency.
- Fixed a bug in asynchronous buffer reads that could cause brief periods of unavailability on reader nodes during WAL replay.

PostgreSQL 11.9, Aurora PostgreSQL 3.4

This release of Aurora PostgreSQL is compatible with PostgreSQL 11.9. For more information about the improvements in PostgreSQL 11.9, see [PostgreSQL release 11.9](#).

Releases and patches

- [Aurora PostgreSQL 11.9.11, March 13, 2024](#)
- [Aurora PostgreSQL 11.9.9, December 27, 2023](#)
- [Aurora PostgreSQL 3.4.8, October 10, 2023](#)
- [Aurora PostgreSQL 3.4.7, December 22, 2022](#)
- [Aurora PostgreSQL 3.4.6, July 8, 2022](#)
- [Aurora PostgreSQL 3.4.5](#)
- [Aurora PostgreSQL 3.4.3](#)
- [Aurora PostgreSQL 3.4.2](#)
- [Aurora PostgreSQL 3.4.1](#)
- [Aurora PostgreSQL 3.4.0](#)

Aurora PostgreSQL 11.9.11, March 13, 2024

General stability enhancements

- Allow `rds_superuser` to terminate backends which are not explicitly associated with a role.
- Upgraded PLV8 extension to version 2.3.15.

High priority stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2024-0985](#)

Critical stability enhancements

- Fixed an issue related to `apg_plan_mgmt`.
- Fixed an issue where active transactions during slot creation may be partially replicated by the slot.
- Fixed a deadlock issue in Aurora storage which can result in writer failover.

Aurora PostgreSQL 11.9.9, December 27, 2023

Critical stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-5870](#)
 - [CVE-2023-5869](#)
 - [CVE-2023-5868](#)

General stability enhancements

- Fixed an issue with logical replication actions being performed by someone other than the table owner

Aurora PostgreSQL 3.4.8, October 10, 2023

High priority stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2023-39417](#)
 - [CVE-2023-2455](#)
 - [CVE-2023-2454](#)
 - [CVE-2022-2625](#)

Aurora PostgreSQL 3.4.7, December 22, 2022

General enhancements

- Fixed an issue that causes database activity stream inconsistency when the monitoring agent is unavailable.

Aurora PostgreSQL 3.4.6, July 8, 2022

Security enhancements

- Backpatched the PostgreSQL community fix for CVE-2022-1552: Autovacuum, REINDEX, and others omit "security restricted operation". For more information, see [CVE-2022-1552](#).

Aurora PostgreSQL 3.4.5

Security enhancements

- Modified the `ip4r` extension to mitigate a security issue during create extension. The issue was originally disclosed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Backpatched the PostgreSQL community fix for CVE-2021-3677: "Memory disclosure in certain queries". For more information, see [CVE-2021-3677](#)
- Backpatched the PostgreSQL community fix for CVE-2021-3393: "Partition constraint violation errors leak values of denied columns". For more information, see [CVE-2021-3393](#)
- Backpatched [postgis](#) to PostGIS 2.5.2. This is a PostGIS fix for the vulnerability addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Backpatched an input validation error in the `log_fdw` extension function parameters.

Aurora PostgreSQL 3.4.3

High priority stability enhancements

- Provided a patch for PostgreSQL community security issues CVE-2021-32027, CVE-2021-32028 and CVE-2021-32029.

Additional improvements and enhancements

- Fixed a bug in the `aws_s3` extension to allow import of objects with leading forward slashes in the object identifier.
- Fixed a bug in the `rds_activity_stream` extension that caused an error during startup when attempting to log audit events.
- Fixed a bug that returned an `ERROR` when attempting to create the `rds_activity_stream` extension.
- Fixed a bug that could cause brief periods of unavailability due to running out of memory when creating the `postgis` extension with `pgAudit` enabled.
- Fixed multiple issues in the Aurora storage daemon that could lead to brief periods of unavailability when specific network configurations are used.

Aurora PostgreSQL 3.4.2

High priority stability enhancements

- Fixed a bug where in rare cases a reader had inconsistent results when it restarted while a transaction with more than 64 subtransactions was being processed.

Additional improvements and enhancements

- Fixed a bug that could lead to intermittent unavailability due to a race condition when handling responses from storage nodes.
- Fixed a bug that could lead to intermittent unavailability due to the rotation of network encryption keys.
- Fixed a bug that could lead to intermittent unavailability due to heat management of the underlying storage segments.
- Fixed a bug where a large S3 import with thousands of clients can cause one or more of the import clients to stop responding.
- Removed a restriction that prevented setting configuration variable strings that contained `brazil`.
- Fixed a bug that could lead to intermittent unavailability if a reader node runs a query that access many tables while the writer node is acquiring exclusive locks on all of the same tables.

Aurora PostgreSQL 3.4.1

Critical stability enhancements

- Fixed a bug that caused a read replica to unsuccessfully restart repeatedly in rare cases.
- Fixed a bug where a cluster became unavailable when attempting to create more than 16 read replicas or Aurora global database secondary AWS Regions. The cluster became available again when the new read replica or secondary AWS Region was removed.

Additional improvements and enhancements

- Fixed a bug that when under heavy load, snapshot import, COPY import, or S3 import stopped responding in rare cases.
- Fixed a bug where a read replica might not join the cluster when the writer was very busy with a write-intensive workload.
- Fixed a bug where a cluster could be unavailable briefly when a high-volume S3 import was running.
- Fixed a bug that caused a cluster to take several minutes to restart if a logical replication stream was terminated while handling many complex transactions.
- Disallowed the use of both IAM and Kerberos authentication for the same user.

Aurora PostgreSQL 3.4.0

New features

- Aurora PostgreSQL now supports invocation of AWS Lambda functions. This includes the new `aws_lambda` extension. For more information, see [Invoking an AWS Lambda function from an Aurora PostgreSQL DB cluster](#) in the *Amazon Aurora User Guide*.
- The `db.r6g` instance classes are now available in preview for Aurora. For more information, see [Aurora DB instance classes](#) in the *Amazon Aurora User Guide*.

Critical stability enhancements

- None

High priority stability enhancements

- Fixed a bug in Aurora PostgreSQL replication that could result in the error message `ERROR: MultiXactId nnnn has not been created yet -- apparent wraparound`.
- Fixed a bug where in some cases, DB clusters that have logical replication enabled did not remove truncated WAL segment files from storage. This resulted in volume size growth.
- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2020-25694](#)
 - [CVE-2020-25695](#)
 - [CVE-2020-25696](#)
- Fixed a bug in the `pg_stat_statements` extension that caused excessive CPU consumption.

Additional improvements and enhancements

- You can now use `pg_replication_slot_advance` to advance a logical replication slot for the roles `rds_replication` and `rds_superuser`.
- Improved the asynchronous mode performance of database activity streams.
- Reduced the delay when publishing to CloudWatch the `rpo_lag_in_msec` metric for Aurora global database clusters.
- Aurora PostgreSQL no longer falls behind on a read node when the backend is blocked writing to the database client.
- Fixed a bug that in rare cases caused a brief period of unavailability on a read replica when the storage volume grew.
- Fixed a bug when creating a database that could return the following: `ERROR: could not create directory on local disk`
- Updated data grid files to fix errors or incorrect transformation results from the `ST_Transform` method of the `PostGIS` extension.
- Fixed a bug where in some cases replaying `XLOG_BTREE_REUSE_PAGE` records on Aurora reader instances caused unnecessary replay lag.
- Fixed a small memory leak in a b-tree index that could lead to an out of memory condition.
- Fixed a bug in the `GiST` index that could result in an out of memory condition after promoting an Aurora read replica.

- Fixed an S3 import bug that reported ERROR: HTTP 403. Permission denied when importing data from a file inside an S3 subfolder.
- Fixed a bug in the `aws_s3` extension for pre-signed URL handling that could result in the error message S3 bucket names with a period (.) are not supported.
- Fixed a bug in the `aws_s3` extension where an import might be blocked indefinitely if an exclusive lock was taken on the relation prior to beginning the operation.
- Fixed a bug related to replication when Aurora PostgreSQL is acting as a physical replica of an RDS for PostgreSQL instance that uses GiST indexes. In rare cases, this bug caused a brief period of unavailability after promoting the Aurora cluster.
- Fixed a bug in database activity streams where customers were not notified of the end of an outage.
- Updated the `pg_audit` extension to version 1.3.1.

PostgreSQL 11.8, Aurora PostgreSQL 3.3 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 11.8. For more information about the improvements in PostgreSQL 11.8, see [PostgreSQL release 11.8](#).

Releases and patches

- [Aurora PostgreSQL release 3.3.2](#)
- [Aurora PostgreSQL 3.3.1](#)
- [Aurora PostgreSQL 3.3.0](#)

Aurora PostgreSQL release 3.3.2

Critical stability enhancements

- None

High priority stability enhancements

- Fixed a bug in Aurora PostgreSQL replication that could result in the error message ERROR: MultiXactId nnnn has not been created yet -- apparent wraparound.
- Fixed a bug where in some cases, DB clusters that have logical replication enabled did not remove truncated WAL segment files from storage. This resulted in volume size growth.

- Fixed an issue with creating a global database cluster in a secondary region.
- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2020-25694](#)
 - [CVE-2020-25695](#)
 - [CVE-2020-25696](#)
- Fixed a bug in the `pg_stat_statements` extension that caused excessive CPU consumption.

Additional improvements and enhancements

- Aurora PostgreSQL no longer falls behind on a read node when the backend is blocked writing to the database client.
- Reduced the delay when publishing to CloudWatch the `rpo_lag_in_msec` metric for Aurora global database clusters.
- Fixed a bug where a `DROP DATABASE` statement didn't remove any relation files.
- Fixed a bug where in some cases replaying `XLOG_BTREE_REUSE_PAGE` records on Aurora reader instances caused unnecessary replay lag.
- Fixed a small memory leak in a b-tree index that could lead to an out of memory condition.
- Fixed a bug in the `aurora_replica_status()` function where the `server_id` field was sometimes truncated.
- Fixed a bug where a log record was incorrectly processed causing the Aurora replica to crash.
- Fixed an S3 import bug that reported `ERROR: HTTP 403. Permission denied` when importing data from a file inside an S3 subfolder.
- You can now use `pg_replication_slot_advance` to advance a logical replication slot for the roles `rds_replication` and `rds_superuser`.
- Improved performance of the asynchronous mode for database activity streams.
- Fixed a bug in the `aws_s3` extension that could result in the error message `S3 bucket names with a period (.) are not supported`.
- Fixed a race condition that caused valid imports to intermittently fail.
- Fixed a bug related to replication when Aurora PostgreSQL is acting as a physical replica of an RDS for PostgreSQL instance that uses GiST indexes. In rare cases, this bug caused a brief period of unavailability after promoting the Aurora DB cluster.
- Fixed a bug in the `aws_s3` extension where an import may be blocked indefinitely if an exclusive lock was taken on the relation prior to beginning the operation.

Aurora PostgreSQL 3.3.1

You can find the following improvements in this release.

Critical stability enhancements

1. Fixed a bug that appears when the NOT EXISTS operator incorrectly returns TRUE, which can only happen when the following unusual set of circumstances occurs:
 - A query is using the NOT EXISTS operator.
 - The column or columns being evaluated against the outer query in the NOT EXISTS subquery contain a NULL value.
 - There isn't a another predicate in the subquery that removes the need for the evaluation of the NULL values.
 - The filter used in the subquery does not use an index seek for its execution.
 - The operator isn't converted to a join by the query optimizer.

Aurora PostgreSQL 3.3.0

New features

- Added support for the RDKit extension version 3.8.

The RDKit extension provides modeling functions for cheminformatics. Cheminformatics is storing, indexing, searching, retrieving, and applying information about chemical compounds. For example, with the RDKit extension you can construct models of molecules, search for molecular structures, and read or create molecules in various notations. You can also perform research on data loaded from the [ChEMBL website](#) or a SMILES file. The Simplified Molecular Input Line Entry System (SMILES) is a typographical notation for representing molecules and reactions. For more information, see [The RDKit database cartridge](#) in the RDKit documentation.

- Added support for a minimum TLS version

Support for a minimum Transport Layer Security (TLS) version is back ported from PostgreSQL 12. It allows the Aurora PostgreSQL server to constrain the TLS protocols with which a client is allowed to connect via two new PostgreSQL parameters. These parameters include [ssl_min_protocol_version](#) and [ssl_max_protocol_version](#). For example, to limit client connections to the Aurora PostgreSQL server to at least TLS 1.2 protocol version, set the `ssl_min_protocol_version` to `TLSv1.2`.

- Added support for the `pglogical` extension version 2.2.2.

The `pglogical` extension is a logical streaming replication system that provides additional features beyond what's available in PostgreSQL native logical replication. Features include conflict handling, row filtering, DDL/sequence replication and delayed apply. You can use the `pglogical` extension to set up replication between Aurora PostgreSQL clusters, between RDS for PostgreSQL and Aurora PostgreSQL, and with PostgreSQL databases running outside of RDS.

- Aurora dynamically resizes your cluster storage space. With dynamic resizing, the storage space for your Aurora DB cluster automatically decreases when you remove data from the DB cluster. For more information, see [Storage scaling](#) in the *Amazon Aurora User Guide*.

Note

The dynamic resizing feature is being deployed in phases to the AWS Regions where Aurora is available. Depending on the Region where your cluster is, this feature might not be available yet. For more information, see [the What's New announcement](#).

Critical stability enhancements

- Fixed a bug related to heap page extend that in rare cases resulted in longer recovery time and impacted availability.

High priority stability enhancements

- Fixed a bug in Aurora Global Database that could cause delays in upgrading the database engine in a secondary AWS Region. For more information, see [Using Amazon Aurora global databases](#) in the *Amazon Aurora User Guide*.
- Fixed a bug that in rare cases caused delays in upgrading a database to engine version 11.8.

Additional improvements and enhancements

- Fixed a bug where the Aurora replica crashed when workloads with heavy subtransactions are made on the writer instance.
- Fixed a bug where the writer instance crashed due to a memory leak and the depletion of memory used to track active transactions.

- Fixed a bug that lead to a crash due to improper initialization when there is no free memory available during PostgreSQL backend startup.
- Fixed a bug where an Aurora PostgreSQL Serverless DB cluster might return the following error after a scaling event: ERROR: prepared statement "S_6" already exists.
- Fixed an out-of-memory problem when issuing the CREATE EXTENSION command with PostGIS when Database Activity Streams is enabled.
- Fixed a bug where a SELECT query might incorrectly return the error Attempting to read past EOF of relation rrrr. blockno=bbb nblocks=nnn.
- Fixed a bug where the database might be unavailable briefly due to error handling in database storage growth.
- Fixed a bug in Aurora PostgreSQL Serverless where queries that executed on previously idle connections got delayed until the scale operation completed.
- Fixed a bug where an Aurora PostgreSQL DB cluster with Database Activity Streams enabled might report the beginning of a potential loss window for activity records, but does not report the restoration of connectivity.
- Fixed a bug with the `aws_s3.table_import_from_s3` function where a COPY from S3 failed with the error HTTP error code: 248. For more information, see [aws_s3.table_import_from_s3](#) in the *Amazon Aurora User Guide*.

PostgreSQL 11.7, Aurora PostgreSQL 3.2 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 11.7. For more information about the improvements in PostgreSQL 11.7, see [PostgreSQL release 11.7](#).

Releases and patches

- [Aurora PostgreSQL 3.2.7](#)
- [Aurora PostgreSQL 3.2.6](#)
- [Aurora PostgreSQL 3.2.4](#)
- [Aurora PostgreSQL 3.2.3](#)
- [Aurora PostgreSQL 3.2.2](#)
- [Aurora PostgreSQL 3.2.1](#)

Aurora PostgreSQL 3.2.7

You can find the following improvements in this release.

Critical stability enhancements

- None

High priority stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2020-25694](#)
 - [CVE-2020-25695](#)
 - [CVE-2020-25696](#)

Additional improvements and enhancements

- None

Aurora PostgreSQL 3.2.6

You can find the following improvements in this release.

Critical stability enhancements

- None

High priority stability enhancements

- Fixed a bug in Aurora PostgreSQL replication that might result in the error message, ERROR: MultiXactId nnnn has not been created yet -- apparent wraparound.

Additional improvements and enhancements

- Fixed a bug that in rare cases caused brief read replica unavailability when storage volume grew.
- Aurora PostgreSQL Serverless now supports execution of queries on all connections during a scale event.

- Fixed a bug in Aurora PostgreSQL Serverless where a leaked lock resulted in a prolonged scale event.
- Fixed a bug where the `aurora_replica_status` function showed truncated server identifiers.
- Fixed a bug in Aurora PostgreSQL Serverless where connections being migrated during a scale event disconnected with the message: "ERROR: could not open relation with OID"
- Fixed a small memory leak in a b-tree index that could lead to an out of memory condition.
- Fixed a bug in a GiST index that might result in an out-of-memory condition after promoting an Aurora Read Replica.
- Improved performance for Database Activity Streams.
- Fixed a bug in Database Activity Streams where customers were not notified when an outage ended.
- Fixed a bug in the `aws_s3` extension for pre-signed URL handling that could have resulted in the error message S3 bucket names with a period (.) are not supported.
- Fixed a bug in the `aws_s3` extension where incorrect error handling could lead to failures during the import process.
- Fixed a bug in the `aws_s3` extension where an import may be blocked indefinitely if an exclusive lock was taken on the relation prior to beginning the operation.

Aurora PostgreSQL 3.2.4

You can find the following improvements in this release.

Critical stability enhancements

1. Fixed a bug that appears when the `NOT EXISTS` operator incorrectly returns `TRUE`, which can only happen when the following unusual set of circumstances occurs:
 - A query is using the `NOT EXISTS` operator.
 - The column or columns being evaluated against the outer query in the `NOT EXISTS` subquery contain a `NULL` value.
 - There isn't a another predicate in the subquery that removes the need for the evaluation of the `NULL` values.
 - The filter used in the subquery does not use an index seek for its execution.
 - The operator isn't converted to a join by the query optimizer.

Aurora PostgreSQL 3.2.3

You can find the following improvements in this release.

Critical stability enhancements

- None

High priority stability enhancements

- None

Additional improvements and enhancements

- Fixed a bug in Aurora PostgreSQL Serverless where queries that ran on previously idle connections got delayed until the scale operation completed.
- Fixed a bug that might cause brief unavailability for heavy subtransaction workloads when multiple reader instances restart or rejoin the cluster.

Aurora PostgreSQL 3.2.2

You can find the following improvements in this release.

Critical stability enhancements

- Fixed a bug related to heap page extend that in rare cases resulted in longer recovery time and impacted availability.

High priority stability enhancements

- Fixed a bug in Aurora Global Database that could cause delays in upgrading the database engine in a secondary region. For more information, see [Using Amazon Aurora global databases](#) in the *Amazon Aurora User Guide*.
- Fixed a bug that in rare cases caused delays in upgrading a database to engine version 11.7.

Additional improvements and enhancements

- Fixed a bug where the database might be unavailable briefly due to error handling in database storage growth.
- Fixed a bug where a SELECT query might incorrectly return the error, Attempting to read past EOF of relation rrrr. blockno=bbb nblocks=nnn.
- Fixed a bug where an Aurora PostgreSQL Serverless DB cluster might return the following error after a scaling event: ERROR: prepared statement "S_6" already exists.

Aurora PostgreSQL 3.2.1

New features

- Added support for Amazon Aurora PostgreSQL Global Database. For more information, see [Using Amazon Aurora global databases](#) in the *Amazon Aurora User Guide*.
- Added the ability to configure the recovery point objective (RPO) of a global database for Aurora PostgreSQL. For more information, see [Managing RPOs for Aurora PostgreSQL-based global databases](#) in the *Amazon Aurora User Guide*.

You can find the following improvements in this release.

Critical stability enhancements

None.

High priority stability enhancements

- Improved performance and availability of read instances when applying DROP TABLE and TRUNCATE TABLE operations.
- Fixed a small but continuous memory leak in a diagnostic module that could lead to an out-of-memory condition on smaller DB instance types.
- Fixed a bug in the PostGIS extension which could lead to a database restart. This has been reported to the PostGIS community as <https://trac.osgeo.org/postgis/ticket/4646>.
- Fixed a bug where read requests might stop responding due to incorrect error handling in the storage engine.

- Fixed a bug that fails for some queries and results in the message `ERROR: found xmin xxxxxx from before relfrozenxid yyyyyyy`. This could occur following the promotion of a read instance to a write instance.
- Fixed a bug where an Aurora serverless DB cluster might crash while rolling back a scale attempt.

Additional improvements and enhancements

- Improved performance for queries that read many rows from storage.
- Improved performance and availability of reader DB instances during heavy read workload.
- Enabled correlated IN and NOT IN subqueries to be transformed to joins when possible.
- Improved the filtering estimation for enhanced semi-join filter pushdown by using multi-column statistics or indexes when available.
- Improved read performance of the `pg_prewarm` extension.
- Fixed a bug where an Aurora serverless DB cluster might report the message `ERROR: incorrect binary data format in bind parameter ...` following a scale event.
- Fixed a bug where a serverless DB cluster might report the message `ERROR: insufficient data left in message` following a scale event.
- Fixed a bug where an Aurora serverless DB cluster can experience prolonged or failed scale attempts.
- Fixed a bug that resulted in the message `ERROR: could not create file "base/xxxxxx/yyyyyy" as a previous version still exists on disk: Success`. Please contact AWS customer support. This can occur during object creation after PostgreSQL's 32-bit object identifier has wrapped around.
- Fixed a bug where the write-ahead-log (WAL) segment files for PostgreSQL logical replication were not deleted when changing the `wal_level` value from `logical` to `replica`.
- Fixed a bug in the `pg_hint_plan` extension where a multi-statement query could lead to a crash when `enable_hint_table` is enabled. This is tracked in the PostgreSQL community as https://github.com/osscc-db/pg_hint_plan/issues/25.
- Fixed a bug where JDBC clients might report the message `java.io.IOException: Unexpected packet type: 75` following a scale event in an Aurora serverless DB cluster.
- Fixed a bug in PostgreSQL logical replication that resulted in the message `ERROR: snapshot reference is not owned by resource owner TopTransaction`.
- Changed the following extensions:
 - Updated `orafce` to version 3.8

- Updated pgTAP to version 1.1
- Provided support for fault injection queries.

PostgreSQL 11.6, Aurora PostgreSQL 3.1 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 11.6. For more information about the improvements in PostgreSQL 11.6, see [PostgreSQL release 11.6](#).

This release contains multiple critical stability enhancements. Amazon highly recommends upgrading your Aurora PostgreSQL clusters that use older PostgreSQL 11 engines to this release.

Releases and patches

- [Aurora PostgreSQL 3.1.4](#)
- [Aurora PostgreSQL 3.1.3](#)
- [Aurora PostgreSQL 3.1.2](#)
- [Aurora PostgreSQL 3.1.1](#)
- [Aurora PostgreSQL 3.1.0](#)

Aurora PostgreSQL 3.1.4

You can find the following improvements in this release.

Critical stability enhancements

- None

High priority stability enhancements

- Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2020-25694](#)
 - [CVE-2020-25695](#)
 - [CVE-2020-25696](#)

Additional improvements and enhancements

- None

Aurora PostgreSQL 3.1.3

New features

- Aurora PostgreSQL now supports the PostgreSQL [vacuum_truncate](#) storage parameter to manage vacuum truncation for specific tables. Set this [storage parameter](#) to false for a table to prevent the [VACUUM](#) SQL command from truncating the table's trailing empty pages.

Critical stability enhancements

- None

High priority stability enhancements

- Fixed a bug where reads from storage might stop responding due to incorrect error handling.

Additional improvements and enhancements

- None

Aurora PostgreSQL 3.1.2

This release contains a critical stability enhancement. Amazon highly recommends updating your older Aurora PostgreSQL 11-compatible clusters to this release.

Critical stability enhancements

- Fixed a bug in which a reader DB instance might temporarily use stale data. This could lead to wrong results such as too few or too many rows. This error is not persisted on storage, and will clear when the database page containing the row has been evicted from cache. This can happen when the primary DB instance enters a transaction snapshot overflow due to having more than 64 subtransactions in a single transaction. Applications susceptible to this bug include those that use SQL savepoints or PostgreSQL exception handlers with more than 64 subtransactions in the top transaction.

High priority stability enhancements

- Fixed a bug that might cause a reader DB instance to crash causing unavailability while attempting to join the DB cluster. This can happen in some cases when the primary DB instance has a transaction snapshot overflow due to a high number of subtransactions. In this situation the reader DB instance will be unable to join until the snapshot overflow has cleared.

Additional improvements and enhancements

- Fixed a bug that prevented Performance Insights from determining the query ID of a running statement.

Aurora PostgreSQL 3.1.1

You can find the following improvements in this release.

Critical stability enhancements

- Fixed a bug in which the DB instance might be briefly unavailable due to the self-healing function of the underlying storage.

High priority stability enhancements

- Fixed a bug in which the database engine might crash causing unavailability. This occurred while scanning an included, non-key column of a B-Tree index. This only applies to PostgreSQL 11 "included column" indexes.
- Fixed a bug that might cause the database engine to crash causing unavailability. This occurred if a newly established database connection encountered a resource exhaustion-related error during initialization after successful authentication.

Additional improvements and enhancements

- Provided a fix for the `pg_hint_plan` extension that could lead the database engine to crash causing unavailability. The open source issue can be tracked at https://github.com/ossdb/pg_hint_plan/pull/45.
- Fixed a bug where SQL of the form `ALTER FUNCTION ... OWNER TO ...` incorrectly reported `ERROR: improper qualified name (too many dotted names)`.

- Improved the performance of GIN index vacuum via prefetching.
- Fixed a bug in open source PostgreSQL that could lead to a database engine crash causing unavailability. This occurred during parallel B-Tree index scans. This issue has been reported to the PostgreSQL community.
- Improved the performance of in-memory B-Tree index scans.

Aurora PostgreSQL 3.1.0

You can find the following new features and improvements in this engine version.

New features

1. Support for exporting data to Amazon S3. For more information, see [Exporting data from an Aurora PostgreSQL DB cluster to Amazon S3](#) in the *Amazon Aurora User Guide*.
2. Support for Amazon Aurora Machine Learning. For more information, see [Using machine learning \(ML\) with Aurora PostgreSQL](#) in the *Amazon Aurora User Guide*.
3. SQL processing enhancements include:
 - Optimizations for NOT IN with the `apg_enable_not_in_transform` parameter.
 - Semi-join filter pushdown enhancements for hash joins with the `apg_enable_semijoin_push_down` parameter.
 - Optimizations for redundant inner join removal with the `apg_enable_remove_redundant_inner_joins` parameter.
 - Improved ANSI compatibility options with the `ansi_constraint_trigger_ordering`, `ansi_force_foreign_key_checks` and `ansi_qualified_update_set_target` parameters.

For more information, see [Amazon Aurora PostgreSQL parameters](#) in the *Amazon Aurora User Guide*.

4. New and updated PostgreSQL extensions include:
 - The new `aws_ml` extension. For more information, see [Using machine learning \(ML\) with Aurora PostgreSQL](#) in the *Amazon Aurora User Guide*.
 - The new `aws_s3` extension. For more information, see [Exporting data from an Aurora PostgreSQL DB cluster to Amazon S3](#) in the *Amazon Aurora User Guide*.
 - Updates to the `apg_plan_mgmt` extension. For more information, see [Managing query execution plans for Aurora PostgreSQL](#) in the *Amazon Aurora User Guide*.

Critical stability enhancements

1. Fixed a bug related to creating B-tree indexes on temporary tables that in rare cases might result in longer recovery time, and impact availability.
2. Fixed a bug related to replication when Aurora PostgreSQL is acting as a physical replica of an RDS for PostgreSQL instance. In rare cases, this bug causes a log write failure that might result in longer recovery time, and impact availability.
3. Fixed a bug related to handling of reads with high I/O latency that in rare cases might result in longer recovery time, and impact availability.

High priority stability enhancements

1. Fixed a bug related to logical replication in which `wal` segments are not properly removed from storage. This can result in storage bloat. To monitor this, view the `TransactionLogDiskUsage` parameter.
2. Fixed multiple bugs, which cause Aurora to crash during prefetch operations on Btree indexes.
3. Fixed a bug in which an Aurora restart might time out when logical replication is used.
4. Enhanced the validation checks performed on data blocks in the buffer cache. This improves Aurora's detection of inconsistency.

Additional improvements and enhancements

1. The query plan management extension `apg_plan_mgmt` has an improved algorithm for managing plan generation for highly partitioned tables.
2. Reduced startup time on instances with large caches via improvements in the buffer cache recovery algorithm.
3. Improved the performance of the read-node-apply process under high transaction rate workloads by using changes to PostgreSQL LWLock prioritization. These changes prevent starvation of the read-node-apply process while the PostgreSQL `PROCARRAY` is under heavy contention.
4. Improved handling of batch reads during vacuum, table scans, and index scans. This results in greater throughput and lower CPU consumption.
5. Fixed a bug in which a read node might crash during the replay of a PostgreSQL SLRU-truncate operation.

6. Fixed a bug where in rare cases, database writes might stall following an error returned by one of the six copies of an Aurora log record.
7. Fixed a bug related to logical replication where an individual transaction larger than 1 GB in size might result in an engine crash.
8. Fixed a memory leak on read nodes when cluster cache management is enabled.
9. Fixed a bug in which importing an RDS for PostgreSQL snapshot might stop responding if the source snapshot contains a large number of unlogged relations.
- 10 Fixed a bug in which the Aurora storage daemon might crash under heavy I/O load.
- 11 Fixed a bug related to `hot_standby_feedback` for read nodes in which the read node might report the wrong transaction id epoch to the write node. This can cause the write node to ignore the `hot_standby_feedback` and invalidate snapshots on the read node.
- 12 Fixed a bug in which storage errors that occur during `CREATE DATABASE` statements are not properly handled. The bug left the resulting database inaccessible. The correct behavior is to fail the database creation and return the appropriate error to the user.
- 13 Improved handling of PostgreSQL snapshot overflow when a read node attempts to connect to a write node. Prior to this change, if the write node was in a snapshot overflow state, the read node was unable to join. A message appeared in the PostgreSQL log file in the form `DEBUG: recovery snapshot waiting for non-overflowed snapshot or until oldest active xid on standby is at least xxxxxxx (now yyyyyyy)`. A snapshot overflow occurs when an individual transaction has created over 64 subtransactions.
- 14 Fixed a bug related to common table expressions in which an error is incorrectly raised when a `NOT IN` class exists in a CTE. The error is `CTE with NOT IN fails with ERROR: could not find CTE CTE-Name`.
- 15 Fixed a bug related to an incorrect `last_error_timestamp` value in the `aurora_replica_status` table.
- 16 Fixed a bug to avoid populating shared buffers with blocks belonging to temporary objects. These blocks correctly reside in PostgreSQL backend local buffers.
- 17 Changed the following extensions:
 - Updated `pg_hint_plan` to version 1.3.4.
 - Added `plprofiler` version 4.1.
 - Added `pgTAP` version 1.0.0.

PostgreSQL 11.4, Aurora PostgreSQL 3.0 (Deprecated)

Note

The PostgreSQL engine version 11.4 with the Aurora PostgreSQL 3.0 is no longer supported. To upgrade, see [Upgrading the PostgreSQL DB engine for Aurora PostgreSQL](#) in the *Amazon Aurora User Guide*.

This release of Aurora PostgreSQL is compatible with PostgreSQL 11.4. For more information about the improvements in PostgreSQL 11.4, see [PostgreSQL release 11.4](#).

You can find the following improvements in this release.

Improvements

1. This release contains all fixes, features, and improvements present in [Aurora PostgreSQL 2.3.5](#).
2. Partitioning – Partitioning improvements include support for hash partitioning, enabling creation of a default partition, and dynamic row movement to another partition based on the key column update.
3. Performance – Performance improvements include parallelism while creating indexes, materialized views, hash joins, and sequential scans to make the operations perform better.
4. Stored procedures – SQL stored procedures now added support for embedded transactions.
5. Autovacuum improvements – To provide valuable logging, the parameter `rds.force_autovacuum_logging` is ON by default in conjunction with the `log_autovacuum_min_duration` parameter set to 10 seconds. To increase autovacuum effectiveness, the values for the `autovacuum_max_workers` and `autovacuum_vacuum_cost_limit` parameters are computed based on host memory capacity to provide larger default values.
6. Improved transaction timeout – The parameter `idle_in_transaction_session_timeout` is set to 24 hours. Any session that has been idle more than 24 hours is terminated.
7. The `tsearch2` module is no longer supported – If your application uses `tsearch2` functions, update it to use the equivalent functions provided by the core PostgreSQL engine. For more information about the `tsearch2` module, see [PostgreSQL tsearch2](#).
8. The `chkpass` module is no longer supported – For more information about the `chkpass` module, see [PostgreSQL chkpass](#).

9. Updated the following extensions:

- `address_standardizer` to version 2.5.1
- `address_standardizer_data_us` to version 2.5.1
- `btree_gin` to version 1.3
- `citext` to version 1.5
- `cube` to version 1.4
- `hstore` to version 1.5
- `ip4r` to version 2.2
- `isn` to version 1.2
- `orafce` to version 3.7
- `pg_hint_plan` to version 1.3.4
- `pg_prewarm` to version 1.2
- `pg_repack` to version 1.4.4
- `pg_trgm` to version 1.4
- `pgaudit` to version 1.3
- `pgrouting` to version 2.6.1
- `pgtap` to version 1.0.0
- `plcoffee` to version 2.3.8
- `plls` to version 2.3.8
- `plv8` to version 2.3.8
- `postgis` to version 2.5.1
- `postgis_tiger_geocoder` to version 2.5.1
- `postgis_topology` to version 2.5.1
- `rds_activity_stream` to version 1.3

PostgreSQL 10.21 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 10.21. For more information about the improvements in PostgreSQL 10.21, see [PostgreSQL release 10.21](#).

- [Aurora PostgreSQL 10.21.5, December 14, 2022](#)
- [Aurora PostgreSQL 10.21.4, November 17, 2022](#)
- [Aurora PostgreSQL 10.21.3, October 13, 2022](#)
- [Aurora PostgreSQL 10.21.1, July 6, 2022](#)
- [Aurora PostgreSQL 10.21.0, June 9, 2022](#)

Aurora PostgreSQL 10.21.5, December 14, 2022

General stability enhancements

- Fixed an issue where the engine experienced stability issues.

Aurora PostgreSQL 10.21.4, November 17, 2022

High priority stability enhancements

- Fixed an issue that can cause increased network traffic when a writer instance transmits logs to a replica instance.

Aurora PostgreSQL 10.21.3, October 13, 2022

High priority stability enhancements

- Fixed a PLV8 issue where the base parameter doesn't get loaded properly into the memory.

General stability enhancements

- Fixed a bug where Aurora PostgreSQL can't file the relfilenode.
- Fixed a stuck scaling issue when the current scaling event times out.
- Upgraded the PostGIS extension to version 3.1.7.
- Fixed an issue where extended query messages might be lost during zero-downtime patching (ZDP) causing the extended query to hang after the ZDP completion.

Aurora PostgreSQL 10.21.1, July 6, 2022

Critical stability enhancements

- Fixed an issue that could cause periods of unavailability during a storage node restart.

High priority stability enhancements

- Fixed an error handling issue related to out-of-memory conditions which could result in brief periods of unavailability.
- Fixed an issue when the connection to SQL Server fails using the TDS_FDW extension to query a foreign table.
- Fixed an issue that caused connections using the provided root certificate to fail.
- Improved the diagnostic and supportability information in case of inconsistent B-tree index entries.

Aurora PostgreSQL 10.21.0, June 9, 2022

New features

- Added support for the `large object` module (extension). For more information, see [Managing large objects with the lo module](#).
- Added support for zero-downtime patching (ZDP) for minor version upgrades and patches. For more information, see [Minor release upgrades and zero-downtime patching](#) in the *Amazon Aurora User Guide*.

Critical updates

- Fixed a replay crash due to an LSN mismatch.
- Fixed the `aws_s3` extension to prevent invalid region injection.

High stability updates

- Fixed multiple issues related to out-of-memory conditions which could result in brief periods of unavailability.

General stability updates

- Fixed a lock contention crash during an Aurora Serverless v1 scaling event.
- Fixed an issue where logical replication becomes stuck after a restart.
- Fixed multiple issues that could lead to brief periods of unavailability.
- Fixed, during redo, an invalid page hit on the Generic Redo for `GENERIC_XLOG_FULL_PAGE_DATA`. This happens due to a timing hole between generating the log record and then writing the metadata for the record on the RW node and the RO node replays between those operations.
- Improved the query performance by supporting parallel workers.
- Upgraded the plugin `wal2json` version to 2.4.
- Upgraded the `pglogical` extension to version 2.4.1.

PostgreSQL 10.20 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 10.20. For more information about the improvements in PostgreSQL 10.20, see [PostgreSQL release 10.20](#).

Releases and patches

- [Aurora PostgreSQL 10.20.6, December 16, 2022](#)
- [Aurora PostgreSQL 10.20.4, July 18, 2022](#)
- [Aurora PostgreSQL 10.20.1, April 27, 2022](#)
- [Aurora PostgreSQL 10.20.0, March 29, 2022](#)

Aurora PostgreSQL 10.20.6, December 16, 2022

General enhancements

- Fixed an issue that can cause increased network traffic when a writer instance transmits logs to a replica instance.
- Updated the PostGIS extension to version 3.1.7.

Aurora PostgreSQL 10.20.4, July 18, 2022

Security enhancements

- Backpatched the PostgreSQL community fix for CVE-2022-1552: Autovacuum, REINDEX, and others omit "security restricted operation". For more information, see [CVE-2022-1552](#).

Critical enhancements

- Fixed an issue during a storage node restart that could result in periods of unavailability.

High stability enhancements

- Fixed an error handling issue related to out-of-memory conditions that could result in brief periods of unavailability.
- Fixed an issue related to the existence of duplicate relation files that could result in periods of unavailability.
- Fixed a defect where the validation of cached plans may lead to a database restart when the plan was previously invalidated.

Aurora PostgreSQL 10.20.1, April 27, 2022

High priority stability enhancements

- Fixed an issue that could cause incorrect WriteIOPS reporting in the AWS console.
- Fixed an issue that could cause unavailability after removal of a read node from a cluster.

General enhancements

- Fixed an issue that could cause an engine restart during periods of low free memory.

Aurora PostgreSQL 10.20.0, March 29, 2022

High priority stability enhancements

- Fixed multiple issues that may result in unavailability of a read node.

- Fixed an issue that may result in a read node being unable to replay WAL requiring the replication slot to be dropped and resynchronized.
- Fixed an issue that could cause excess storage use due to files not being properly closed.

General enhancements

- Fixed a small memory leak on read nodes when `commit_ts` is set.
- Fixed an issue that caused Performance Insights to show "Unknown wait event".
- Fixed an issue that could cause an import from S3 to fail when using the `aws_s3` extension.
- Fixed multiple issues that could result in periods of unavailability when using `apg_plan_mgmt`.
- Fixed multiple issues that could result in periods of unavailability when QPM is enabled.

PostgreSQL 10.19 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 10.19. For more information about the improvements in PostgreSQL 10.19, see [PostgreSQL release 10.19](#).

Releases and patches

- [Aurora PostgreSQL 10.19.6, December 16, 2022](#)
- [Aurora PostgreSQL 10.19.4, July 20, 2022](#)
- [Aurora PostgreSQL 10.19.3, April 13, 2022](#)
- [Aurora PostgreSQL 10.19.1](#)
- [Aurora PostgreSQL 10.19.0](#)

Aurora PostgreSQL 10.19.6, December 16, 2022

General enhancements

- Fixed an issue that can cause increased network traffic when a writer instance transmits logs to a replica instance.
- Fixed an issue that causes database activity stream inconsistency when the monitoring agent is unavailable.
- Updated the PostGIS extension to version 3.1.7.

Aurora PostgreSQL 10.19.4, July 20, 2022

Security enhancements

- Backpatched the PostgreSQL community fix for CVE-2022-1552: Autovacuum, REINDEX, and others omit "security restricted operation". For more information, see [CVE-2022-1552](#).

Critical enhancements

- Fixed an issue during a storage node restart that could result in periods of unavailability.

High stability enhancements

- Fixed an error handling issue related to out-of-memory conditions that could result in brief periods of unavailability.
- Fixed an issue related to the existence of duplicate relation files that could result in periods of unavailability.
- Fixed an issue that could cause excess storage use due to files not being properly closed.
- Fixed an issue that caused Performance Insights to show "Unknown wait event".

Aurora PostgreSQL 10.19.3, April 13, 2022

General enhancements

- Fixed a bug that could cause an engine restart during periods of low free memory.

Aurora PostgreSQL 10.19.1

Security enhancements

- Updated the PostGIS extension from version 3.1.4 to 3.1.5. This update contains a PostGIS fix for the vulnerability addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Modified the `ip4r` extension to mitigate a security issue during create extension. The issue was originally disclosed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).

Aurora PostgreSQL 10.19.0

Critical stability enhancements

- Fixed a bug where logical replication may hang resulting in the replay falling behind on the read node. The instance may eventually restart.

Additional improvements and enhancements

- Fixed a buffer cache bug that could cause brief periods of unavailability.
- Fixed a bug in the `apg_plan_mgmt` extension where an index based plan was not being enforced.
- Fixed a bug in the `pg_logical` extension that could cause brief periods of unavailability due to improper handling of NULL arguments.
- Fixed an issue where orphaned files caused major version upgrades to fail.
- Fixed incorrect Aurora Storage Daemon log write metrics.
- Fixed multiple bugs that could result in WAL replay falling behind and eventually causing the reader instances to restart.
- Improved the Aurora buffer cache page validation on reads.
- Improved the Aurora storage metadata validation.
- Updated the `pg_hint_plan` extension to v1.3.6.

PostgreSQL 10.18 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 10.18. For more information about the improvements in PostgreSQL 10.18, see [PostgreSQL release 10.18](#).

Releases and patches

- [Aurora PostgreSQL 10.18.6, December 19, 2022](#)
- [Aurora PostgreSQL 10.18.4, July 6, 2022](#)
- [Aurora PostgreSQL 10.18.3, June 6, 2022](#)
- [Aurora PostgreSQL 10.18.2, April 12, 2022](#)
- [Aurora PostgreSQL 10.18.1](#)
- [Aurora PostgreSQL 10.18.0](#)

Aurora PostgreSQL 10.18.6, December 19, 2022

General enhancements

- Fixed an issue that causes database activity stream inconsistency when the monitoring agent is unavailable.

Aurora PostgreSQL 10.18.4, July 6, 2022

Security enhancements

- Backpatched the PostgreSQL community fix for CVE-2022-1552: Autovacuum, REINDEX, and others omit "security restricted operation". For more information, see [CVE-2022-1552](#).

General enhancements

- Fixed an error handling issue related to out-of-memory conditions which could result in brief periods of unavailability.
- Fixed an issue that could cause excess storage use due to files not being properly closed.
- Fixed an issue that could cause Performance Insights to display "Unknown wait event".
- Fixed an issue that could result in periods of unavailability due to the existence of duplicate relation files.

Aurora PostgreSQL 10.18.3, June 6, 2022

Security enhancements

- Backpatched the PostgreSQL community fix for CVE-2022-1552: Autovacuum, REINDEX, and others omit "security restricted operation". For more information, see [CVE-2022-1552](#).

High priority stability updates

- Fixed an issue that can cause a restart of the postmaster process in Amazon Aurora Serverless v1.
- Fixed an issue that can cause a restart of the Aurora Runtime process in Amazon Aurora Serverless v1.

General enhancements

- Fixed a memory leak in the Aurora Runtime that could lead to an out-of-memory condition.

Aurora PostgreSQL 10.18.2, April 12, 2022

General updates

- Fixed a buffer cache bug that could cause brief periods of unavailability.

Aurora PostgreSQL 10.18.1

Security enhancements

- Updated the PostGIS extension from version 3.1.4 to 3.1.5. This update contains a PostGIS fix for the vulnerability addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Modified the `ip4r` extension to mitigate a security issue during create extension. The issue was originally disclosed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).

Aurora PostgreSQL 10.18.0

Critical stability updates

- Fixed an issue where, in rare circumstances, a data cache of a read node may be inconsistent following a restart of that node.

High priority stability updates

- Fixed an issue where queries may become unresponsive due to I/O resource exhaustion triggered by prefetch.
- Fixed an issue where Aurora may flag an issue following a major version update with the message: "PANIC: could not access status of next transaction id xxxxxxxx".

Additional improvements and enhancements

- Fixed an issue where read nodes restart due to a replication origin cache lookup failure.
- Fixed an issue where read queries may time out on read nodes during the replay of lazy truncation triggered by vacuum on the write node.
- Fixed an issue that causes Performance Insights to incorrectly set the backend type of a database connection.
- Fixed an issue where the `aurora_postgres_replica_status()` function returned stale or lagging CPU stats.
- Fixed an issue where, in rare cases, an Aurora Global Database secondary mirror cluster may restart due to a stall in the log apply process.
- Removed support for the DES, 3DES, and RC4 cipher suites.
- Updated PostGIS extension to version 3.1.4.
- Added support for `postgis_raster` extension version 3.1.4.

PostgreSQL 10.17, Aurora PostgreSQL 2.9 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 10.17. For more information about the improvements in PostgreSQL 10.17, see [PostgreSQL release 10.17](#).

Releases and patches

- [Aurora PostgreSQL 10.17.5, December 30, 2022](#)
- [Aurora PostgreSQL 10.17.4, July 14, 2022](#)
- [Aurora PostgreSQL 2.9.2](#)
- [Aurora PostgreSQL 2.9.1](#)
- [Aurora PostgreSQL 2.9](#)

Aurora PostgreSQL 10.17.5, December 30, 2022

General enhancements

- Amazon Aurora PostgreSQL version 10.17.5 was released with general enhancements.

Aurora PostgreSQL 10.17.4, July 14, 2022

Security enhancements

- Backpatched the PostgreSQL community fix for CVE-2022-1552: Autovacuum, REINDEX, and others omit "security restricted operation". For more information, see [CVE-2022-1552](#).

High priority stability enhancements

- Fixed an error handling issue related to out-of-memory conditions which could result in brief periods of unavailability.
- Fixed an issue that could cause excess storage use due to files not being properly closed.
- Fixed an issue that caused Performance Insights to show "Unknown wait event".

Aurora PostgreSQL 2.9.2

Security enhancements

- Modified the `ip4r` extension to mitigate a security issue during create extension. The issue was originally disclosed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Modified the `ip4r` extension to mitigate a security issue during create extension. The issue was originally disclosed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Backpatched [postgis](#) to PostGIS 2.4.7. This is a PostGIS fix for the vulnerability addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).

Aurora PostgreSQL 2.9.1

Critical stability updates

- Fixed an issue where, in rare circumstances, a data cache of a read node may be inconsistent following a restart of that node.

High priority stability updates

- Fixed an issue where queries may become unresponsive due to I/O resource exhaustion triggered by prefetch.
- Fixed an issue where Aurora may flag an issue following a major version update with the message: "PANIC: could not access status of next transaction id xxxxxxxx".

Additional improvements and enhancements

- Fixed an issue where read nodes restart due to a replication origin cache lookup failure.
- Fixed an issue where in rare cases, an Aurora Global Database secondary mirror cluster may restart due to a stall in the log apply process.
- Fixed an issue that causes Performance Insights to incorrectly set the backend type of a database connection.
- Fixed an issue where orphaned files caused failed translations in read codepaths during or after major version upgrade.
- Fixed multiple issues in the Aurora storage daemon that could lead to brief periods of unavailability when specific network configurations are used.
- Fixed an out-of-memory crash issue with Aurora storage daemon that leads to writer node restart. This also reduces the overall system memory consumption.

Aurora PostgreSQL 2.9

High priority stability updates

1. Fixed an issue where creating a database from an existing template database with tablespace resulted in an error with the message `ERROR: could not open file pg_tblspc/...: No such file or directory`.
2. Fixed an issue where, in rare cases, an Aurora replica may be unable to start when a large number of PostgreSQL subtransactions (i.e. SQL savepoints) have been used.
3. Fixed an issue where, in rare circumstances, read results may be inconsistent for repeated read requests on replica nodes.

Additional improvements and enhancements

1. Upgraded OpenSSL to 1.1.1k.
2. Reduced CPU usage and memory consumption of the WAL apply process on Aurora replicas for some workloads.
3. Improved safety checks in the write path to detect incorrect writes to metadata.
4. Improved security by removing 3DES and other older ciphers for SSL/TLS connections.
5. Fixed an issue where a duplicate file entry can prevent the Aurora PostgreSQL engine from starting up.
6. Fixed an issue that could cause temporary unavailability under heavy workloads.
7. Added back ability to use a leading forward slash in the S3 path during S3 import.
8. Updated the orafce extension to version 3.16.
9. Updated the PostGIS extension to version 2.4.7.

PostgreSQL 10.16, Aurora PostgreSQL 2.8 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 10.16. For more information about the improvements in PostgreSQL 10.16, see [PostgreSQL release 10.16](#).

Releases and patches

- [Aurora PostgreSQL 2.8.1](#)
- [Aurora PostgreSQL 2.8.0](#)

Aurora PostgreSQL 2.8.1

Security enhancements

- Modified the `ip4r` extension to mitigate a security issue during create extension. The issue was originally disclosed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Backpatched `postgis` to PostGIS 2.4.4. This is a PostGIS fix for the vulnerability addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Backpatched an input validation error in the `log_fdw` extension function parameters.

Aurora PostgreSQL 2.8.0

High priority stability updates

1. Fixed a bug where in rare cases a reader had inconsistent results when it restarted while a transaction with more than 64 subtransactions was being processed.
2. Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2021-32027](#)
 - [CVE-2021-32028](#)
 - [CVE-2021-32029](#)

Additional improvements and enhancements

1. Fixed a bug where the database could not be started when there were many relations in memory-constrained environments.
2. Fixed a bug in the `apg_plan_mgmt` extension that could cause brief periods of unavailability due to an internal buffer overflow.
3. Fixed a bug on reader nodes that could cause brief periods of unavailability during WAL replay.
4. Fixed a bug in the `rds_activity_stream` extension that caused an error during startup when attempting to log audit events.
5. Fixed a bug that prevented minor version updates of an Aurora global database cluster.
6. Fixed bugs in the `aurora_replica_status` function where rows were sometimes partially populated and some values such as Replay Latency, and CPU usage were always 0.
7. Fixed a bug where the database engine would attempt to create shared memory segments larger than the instance total memory and fail repeatedly. For example, attempts to create 128 GiB shared buffers on a `db.r5.large` instance would fail. With this change, requests for total shared memory allocations larger than the instance memory allow setting the instance to incompatible parameters.
8. Added logic to clean up unnecessary `pg_wal` temporary files on a database startup.
9. Fixed a bug that reported `ERROR: rds_activity_stream stack item 2 not found on top - cannot pop` when attempting to create the `rds_activity_stream` extension.
10. Fixed a bug that could cause the error failed to build any 3-way joins in a correlated IN subquery under an EXISTS subquery.

- 11 Fixed a bug that could cause brief periods of unavailability due to running out of memory when creating the `postgis` extension with `pgAudit` enabled.
- 12 Fixed a bug when using outbound logical replication to synchronize changes to another database that could fail with an error message like `ERROR: could not map filenode "base/16395/228486645" to relation OID`.
- 13 Fixed a bug where the `rds_ad` role wasn't created after upgrading from a version of Aurora PostgreSQL that doesn't support Microsoft Active Directory authentication.
- 14 Added `btree` page checks to detect tuple metadata inconsistency.
- 15 Fixed a bug in asynchronous buffer reads that could cause brief periods of unavailability on reader nodes during WAL replay.

PostgreSQL 10.14, Aurora PostgreSQL 2.7 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 10.14. For more information about the improvements in PostgreSQL 10.14, see [PostgreSQL release 10.14](#).

Releases and patches

- [Aurora PostgreSQL 2.7.5](#)
- [Aurora PostgreSQL 2.7.3](#)
- [Aurora PostgreSQL 2.7.2](#)
- [Aurora PostgreSQL 2.7.1](#)
- [Aurora PostgreSQL 2.7.0](#)

Aurora PostgreSQL 2.7.5

Security enhancements

- Modified the `ip4r` extension to mitigate a security issue during create extension. The issue was originally disclosed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Backpatched `postgis` to PostGIS 2.4.4. This is a PostGIS fix for the vulnerability addressed in core PostgreSQL by CVE-2020-14350. For more information, see [CVE-2020-14350](#).
- Backpatched an input validation error in the `log_fdw` extension function parameters.

Aurora PostgreSQL 2.7.3

High priority stability updates

1. Provided a patch for PostgreSQL community security issues CVE-2021-32027, CVE-2021-32028 and CVE-2021-32029.

Additional improvements and enhancements

1. Fixed a bug in the `aws_s3` extension to allow import of objects with leading forward slashes in the object identifier.
2. Fixed a bug in the `rds_activity_stream` extension that caused an error during startup when attempting to log audit events.
3. Fixed a bug that returned an `ERROR` when attempting to create the `rds_activity_stream` extension.
4. Fixed a bug that could cause brief periods of unavailability due to running out of memory when creating the `postgis` extension with `pgAudit` enabled.
5. Fixed multiple issues in the Aurora storage daemon that could lead to brief periods of unavailability when specific network configurations are used.

Aurora PostgreSQL 2.7.2

High priority stability updates

1. Fixed a bug where a reader node might render an extra or missing row if the reader restarted while the writer node is processing a long transaction with more than 64 subtransactions.

Additional improvements and enhancements

1. Fixed a bug that could lead to intermittent unavailability due to the rotation of network encryption keys.
2. Fixed a bug where a large S3 import with thousands of clients can cause one or more of the import clients to stop responding.

Aurora PostgreSQL 2.7.1

Critical stability updates

1. Fixed a bug that caused a read replica to unsuccessfully restart repeatedly in rare cases.
2. Fixed a bug where a cluster became unavailable when attempting to create more than 16 read replicas or Aurora global database secondary AWS Regions. The cluster became available again when the new read replica or secondary AWS Region was removed.

Additional improvements and enhancements

1. Fixed a bug that when under heavy load, snapshot import, COPY import, or S3 import stopped responding in rare cases.
2. Fixed a bug where a read replica might not join the cluster when the writer was very busy with a write-intensive workload.
3. Fixed a bug that caused a cluster to take several minutes to restart if a logical replication stream was terminated while handling many complex transactions.
4. Disallowed the use of both IAM and Kerberos authentication for the same user.

Aurora PostgreSQL 2.7.0

Critical stability updates

- None

High priority stability updates

1. Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2020-25694](#)
 - [CVE-2020-25695](#)
 - [CVE-2020-25696](#)
2. Fixed a bug in Aurora PostgreSQL replication that could result in the error message `ERROR: MultiXactId nnnn has not been created yet -- apparent wraparound`.
3. Fixed a bug where in some cases, DB clusters that have logical replication enabled did not remove truncated WAL segment files from storage. This resulted in volume size growth.

4. Fixed a bug in the `pg_stat_statements` extension that caused excessive CPU consumption.

Additional improvements and enhancements

1. Improved the asynchronous mode performance of database activity streams.
2. Aurora Serverless v1 for PostgreSQL now supports query execution on all connections during a scale event.
3. Reduced the delay when publishing to CloudWatch the `rpo_lag_in_msec` metric for Aurora global database clusters.
4. Fixed a bug in Serverless clusters where transaction processing was unnecessarily suspended for long periods when creating a scale point.
5. Fixed a bug in Aurora Serverless v1 for PostgreSQL where a leaked lock resulted in a prolonged scale event.
6. Fixed a bug in Aurora Serverless v1 for PostgreSQL where connections being migrated during a scale event was disconnected with the following message: `ERROR: could not open relation with OID ...`
7. Aurora PostgreSQL no longer falls behind on a read node when the backend is blocked writing to the database client.
8. Fixed a bug that in rare cases caused a brief period of unavailability on a read replica when the storage volume grew.
9. Fixed a bug when creating a database that could return the following error: `ERROR: could not create directory on local disk`
- 10 Fixed a bug where in some cases replaying `XLOG_BTREE_REUSE_PAGE` records on Aurora reader instances caused unnecessary replay lag.
- 11 Fixed a bug in the GiST index that could result in an out of memory condition after promoting an Aurora read replica.
- 12 Fixed a bug where the `aurora_replica_status` function showed truncated server identifiers.
- 13 Fixed an S3 import bug that reported `ERROR: HTTP 403. Permission denied` when importing data from a file inside an S3 subfolder.
- 14 Fixed a bug in the `aws_s3` extension for pre-signed URL handling that could result in the error message `S3 bucket names with a period (.) are not supported`.
- 15 Fixed a bug in the `aws_s3` extension where an import might be blocked indefinitely if an exclusive lock was taken on the relation prior to beginning the operation.

16 Fixed a bug related to replication when Aurora PostgreSQL is acting as a physical replica of an RDS for PostgreSQL instance that uses GiST indexes. In rare cases, this bug caused a brief period of unavailability after promoting the Aurora cluster.

17 Fixed a bug in database activity streams where customers were not notified of the end of an outage.

PostgreSQL 10.13, Aurora PostgreSQL 2.6 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 10.13. For more information about the improvements in PostgreSQL 10.13, see [PostgreSQL release 10.13](#).

Releases and patches

- [Aurora PostgreSQL release 2.6.2](#)
- [Aurora PostgreSQL 2.6.1](#)
- [Aurora PostgreSQL 2.6.0](#)

Aurora PostgreSQL release 2.6.2

Critical stability updates

1. None

High priority stability updates

1. Fixed a bug in Aurora PostgreSQL replication that could result in the error message `ERROR: MultiXactId nnnn has not been created yet -- apparent wraparound`.
2. Fixed a bug where in some cases, DB clusters that have logical replication enabled did not remove truncated WAL segment files from storage. This resulted in volume size growth.
3. Fixed an issue with creating a global database cluster in a secondary region.
4. Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2020-25694](#)
 - [CVE-2020-25695](#)
 - [CVE-2020-25696](#)
5. Fixed a bug in the `pg_stat_statements` extension that caused excessive CPU consumption.

Additional improvements and enhancements

1. Aurora PostgreSQL no longer falls behind on a read node when the backend is blocked writing to the database client.
2. Reduced the delay when publishing to CloudWatch the `xpo_lag_in_msec` metric for Aurora global database clusters.
3. Fixed a bug where a `DROP DATABASE` statement didn't remove any relation files.
4. Fixed a bug where in some cases replaying `XLOG_BTREE_REUSE_PAGE` records on Aurora reader instances caused unnecessary replay lag.
5. Fixed a small memory leak in a b-tree index that could lead to an out of memory condition.
6. Fixed a bug in the `aurora_replica_status()` function where the `server_id` field was sometimes truncated.
7. Fixed a bug where a log record was incorrectly processed causing the Aurora replica to crash.
8. Fixed an S3 import bug that reported `ERROR: HTTP 403. Permission denied` when importing data from a file inside an S3 subfolder.
9. Improved performance of the asynchronous mode for database activity streams.
- 10 Fixed a bug in the `aws_s3` extension that could result in the error message `S3 bucket names with a period (.) are not supported`.
- 11 Fixed a race condition that caused valid imports to intermittently fail.
- 12 Fixed a bug related to replication when Aurora PostgreSQL is acting as a physical replica of an RDS for PostgreSQL instance that uses GiST indexes. In rare cases, this bug caused a brief period of unavailability after promoting the Aurora DB cluster.
- 13 Fixed a bug in the `aws_s3` extension where an import may be blocked indefinitely if an exclusive lock was taken on the relation prior to beginning the operation.

Aurora PostgreSQL 2.6.1

You can find the following improvements in this release.

Critical stability enhancements

1. Fixed a bug that appears when the `NOT EXISTS` operator incorrectly returns `TRUE`, which can only happen when the following unusual set of circumstances occurs:
 - A query is using the `NOT EXISTS` operator.

- The column or columns being evaluated against the outer query in the NOT EXISTS subquery contain a NULL value.
- There isn't a another predicate in the subquery that removes the need for the evaluation of the NULL values.
- The filter used in the subquery does not use an index seek for its execution.
- The operator isn't converted to a join by the query optimizer.

Aurora PostgreSQL 2.6.0

You can find the following improvements in this release.

New features

1. Added support for the RDKit extension version 3.8.

The RDKit extension provides modeling functions for cheminformatics. Cheminformatics is storing, indexing, searching, retrieving, and applying information about chemical compounds. For example, with the RDKit extension you can construct models of molecules, search for molecular structures, and read or create molecules in various notations. You can also perform research on data loaded from the [ChEMBL website](#) or a SMILES file. The Simplified Molecular Input Line Entry System (SMILES) is a typographical notation for representing molecules and reactions. For more information, see [The RDKit database cartridge](#) in the RDKit documentation.

2. Added support for the pglogical extension version 2.2.2.

The pglogical extension is a logical streaming replication system that provides additional features beyond what's available in PostgreSQL native logical replication. Features include conflict handling, row filtering, DDL/sequence replication and delayed apply. You can use the pglogical extension to set up replication between Aurora PostgreSQL clusters, between RDS for PostgreSQL and Aurora PostgreSQL, and with PostgreSQL databases running outside of RDS.

3. Aurora dynamically resizes your cluster storage space. With dynamic resizing, the storage space for your Aurora DB cluster automatically decreases when you remove data from the DB cluster. For more information, see [Storage scaling](#) in the *Amazon Aurora User Guide*.

Note

The dynamic resizing feature is being deployed in phases to the AWS Regions where Aurora is available. Depending on the Region where your cluster is, this feature might not be available yet. For more information, see [the What's New announcement](#).

Critical stability updates

1. Fixed a bug related to heap page extend that in rare cases resulted in longer recovery time and impacted availability.

High priority stability updates

1. Fixed a bug when upgrading Aurora Global Database clusters from 10.11.
2. Fixed a bug in Aurora Global Database that could cause delays in upgrading the database engine in a secondary AWS Region. For more information, see [Using Amazon Aurora global databases](#) in the *Amazon Aurora User Guide*.
3. Fixed a bug that in rare cases caused delays in upgrading a database to engine version 10.13.

Additional improvements and enhancements

1. Fixed a bug where the Aurora replica crashed when workloads with heavy subtransactions are made on the writer instance.
2. Fixed a bug where the writer instance crashed due to a memory leak and the depletion of memory used to track active transactions.
3. Fixed a bug that lead to a crash due to improper initialization when there is no free memory available during PostgreSQL backend startup.
4. Fixed a bug where an Aurora PostgreSQL Serverless DB cluster might return the following error after a scaling event: ERROR: prepared statement "S_6" already exists.
5. Fixed an out-of-memory problem when issuing the CREATE EXTENSION command with PostGIS when Database Activity Streams is enabled.
6. Fixed a bug where a SELECT query might incorrectly return the error Attempting to read past EOF of relation rrrr. blockno=bbb nblocks=nnn.

7. Fixed a bug where the database might be unavailable briefly due to error handling in database storage growth.
8. Fixed a bug in Aurora PostgreSQL Serverless where queries that executed on previously idle connections got delayed until the scale operation completed.
9. Fixed a bug where an Aurora PostgreSQL DB cluster with Database Activity Streams enabled might report the beginning of a potential loss window for activity records, but does not report the restoration of connectivity.

PostgreSQL 10.12, Aurora PostgreSQL 2.5 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 10.12. For more information about the improvements in PostgreSQL 10.12, see [PostgreSQL release 10.12](#).

Releases and patches

- [Aurora PostgreSQL 2.5.7](#)
- [Aurora PostgreSQL 2.5.6](#)
- [Aurora PostgreSQL 2.5.4](#)
- [Aurora PostgreSQL 2.5.3](#)
- [Aurora PostgreSQL 2.5.2](#)
- [Aurora PostgreSQL 2.5.1](#)

Aurora PostgreSQL 2.5.7

You can find the following improvements in this release.

Critical stability updates

- None

High priority stability updates

1. Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2020-25694](#)
 - [CVE-2020-25695](#)
 - [CVE-2020-25696](#)

Additional improvements and enhancements

- None

Aurora PostgreSQL 2.5.6

You can find the following improvements in this release.

Critical stability updates

- None

High priority stability updates

1. Fixed a bug in Aurora PostgreSQL replication that might result in the error message, `ERROR: MultiXactId nnnn has not been created yet -- apparent wraparound`.

Additional improvements and enhancements

1. Fixed a bug that in rare cases caused brief read replica unavailability when storage volume grew.
2. Aurora PostgreSQL Serverless now supports execution of queries on all connections during a scale event.
3. Fixed a bug in Aurora PostgreSQL Serverless where a leaked lock resulted in a prolonged scale event.
4. Fixed a bug where the `aurora_replica_status` function showed truncated server identifiers.
5. Fixed a bug in Aurora PostgreSQL Serverless where connections being migrated during a scale event disconnected with the message: "ERROR: could not open relation with OID"
6. Fixed a bug in a GiST index that might result in an out-of-memory condition after promoting an Aurora Read Replica.
7. Improved performance for Database Activity Streams.
8. Fixed a bug in Database Activity Streams where customers were not notified when an outage ended.
9. Fixed a bug in the `aws_s3` extension for pre-signed URL handling that could have resulted in the error message `S3 bucket names with a period (.) are not supported`.
10. Fixed a bug in the `aws_s3` extension where incorrect error handling could lead to failures during the import process.

11 Fixed a bug in the `aws_s3` extension where an import may be blocked indefinitely if an exclusive lock was taken on the relation prior to beginning the operation.

Aurora PostgreSQL 2.5.4

You can find the following improvements in this release.

Critical stability enhancements

1. Fixed a bug that appears when the `NOT EXISTS` operator incorrectly returns `TRUE`, which can only happen when the following unusual set of circumstances occurs:
 - A query is using the `NOT EXISTS` operator.
 - The column or columns being evaluated against the outer query in the `NOT EXISTS` subquery contain a `NULL` value.
 - There isn't a another predicate in the subquery that removes the need for the evaluation of the `NULL` values.
 - The filter used in the subquery does not use an index seek for its execution.
 - The operator isn't converted to a join by the query optimizer.

Aurora PostgreSQL 2.5.3

You can find the following improvements in this release.

Critical stability enhancements

- None

High priority stability enhancements

- None

Additional improvements and enhancements

1. Fixed a bug in Aurora PostgreSQL Serverless where queries that ran on previously idle connections got delayed until the scale operation completed.

2. Fixed a bug that might cause brief unavailability for heavy subtransaction workloads when multiple reader instances restart or rejoin the cluster.
3. Fixed a bug in Aurora PostgreSQL Global Database where upgrading a secondary cluster might result in failure due to incorrect checksum versioning. This might have required re-creating the secondary clusters.

Aurora PostgreSQL 2.5.2

You can find the following improvements in this release.

Critical stability updates

1. Fixed a bug related to heap page extend that in rare cases resulted in longer recovery time and impacted availability.

High priority stability updates

1. Fixed a bug in Aurora Global Database that could cause delays in upgrading the database engine in a secondary region. For more information, see [Using Amazon Aurora global databases](#) in the *Amazon Aurora User Guide*.
2. Fixed a bug that in rare cases caused delays in upgrading a database to engine version 10.12.

Additional improvements and enhancements

1. Fixed a bug where the database might be unavailable briefly due to error handling in database storage growth.
2. Fixed a bug where a SELECT query might incorrectly return the error, Attempting to read past EOF of relation rrrr. blockno=bbb nblocks=nnn.
3. Fixed a bug where an Aurora PostgreSQL Serverless DB cluster might return the following error after a scaling event: ERROR: prepared statement "S_6" already exists.

Aurora PostgreSQL 2.5.1

New features

1. Added support for Amazon Aurora PostgreSQL Global Database. For more information, see [Using Amazon Aurora global databases](#) in the *Amazon Aurora User Guide*.
2. Added the ability to configure the recovery point objective (RPO) of a global database for Aurora PostgreSQL. For more information, see [Managing RPOs for Aurora PostgreSQL-based global databases](#) in the *Amazon Aurora User Guide*.

You can find the following improvements in this release.

Critical stability updates

None.

High priority stability updates

1. Improved performance and availability of read instances when applying DROP TABLE and TRUNCATE TABLE operations.
2. Fixed a small but continuous memory leak in a diagnostic module that could lead to an out-of-memory condition on smaller DB instance types.
3. Fixed a bug in the PostGIS extension which could lead to a database restart. This has been reported to the PostGIS community as <https://trac.osgeo.org/postgis/ticket/4646>.
4. Fixed a bug where read requests might stop responding due to incorrect error handling in the storage engine.
5. Fixed a bug that fails for some queries and results in the message ERROR: found xmin xxxxxx from before relfrozenxid yyyyyyy. This could occur following the promotion of a read instance to a write instance.
6. Fixed a bug where an Aurora serverless DB cluster might crash while rolling back a scale attempt.

Additional improvements and enhancements

1. Improved performance for queries that read many rows from storage.
2. Improved performance and availability of reader DB instances during heavy read workload.
3. Enabled correlated IN and NOT IN subqueries to be transformed to joins when possible.

4. Improved read performance of the `pg_prewarm` extension.
5. Fixed a bug where an Aurora serverless DB cluster might report the message `ERROR: incorrect binary data format in bind parameter ... following a scale event`.
6. Fixed a bug where a serverless DB cluster might report the message `ERROR: insufficient data left in message following a scale event`.
7. Fixed a bug where an Aurora serverless DB cluster may experience prolonged or failed scale attempts.
8. Fixed a bug that resulted in the message `ERROR: could not create file "base/xxxxxx/yyyyyy" as a previous version still exists on disk: Success`. Please contact AWS customer support. This can occur during object creation after PostgreSQL's 32-bit object identifier has wrapped around.
9. Fixed a bug where the write-ahead-log (WAL) segment files for PostgreSQL logical replication were not deleted when changing the `wal_level` value from `logical` to `replica`.
10. Fixed a bug in the `pg_hint_plan` extension where a multi-statement query could lead to a crash when `enable_hint_table` is enabled. This is tracked in the PostgreSQL community as https://github.com/oss-c-db/pg_hint_plan/issues/25.
11. Fixed a bug where JDBC clients might report the message `java.io.IOException: Unexpected packet type: 75 following a scale event in an Aurora serverless DB cluster`.
12. Fixed a bug in PostgreSQL logical replication that resulted in the message `ERROR: snapshot reference is not owned by resource owner TopTransaction`.
13. Changed the following extensions:
 - Updated `orafce` to version 3.8

PostgreSQL 10.11, Aurora PostgreSQL 2.4 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 10.11. For more information about the improvements in PostgreSQL 10.11, see [PostgreSQL release 10.11](#).

This release contains multiple critical stability updates. Amazon highly recommends upgrading your Aurora PostgreSQL clusters that use older PostgreSQL 10 engines to this release.

Releases and patches

- [Aurora PostgreSQL 2.4.4](#)
- [Aurora PostgreSQL 2.4.3](#)
- [Aurora PostgreSQL 2.4.2](#)

- [Aurora PostgreSQL 2.4.1](#)
- [Aurora PostgreSQL 2.4.0](#)

Aurora PostgreSQL 2.4.4

You can find the following improvements in this release.

Critical stability updates

- None

High priority stability updates

1. Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2020-25694](#)
 - [CVE-2020-25695](#)
 - [CVE-2020-25696](#)

Additional improvements and enhancements

- None

Aurora PostgreSQL 2.4.3

New features

1. Aurora PostgreSQL now supports the PostgreSQL [vacuum_truncate](#) storage parameter to manage vacuum truncation for specific tables. Set this [storage parameter](#) to false for a table to prevent the [VACUUM](#) SQL command from truncating the table's trailing empty pages.

Critical stability updates

- None

High priority stability updates

1. Fixed a bug where reads from storage might stop responding due to incorrect error handling.

Additional improvements and enhancements

- None

Aurora PostgreSQL 2.4.2

You can find the following improvements in this release.

Critical stability updates

1. Fixed a bug in which a reader DB instance might temporarily use stale data. This could lead to wrong results such as too few or too many rows. This error is not persisted on storage, and will clear when the database page containing the row has been evicted from cache. This can happen when the primary DB instance enters a transaction snapshot overflow due to having more than 64 subtransactions in a single transaction. Applications susceptible to this bug include those that use SQL savepoints or PostgreSQL exception handlers with more than 64 subtransactions in the top transaction.

High priority stability updates

1. Fixed a bug that may cause a reader DB instance to crash causing unavailability while attempting to join the DB cluster. This can happen in some cases when the primary DB instance has a transaction snapshot overflow due to a high number of subtransactions. In this situation the reader DB instance will be unable to join until the snapshot overflow has cleared.

Additional improvements and enhancements

1. Fixed a bug that prevented Performance Insights from determining the query ID of a running statement.

Aurora PostgreSQL 2.4.1

You can find the following improvements in this release.

Critical stability updates

1. Fixed a bug in which the DB instance might be briefly unavailable due to the self-healing function of the underlying storage.

High priority stability updates

1. Fixed a bug that might cause the database engine to crash causing unavailability. This occurred if a newly established database connection encountered a resource exhaustion-related error during initialization after successful authentication.

Additional improvements and enhancements

1. Provided a fix for the `pg_hint_plan` extension that could lead the database engine to crash causing unavailability. The open source issue can be tracked at https://github.com/ossdb/pg_hint_plan/pull/45.
2. Fixed a bug where SQL of the form `ALTER FUNCTION ... OWNER TO ...` incorrectly reported `ERROR: improper qualified name (too many dotted names)`.
3. Improved the performance of GIN index vacuum via prefetching.
4. Fixed a bug in open source PostgreSQL that could lead to a database engine crash causing unavailability. This occurred during parallel B-Tree index scans. This issue has been reported to the PostgreSQL community.
5. Improved the performance of in-memory B-Tree index scans.
6. Additional general improvements to the stability and availability of Aurora PostgreSQL.

Aurora PostgreSQL 2.4.0

You can find the following new features and improvements in this engine version.

New features

1. Support for exporting data to Amazon S3. For more information, see [Exporting data from an Aurora PostgreSQL DB cluster to Amazon S3](#) in the *Amazon Aurora User Guide*.
2. Support for Amazon Aurora Machine Learning. For more information, see [Using machine learning \(ML\) with Aurora PostgreSQL](#) in the *Amazon Aurora User Guide*.
3. SQL processing enhancements include:

- Optimizations for NOT IN with the `apg_enable_not_in_transform` parameter.
- Semi-join filter pushdown enhancements for hash joins with the `apg_enable_semijoin_push_down` parameter.
- Optimizations for redundant inner join removal with the `apg_enable_remove_redundant_inner_joins` parameter.
- Improved ANSI compatibility options with the `ansi_constraint_trigger_ordering`, `ansi_force_foreign_key_checks` and `ansi_qualified_update_set_target` parameters.

For more information, see [Amazon Aurora PostgreSQL parameters](#) in the *Amazon Aurora User Guide*.

4. New and updated PostgreSQL extensions include:

- The new `aws_ml` extension. For more information, see [Using machine learning \(ML\) with Aurora PostgreSQL](#) in the *Amazon Aurora User Guide*.
- The new `aws_s3` extension. For more information, see [Exporting data from an Aurora PostgreSQL DB cluster to Amazon S3](#) in the *Amazon Aurora User Guide*.
- Updates to the `apg_plan_mgmt` extension. For more information, see [Managing query execution plans for Aurora PostgreSQL](#) in the *Amazon Aurora User Guide*.

Critical stability updates

1. Fixed a bug related to creating B-tree indexes on temporary tables that in rare cases may result in longer recovery time, and impact availability.
2. Fixed a bug related to replication when Aurora PostgreSQL is acting as a physical replica of an RDS for PostgreSQL instance. In rare cases, this bug causes a log write failure that may result in longer recovery time, and impact availability.
3. Fixed a bug related to handling of reads with high I/O latency that in rare cases may result in longer recovery time, and impact availability.

High priority stability updates

1. Fixed a bug related to logical replication in which `wal` segments are not properly removed from storage. This can result in storage bloat. To monitor this, view the `TransactionLogDiskUsage` parameter.

2. Fixed multiple bugs, which cause Aurora to crash during prefetch operations on Btree indexes.
3. Fixed a bug in which an Aurora restart may timeout when logical replication is used.
4. Enhanced the validation checks performed on data blocks in the buffer cache. This improves Aurora's detection of inconsistency.

Additional improvements and enhancements

1. The query plan management extension `apg_plan_mgmt` has an improved algorithm for managing plan generation for highly partitioned tables.
2. Reduced startup time on instances with large caches via improvements in the buffer cache recovery algorithm.
3. Improved the performance of the read-node-apply process under high transaction rate workloads by using changes to PostgreSQL LWLock prioritization. These changes prevent starvation of the read-node-apply process while the PostgreSQL `ProcArray` is under heavy contention.
4. Improved handling of batch reads during vacuum, table scans, and index scans. This results in greater throughput and lower CPU consumption.
5. Fixed a bug in which a read node may crash during the replay of a PostgreSQL SLRU-truncate operation.
6. Fixed a bug where in rare cases, database writes may stall following an error returned by one of the six copies of an Aurora log record.
7. Fixed a bug related to logical replication where an individual transaction larger than 1 GB in size may result in an engine crash.
8. Fixed a memory leak on read nodes when cluster cache management is enabled.
9. Fixed a bug in which importing an RDS for PostgreSQL snapshot might stop responding if the source snapshot contains a large number of unlogged relations.
10. Fixed a bug in which the Aurora storage daemon may crash under heavy I/O load.
11. Fixed a bug related to `hot_standby_feedback` for read nodes in which the read node may report the wrong transaction id epoch to the write node. This can cause the write node to ignore the `hot_standby_feedback` and invalidate snapshots on the read node.
12. Fixed a bug in which storage errors that occur during `CREATE DATABASE` statements are not properly handled. The bug left the resulting database inaccessible. The correct behavior is to fail the database creation and return the appropriate error to the user.

- 13 Improved handling of PostgreSQL snapshot overflow when a read node attempts to connect to a write node. Prior to this change, if the write node was in a snapshot overflow state, the read node was unable to join. A message appeared in the PostgreSQL log file in the form `DEBUG: recovery snapshot waiting for non-overflowed snapshot or until oldest active xid on standby is at least xxxxxxxx (now yyyyyyyy)`. A snapshot overflow occurs when an individual transaction has created over 64 subtransactions.
- 14 Fixed a bug related to common table expressions in which an error is incorrectly raised when a NOT IN class exists in a CTE. The error is `CTE with NOT IN fails with ERROR: could not find CTE CTE-Name`.
- 15 Fixed a bug related to an incorrect `last_error_timestamp` value in the `aurora_replica_status` table.
- 16 Fixed a bug to avoid populating shared buffers with blocks belonging to temporary objects. These blocks correctly reside in PostgreSQL backend local buffers.
- 17 Improved the performance of vacuum cleanup on GIN indexes.
- 18 Fixed a bug where in rare cases Aurora may exhibit 100% CPU utilization while acting as a replica of an RDS for PostgreSQL instance even when the replication stream is idle.
- 19 Backported a change from PostgreSQL 11 which improves the cleanup of orphaned temporary tables. Without this change, it is possible that in rare cases orphaned temporary tables can lead to transaction ID wraparound. For more information, see this [PostgreSQL community commit](#).
- 20 Fixed a bug where a Writer instance may accept replication registration requests from Reader instances while having an uninitialized startup process.
- 21 Changed the following extensions:
- Updated `pg_hint_plan` to version 1.3.3.
 - Added `plprofiler` version 4.1.

PostgreSQL 10.7, Aurora PostgreSQL 2.3 (Deprecated)

Note

The PostgreSQL engine version 10.7 with the Aurora PostgreSQL 2.3 is no longer supported. To upgrade, see [Upgrading the PostgreSQL DB engine for Aurora PostgreSQL](#) in the *Amazon Aurora User Guide*.

This release of Aurora PostgreSQL is compatible with PostgreSQL 10.7. For more information about the improvements in PostgreSQL 10.7, see [PostgreSQL release 10.7](#).

Releases and patches

- [Aurora PostgreSQL 2.3.5](#)
- [Aurora PostgreSQL 2.3.3](#)
- [Aurora PostgreSQL 2.3.1](#)
- [Aurora PostgreSQL 2.3.0](#)

Aurora PostgreSQL 2.3.5

You can find the following improvements in this release.

Improvements

1. Fixed a bug that could cause DB instance restarts.
2. Fixed a bug that could cause a crash when the PostgreSQL backend exits while using logical replication.
3. Fixed a bug that could cause a restart when reads occurred during failovers.
4. Fixed a bug with the `wal2json` module for logical replication.
5. Fixed a bug that could result in inconsistent metadata.

Aurora PostgreSQL 2.3.3

You can find the following improvements in this release.

Improvements

1. Provided a backport fix for the PostgreSQL community security issue CVE-2019-10130.
2. Provided a backport fix for the PostgreSQL community security issue CVE-2019-10164.
3. Fixed a bug in which data activity streaming could consume excessive CPU time.
4. Fixed a bug in which parallel threads scanning a B-tree index might stop responding following a disk read.
5. Fixed a bug where use of the `not in` predicate against a common table expression (CTE) could return the following error: "ERROR: bad levelsup for CTE".

6. Fixed a bug in which the read node replay process might stop responding while applying a modification to a generalized search tree (GiST) index.
7. Fixed a bug in which visibility map pages could contain incorrect freeze bits following a failover to a read node.
8. Optimized log traffic between the write node and read nodes during index maintenance.
9. Fixed a bug in which queries on read nodes may crash while performing a B-tree index scan.
10. Fixed a bug in which a query that has been optimized for redundant inner join removal could crash.
11. The function `aurora_stat_memctx_usage` now reports the number of instances of a given context name.
12. Fixed a bug in which the function `aurora_stat_memctx_usage` reported incorrect results.
13. Fixed a bug in which the read node replay process could wait to stop conflicting queries beyond the configured `max_standby_streaming_delay` value.
14. Additional information is now logged on read nodes when active connections conflict with the relay process.
15. Provided a backport fix for the PostgreSQL community bug #15677, where a crash could occur while deleting from a partitioned table.

Aurora PostgreSQL 2.3.1

You can find the following improvements in this release.

Improvements

1. Fixed multiple bugs related to I/O prefetching that caused engine crashes.

Aurora PostgreSQL 2.3.0

You can find the following improvements in this release.

New features

1. Aurora PostgreSQL now performs I/O prefetching while scanning B-tree indexes. This results in significantly improved performance for B-tree scans over uncached data.

Improvements

1. Fixed a bug in which read nodes may fail with the error "too many LWLocks taken".
2. Addressed numerous issues that caused read nodes to fail to startup while the cluster is under heavy write workload.
3. Fixed a bug in which usage of the `aurora_stat_memctx_usage()` function could lead to a crash.
4. Improved the cache replacement strategy used by table scans to minimize thrashing of the buffer cache.

PostgreSQL 10.6, Aurora PostgreSQL 2.2 (Deprecated)

Note

The PostgreSQL engine version 10.6 with the Aurora PostgreSQL 2.2 is no longer supported. To upgrade, see [Upgrading the PostgreSQL DB engine for Aurora PostgreSQL](#) in the *Amazon Aurora User Guide*.

This release of Aurora PostgreSQL is compatible with PostgreSQL 10.6. For more information about the improvements in PostgreSQL 10.6, see [PostgreSQL release 10.6](#).

Releases and patches

- [Aurora PostgreSQL 2.2.1](#)
- [Aurora PostgreSQL 2.2.0](#)

Aurora PostgreSQL 2.2.1

You can find the following improvements in this release.

Improvements

1. Improved stability of logical replication.
2. Fixed a bug which could cause an error running queries. The message reported was of the form "CLOG segment 123 does not exist: No such file or directory".

3. Increased the supported size of IAM passwords to 8KB.
4. Improved consistency of performance under high throughput write workloads.
5. Fixed a bug which could cause a read replica to crash during a restart.
6. Fixed a bug which could cause an error running queries. The message reported was of the form "SQL ERROR: Attempting to read past EOF of relation".
7. Fixed a bug which could cause an increase in memory usage after a restart.
8. Fixed a bug which could cause a transaction with a large number of subtransactions to fail.
9. Merged a patch from community PostgreSQL which addresses potential failures when using GIN indexes. For more information, see <https://git.postgresql.org/gitweb/?p=postgresql.git;a=commit;h=f9e66f2fbbb49a493045c8d8086a9b15d95b8f18>.
10. Fixed a bug which could cause a snapshot import from RDS for PostgreSQL to fail.

Aurora PostgreSQL 2.2.0

You can find the following improvements in this release.

New features

1. Added the restricted password management feature. Restricted password management enables you to restrict who can manage user passwords and password expiration changes by using the parameter `rds.restrict_password_commands` and the role `rds_password`. For more information, see [Restricting password management](#) in the *Amazon Aurora User Guide*.

PostgreSQL 10.5, Aurora PostgreSQL 2.1 (Deprecated)

Note

The PostgreSQL engine version 10.5 with the Aurora PostgreSQL 2.1 is no longer supported. To upgrade, see [Upgrading the PostgreSQL DB engine for Aurora PostgreSQL](#) in the *Amazon Aurora User Guide*.

This release of Aurora PostgreSQL is compatible with PostgreSQL 10.5. For more information about the improvements in PostgreSQL 10.5, see [PostgreSQL release 10.5](#).

Releases and patches

- [Aurora PostgreSQL 2.1.1](#)
- [Aurora PostgreSQL 2.1.0](#)

Aurora PostgreSQL 2.1.1

You can find the following improvements in this release.

Improvements

1. Fixed a bug which could cause an error running queries. The message reported was of the form "CLOG segment 123 does not exist: No such file or directory".
2. Increased the supported size of IAM passwords to 8KB.
3. Improved consistency of performance under high throughput write workloads.
4. Fixed a bug which could cause a read replica to crash during a restart.
5. Fixed a bug which could cause an error running queries. The message reported was of the form "SQL ERROR: Attempting to read past EOF of relation".
6. Fixed a bug which could cause an increase in memory usage after a restart.
7. Fixed a bug which could cause a transaction with a large number of subtransactions to fail.
8. Merged a patch from community PostgreSQL which addresses potential failures when using GIN indexes. For more information, see <https://git.postgresql.org/gitweb/?p=postgresql.git;a=commit;h=f9e66f2fbbb49a493045c8d8086a9b15d95b8f18>.
9. Fixed a bug which could cause a snapshot import from RDS for PostgreSQL to fail.

Aurora PostgreSQL 2.1.0

You can find the following improvements in this release.

New features

1. General availability of Aurora Query Plan Management, which enables customers to track and manage any or all query plans used by their applications, to control query optimizer plan selection, and to ensure high and stable application performance. For more information, see [Managing query execution plans for Aurora PostgreSQL](#) in the *Amazon Aurora User Guide*.

2. Updated the `libprotobuf` extension to version 1.3.0. This is used by the PostGIS extension.
3. Updated the `pg_similarity` extension to version 1.0.
4. Updated the `log_fdw` extension to version 1.1.
5. Updated the `pg_hint_plan` extension to version 1.3.1.

Improvements

1. Network traffic between the writer and reader nodes is now compressed to reduce network utilization. This reduces the chance of read node unavailability due to network saturation.
2. Implemented a high performance, scalable subsystem for PostgreSQL subtransactions. This improves the performance of applications which make extensive use of savepoints and PL/pgSQL exception handlers.
3. The `rds_superuser` role can now set the following parameters on a per-session, database, or role level:
 - `log_duration`
 - `log_error_verbosity`
 - `log_executor_stats`
 - `log_lock_waits`
 - `log_min_duration_statement`
 - `log_min_error_statement`
 - `log_min_messages`
 - `log_parser_stats`
 - `log_planner_stats`
 - `log_replication_commands`
 - `log_statement_stats`
 - `log_temp_files`
4. Fixed a bug in which the SQL command "ALTER FUNCTION ... OWNER TO ..." might fail with error "improper qualified name (too many dotted names)".
5. Fixed a bug in which a crash could occur while committing a transaction with more than two million subtransactions.
6. Fixed a bug in community PostgreSQL code related to GIN indexes which can cause the Aurora Storage volume to become unavailable.

7. Fixed a bug in which an Aurora PostgreSQL replica of an RDS for PostgreSQL instance might fail to start, reporting error: "PANIC: could not locate a valid checkpoint record".
8. Fixed a bug in which passing an invalid parameter to the `aurora_stat_backend_waits` function could cause a crash.

Known issues

1. The `pageinspect` extension is not supported in Aurora PostgreSQL.

PostgreSQL 10.4, Aurora PostgreSQL 2.0 (Deprecated)

Note

The PostgreSQL engine version 10.4 with the Aurora PostgreSQL 2.0 is no longer supported. To upgrade, see [Upgrading the PostgreSQL DB engine for Aurora PostgreSQL](#) in the *Amazon Aurora User Guide*.

This release of Aurora PostgreSQL is compatible with PostgreSQL 10.4. For more information about the improvements in PostgreSQL 10.4, see [PostgreSQL release 10.4](#).

Releases and patches

- [Aurora PostgreSQL 2.0.1](#)
- [Aurora PostgreSQL 2.0.0](#)

Aurora PostgreSQL 2.0.1

You can find the following improvements in this release.

Improvements

1. Fixed a bug which could cause an error running queries. The message reported was of the form "CLOG segment 123 does not exist: No such file or directory".
2. Increased the supported size of IAM passwords to 8KB.
3. Improved consistency of performance under high throughput write workloads.

4. Fixed a bug which could cause a read replica to crash during a restart.
5. Fixed a bug which could cause an error running queries. The message reported was of the form "SQL ERROR: Attempting to read past EOF of relation".
6. Fixed a bug which could cause an increase in memory usage after a restart.
7. Fixed a bug which could cause a transaction with a large number of subtransactions to fail.
8. Merged a patch from community PostgreSQL which addresses potential failures when using GIN indexes. For more information, see <https://git.postgresql.org/gitweb/?p=postgresql.git;a=commit;h=f9e66f2fbbb49a493045c8d8086a9b15d95b8f18>.
9. Fixed a bug which could cause a snapshot import from RDS for PostgreSQL to fail.

Aurora PostgreSQL 2.0.0

You can find the following improvements in this release.

Improvements

1. This release contains all fixes, features, and improvements present in [PostgreSQL 9.6.9, Aurora PostgreSQL 1.3 \(Deprecated\)](#).
2. The temporary file size limitation is user-configurable. You require the **rds_superuser** role to modify the `temp_file_limit` parameter.
3. Upgraded the GDAL library, which is used by the PostGIS extension.
4. Updated the `ip4r` extension to version 2.1.1.
5. Updated the `pg_repack` extension to version 1.4.3.
6. Updated the `plv8` extension to version 2.1.2.
7. Parallel queries – When you create a new Aurora PostgreSQL version 2.0 instance, parallel queries are enabled for the default `.postgresql0` parameter group. The parameter `max_parallel_workers_per_gather` is set to 2 by default, but you can modify it to support your specific workload requirements.
8. Fixed a bug in which read nodes may crash following a specific type of free space change from the write node.

PostgreSQL 9.6.22, Aurora PostgreSQL 1.11 (Deprecated)

Note

The PostgreSQL engine version 9.6.22 and Aurora PostgreSQL 1.10 are no longer supported. To upgrade, see [Upgrading the PostgreSQL DB engine for Aurora PostgreSQL](#) in the *Amazon Aurora User Guide*.

This release of Aurora PostgreSQL is compatible with PostgreSQL 9.6.22. For more information about the improvements in PostgreSQL 9.6.22, see [PostgreSQL release 9.6.22](#).

Releases and patches

- [Aurora PostgreSQL 1.11.1](#)
- [Aurora PostgreSQL 1.11](#)

Aurora PostgreSQL 1.11.1

High priority stability updates

- Fixed an issue where queries may become unresponsive due to I/O resource exhaustion triggered by prefetch.

Additional improvements and stability updates

- Fixed multiple issues in the Aurora storage daemon that could lead to brief periods of unavailability when specific network configurations are used.

Aurora PostgreSQL 1.11

High priority stability enhancements

1. Fixed an issue where creating a database from an existing template database with tablespace resulted in an error with the message `ERROR: could not open file pg_tblspc/...: No such file or directory`.
2. Fixed an issue where, in rare cases, an Aurora replica may be unable to start when a large number of PostgreSQL subtransactions (i.e. SQL savepoints) have been used.

3. Fixed an issue where, in rare circumstances, read results may be inconsistent for repeated read requests on replica nodes.

Additional improvements and enhancements

1. Upgraded OpenSSL to 1.1.1k.
2. Reduced CPU usage and memory consumption of the WAL apply process on Aurora replicas for some workloads.
3. Improve safety checks in the write path to detect incorrect writes to metadata.
4. Fixed an issue where a duplicate file entry can prevent the Aurora PostgreSQL engine from starting up.
5. Fixed an issue that could cause temporary unavailability under heavy workloads.
6. Added back ability to use a leading forward slash in the S3 path during S3 import.
7. Updated the PostGIS extension to version 2.4.7.
8. Updated the oraofce extension to version 3.16.

PostgreSQL 9.6.21, Aurora PostgreSQL 1.10 (Deprecated)

Note

The PostgreSQL engine version 9.6.21 and Aurora PostgreSQL 1.10 are no longer supported. To upgrade, see [Upgrading the PostgreSQL DB engine for Aurora PostgreSQL](#) in the *Amazon Aurora User Guide*.

This release of Aurora PostgreSQL is compatible with PostgreSQL 9.6.21. For more information about the improvements in PostgreSQL 9.6.21, see [PostgreSQL release 9.6.21](#).

Aurora PostgreSQL 1.10.0

High priority stability enhancements

1. Fixed a bug where in rare cases a reader had inconsistent results when it restarted while a transaction with more than 64 subtransactions was being processed.
2. Backported fixes for the following PostgreSQL community security issues:

- [CVE-2021-32027](#)
- [CVE-2021-32028](#)
- [CVE-2021-32029](#)

Additional improvements and enhancements

1. Fixed a bug where the database could not be started when there were many relations in memory-constrained environments.
2. Fixed a bug in the `apg_plan_mgmt` extension that could cause brief periods of unavailability due to an internal buffer overflow.
3. Fixed a bug where the database engine would attempt to create shared memory segments larger than the instance total memory and fail repeatedly. For example, attempts to create 128 GiB shared buffers on a `db.r5.large` instance would fail. With this change, requests for total shared memory allocations larger than the instance memory allow setting the instance to incompatible parameters.
4. Added logic to clean up unnecessary `pg_wal` temporary files on a database startup.
5. Fixed a bug in Aurora PostgreSQL 9.6 that sometimes prevented read/write nodes from starting up when inbound replication is used.
6. Fixed a bug that could cause brief periods of unavailability due to running out of memory when creating the PostGIS extension with `pgAudit` enabled.
7. Added `btree` page checks to detect tuple metadata inconsistency.

PostgreSQL 9.6.19, Aurora PostgreSQL 1.9 (Deprecated)

Note

The PostgreSQL engine version 9.6.19 and Aurora PostgreSQL 1.9 are no longer supported. To upgrade, see [Upgrading the PostgreSQL DB engine for Aurora PostgreSQL](#) in the *Amazon Aurora User Guide*.

This release of Aurora PostgreSQL is compatible with PostgreSQL 9.6.19. For more information about the improvements in PostgreSQL 9.6.19, see [PostgreSQL release 9.6.19](#).

Releases and patches

- [Aurora PostgreSQL 1.9.2](#)
- [Aurora PostgreSQL 1.9.1](#)
- [Aurora PostgreSQL 1.9.0](#)

Aurora PostgreSQL 1.9.2

High priority stability enhancements

1. Fixed a bug where a reader node might render an extra or missing row if the reader restarted while the writer node is processing a long transaction with more than 64 subtransactions.

Additional improvements and enhancements

1. Fixed a bug where a large S3 import with thousands of clients can cause one or more of the import clients to stop responding.

Aurora PostgreSQL 1.9.1

Critical stability enhancements

1. Fixed a bug that caused a read replica to unsuccessfully restart repeatedly in rare cases.

Additional improvements and enhancements

1. Fixed a bug that when under heavy load, snapshot import, COPY import, or S3 import stopped responding in rare cases.
2. Fixed a bug where a read replica might not join the cluster when the writer was very busy with a write-intensive workload.

Aurora PostgreSQL 1.9.0

Critical stability enhancements

- None

High priority stability enhancements

1. Backported fixes for the PostgreSQL community security issues CVE-2020-25694, CVE-2020-25695, and CVE-2020-25696.
2. Fixed a bug in Aurora PostgreSQL replication that might result in the following error message: `ERROR: MultiXactId nnnn has not been created yet -- apparent wraparound`

Additional improvements and enhancements

1. Aurora PostgreSQL no longer falls behind on a read node when the backend is blocked writing to the database client.
2. Fixed a bug that in rare cases caused a brief period of unavailability on a read replica when the storage volume grew.
3. Fixed a bug when creating a database that could return the following error: `ERROR: could not create directory on local disk`
4. Fixed a bug in the GiST index that could result in an out of memory condition after promoting an Aurora read replica.
5. Fixed a bug related to replication when Aurora PostgreSQL is acting as a physical replica of an RDS for PostgreSQL instance that uses GiST indexes. In rare cases, this bug caused a brief period of unavailability after promoting the Aurora cluster.

PostgreSQL 9.6.18, Aurora PostgreSQL 1.8 (Deprecated)

Note

The PostgreSQL engine version 9.6.18 and Aurora PostgreSQL 1.8 are no longer supported. To upgrade, see [Upgrading the PostgreSQL DB engine for Aurora PostgreSQL](#) in the *Amazon Aurora User Guide*.

This release of Aurora PostgreSQL is compatible with PostgreSQL 9.6.18. For more information about the improvements in PostgreSQL 9.6.18, see [PostgreSQL release 9.6.18](#).

Releases and patches

- [Aurora PostgreSQL release 1.8.2](#)

- [Aurora PostgreSQL 1.8.0](#)

There is no version 1.8.1.

Aurora PostgreSQL release 1.8.2

Critical stability enhancements

1. None

High priority stability enhancements

1. Fixed a bug in Aurora PostgreSQL replication that could result in the error message `ERROR: MultiXactId nnnn has not been created yet -- apparent wraparound`.
2. Backported fixes for the following PostgreSQL community security issues:
 - [CVE-2020-25694](#)
 - [CVE-2020-25695](#)
 - [CVE-2020-25696](#)

Additional improvements and enhancements

1. Aurora PostgreSQL no longer falls behind on a read node when the backend is blocked writing to the database client.
2. Fixed a bug where a `DROP DATABASE` statement didn't remove any relation files.
3. Fixed a small memory leak in a b-tree index that could lead to an out of memory condition.
4. Fixed a bug in the `aurora_replica_status()` function where the `server_id` field was sometimes truncated.
5. Fixed a bug related to replication when Aurora PostgreSQL is acting as a physical replica of an RDS for PostgreSQL instance that uses GiST indexes. In rare cases, this bug caused a brief period of unavailability after promoting the Aurora DB cluster.

Aurora PostgreSQL 1.8.0

You can find the following improvements in this release.

Critical stability enhancements

1. Fixed a bug related to heap page extend that in rare cases resulted in longer recovery time and impacted availability.

Additional improvements and enhancements

1. Fixed a bug where the Aurora replica crashed when workloads with heavy subtransactions are made on the writer instance.
2. Fixed a bug where the writer instance crashed due to a memory leak and the depletion of memory used to track active transactions.
3. Fixed a bug that lead to a crash due to improper initialization when there is no free memory available during PostgreSQL backend startup.
4. Fixed a crash during a BTree prefetch that occurred under certain conditions that depended on the shape and data contained in the index.
5. Fixed a bug where a SELECT query might incorrectly return the error Attempting to read past EOF of relation rrrr. blockno=bbb nblocks=nnn.
6. Fixed a bug where the database might be unavailable briefly due to error handling in database storage growth.

PostgreSQL 9.6.17, Aurora PostgreSQL 1.7 (Deprecated)

This release of Aurora PostgreSQL is compatible with PostgreSQL 9.6.17. For more information about the improvements in PostgreSQL 9.6.17, see [PostgreSQL release 9.6.17](#).

Releases and patches

- [Aurora PostgreSQL 1.7.7](#)
- [Aurora PostgreSQL 1.7.6](#)
- [Aurora PostgreSQL 1.7.3](#)
- [Aurora PostgreSQL 1.7.2](#)
- [Aurora PostgreSQL 1.7.1](#)

Aurora PostgreSQL 1.7.7

You can find the following improvements in this release.

Critical stability enhancements

- None

High priority stability enhancements

1. Backported fixes for the following PostgreSQL community security issues:

- [CVE-2020-25694](#)
- [CVE-2020-25695](#)
- [CVE-2020-25696](#)

Additional improvements and enhancements

- None

Aurora PostgreSQL 1.7.6

You can find the following improvements in this release.

Critical stability enhancements

- None

High priority stability enhancements

1. Fixed a bug in Aurora PostgreSQL replication that might result in the error message, ERROR: MultiXactId nnnn has not been created yet -- apparent wraparound.

Additional improvements and enhancements

1. Fixed a bug that in rare cases caused brief read replica unavailability when storage volume grew.
2. Fixed a bug in a b-tree index read optimization that might have caused a brief period of unavailability.
3. Fixed a bug in a GiST index that might result in an out-of-memory condition after promoting an Aurora Read Replica.

Aurora PostgreSQL 1.7.3

You can find the following improvements in this release.

Critical stability enhancements

- None

High priority stability enhancements

- None

Additional improvements and enhancements

1. Fixed a bug that might cause brief unavailability for heavy subtransaction workloads when multiple reader instances restart or rejoin the cluster.

Aurora PostgreSQL 1.7.2

You can find the following improvements in this release.

Critical stability enhancements

1. Fixed a bug related to heap page extend that in rare cases resulted in longer recovery time and impacted availability.

High Priority Stability Enhancements

None

Additional improvements and enhancements

1. Fixed a bug where the database might be unavailable briefly due to error handling in database storage growth.
2. Fixed a bug where a SELECT query might incorrectly return the error, Attempting to read past EOF of relation rrrr. blockno=bbb nblocks=nnn.
3. Fixed an issue with the internal metrics collector that could result in erratic CPU spikes on database instances.

Aurora PostgreSQL 1.7.1

You can find the following improvements in this release.

Critical stability enhancements

None.

High priority stability enhancements

1. Improved performance and availability of read instances when applying DROP TABLE and TRUNCATE TABLE operations.
2. Fixed a small but continuous memory leak in a diagnostic module that could lead to an out-of-memory condition on smaller DB instance types.
3. Fixed a bug in the PostGIS extension which could lead to a database restart. This has been reported to the PostGIS community as <https://trac.osgeo.org/postgis/ticket/4646>.
4. Fixed a bug where read requests might stop responding due to incorrect error handling in the storage engine.
5. Fixed a bug that fails for some queries and results in the message ERROR: found xmin xxxxxx from before relfrozenxid yyyyyyy. This could occur following the promotion of a read instance to a write instance.

Additional improvements and enhancements

1. Improved performance for queries that read many rows from storage.
2. Improved performance and availability of reader DB instances during heavy read workload.
3. Fixed a bug that resulted in the message ERROR: could not create file "base/xxxxxx/yyyyyy" as a previous version still exists on disk: Success. Please contact AWS customer support. This can occur during object creation after PostgreSQL's 32-bit object identifier has wrapped around.
4. Fixed a bug in the pg_hint_plan extension where a multi-statement query could lead to a crash when enable_hint_table is enabled. This is tracked in the PostgreSQL community as https://github.com/oss-c-db/pg_hint_plan/issues/25.
5. Changed the following extensions:
 - Updated orafce to version 3.8

PostgreSQL 9.6.16, Aurora PostgreSQL 1.6 (Deprecated)

This version of Aurora PostgreSQL is compatible with PostgreSQL 9.6.16. For more information about the improvements in release 9.6.16, see [PostgreSQL release 9.6.16](#).

This release contains multiple critical stability enhancements. Amazon highly recommends upgrading your Aurora PostgreSQL clusters that use older PostgreSQL 9.6 engines to this release.

Patch versions

- [Aurora PostgreSQL 1.6.4](#)
- [Aurora PostgreSQL 1.6.3](#)
- [Aurora PostgreSQL 1.6.2](#)
- [Aurora PostgreSQL 1.6.1](#)
- [Aurora PostgreSQL 1.6.0](#)

Aurora PostgreSQL 1.6.4

You can find the following improvements in this release.

Critical stability enhancements

- None

High priority stability enhancements

1. Backported fixes for the following PostgreSQL community security issues:

- [CVE-2020-25694](#)
- [CVE-2020-25695](#)
- [CVE-2020-25696](#)

Additional improvements and enhancements

- None

Aurora PostgreSQL 1.6.3

New features

1. Aurora PostgreSQL now supports the PostgreSQL [vacuum_truncate](#) storage parameter to manage vacuum truncation for specific tables. Set this [storage parameter](#) to false when creating or altering a table to prevent the [VACUUM](#) SQL command from truncating the table's trailing empty pages.

Critical stability enhancements

- None

High priority stability enhancements

1. Fixed a bug where reads from storage might stop responding due to incorrect error handling.

Additional improvements and enhancements

- None

Aurora PostgreSQL 1.6.2

You can find the following improvements in this engine update.

Critical stability enhancements

1. Fixed a bug in which a reader DB instance might temporarily use stale data. This could lead to wrong results such as too few or too many rows. This error is not persisted on storage, and will clear when the database page containing the row has been evicted from cache. This can happen when the primary DB instance enters a transaction snapshot overflow due to having more than 64 subtransactions in a single transaction. Applications susceptible to this bug include those that use SQL savepoints or PostgreSQL exception handlers with more than 64 subtransactions in the top transaction.

High priority stability enhancements

1. Fixed a bug that may cause a reader DB instance to crash causing unavailability while attempting to join the DB cluster. This can happen in some cases when the primary DB instance has a transaction snapshot overflow due to a high number of subtransactions. In this situation the reader DB instance will be unable to join until the snapshot overflow has cleared.

Additional improvements and enhancements

1. Fixed a bug that prevented Performance Insights from determining the query ID of a running statement.

Aurora PostgreSQL 1.6.1

You can find the following improvements in this engine update.

Critical stability enhancements

1. None

High priority stability enhancements

1. Fixed a bug that might cause the database engine to crash causing unavailability. This occurred if a newly established database connection encountered a resource exhaustion-related error during initialization after successful authentication.

Additional improvements and enhancements

1. Provided general improvements to the stability and availability of Aurora PostgreSQL.

Aurora PostgreSQL 1.6.0

You can find the following new features and improvements in this engine version.

New features

1. Updates to the `apg_plan_mgmt` extension. For more information, see [Managing query execution plans for Aurora PostgreSQL](#) in the *Amazon Aurora User Guide*.

Critical stability enhancements

1. Fixed a bug related to creating B-tree indexes on temporary tables that in rare cases may result in longer recovery time, and impact availability.
2. Fixed a bug related to replication when Aurora PostgreSQL is acting as a physical replica of an RDS for PostgreSQL instance. In rare cases, this bug causes a log write failure that may result in longer recovery time, and impact availability.
3. Fixed a bug related to handling of reads with high I/O latency that in rare cases may result in longer recovery time, and impact availability.

High priority stability enhancements

1. Fixed multiple bugs, which cause Aurora to crash during prefetch operations on Btree indexes.
2. Enhanced the validation checks performed on data blocks in the buffer cache. This improves Aurora's detection of inconsistency.

Additional improvements and enhancements

1. The query plan management extension `apg_plan_mgmt` has an improved algorithm for managing plan generation for highly partitioned tables.
2. Reduced startup time on instances with large caches via improvements in the buffer cache recovery algorithm.
3. Improved the performance of the read-node-apply process under high transaction rate workloads by using changes to PostgreSQL LWLock prioritization. These changes prevent starvation of the read-node-apply process while the PostgreSQL `PROCARRAY` is under heavy contention.
4. Fixed a bug in which a read node may crash during the replay of a PostgreSQL SLRU-truncate operation.
5. Fixed a bug where in rare cases, database writes might stall following an error returned by one of the six copies of an Aurora log record.
6. Fixed a memory leak on read nodes when cluster cache management is enabled.
7. Fixed a bug in which importing an RDS for PostgreSQL snapshot might stop responding if the source snapshot contains a large number of unlogged relations.

8. Fixed a bug related to `hot_standby_feedback` for read nodes in which the read node may report the wrong transaction id epoch to the write node. This can cause the write node to ignore the `hot_standby_feedback` and invalidate snapshots on the read node.
9. Fixed a bug in which storage errors that occur during `CREATE DATABASE` statements are not properly handled. The bug left the resulting database inaccessible. The correct behavior is to fail the database creation and return the appropriate error to the user.
- 10 Improved handling of PostgreSQL snapshot overflow when a read node attempts to connect to a write node. Prior to this change, if the write node was in a snapshot overflow state, the read node was unable to join. A message appear in the PostgreSQL log file in the form `DEBUG: recovery snapshot waiting for non-overflowed snapshot or until oldest active xid on standby is at least xxxxxxxx (now yyyyyyyy)`. A snapshot overflow occurs when an individual transaction has created over 64 subtransactions.
- 11 Fixed a bug related to common table expressions in which an error is incorrectly raised when a `NOT IN` class exists in a CTE. The error is `CTE with NOT IN fails with ERROR: could not find CTE CTE-Name`.
- 12 Fixed a bug related to an incorrect `last_error_timestamp` value in the `aurora_replica_status` table.
- 13 Fixed a bug to avoid populating shared buffers with blocks belonging to temporary objects. These blocks correctly reside in PostgreSQL backend local buffers.
- 14 Fixed a bug where in rare cases Aurora may exhibit 100% CPU utilization while acting as a replica of an RDS for PostgreSQL instance even when the replication stream is idle.
- 15 Backported a change from PostgreSQL 11 which improves the cleanup of orphaned temporary tables. Without this change, it is possible that in rare cases orphaned temporary tables can lead to transaction ID wraparound. For more information, see this [PostgreSQL community commit](#).
- 16 Fixed a bug where a Writer instance may accept replication registration requests from Reader instances while having an uninitialized startup process.
- 17 Changed the following extensions:
 - Updated `pg_hint_plan` to version 1.2.5.

PostgreSQL 9.6.12, Aurora PostgreSQL 1.5 (Deprecated)

Note

The PostgreSQL engine version 9.6.12 with the Aurora PostgreSQL 1.5 is no longer supported. To upgrade, see [Upgrading the PostgreSQL DB engine for Aurora PostgreSQL](#) in the *Amazon Aurora User Guide*.

This release of Aurora PostgreSQL is compatible with PostgreSQL 9.6.12. For more information about the improvements in PostgreSQL 9.6.12, see [PostgreSQL release 9.6.12](#).

Releases and patches

- [Aurora PostgreSQL 1.5.3](#)
- [Aurora PostgreSQL 1.5.2](#)
- [Aurora PostgreSQL 1.5.1](#)
- [Aurora PostgreSQL 1.5.0](#)

Aurora PostgreSQL 1.5.3

You can find the following improvements in this release.

Improvements

1. Fixed a bug that could cause DB instance restarts.
2. Fixed a bug that could cause a restart when reads occurred during failovers.
3. Fixed a bug that could result in inconsistent metadata.

Aurora PostgreSQL 1.5.2

You can find the following improvements in this release.

Improvements

1. Provided a backport fix for the PostgreSQL community security issue CVE-2019-10130.
2. Fixed a bug in which the read node replay process might stop responding while applying a modification to a generalized search tree (GiST) index.

3. Fixed a bug in which visibility map pages may contain incorrect freeze bits following a failover to a read node.
4. Fixed a bug in which the error "relation relation-name does not exist" is incorrectly reported.
5. Optimized log traffic between the write node and read nodes during index maintenance.
6. Fixed a bug in which queries on read nodes may crash while performing a B-tree index scan.
7. The function `aurora_stat_memctx_usage` now reports the number of instances of a given context name.
8. Fixed a bug in which the function `aurora_stat_memctx_usage` reported incorrect results.
9. Fixed a bug in which the read node replay process may wait to stop conflicting queries beyond the configured `max_standby_streaming_delay`.
10. Additional information is now logged on read nodes when active connections conflict with the relay process.

Aurora PostgreSQL 1.5.1

You can find the following improvements in this release.

Improvements

1. Fixed multiple bugs related to I/O prefetching, which caused engine crashes.

Aurora PostgreSQL 1.5.0

You can find the following improvements in this release.

New features

1. Aurora PostgreSQL now performs I/O prefetching while scanning B-tree indexes. This results in significantly improved performance for B-tree scans over uncached data.

Improvements

1. Addressed numerous issues that caused read nodes to fail to startup while the cluster is under heavy write workload.
2. Fixed a bug in which usage of the `aurora_stat_memctx_usage()` function could lead to a crash.

3. Improved the cache replacement strategy used by table scans to minimize thrashing of the buffer cache.

PostgreSQL 9.6.11, Aurora PostgreSQL 1.4 (Deprecated)

Note

The PostgreSQL engine version 9.6.11 with the Aurora PostgreSQL 1.4 is no longer supported. To upgrade, see [Upgrading the PostgreSQL DB engine for Aurora PostgreSQL](#) in the *Amazon Aurora User Guide*.

This release of Aurora PostgreSQL is compatible with PostgreSQL 9.6.11. For more information about the improvements in PostgreSQL 9.6.11, see [PostgreSQL release 9.6.11](#).

You can find the following improvements in this release.

New features

1. Support is added for the `pg_similarity` extension version 1.0.
2. Aurora PostgreSQL now supports the PostgreSQL `vacuum_truncate` storage parameter to manage vacuum truncation for specific tables. Set this [storage parameter](#) to false when creating or altering a table to prevent the `VACUUM` SQL command from truncating the table's trailing empty pages.

Improvements

1. This release contains all fixes, features, and improvements present in [PostgreSQL 9.6.9, Aurora PostgreSQL 1.3 \(Deprecated\)](#).
2. Network traffic between the writer and reader nodes is now compressed to reduce network utilization. This reduces the chance of read node unavailability due to network saturation.
3. Performance of subtransactions has improved under high concurrency workloads.
4. An update for the `pg_hint_plan` extension to version 1.2.3.
5. Fixed an issue where on a busy system, a commit with millions of subtransactions (and sometimes with commit timestamps enabled) can cause Aurora to crash.

6. Fixed an issue where an INSERT statement with VALUES could fail with the message "Attempting to read past EOF of relation".
7. An upgrade of the `apg_plan_mgmt` extension to version 1.0.1. For details, see [Version 1.0.1 of the Aurora PostgreSQL `apg_plan_mgmt` extension](#).

The `apg_plan_mgmt` extension is used with query plan management. For more about how to install, upgrade, and use the `apg_plan_mgmt` extension, see [Managing query execution plans for Aurora PostgreSQL](#) in the *Amazon Aurora User Guide*.

PostgreSQL 9.6.9, Aurora PostgreSQL 1.3 (Deprecated)

Note

The PostgreSQL engine version 9.6.9 with the Aurora PostgreSQL 1.3 is no longer supported. To upgrade, see [Upgrading the PostgreSQL DB engine for Aurora PostgreSQL](#) in the *Amazon Aurora User Guide*.

This release of Aurora PostgreSQL is compatible with PostgreSQL 9.6.9. For more information about the improvements in PostgreSQL 9.6.9, see [PostgreSQL release 9.6.9](#).

Releases and patches

- [Aurora PostgreSQL 1.3.2](#)
- [Aurora PostgreSQL 1.3.0](#)

Aurora PostgreSQL 1.3.2

You can find the following improvements in this release.

New features

1. Added the `ProcArrayGroupUpdate` wait event.

Improvements

1. Fixed a bug which could cause an error running queries. The message reported was of the form "CLOG segment 123 does not exist: No such file or directory".

2. Increased the supported size of IAM passwords to 8KB.
3. Improved consistency of performance under high throughput write workloads.
4. Fixed a bug which could cause a read replica to crash during a restart.
5. Fixed a bug which could cause an error running queries. The message reported was of the form "SQL ERROR: Attempting to read past EOF of relation".
6. Fixed a bug which could cause an increase in memory usage after a restart.
7. Fixed a bug which could cause a transaction with a large number of subtransactions to fail.
8. Merged a patch from community PostgreSQL which addresses potential failures when using GIN indexes. For more information, see <https://git.postgresql.org/gitweb/?p=postgresql.git;a=commit;h=f9e66f2fbbb49a493045c8d8086a9b15d95b8f18>.
9. Fixed a bug which could cause a snapshot import from RDS for PostgreSQL to fail.

Aurora PostgreSQL 1.3.0

You can find the following improvements in this release.

Improvements

1. This release contains all fixes, features, and improvements present in [PostgreSQL 9.6.8, Aurora PostgreSQL 1.2 \(Deprecated\)](#).
2. Updated the GDAL library, which is used by the PostGIS extension.
3. Updated the following PostgreSQL extensions:
 - `ip4r` updated to version 2.1.1.
 - `pgaudit` updated to version 1.1.1.
 - `pg_repack` updated to version 1.4.3.
 - `plv8` updated to version 2.1.2.
4. Fixed an issue in the monitoring system that could incorrectly cause a failover when local disk usage is high.
5. Fixed a bug in which Aurora PostgreSQL can repeatedly crash, reporting:

```
PANIC: new_record_total_len (8201) must be less than BLCKSZ (8192), rmid (6), info (32)
```

6. Fixed a bug in which an Aurora PostgreSQL read node might be unable to rejoin a cluster due to recovery of a large buffer cache. This issue is unlikely to occur on instances other than **r4.16xlarge**.
7. Fixed a bug in which inserting into an empty GIN index leaf page imported from pre-9.4 engine versions can cause the Aurora storage volume to become unavailable.
8. Fixed a bug in which, in rare circumstances, a crash during transaction commit could result in the loss of CommitTs data for the committing transaction. The actual durability of the transaction was not impacted by this bug.
9. Fixed a bug in the PostGIS extension in which PostGIS can crash in the function `gserialized_gist_picksplit_2d()`.
- 10 Improved the stability of read-only nodes during heavy write traffic on instances smaller than **r4.8xl**. This specifically addresses a situation where the network bandwidth between the writer and the reader is constrained.
- 11 Fixed a bug in which an Aurora PostgreSQL instance acting as a replication target of an RDS for PostgreSQL instance crashed with the following error:


```
FATAL: could not open file "base/16411/680897_vm": No such file or directory" during "xlog redo at 782/3122D540 for Storage/TRUNCATE"
```
- 12 Fixed a memory leak on read-only nodes in which the heap size for the "aurora wal replay process" will continue to grow. This is observable via Enhanced Monitoring.
- 13 Fixed a bug in which Aurora PostgreSQL can fail to start, with the following message reported in the PostgreSQL log:


```
FATAL: Storage initialization failed.
```
- 14 Fixed a performance limitation on heavy write workloads that caused waits on the `LWLock:buffer_content` and `I0:ControlFileSyncUpdate` events.
- 15 Fixed a bug in which read nodes could crash following a specific type of free space change from the write node.

PostgreSQL 9.6.8, Aurora PostgreSQL 1.2 (Deprecated)

Note

The PostgreSQL engine version 9.6.8 with the Aurora PostgreSQL 1.2 is no longer supported. To upgrade, see [Upgrading the PostgreSQL DB engine for Aurora PostgreSQL](#) in the *Amazon Aurora User Guide*.

For more information about PostgreSQL 9.6.8, see [PostgreSQL release 9.6.8](#).

Releases and patches

- [Aurora PostgreSQL 1.2.2](#)
- [Aurora PostgreSQL 1.2.0](#)

Aurora PostgreSQL 1.2.2

You can find the following improvements in this release.

New features

1. Added the ProcArrayGroupUpdate wait event.

Improvements

1. Fixed a bug which could cause an error running queries. The message reported was of the form "CLOG segment 123 does not exist: No such file or directory".
2. Increased the supported size of IAM passwords to 8KB.
3. Improved consistency of performance under high throughput write workloads.
4. Fixed a bug which could cause a read replica to crash during a restart.
5. Fixed a bug which could cause an error running queries. The message reported was of the form "SQL ERROR: Attempting to read past EOF of relation".
6. Fixed a bug which could cause an increase in memory usage after a restart.
7. Fixed a bug which could cause a transaction with a large number of subtransactions to fail.

8. Merged a patch from community PostgreSQL which addresses potential failures when using GIN indexes. For more information, see <https://git.postgresql.org/gitweb/?p=postgresql.git;a=commit;h=f9e66f2fbbb49a493045c8d8086a9b15d95b8f18>.
9. Fixed a bug which could cause a snapshot import from RDS for PostgreSQL to fail.

Aurora PostgreSQL 1.2.0

You can find the following improvements in this release.

New features

1. Introduced the `aurora_stat_memctx_usage()` function. This function reports internal memory context usage for each PostgreSQL backend. You can use this function to help determine why certain backends are consuming large amounts of memory.

Improvements

1. This release contains all fixes, features, and improvements present in [PostgreSQL 9.6.6 Aurora PostgreSQL 1.1 \(Deprecated\)](#).
2. Updates the following PostgreSQL extensions:
 - `pg_hint_plan` updated to version 1.2.2
 - `plv8` updated to version 2.1.0
3. Improves efficiency of traffic between writer and reader nodes.
4. Improves connection establishment performance.
5. Improve the diagnostic data provided in the PostgreSQL error log when an out-of-memory error is encountered.
6. Multiple fixes to improve the reliability and performance of snapshot import from Amazon RDS for PostgreSQL to Aurora PostgreSQL-Compatible Edition.
7. Multiple fixes to improve the reliability and performance of Aurora PostgreSQL read nodes.
8. Fixes a bug in which an otherwise idle instance can generate unnecessary read traffic on an Aurora storage volume.
9. Fixes a bug in which duplicate sequence values can be encountered during insert. The problem only occurs when migrating a snapshot from RDS for PostgreSQL to Aurora PostgreSQL. The fix prevents the problem from being introduced when performing the migration. Instances migrated before this release can still encounter duplicate key errors.

- 10 Fixes a bug in which an RDS for PostgreSQL instance migrated to Aurora PostgreSQL using replication can run out of memory doing insert/update of GIST indexes, or cause other issues with GIST indexes.
- 11 Fixes a bug in which vacuum can fail to update the corresponding `pg_database.datfrozenxid` value for a database.
- 12 Fixes a bug in which a crash while creating a new MultiXact (contended row level lock) can cause Aurora PostgreSQL to stop responding indefinitely on the first access to the same relation after the engine restarts.
- 13 Fixes a bug in which a PostgreSQL backend can't be terminated or canceled while invoking an `fdw` call.
- 14 Fixes a bug in which one vCPU is fully utilized at all times by the Aurora storage daemon. This issue is especially noticeable on smaller instance classes, such as `r4.large`, where it can lead to 25–50 percent CPU usage when idle.
- 15 Fixes a bug in which an Aurora PostgreSQL writer node can fail over spuriously.
- 16 Fixes a bug in which, in a rare scenario, an Aurora PostgreSQL read node can report:

"FATAL: lock buffer_io is not held"
- 17 Fixes a bug in which stale relcache entries can halt vacuuming of relations and push the system close to transaction ID wraparound. The fix is a port of a PostgreSQL community patch scheduled to be released in a future minor version.
- 18 Fixes a bug in which a failure while extending a relation can cause Aurora to crash while scanning the partially extended relation.

PostgreSQL 9.6.6 Aurora PostgreSQL 1.1 (Deprecated)

Note

The PostgreSQL engine version 9.6.6 with the Aurora PostgreSQL 1.1 is no longer supported. To upgrade, see [Upgrading the PostgreSQL DB engine for Aurora PostgreSQL](#) in the *Amazon Aurora User Guide*.

For more information about PostgreSQL 9.6.6 see, [PostgreSQL release 9.6.6](#).

You can find the following improvements in this engine update:

New features

1. Introduced the `aurora_stat_utils` extension. This extension includes two functions:
 - `aurora_wait_report()` function for wait event monitoring
 - `aurora_log_report()` for log record write monitoring
2. Added support for the following extensions:
 - `orafce` 3.6.1
 - `pgrouting` 2.4.2
 - `postgresql-hll` 2.10.2
 - `prefix` 1.2.6

Improvements

1. This release contains all fixes, features, and improvements present in [Aurora PostgreSQL 1.0.11](#)
2. Updates for the following PostgreSQL extensions:
 - PostGIS extension updated to version 2.3.4
 - geos library updated to version 3.6.2
 - `pg_repack` updated to version 1.4.2
3. Access to the `pg_statistic` relation enabled.
4. Disabled the 'effective_io_concurrency' guc parameter, as it does not apply to Aurora storage.
5. Changed the 'hot_standby_feedback' guc parameter to not-modifiable and set the value to '1'.
6. Improved heap page read performance during a vacuum operation.
7. Improved performance of snapshot conflict resolution on read nodes.
8. Improved performance of transaction snapshot acquisition on read nodes.
9. Improved write performance for GIN meta page updates.
- 10 Improved buffer cache recovery performance during startup.
- 11 Fixes a bug that caused a database engine crash at startup while recovering prepared transactions.
- 12 Fixes a bug that could result in the inability to start a read node when there are a large number of prepared transactions.
- 13 Fixes a bug that could cause a read node to report:

ERROR: could not access status of transaction 6080077

DETAIL:* *Could not open file "pg_subtrans/005C": No such file or directory.

14 Fixes a bug that could cause the error below when replicating from RDS PostgreSQL to Aurora PostgreSQL:

FATAL: lock buffer_content is not held

CONTEXT: xlog redo at 46E/F1330870 for Storage/TRUNCATE: base/13322/8058750 to 0 blocks flags 7

15 Fixes a bug that could cause Aurora PostgreSQL to stop responding while replaying a multixact WAL record when replicating from RDS for PostgreSQL to Aurora PostgreSQL.

16 Multiple improvements to the reliability of importing snapshots from RDS PostgreSQL to Aurora PostgreSQL.

PostgreSQL 9.6.3, Aurora PostgreSQL 1.0 (Deprecated)

Note

The PostgreSQL engine version 9.6.3 with the Aurora PostgreSQL 1.0 is no longer supported. To upgrade, see [Upgrading the PostgreSQL DB engine for Aurora PostgreSQL](#) in the *Amazon Aurora User Guide*.

For more information about PostgreSQL 9.6.3 see, [PostgreSQL release 9.6.3](#).

This version includes the following Releases:

Releases and patches

- [Aurora PostgreSQL 1.0.11](#)
- [Aurora PostgreSQL 1.0.10](#)
- [Aurora PostgreSQL 1.0.9](#)
- [Aurora PostgreSQL 1.0.8](#)
- [Aurora PostgreSQL 1.0.7](#)

Aurora PostgreSQL 1.0.11

You can find the following improvements in this engine update:

1. Fixes an issue with parallel query processing that can lead to incorrect results.
2. Fixes an issue with visibility map handling during replication from Amazon RDS for PostgreSQL that can cause the Aurora storage volume to become unavailable.
3. Corrects the pg-repack extension.
4. Implements improvements to maintain fresh nodes.
5. Fixes issues that can lead to an engine crash.

Aurora PostgreSQL 1.0.10

This update includes a new feature. You can now replicate an Amazon RDS PostgreSQL DB instance to Aurora PostgreSQL. For more information, see [Replication with Amazon Aurora PostgreSQL](#) in the *Amazon Aurora User Guide*.

You can find the following improvements in this engine update:

1. Adds error logging when a cache exists and a parameter change results in a mismatched buffer cache, storage format, or size.
2. Fixes an issue that causes an engine reboot if there is an incompatible parameter value for huge pages.
3. Improves handling of multiple truncate table statements during a replay of a write ahead log (WAL) on a read node.
4. Reduces static memory overhead to reduce out-of-memory errors.
5. Fixes an issue that can lead to out-of-memory errors while performing an insert with a GiST index.
6. Improves snapshot import from RDS for PostgreSQL, removing the requirement that a vacuum be performed on uninitialized pages.
7. Fixes an issue that causes prepared transactions to return to the previous state following an engine crash.
8. Implements improvements to prevent read nodes from becoming stale.
9. Implements improvements to reduce downtime with an engine restart.
10. Fixes issues that can cause an engine crash.

Aurora PostgreSQL 1.0.9

In this engine update, we fix an issue that can cause the Aurora storage volume to become unavailable when importing a snapshot from RDS for PostgreSQL that contained uninitialized pages.

Aurora PostgreSQL 1.0.8

You can find the following improvements in this engine update:

1. Fixes an issue that prevented the engine from starting if the `shared_preload_libraries` instance parameter contained `pg_hint_plan`.
2. Fixes the error "Attempt to fetch heap block XXX is beyond end of heap (YYY blocks)," which can occur during parallel scans.
3. Improves the effectiveness of prefetching on reads for a vacuum.
4. Fixes issues with snapshot import from RDS for PostgreSQL, which can fail if there are incompatible `pg_internal.init` files in the source snapshot.
5. Fixes an issue that can cause a read node to crash with the message "aurora wal replay process (PID XXX) was terminated by signal 11: Segmentation fault". This issue occurs when the reader applied a visibility map change for an uncached visibility map page.

Aurora PostgreSQL 1.0.7

This is the first generally available release of Amazon Aurora PostgreSQL-Compatible Edition.

Babelfish for Aurora PostgreSQL updates

Following, you can find information about versions of the Babelfish that have been released for Aurora PostgreSQL. Babelfish is an option available with Aurora PostgreSQL version 13.4 and higher releases. Updates to Babelfish become available with certain new releases of the Aurora PostgreSQL database engine.

For information about Aurora PostgreSQL extensions with Babelfish, see [Using Aurora PostgreSQL extensions with Babelfish](#).

For information about Babelfish version updates, see [Babelfish version updates](#).

For a list of supported and unsupported functionality across different Babelfish releases, see [Babelfish for Aurora PostgreSQL reference](#).

Topics

- [Babelfish for Aurora PostgreSQL 4.1](#)
- [Babelfish for Aurora PostgreSQL 4.0](#)
- [Babelfish for Aurora PostgreSQL 3.5](#)
- [Babelfish for Aurora PostgreSQL 3.4](#)
- [Babelfish for Aurora PostgreSQL 3.3](#)
- [Babelfish for Aurora PostgreSQL 3.2](#)
- [Babelfish for Aurora PostgreSQL 3.1](#)
- [Babelfish for Aurora PostgreSQL 2.8](#)
- [Babelfish for Aurora PostgreSQL 2.7](#)
- [Babelfish for Aurora PostgreSQL 2.6](#)
- [Babelfish for Aurora PostgreSQL 2.5](#)
- [Babelfish for Aurora PostgreSQL 2.4](#)
- [Babelfish for Aurora PostgreSQL 2.3](#)
- [Babelfish for Aurora PostgreSQL 2.2](#)
- [Babelfish for Aurora PostgreSQL 2.1](#)
- [Babelfish for Aurora PostgreSQL 1.5](#)
- [Babelfish for Aurora PostgreSQL 1.4](#)

- [Babelfish for Aurora PostgreSQL 1.3](#)
- [Babelfish for Aurora PostgreSQL 1.2 \(Deprecated\)](#)
- [Babelfish for Aurora PostgreSQL 1.1 \(Deprecated\)](#)
- [Babelfish for Aurora PostgreSQL 1.0 \(Deprecated\)](#)

Babelfish for Aurora PostgreSQL 4.1

This release of Aurora Babelfish is provided with Aurora PostgreSQL 16.2. For more information about the improvements in Aurora PostgreSQL 16.2, see [Amazon Aurora PostgreSQL updates](#). Babelfish for Aurora PostgreSQL 4.1 adds several new features, enhancements, and fixes. For more information about Babelfish for Aurora PostgreSQL, see [Working with Babelfish for Aurora PostgreSQL](#).

Releases

- [Aurora Babelfish release 4.1.1, June 20, 2024](#)
- [Aurora Babelfish release 4.1.0, April 29, 2024](#)

Aurora Babelfish release 4.1.1, June 20, 2024

High priority stability enhancements

- Optimized performance for Create and Drop Databases for Babelfish.
- Fixed a crash with execution of plpgsql user defined functions.

Aurora Babelfish release 4.1.0, April 29, 2024

New features

- Babelfish introduces support for two spatial data types Geometry and Geography to store and manipulate spatial data under a limited scope. For more information, see [Babelfish supports Geospatial data types](#).
- Allowing SELECT FOR JSON AUTO support in Babelfish.
- Support the ability to perform vector similarity search using the pgvector extension through Babelfish. The ability to use HNSW and IVFLAT indexes is also supported. For more information, see [Using pgvector in Babelfish](#).

- Support the ability to access Amazon Machine Learning services such as Amazon Comprehend, Amazon SageMaker and Amazon Bedrock through `aws_ml` extension. For more information, see [Using Amazon Aurora machine learning with Babelfish](#).
- Support T-SQL procedure `sp_procedure_params_100_managed`.
- `CONTAINS` clause used in Full Text Search will also support for special characters and single digit in search condition. For more information, see [Full Text Search in Babelfish](#).

Critical stability enhancements

- Fixed an issue in Object Explorer Database enumeration with SSMS version 19.2.
- Fixed an issue that caused error during Selecting data from variable `NVARCHAR(MAX)`, `VARCHAR(MAX)`, `VARBINARY(MAX)` with large length strings.
- Fixed blank space padding related issue in `char` datatype for multibyte characters.
- Fixed performance issue of enumerating tables and views in SSMS Object Explorer.
- Fixed default column collation to match server collation handled through `babelfishpg_tsql.server_collation_name` for some system views. List of fixed system views are `sys.check_constraints`, `sys.data_spaces`, `sys.default_constraints`, `sys.dm_exec_connections`, `sys.foreign_keys`, `sys.key_constraints`, `sys.stats`, `sys.syscolumns`, `sys.sysforeignkeys`, `sys.sysprocesses`, `sys.system_objects`, `sys.table_types`, `sys.tables`, `sys.types`, `sys.views` and `sys.xml_indexes`.
- Restrict creation of functions/procedures with the same name in Babelfish.

High priority stability enhancements

- Improved performance for system procedure `sp_tablecollations_100`.
- Fixed an issue with major version upgrades where views contains cast from string literal to binary type.
- Fixed a bug where parallel worker was unable to fetch the logical database name.
- Fixed the performance issue of comparing date to `datetime`.

Additional improvements and enhancements

- Fixed an issue on duplicate `object_id` in `sys.all_objects` after major version upgrade.
- Fixed an issue in `CAST` functions for `Binary` to `Varchar` and `Rowversion` to `Varchar`.

- Fixed an issue with insert into statement execution with table variable when table variable did not exist.
- Fixed an issue where input hex string being converted to type binary did not have the correct data length.
- Fixed an issue with mixed casing error in `sp_columns_100`.
- Fixed a crash in Table Variable lookup after TVP execution via TDS RPC `SPExecuteSQL`.
- Support embedded whitespace in multi-character comparison operators.
- Support operators adjacent to `@variables` without separating whitespace.
- Fixed a crash with procedure execution if procedure deletes itself or rolls back the transaction which created the procedure.
- Support for the AS keyword in CREATE function for all cases.
- Support expressions in `SELECT . . . OFFSET . . . FETCH` clauses.
- Support `SET TRAN ISOLATION LEVEL` syntax.
- Support floating-point notation without exponent.
- Support comparison operators `!<` and `!>`.
- Support for `DROP INDEX schema.table.index` and `DROP INDEX index ON schema.table` syntax.

Babelfish for Aurora PostgreSQL 4.0

This release of Aurora Babelfish is provided with Aurora PostgreSQL 16.1. For more information about the improvements in Aurora PostgreSQL 16.1, see [Amazon Aurora PostgreSQL updates](#). Babelfish for Aurora PostgreSQL 4.0 (version 4.0 is build on top of version 3.4) adds several new features, enhancements, and fixes. For more information about Babelfish for Aurora PostgreSQL, see [Working with Babelfish for Aurora PostgreSQL](#).

Releases

- [Aurora Babelfish release 4.0.2, June 24, 2024](#)
- [Aurora Babelfish release 4.0.0, January 31, 2024](#)

Aurora Babelfish release 4.0.2, June 24, 2024

High priority stability enhancements

- Fixed an issue with Parallel query execution in which a backend may get into indefinite hang in certain cases.
- Optimized performance for Create and Drop Databases for Babelfish.
- Fixed a crash with execution of plpgsql user defined functions.

Aurora Babelfish release 4.0.0, January 31, 2024

New features

- Limited support for Full Text Search in Babelfish. For more information, see [Full Text Search in Babelfish](#).
- Added support for creating INSTEAD OF Triggers on Views.
- Changed the default Babelfish migration mode from single database to multiple databases.

Security enhancements

- Fixed security issues with handling of TSQL login and users.

High priority stability enhancements

- Fixed a regression issue where update-join with inserted table in trigger procedure causes `result relation must be a regular relation` error.
- Fixed the issue where querying `information_schema` for type U and V was earlier giving different results in Babelfish.
- Fixed an issue to avoid blocking of vacuum progress when using temp tables in certain situations.

Additional improvements and enhancements

- Fixed an issue with principal name in `pg_stat_gssapi` catalog view.
- Fixed issue in functions `parsename`, `session_context` and `sp_set_session_context` when using with non-default server collation.

Recommendations

- We recommend you to upgrade from Aurora PostgreSQL version 14 to 15 and then from version 15 to 16. Currently, direct upgrade from version 14 to 16 isn't supported and it fails with an error.

Babelfish for Aurora PostgreSQL 3.5

This release of Aurora Babelfish is provided with Aurora PostgreSQL 15.6. For more information about the improvements in Aurora PostgreSQL 15.6, see [Amazon Aurora PostgreSQL updates](#). Babelfish for Aurora PostgreSQL 3.5 adds several new features, enhancements, and fixes. For more information about Babelfish for Aurora PostgreSQL, see [Working with Babelfish for Aurora PostgreSQL](#).

Releases

- [Aurora Babelfish release 3.5.1, June 20, 2024](#)
- [Aurora Babelfish release 3.5.0, April 29, 2024](#)

Aurora Babelfish release 3.5.1, June 20, 2024

High priority stability enhancements

- Fixed a crash with execution of plpgsql user defined functions.

Aurora Babelfish release 3.5.0, April 29, 2024

New features

- Babelfish introduces support for two spatial data types Geometry and Geography to store and manipulate spatial data under a limited scope. For more information, see [Babelfish supports Geospatial data types](#).
- Allowing SELECT FOR JSON AUTO support in Babelfish.
- Support the ability to perform vector similarity search using the pgvector extension through Babelfish. The ability to use HNSW and IVFLAT indexes is also supported. For more information, see [Using pgvector in Babelfish](#).

- Support the ability to access Amazon Machine Learning services such as Amazon Comprehend, Amazon SageMaker and Amazon Bedrock through `aws_ml` extension. For more information, see [Using Amazon Aurora machine learning with Babelfish](#).
- Support T-SQL procedure `sp_procedure_params_100_managed`.
- Support creating Instead of Triggers (DML) on SQL Server Views.

Critical stability enhancements

- Fixed an issue in Object Explorer Database enumeration with SSMS version 19.2.
- Fixed an issue that caused error during Selecting data from variable `NVARCHAR(MAX)`, `VARCHAR(MAX)`, `VARBINARY(MAX)` with large length strings.
- Fixed blank space padding related issue in `char` datatype for multibyte characters.
- Fixed performance issue of enumerating tables and views in SSMS Object Explorer.
- Fixed default column collation to match server collation handled through `babelfishpg_tsql.server_collation_name` for some system views. List of fixed system views are `sys.check_constraints`, `sys.data_spaces`, `sys.default_constraints`, `sys.dm_exec_connections`, `sys.foreign_keys`, `sys.key_constraints`, `sys.stats`, `sys.syscolumns`, `sys.sysforeignkeys`, `sys.sysprocesses`, `sys.system_objects`, `sys.table_types`, `sys.tables`, `sys.types`, `sys.views` and `sys.xml_indexes`.
- Restrict creation of functions/procedures with the same name in Babelfish.

High priority stability enhancements

- Improved performance for system procedure `sp_tablecollations_100`.
- Fixed an issue with major version upgrades where views contains cast from string literal to binary type.
- Fixed a bug where parallel worker was unable to fetch the logical database name.
- Fixed the performance issue of comparing date to `datetime`.

Additional improvements and enhancements

- Fixed an issue on duplicate `object_id` in `sys.all_objects` after major version upgrade.
- Fixed an issue in `CAST` functions for Binary to Varchar and Rowversion to Varchar.

- Fixed an issue with insert into statement execution with table variable when table variable did not exist.
- Fixed an issue where input hex string being converted to type binary did not have the correct data length.
- Fixed an issue with mixed casing error in `sp_columns_100`.
- Fixed a crash in Table Variable lookup after TVP execution via TDS RPC `SPExecuteSQL`.
- Support embedded whitespace in multi-character comparison operators.
- Support operators adjacent to `@variables` without separating whitespace.
- Fixed a crash with procedure execution if procedure deletes itself or rolls back the transaction which created the procedure.
- Support for the AS keyword in CREATE function for all cases.
- Support expressions in `SELECT . . . OFFSET . . . FETCH` clauses.
- Support `SET TRANSACTION ISOLATION LEVEL` syntax.
- Support floating-point notation without exponent.
- Support comparison operators `!<` and `!>`.
- Support for `DROP INDEX schema.table.index` and `DROP INDEX index ON schema.table` syntax.
- Fixed issue in functions `parsename`, `session_context` and `sp_set_session_context` when using with non-default server collation.

Babelfish for Aurora PostgreSQL 3.4

This release of Aurora Babelfish is provided with Aurora PostgreSQL 15.5. For more information about the improvements in Aurora PostgreSQL 15.5, see [Amazon Aurora PostgreSQL updates](#). Babelfish for Aurora PostgreSQL 3.4 adds several new features, enhancements, and fixes. For more information about Babelfish for Aurora PostgreSQL, see [Working with Babelfish for Aurora PostgreSQL](#).

Releases

- [Aurora Babelfish release 3.4.2, June 24, 2024](#)
- [Aurora Babelfish release 3.4.0, December 21, 2023](#)

Aurora Babelfish release 3.4.2, June 24, 2024

High priority stability enhancements

- Fixed a crash with execution of plpgsql user defined functions.

Aurora Babelfish release 3.4.0, December 21, 2023

New features

- Added support for TSQL Isolation Level SERIALIZABLE and REPEATABLE READ with PostgreSQL semantics. For more information, see [Transaction Isolation Levels in Babelfish](#).
- Added support for enable or disable triggers.
- Added support for TSQL functions DATETRUNC(), DATE_BUCKET(), SWITCHOFFSET(), TODATETIMEOFFSET(), and AT TIME ZONE clause.
- Added support for TSQL functions TYPE_ID(), TYPE_NAME(), COL_LENGTH(), COL_NAME().
- Added support for DEFAULT keyword in calls to stored procedures and functions.
- Added support for casting DATETIME to numeric types.
- Added support for DBCC CHECKIDENT for ability to reset IDENTITY columns.
- Added support for PRIMARY KEY NOT NULL IDENTITY clause in CREATE/ALTER TABLE.
- Added support for double-quoted strings containing single-quote, embedded double quotes in a double-quoted string, and unquoted string parameters.
- Added support for ALTER AUTHORIZATION syntax to change database owner.
- Added support for TSQL KILL command.
- Added support for TSQL Information_schema.key_column_usage view.
- Added support of variable as input for SET ROWCOUNT and SET DATEFIRST.
- Added support for sys.server_role members and sys.database_permissions catalog views.
- Added support for IDENTITY() function in a SELECT-INTO statement. In Babelfish, a column specified as IDENTITY will always be the last column in the new table. Due to this slight difference compared with SQL server, this feature needs to be used with an escape hatch babelfishpg_tsql.escape_hatch_identity_function. User-defined datatypes for IDENTITY() function are not currently supported.
- Added support for ALTER USER...WITH LOGIN syntax.

- Added support for change in transaction isolation from inside transaction block with well defined behavior.
- Added support for casting datetime and smalldatetime to numeric types.
- Added support for PIVOT in limited scope (not supported when used in a view definition, a common table expression, or a join).
- Stored procedure sp_changedbowner is supported.

Security enhancements

- Fixed permission issue for view sys.server_principals.

Critical stability enhancements

- Fixed an issue where ISNULL function may return incorrect data type.
- Fixed an issue where condition may be evaluated incorrectly for conditional statement like IF.
- Fixed an error "database ... does not exist" that may be observed when parallel query is enforced.
- Fixed handling of table variable or temp table when parallel worker is enforced.
- Fixed unexpected error "lost connection to parallel worker" occurring when parallel worker is enforced.
- Fixed an issue with multiple parentheses in SELECT columns.
- Fixed an issue with handling of column name alias which may cause client to hang if column name alias contains string of length more than 64 bytes, for example, select col as '您对“数据一览”中的车型，颜色，内饰，选装，'.
- Fixed datatype of information_schema_tables.TABLE_TYPE column.
- Fixed the error - "column ... does not exist" when using table.column with alias defined for table or schema_name.table.column in set clause of update queries.
- Fixed issue of incorrect schema resolution for multiple functions in query statement.
- Fixed an issue for a few variants of DELETE with OUTPUT clause combined with table alias returns an error.
- Fixed performance issue while expanding stored procedures in SSMS Object Explorer.
- Fixed a crash when UNION with NULL values not cast to fixed-length types.
- Fixed SESSION_USER/SYSTEM_USER in SET/PRINT/DECLARE variable assignment returning wrong result/error.

- Fixed issue of blocking of UNIQUE constraint/index on nullable column not implemented consistently.
- Fix a crash with T-SQL OPENQUERY() and four-part object name when T-SQL keywords are used as server name.
- Fixed the issue of update with TOP, OUTPUT and join failing with error 'unrecognized node type'.
- Fixed the issue of VALUES clause with mixed types gives error containing the clause 'Please use an explicit CAST or CONVERT'.
- Fixed an issue of different assignments of identity values compared with SQL Server when ORDER BY is used with SELECT INTO statement.
- Fix incorrect schema resolution where multiple functions are called in a single statement.

High priority stability enhancements

- Fixed type conversion between varchar and binary datatype with use of proper encoding.
- Fixed an issue where upper/lower case may not be preserved for column name aliases.
- Fixed crash in queries involving money data-type in parallel query mode.
- Fixed failure in MVU with non-default server collation name.
- Fixed the issue of information_schema vs. sys.objects WHERE type IN ('U', 'V') giving different result in Babelfish.
- Fixed issue of sp_columns and sp_columns_100 incorrectly show NULL radix for decimal columns.
- Fixed issue in queries involving sys.format() function in parallel query mode returning error "cannot start subtransactions during a parallel operation".
- Fixed unexpected error "could not access file "pg_hint_plan": No such file or directory" while using pg_hint_plan in parallel query mode.
- Fixed the issue of getting error 'duplicate key value violates unique constraint ...' when re-creating the previously dropped view with the same name.

Additional improvements and enhancements

- Improved performance for stored procedure sp_describe_undeclared_parameters.
- Fixed performance issue for DATEADD(), DATEDIFF().
- SSMS - Fixed issue of stored procedure takes long time to load in Object Explorer.

- SSMS - Fixed performance issue of enumerating tables and views in SSMS Object Explorer.
- Fixed performance issue after create/upgrade of Babelfish extension by running ANALYZE after Babelfish extension creation and upgrade.
- Fixed the issue of index not used when query has an unnecessary cast to bigint.
- Fixed an issue when stored procedures starting with (sp_*) are invoked with a dbo. or sys. prefix.
- Fixed the issue with default_schema_name column of the catalog sys.babelfish_authid_user_ext in case of "guest" user.
- Fixed issue of orphan entries in sys.babelfish_view_def catalog table.
- Fixed an issue with UNION and fixed-length types.
- Fixed performance issue with '+' operator in concatenation operation.
- Fixed performance issue by optimizing use of internal function during index creation and usage in queries.
- Fixed an issue when comparing BIT and VARCHAR types.
- Performance improvements for create/drop database with large number of databases.
- Added sort operators for Babelfish datatypes, so that MAX/MIN aggregation on index column can have a query plan candidate of LIMIT 1 and index scan.
- Fixed nulls order of Babelfish indexes, so that TOP 1 clause on index column can have a query plan candidate of LIMIT 1 and index scan.
- Fixed a crash with SSMS in Table properties dialog box while clicking on Permissions page.
- Restricted use of view as a target with OUTPUT INTO clause.

Babelfish for Aurora PostgreSQL 3.3

This release of Aurora Babelfish is provided with Aurora PostgreSQL 15.4. For more information about the improvements in Aurora PostgreSQL 15.4, see [Amazon Aurora PostgreSQL updates](#). Babelfish for Aurora PostgreSQL 3.3 adds several new features, enhancements, and fixes. For more information about Babelfish for Aurora PostgreSQL, see [Working with Babelfish for Aurora PostgreSQL](#).

Releases

- [Aurora Babelfish release 3.3.0, October 24, 2023](#)

Aurora Babelfish release 3.3.0, October 24, 2023

New features

- Added support for TSQL functions `HOST_ID()`, `EOMONTH()`, `PARSENAME()` and `SMALLDATETIMEFROMPARTS()` are supported.
- `sys.extended_properties` system catalog view is supported.
- Stored procedures `sp_enum_oledb_providers`, `sp_testlinkedserver`, and `sp_who` are supported.
- Added support for the T-SQL square bracket syntax with the LIKE predicate.
- Added support for `pg_stat_statements` extension with Babelfish. For more information, see [pg_stat_statements](#).
- Added support for CREATE or ALTER or DROP EXTENSION statements in `sp_execute_postgresql` procedure. For more information, see [sp_execute_postgresql](#).
- Added support for extended properties for object types database, schema, table, view, column, sequence, function, procedure: `sys.extended_properties` system catalog view, stored procedures `sp_addextendedproperty`, `sp_updateextendedproperty`, `sp_dropextendedproperty`, and system function `fn_listextendedproperty()`.

Critical stability enhancements

- T-SQL trigger can't be performed when function, procedure or trigger of PostgreSQL is in execution stack. If you try to do, the following error message will appear: `T-SQL trigger cannot be executed from PostgreSQL function, procedure or trigger`.

High priority stability enhancements

- Fixed the issue of `GETDATE()` incorrectly returning different values in the same query.
- Fixed the issue of `GETUTCDATE()` incorrectly returning time of transaction instead of time of query.

Additional improvements and enhancements

- Fixed an issue where SSMS generate script for multiple views, or combining a view with other objects throws an error.

- Fixed an issue to avoid system crash while formatting datetime values in the results of FOR JSON or FOR XML.
- Fixed an issue to avoid system crash during table variable cleanup after a runtime error.
- Fixed an issue to avoid system crash when using certain values in nested function calls.
- Fixed an invalid memory access issue while freeing PLTSQL functions.
- Fixed a crash in SqlBulkCopy when the order of columns is different from the table where it is defined.
- Fixed an issue that bcp in results in server crash when the table has large number of columns.
- Fixed crash in parallel query when enable_pg_hint is turned on.
- Fixed incorrect value in procedure output parameter when procedure is called by name and is in different parameter order.
- Fixed issue where sp_describe_first_result_set procedure can return incorrect column order, which could cause BCP to work incorrectly.
- Fixed issue related to loss of decimal digits when converting from REAL to DECIMAL.
- Fixed error handling during the Babelfish upgrade process. Babelfish throws an error if there is a failure during the upgrade.
- Fixed an issue with sender of XML data type to handle NULL value where it was causing client to hang.
- Fixed an issue where USE database statement was incorrectly allowed inside the procedure, function or trigger definition.
- Fixed crash while calling T-SQL procedure from PG port when querying sys.sysobjects.
- Fixed issue when user mapping that is created as part of sp_addlinkedserver works only when OPENQUERY() and remote object references with a four-part object names are invoked within the master database.
- Added support for connect_timeout option in sp_serveroption.
- Fixed a recreation issue with indexed temp tables. You can now create indexed temp tables in Babelfish.
- Fixed an issue with identity columns in procedures.
- Fixed an issue where some catalog entries were not being cleared after use with temp tables, causing occasional error messages.
- Fixed an issue with Babelfish TOP clause that accept number without parenthesis.
- Fixed performance problem for create index or scan index.

- Fixed an issue when using like expression in join on condition failed with nondeterministic error.

Babelfish for Aurora PostgreSQL 3.2

This release of Aurora Babelfish is provided with Aurora PostgreSQL 15.3. For more information about the improvements in Aurora PostgreSQL 15.3, see [Amazon Aurora PostgreSQL updates](#). Babelfish for Aurora PostgreSQL 3.2 adds several new features, enhancements, and fixes. For more information about Babelfish for Aurora PostgreSQL, see [Working with Babelfish for Aurora PostgreSQL](#).

Releases

- [Aurora Babelfish release 3.2.1, October 4, 2023](#)
- [Aurora Babelfish release 3.2.0, July 13, 2023](#)

Aurora Babelfish release 3.2.1, October 4, 2023

High priority stability enhancements

- Fixed an issue causing crash when cursor referencing a table variable is already dropped.
- Fixed an issue where queries with UNION ALL, ORDER BY, and multiple joins could cause unavailability.
- Fixed a crash in parallel query execution when `enable_pg_hint` is set to on.
- Fixed an invalid memory access while freeing PLTSQL functions.

Additional improvements and enhancements

- Fixed an issue to avoid crash by properly handling formatting of datetime values in the results of FOR JSON or FOR XML.
- Fixed a crash in `SqlBulkCopy` when the order of columns is different compared to table defining.
- Fixed an issue that `bcp_in` results in server crash when the table has large number of columns.
- Fixed incorrect value in procedure output parameter when procedure is called by name and is in different parameter order.
- Fixed a crash when dropping temp table or table variables during cleanup.

- Fixed an issue with sender of XML data type to handle NULL value where it was causing client to hang.
- Fixed issue when user mapping that is created as part of `sp_addlinkedserverlogin` works only when `OPENQUERY()` and remote object referenced with a four-part object names are invoked within the master database.
- Fixed an issue to avoid failure error message 2600 while attempting to create a temp table.
- Fixed a bug to prevent temp table index recreation issue.

Aurora Babelfish release 3.2.0, July 13, 2023

New features

- Supports `TIMEFROMPARTS()`, `DATETIME2FROMPARTS()`, `ROWCOUNT_BIG()`, `DATABASE_PRINCIPAL_ID()` and `CONTEXT_INFO()` T-SQL functions.
- Supports `STDEV()`, `STDEVP()`, `VAR()`, `VARP()` statistical T-SQL aggregates.
- Supports `sp_rename` for COLUMN , TRIGGER, TABLE TYPE and USER DEFINED DATATYPE objects.
- Supports Babelfish instance as a linked server from SQL server instance. For more information, see [Babelfish supports linked servers](#).
- Supports 4 parts object name references for remote objects for select queries. For more information, see [Babelfish supports linked servers](#).
- Supports TOP clause for INSERT SELECT statement.
- Supports SET rowcount and SET CONTEXT_INFO T-SQL syntax.

Security enhancements

- Fixed an issue that non-sysadmin logins could DROP or ALTER logins.

Critical stability enhancements

- Fixed an issue when table variables may cause orphaned metadata entries.
- Fixed the issue that CTE top order handles null first behavior incorrectly.

High priority stability enhancements

- Fixed intermittent issue with concurrent SSL connections to Babelfish server.

- Fixed an issue in column name resolution of ORDER BY clause over UNION ALL query.
- Fixed the Unrecognized object issue when dropping database.
- Fixed the crash issue when adding non string unique key.
- User defined scalar functions were created as VOLATILE by default. This fix changes the behavior such that user defined scalar functions which do not perform any DML or DDL are created as STABLE by default.
- Fixed issues in column name resolution logic for UPDATE and DELETE statements with TOP clause.

Additional improvements and enhancements

- Fixed an issue with sp_helpdb where NULL is shown for compatbility_level.
- Fixed a memory management issue with update_DropRoleStmt.
- Fixed table variables to make it immune to transaction rollback.
- The fix corrects the behavior of 'select convert(nvarchar(10),Getdate(),105)' for nvarchar datatype.
- Fixed an issue to allow UPDATE and DELETE for Table Variables inside functions.
- Made enhancement to improve the performance and avoid catalog bloat while using table variables.
- Fixed an issue in @@NEXTLEVEL which returned 1 unit larger than expected.
- Fixed an issue in sp_helpdb where input parameter's case sensitivity is not handled properly.
- Fixed an issue that COMMIT, ROLLBACK, EXECUTE, PRINT, SAVE and RAISERROR could be used in CREATE FUNCTION statement.
- Supports query timeout in sp_serveroption for OPENQUERY. For more information, see [Babelfish supports linked servers](#).
- Fixed the case sensitivity issue in the CREATE USER for windows login.
- Fixed an issue with detecting invalid login name in CREATE LOGIN WITH WINDOWS statement.
- Fixed an issue to support INT values in JSON_MODIFY() function.
- Fixed an issue in JSON_MODIFY() function to support new value parameters as JSON_QUERY, SELECT FOR JSON, or JSON MODIFY.
- Fixed an issue in babelfishpg_tds.product_version.
- Fixed an issue in datetimeoffset operations.

- Fixed an issue for datetimeoffset default values.
- Supports numeric expressions representing datetime values.
- Fixed an issue in sys.database_principals view where the users sys and information_schema, as well as the database role public are not shown.
- Old-style T-SQL catalogs, with names starting with 'sys' (like sysprocesses) were available only in the 'sys' schema, but are now also available in the 'dbo' schema.
- Fixed an issue where a T-SQL view could be created on top of a temporary table.
- Fixed an issue that DATETIME2 doesn't accept 7 as scale argument.

Babelfish for Aurora PostgreSQL 3.1

This release of Aurora Babelfish is provided with Aurora PostgreSQL 15.2. For more information about the improvements in Aurora PostgreSQL 15.2, see [Amazon Aurora PostgreSQL updates](#). Babelfish for Aurora PostgreSQL 3.1 adds several new features, enhancements, and fixes. For more information about Babelfish for Aurora PostgreSQL, see [Working with Babelfish for Aurora PostgreSQL](#).

Releases

- [Aurora Babelfish release 3.1.3, October 4, 2023](#)
- [Aurora Babelfish release 3.1.2, July 24, 2023](#)
- [Aurora Babelfish release 3.1.1, May 10, 2023](#)
- [Aurora Babelfish release 3.1.0, April 5, 2023](#)

Aurora Babelfish release 3.1.3, October 4, 2023

Additional improvements and enhancements

- Fixed a memory management issue with update_DropRoleStmt.
- Fixed a crash in SqlBulkCopy with heap_compute_data_size function in stacktrace when the order of columns is different compared to table defining.
- Fixed an issue that bcp in results in server crash when the table has large number of columns.
- Fixed issue when user mapping that is created as part of sp_addlinkedserver works only when OPENQUERY() and remote object referenced with a four-part object names are invoked within the master database.

- Fixed a crash in parallel query execution when `enable_pg_hint` is set to on.

Aurora Babelfish release 3.1.2, July 24, 2023

Additional improvements and enhancements

- Fixed intermittent SSL connectivity issue during concurrent connections towards Babelfish instance.
- Fixed login name case sensitivity issue with `CREATE USER` for windows login syntax.

Aurora Babelfish release 3.1.1, May 10, 2023

Additional improvements and enhancements

- Fixed an issue to prevent error when sequences are created in a database other than 'master'.
- Fixed a crash during bulk load operation in a specific scenario.
- Fixed an issue to prevent Babelfish instance from crashing when alter table and alter column is called with drop default where the column has no definition.

Aurora Babelfish release 3.1.0, April 5, 2023

New features

- Supports major version upgrade from Babelfish for Aurora PostgreSQL DB cluster 14.6 and 14.7 to Aurora PostgreSQL 15.2. For more information on the major version upgrade, see [Upgrading your Babelfish cluster to a new version](#).
- Support for the following functions: `STR`, `APP_NAME`, `OBJECT_DEFINITION`, `OBJECT_SCHEMA_NAME`, `ATN2`, `DATEDIFF_BIG` functions.
- Support for the following `INFORMATION_SCHEMA` views: sequences, routines and schemata.
- Support `sp_rename` for `TABLE`, `VIEW`, `PROCEDURE`, `FUNCTION`, `SEQUENCE`.
- Support `sys.systypes` system compatibility view.
- Support for a new GUC parameter called `babelfishpg_tds.product_version` that allows you to set SQL Server product version number that is returned as an output by Babelfish. For more information, see [Using Babelfish product version GUC](#).

- Added support to generate data definition scripts for various objects present in a Babelfish for Aurora PostgreSQL database. For more information, see [DDL exports supported by Babelfish](#).
- Babelfish now supports Aurora PostgreSQL database authentication with Kerberos using AWS Directory Service for Microsoft Managed Active Directory. With this feature, for authentication you can use Microsoft Windows Authentication when you connect to your Babelfish database. For more information, see [Database authentication with Babelfish for Aurora PostgreSQL](#).
- Babelfish now supports linked servers from your Aurora PostgreSQL database by using the tds_fdw (TDS Foreign Data Wrapper) APG extension. Only the OPENQUERY function that executes the specified pass-through query on the specified linked server is currently supported. For more information, see [Babelfish supports linked servers](#).

Security enhancements

- Fixed buffer overflow due to out of bound array access.

High priority stability enhancements

- Improved the performance through benefiting interactive queries, ODBC-based applications and tools such as SQL Server Management Studio. Following enhancements has been made for the same:
 - Fixed performance issues in several system functions including OBJECT_ID(), OBJECT_NAME(), SCHEMA_ID().
 - Fixed performance issues in system stored procedures sp_sproc_columns and sp_fkeys.
 - Fixed performance issues in system catalog views sys.all_views, sys.objects and sys.types.
 - Improved the performance of bulk load, parsing of T-SQL and prepared statements.
- Added a new system stored procedure sp_babelfish_volatility that you can use to set the volatility of user-defined functions to improve index use when the functions are used as part of query predicates.
- Fixed an issue where the UPDATE FROM or DELETE FROM statement that references the correlation name of the updated table raised an error.
- Fixed an issue where scope_identity function returns wrong result after exiting one scope.
- Fixed an issue where name resolution doesn't work as expected when commands are invoked from the .NET client framework.

- Fixed an issue where any index defined on column having binary/varbinary data types are not considered by the query optimizer for equality predicates.

Additional improvements and enhancements

- Fixed an issue where the statement timeout parameter for a session was not working as expected.
- Supports sequence creations using user-defined data types.
- Fixed an issue where unicode in column names, aliases or comments causes parsing errors.
- Fixed an issue where scope_identity function requires higher permission than actually needed.
- Support for the following stored procedures for working with linked servers: sp_addlinkedserver, sp_dropserver, sp_linkedservers, sp_addlinkedsrvlogin, sp_droplinkedsrvlogin, sp_helplinkedsrvlogin.
- Support for NEXT VALUE FOR function that gets the next value of a sequence. Note that this function cannot be used in some control-of-flow statements. OVER clause is also not supported.
- Fixed a crash when handling certain errors with sp_describe_undeclared_parameters.
- Fixed a rare error during Babelfish extension creation.
- Fixed an issue which was throwing an error "typename is NULL" while using TVP in sp_executesql.
- Fixed SELECT FOR XML/JSON behavior to not raise error when using SELECT with correlation name in subquery using FOR XML PATH clause.
- Fixed an issue with the SELECT FOR JSON or a SELECT FOR XML query which didn't return correct results for an empty table.
- Fixed an issue where the guest user can create objects in the wrong schema.
- Fixed schema name resolution for user defined types for param types in system stored procedures.
- Fixed an issue where applications issuing queries with more than 100 bind parameters for prepared statements were failing. This limit is now increased to 2100 to match the limits used by SQL Server.
- Fixed an issue with case handling of variable names in the sp_executesql call.
- sp_fkeys stored procedure now also returns 'deferrability' column in the result set.
- Fixed an issue in AVG aggregates which led to the termination of the connection for some integer datatypes.

- The `index_id` and `indid` column for respective views now returns the same value for indexes belonging to same object and the `index_id` is unique only within the object.
- Fixed an issue to not throw an error when `OpenJson` is called in stored procedures using `nvarchar` or `join`.
- Fixed an issue to not throw an error while using `try_convert` and `try_cast` for prohibited conversions involving some integer literals.
- Fixed an issue to allow `OPENJSON WITH` clause to accept a table alias.
- Support Degrees, Radians and Power functions returning the proper type.
- Fixed an issue where membership handling for `sysadmin` is not handled correctly.
- Fixed the default output style when converting `DATE/TIME` types to `VARCHAR` type using `CONVERT` function.
- Support `EXECUTE AS CALLER` clause in `CREATE PROC/FUNCTION/TRIGGER`.
- Fixed an issue where configurations are not reverted after existing `sp_executesql` scope.
- Fixed issues with handling cross-database access for the `sys.has_perms_by_name` function.
- Support the `ProductLevel` and `ProductUpdateLevel` properties for the `SERVERPROPERTY` function. `ProductUpdateLevel` always returns `NULL` and `ProductLevel` tracks the Babelfish version number closely with the T-SQL definition.
- Fixed an issue where the table variable when used as a bind parameter from client application resulted in an error.

Babelfish for Aurora PostgreSQL 2.8

This release of Aurora Babelfish is provided with Aurora PostgreSQL 14.11. For more information about the improvements in Aurora PostgreSQL 14.11, see [Amazon Aurora PostgreSQL updates](#). Babelfish for Aurora PostgreSQL 2.8 adds several new features, enhancements, and fixes. For more information about Babelfish for Aurora PostgreSQL, see [Working with Babelfish for Aurora PostgreSQL](#).

Releases

- [Aurora Babelfish release 2.8.0, April 29, 2024](#)

Aurora Babelfish release 2.8.0, April 29, 2024

Critical stability enhancements

- Fixed an issue in Object Explorer Database enumeration with SSMS version 19.2.
- Fixed an issue that caused error during Selecting data from variable NVARCHAR(MAX), VARCHAR(MAX), VARBINARY(MAX) with large length strings.
- Fixed blank space padding related issue in char datatype for multibyte characters.
- Fixed performance issue of enumerating tables and views in SSMS Object Explorer.

High priority stability enhancements

- Improved performance for system procedure `sp_tablecollations_100`.
- Fixed an issue with major version upgrades where views contains cast from string literal to binary type.
- Fixed a bug where parallel worker was unable to fetch the logical database name.
- Fixed the performance issue of comparing date to datetime.

Additional improvements and enhancements

- Fixed an issue on duplicate `object_id` in `sys.all_objects` after major version upgrade.
- Fixed an issue in CAST functions for Binary to Varchar and Rowversion to Varchar.
- Fixed an issue with insert into statement execution with table variable when table variable did not exist.
- Fixed an issue where input hex string being converted to type binary did not have the correct data length.
- Fixed an issue with mixed casing error in `sp_columns_100`.
- Fixed a crash in Table Variable lookup after TVP execution via TDS RPC `SPExecuteSQL`.
- Fixed Babelfish view definition table index to have correct collation when upgrading from 14.5 to 14.11.

Babelfish for Aurora PostgreSQL 2.7

This release of Aurora Babelfish is provided with Aurora PostgreSQL 14.10. For more information about the improvements in Aurora PostgreSQL 14.10, see [Amazon Aurora PostgreSQL updates](#). Babelfish for Aurora PostgreSQL 2.7 adds several new features, enhancements, and fixes. For more information about Babelfish for Aurora PostgreSQL, see [Working with Babelfish for Aurora PostgreSQL](#).

Releases

- [Aurora Babelfish release 2.7.0, December 21, 2023](#)

Aurora Babelfish release 2.7.0, December 21, 2023

Security enhancements

- Fixed permission issue for view `sys.server_principals`.

Critical stability enhancements

- Fixed an issue where `ISNULL` function may return incorrect data type.
- Fixed an issue where condition may be evaluated incorrectly for conditional statement like `IF`.
- Fixed an error "database ... does not exist" that may be observed when parallel query is enforced.
- Fixed handling of table variable or temp table when Parallel worker is enforced.
- Fixed unexpected error "lost connection to parallel worker" occurring when parallel worker is enforced.
- Fixed an issue with multiple parentheses in `SELECT` columns.
- Fixed an issue with handling of column name alias which may cause client to hang if column name alias contains string of length more than 64 bytes, for example, `select col as '您对“数据一览”中的车型，颜色，内饰，选装，'`.
- Fixed datatype of `information_schema_tables.TABLE_TYPE` column.
- Fixed the error - "column ... does not exist" when using `table.column` with alias defined for table or `schema_name.table.column` in set clause of update queries.
- Fixed issue of incorrect schema resolution for multiple functions in query statement.

High priority stability enhancements

- Fixed type conversion between varchar and binary datatype with use of proper encoding.
- Fixed an issue where upper/lower case may not be preserved for column name aliases.
- Fixed crash in queries involving money data-type in parallel query mode.
- Fixed failure in MVU with non-default server collation name.
- Fixed the issue of information_schema vs. sys.objects WHERE type IN ('U', 'V') giving different result in Babelfish.
- Fixed issue of sp_columns and sp_columns_100 incorrectly show NULL radix for decimal columns.
- Fixed issue in queries involving sys.format() function in parallel query mode returning error "cannot start subtransactions during a parallel operation".
- Fixed unexpected error "could not access file "pg_hint_plan": No such file or directory" while using pg_hint_plan in parallel query mode.
- Fixed the issue of getting error 'duplicate key value violates unique constraint ...' when re-creating a previously dropped view with the same name.

Additional improvements and enhancements

- Improved performance for stored procedure sp_describe_undeclared_parameters.
- Fixed performance issue for DATEADD(), DATEDIFF().
- SSMS - Fixed issue of stored procedure takes long time to load in Object Explorer.
- SSMS - Fixed performance issue of enumerating tables and views in SSMS Object Explorer.
- Fixed performance issue after create/upgrade of Babelfish extension by running ANALYZE after Babelfish extension creation and upgrade.
- Fixed the issue of index not used when query has an unnecessary cast to bigint.
- Fixed an issue when stored procedures starting with (sp_*) are invoked with a dbo. or sys. prefix.
- Fixed the issue with default_schema_name column of the catalog sys.babelfish_authid_user_ext in case of "guest" user.
- Fixed issue of orphan entries in sys.babelfish_view_def catalog table.

Babelfish for Aurora PostgreSQL 2.6

This release of Aurora Babelfish is provided with Aurora PostgreSQL 14.9. For more information about the improvements in Aurora PostgreSQL 14.9, see [Amazon Aurora PostgreSQL updates](#). Babelfish for Aurora PostgreSQL 2.6 adds several new features, enhancements, and fixes. For more information about Babelfish for Aurora PostgreSQL, see [Working with Babelfish for Aurora PostgreSQL](#).

Releases

- [Aurora Babelfish release 2.6.0, October 24, 2023](#)

Aurora Babelfish release 2.6.0, October 24, 2023

New features

- Added support for TSQL function SMALLDATETIMEFROMPARTS().

Critical stability enhancements

- T-SQL trigger can't be executed when function, procedure or trigger of PostgreSQL is in execution stack.

High priority stability enhancements

- Fixed the issue of GETDATE() incorrectly returning different values in the same query.
- Fixed the issue of GETUTCDATE() incorrectly returning time of transaction instead of time of query.

Additional improvements and enhancements

- Fixed an issue where SSMS generate script for multiple views, or combining a view with other objects throws an error.
- Fixed an issue to avoid system crash while formatting datetime values in the results of FOR JSON or FOR XML.
- Fixed an issue to avoid system crash during table variable cleanup after a runtime error.
- Fixed an issue to avoid system crash when using certain values in nested function calls.

- Fixed an invalid memory access issue while freeing PLTSQL functions.
- Fixed a crash in `SqlBulkCopy` when the order of columns is different from the table where it is defined.
- Fixed an issue that `bcp in` results in server crash when the table has large number of columns.
- Fixed crash in parallel query when `enable_pg_hint` is turned on.
- Fixed incorrect value in procedure output parameter when procedure is called by name and is in different parameter order.
- Fixed issue where `sp_describe_first_result_set` procedure can return incorrect column order, which could cause BCP to work incorrectly.
- Fixed issue related to loss of decimal digits when converting from REAL to DECIMAL.
- Fixed error handling during the Babelfish upgrade process. Babelfish throws an error if there is a failure during the upgrade.
- Fixed an issue with sender of XML data type to handle NULL value where it was causing client to hang.
- Fixed an issue where USE database statement was incorrectly allowed inside the procedure, function or trigger definition.
- Fixed crash while calling T-SQL procedure from PG port when querying `sys.sysobjects`.

Babelfish for Aurora PostgreSQL 2.5

This release of Aurora Babelfish is provided with Aurora PostgreSQL 14.8. For more information about the improvements in Aurora PostgreSQL 14.8, see [Amazon Aurora PostgreSQL updates](#). Babelfish for Aurora PostgreSQL 2.5 adds several new features, enhancements, and fixes. For more information about Babelfish for Aurora PostgreSQL, see [Working with Babelfish for Aurora PostgreSQL](#).

Releases

- [Aurora Babelfish release 2.5.1, October 4, 2023](#)
- [Aurora Babelfish release 2.5.0, July 13, 2023](#)

Aurora Babelfish release 2.5.1, October 4, 2023

High priority stability enhancements

- Fixed an issue causing crash when cursor referencing a table variable is already dropped.
- Fixed an issue where queries with UNION ALL, ORDER BY, and multiple joins could cause unavailability.
- Fixed a crash in parallel query execution when `enable_pg_hint` is set to on.
- Fixed an invalid memory access while freeing PLTSQL functions.

Additional improvements and enhancements

- Fixed an issue to avoid crash by properly handling formatting of datetime values in the results of FOR JSON or FOR XML.
- Fixed a crash in `SqlBulkCopy` when the order of columns is different compared to table defining.
- Fixed an issue that `bcp in` results in server crash when the table has large number of columns.
- Fixed incorrect value in procedure output parameter when procedure is called by name and is in different parameter order.
- Fixed a crash when dropping temp table or table variables during cleanup.
- Fixed an issue with sender of XML data type to handle NULL value where it was causing client to hang.

Aurora Babelfish release 2.5.0, July 13, 2023

Security enhancements

- Fixed an issue that non-sysadmin logins could DROP or ALTER logins.

Critical stability enhancements

- Fixed an issue when table variables may cause orphaned metadata entries.
- Fixed the issue where CTE top order handles null first behavior incorrectly.

High priority stability enhancements

- Fixed intermittent issue with concurrent SSL connections to Babelfish server.
- Fixed an issue in column name resolution of ORDER BY clause over UNION ALL query.
- Fixed the Unrecognized object issue when dropping database.
- Fixed the crash issue when adding non string unique key.

Additional improvements and enhancements

- Fixed an issue with sp_helpdb where NULL is shown for compatibility_level.
- Fixed a memory management issue with update_DropRoleStmt.
- Fixed table variables to make it immune to transaction rollback.
- The fix corrects the behavior of 'select convert(nvarchar(10),Getdate(),105)' for nvarchar datatype.
- Fixed an issue to allow UPDATE and DELETE for Table Variables inside functions.
- Made enhancement to improve the performance and avoid catalog bloat while using table variables.
- Fixed an issue in @@NEXTLEVEL which returned 1 unit larger than expected.
- Fixed an issue in sp_helpdb where input parameter's case sensitivity is not handled properly.

Babelfish for Aurora PostgreSQL 2.4

This release of Aurora Babelfish is provided with Aurora PostgreSQL 14.7. For more information about the improvements in Aurora PostgreSQL 14.7, see [Amazon Aurora PostgreSQL updates](#). Babelfish for Aurora PostgreSQL 2.4 adds several new features, enhancements, and fixes. For more information about Babelfish for Aurora PostgreSQL, see [Working with Babelfish for Aurora PostgreSQL](#).

Releases

- [Aurora Babelfish release 2.4.3, October 4, 2023](#)
- [Aurora Babelfish release 2.4.2, July 24, 2023](#)
- [Aurora Babelfish release 2.4.1, May 10, 2023](#)
- [Aurora Babelfish release 2.4.0, April 5, 2023](#)

Aurora Babelfish release 2.4.3, October 4, 2023

- Fixed a memory management issue with `update_DropRoleStmt`.
- Fixed a crash in `SqlBulkCopy` with `heap_compute_data_size` function in stacktrace when the order of columns is different compared to table defining.
- Fixed an issue that `bcp in` results in server crash when the table has large number of columns.
- Fixed a crash in parallel query execution when `enable_pg_hint` is set to on.

Aurora Babelfish release 2.4.2, July 24, 2023

Additional improvements and enhancements

- Fixed intermittent SSL connectivity issue during concurrent connections towards Babelfish instance.

Aurora Babelfish release 2.4.1, May 10, 2023

Additional improvements and enhancements

- Fixed an issue to prevent error when sequences are created in a database other than 'master'.
- Fixed a crash during bulk load operation in a specific scenario.

Aurora Babelfish release 2.4.0, April 5, 2023

New features

- Supports minor version upgrade from Babelfish for Aurora PostgreSQL DB cluster 14.3 onwards to Aurora PostgreSQL 14.7. For more information on the minor version upgrade, see [Upgrading Babelfish to a new minor version](#).
- Supports major version upgrade from Babelfish for Aurora PostgreSQL DB cluster 13.x onwards to Aurora PostgreSQL 14.7. For more information on the major version upgrade, see [Upgrading Babelfish to a new major version](#).
- Support for the following functions: `STR`, `APP_NAME`, `OBJECT_DEFINITION`, `OBJECT_SCHEMA_NAME`, `ATN2`, `DATEDIFF_BIG` functions.
- Support for the following `INFORMATION_SCHEMA` views: sequences, routines and schemata.

- Support `sp_rename` for TABLE, VIEW, PROCEDURE, FUNCTION, SEQUENCE.
- Support `sys.systypes` system compatibility view.
- Support for a new GUC parameter called `babelfishpg_tds.product_version` that allows you to set SQL Server product version number that is returned as an output by Babelfish. For more information, see [Using Babelfish product version GUC](#).
- Added support to generate data definition scripts for various objects present in a Babelfish for Aurora PostgreSQL database. For more information, see [DDL exports supported by Babelfish](#).

Security enhancements

- Fixed buffer overflow due to out of bound array access.

High priority stability enhancements

- Improved the performance through interactive queries, ODBC-based applications and tools such as SQL Server Management Studio. Following enhancements has been made for the same:
 - Fixed performance issues in several system functions including `OBJECT_ID()`, `OBJECT_NAME()`, `SCHEMA_ID()`.
 - Fixed performance issues in system stored procedures `sp_sproc_columns` and `sp_fkeys`.
 - Fixed performance issues in system catalog views `sys.all_views`, `sys.objects` and `sys.types`.
 - Improved the performance of bulk load, parsing of T-SQL and prepared statements.
- Added a new system stored procedure `sp_babelfish_volatility` that you can use to set the volatility of user-defined functions to improve index use when the functions are used as part of query predicates.
- Fixed an issue where the `UPDATE FROM` or `DELETE FROM` statement that references the correlation name of the updated table raised an error.
- Fixed an issue where `scope_identity` function returns wrong result after exiting one scope.
- Fixed an issue where name resolution doesn't work as expected when commands are invoked from the .NET client framework.

Additional improvements and enhancements

- Fixed an issue where the statement timeout parameter for a session was not working as expected.

- Support for sequence creations using user-defined data types.
- Fixed an issue where unicode in column names, aliases or comments causes parsing errors.
- Fixed an issue where `scope_identity` function requires higher permission than actually needed.
- Support for `NEXT VALUE FOR` function that gets the next value of a sequence. Note that this function cannot be used in some control-of-flow statements. `OVER` clause is also not supported.
- Fixed a crash when handling certain errors with `sp_describe_undeclared_parameters`.
- Fixed a rare error during Babelfish extension creation.
- Fixed an issue which was throwing an error "typename is NULL" while using TVP in `sp_executesql`.
- Fixed `SELECT FOR XML/JSON` behavior to not raise error when using `SELECT` with correlation name in subquery using `FOR XML PATH` clause.
- Fixed an issue with the `SELECT FOR JSON` or a `SELECT FOR XML` query which didn't return correct results for an empty table.
- Fixed an issue where the guest user can create objects in the wrong schema.
- Fixed schema name resolution for user defined types for param types in system stored procedures.
- Fixed the issue where applications issuing queries with more than 100 bind parameters for prepared statements were failing. This limit is now increased to 2100 to match the limits used by SQL Server.
- Fixed an issue with case handling of variable names in the `sp_executesql` call.
- `sp_fkeys` stored procedure now also returns 'deferrability' column in the result set.
- Fixed an issue in `AVG` aggregates which led to the termination of the connection for various integer datatypes.
- The `index_id` and `indid` column for respective views now returns the same value for indexes belonging to same object and the `index_id` is unique only within the object.
- Fixed an issue to not throw an error when `OpenJson` is called in stored procedures using `nvarchar` or `join`.
- Fixed an issue to not throw an error while using `try_convert` and `try_cast` for prohibited conversions involving int literals.
- Fixed an issue to allow `OPENJSON WITH` clause to accept a table alias.
- Support Degrees, Radians and Power functions returning the proper type.
- Fixed an issue where membership handling for `sysadmin` is not handled correctly.

- Fixed the default output style when converting DATE/TIME types to VARCHAR type using CONVERT function.
- Support EXECUTE AS CALLER clause in CREATE PROC/FUNCTION/TRIGGER.
- Fixed an issue where configurations are not reverted after existing sp_executesql scope.
- Fixed issues with handling cross-database access for the sys.has_perms_by_name function.
- Support the ProductLevel and ProductUpdateLevel properties for the SERVERPROPERTY function. ProductUpdateLevel always returns NULL and ProductLevel tracks the Babelfish version number closely with the T-SQL definition.
- Fixed an issue where the table variable when used as a bind parameter from client application resulted in an error.

Babelfish for Aurora PostgreSQL 2.3

This release of Aurora Babelfish is provided with Aurora PostgreSQL 14.6. For more information about the improvements in Aurora PostgreSQL 14.6, see [Amazon Aurora PostgreSQL updates](#). Babelfish for Aurora PostgreSQL 2.3 adds several new features, enhancements, and fixes. For more information about Babelfish for Aurora PostgreSQL, see [Working with Babelfish for Aurora PostgreSQL](#).

Releases

- [Aurora Babelfish release 2.3.3, September 13, 2023](#)
- [Aurora Babelfish release 2.3.2, March 3, 2023](#)
- [Aurora Babelfish release 2.3.0, January 20, 2023](#)

Aurora Babelfish release 2.3.3, September 13, 2023

Additional improvements and enhancements

- Fixed a rare error during Babelfish extension creation.
- Fixed a memory management issue with update_DropRoleStme.

Aurora Babelfish release 2.3.2, March 3, 2023

Security enhancements

- Fixed buffer overflow due to out of bound array access.

Aurora Babelfish release 2.3.0, January 20, 2023

New features

- Supports major version upgrade from Babelfish for Aurora PostgreSQL DB cluster 13.6 and later to Aurora PostgreSQL 14.6. For more information on the major version upgrade, see [Upgrading your Babelfish cluster to a new version](#).
- Support for T-SQL hints (join methods, index usage, MAXDOP). For more information on the T-SQL hints supported by Babelfish, see [Using T-SQL query hints to improve Babelfish query performance](#).
- Babelfish now supports Zero-downtime patching (ZDP). For more information, see [Minor release upgrades and zero-downtime patching](#) in the *Amazon Aurora User Guide*.
- Support for FORMAT() T-SQL function with minor limitations.
- Support the estimated execution plans for THROW, PRINT, USE, and RAISEERROR statements.
- Support for JSON_MODIFY function in Babelfish which updates the value of a property in a JSON string and returns the updated JSON string.
- Support the VALUES() constructor in FROM clause in a SELECT statement.
- Support sp_addrole, sp_droprole, sp_addrolemember, sp_droprolemember procedures to create or alter a role.
- Support for sys.all_parameters catalog view.
- Support guest user in all the user created databases and support GRANT/CONNECT TO/FROM user (including guest).
- Support sp_helpdbfixedrole and DATETIMEOFFSETFROMPARTS functions.

High priority stability enhancements

- Improved performance for INSERT statement with IDENTITY_INSERT=ON.
- Fixed an issue where "DROP DATABASE" statement fails due to incorrect comparison operator used.

- Fixed an issue where numeric overflow error was not handled properly for numeric types.
- Fixed an issue where DB owner is not considered as dbo in its own DB.
- Fixed issues with SSL handshake failure and added a few other improvements.
- Fixed the sys.all_objects view to correctly identify inline table-valued functions (IF) and table-valued functions (TF) which were previously reported as scalar functions (FN). Similar issue is fixed for the IsInlineFunction property of the OBJECTPROPERTY function.
- Fixed an issue where DBO is assumed member of a DB role incorrectly.
- Fixed an issue where member of sysadmin could not connect through SSMS.
- Corrected the schema name resolution for triggers and views so that it selects/modifies the correct object(tables).
- Fixed the mapping consistency in catalog when creating roles with names in upper/lower case.
- Fixed an issue where drop database is blocked after access denial to other logins due to insufficient permission.
- Fixed the default collation of Babelfish data types except TEXT and NTEXT to be the same as that mentioned in the babelfishpg_tsql.server_collation_name parameter. For more information, see [Default Collation in Babelfish](#).
- Fixed the cross-DB references to tempdb.sys.objects for correct results.

Additional improvements and enhancements

- Fixed an issue to make trigger names unique for each database.
- Fixed an issue in sp_tables when it is invoked from JDBC metadata functions.
- Fixed an issue when CHECK constraints are used with LIKE condition.
- Performance improvements with sp_sproc_columns when dealing with stored procedures.
- sp_sproc_columns now includes table-valued parameter row for stored procedures that use TVP as a parameter.
- Fixed the cross-DB references to INFORMATION_SCHEMA.ROUTINES and tempdb.sys.objects to give the correct results.
- Fixed issues to support datetime/smalldatetime operation with various numeric and non numeric datatypes.
- Fixed the return values of SUM aggregates for integer datatypes to return the correct datatypes.
- Fixed an issue when UPDATE/DELETE is used with table aliases.

- Support added for `sysobjects.crdate` (`create_date`) for all user defined tables, views, procedures, functions, triggers and table types.
- Procedure/function call is not allowed when required parameter is missing and an explicit error is raised.
- Fixed issue to calculate the day difference and the hour difference, without considering timestamp (i.e., hh:mm:ss.msec).
- Fixed an issue with `DATEDIFF()` function to return correct results between two input dates regardless of the input parameters.
- Fixed an issue with `DATEADD()` function when used with the 'nanosecond' units.
- Fixed an issue with `DATEPART()`, `DATENAME()`, `DATEDIFF()` and `DATEADD()` functions when used with 'w' units
- Fixed an issue with `DATEPART()` and `DATENAME()` to allow units 'y'.
- Fixed issues with `DATEPART()`, `DATENAME()`, `DATEDIFF()` and `DATEADD()` functions to convert string to datetime and to recognize mi units.
- Support for `TRY_CONVERT()` function.
- Fixed issue with using strict/lax jsonpath with arrays to avoid OPENJSON error: "syntax error at or near " " of jsonpath input".
- Support UDF (User Defined Function) as column default in ALTER TABLE statement.
- Fixed an issue when `SUBSTRING()` takes NULL arguments.
- Support for cast operations to `SMALLDATETIME` from various numeric types.
- Fixed an issue where `dbname` parameter is not handled properly for `sp_helpdb`.
- Fixed an issue where DB owner is allowed to create another user for itself.
- Fixed an issue where trailing spaces are not ignored in `sp_helpsrvrolemember` and `IS_ROLEMEMBER/IS_MEMBER` functions.
- Improved error message for unsupported data types: `HIERARCHYID`, `GEOGRAPHY`, `GEOMETRY`.
- Fixed issues where cross database procedure calls and `sp_` procedures access from other databases should succeed even without `EXECUTE` keyword.
- Fixed an issue where user 'guest' is not dropped in any database, but only disabled.
- Fixed the column value for `SID` in the procedure `sp_helpuser` when the user is guest.
- Fixed an issue where overflow/underflow is not getting handled with money datatype.
- Fixed an issue where error is not getting handled while error processing in tds.
- Fixed a better error message for `CREATE USER WITHOUT LOGIN`.

- Fixed an issue where `sp_helpsrvrolemember` is throwing unsupported errors for unsupported server level roles.
- Fixed an issue where `SET BABELFISH_STATISTICS PROFILE` shows planning and execution times.
- Corrected the schema name resolution for Babelfish objects like views and triggers, so that correct object is selected or modified.
- Support `rowversion/timestamp` Datatype for Insert Bulk.
- In Babelfish, `sp_babelfish_configure` supports `enable_pg_hint` and explain-related configurations by turning them "on/off". Accepting "ignore/strict" option is allowed when there are multiple matches while using `sp_babelfish_configure`.
- Support to Keep Nulls (-k) bcp option for optimized implementation to insert Bulk.
- Support multi-byte currency symbols to use with money data type.
- Fixed issue for dotnet clients (including SSMS) that received invalid precision/scale error for certain arithmetic expressions.
- Fixed the `sys.all_objects` view to correctly identify inline table-valued functions (IF) and table-valued functions (TF) which were previously reported as scalar functions (FN). Fixed similar issue for the `IsInlineFunction` property of the `OBJECTPROPERTY` function.
- Fixed an issue where the `is_member` function returns an incorrect result for certain roles.
- Improvements in FOR JSON PATH clause of SELECT statement which supports `ROOT`, `INCLUDE_NULL_VALUES`, `WITHOUT_ARRAY_WRAPPER`.
- Supports a new escape hatch, 'escape_hatch_checkpoint' with a default pf 'ignore'. This escape hatch allows the use of CHECKPOINT statement in the procedural code, but the CHECKPOINT statement is currently not implemented.

Babelfish for Aurora PostgreSQL 2.2

This release of Aurora Babelfish is provided with Aurora PostgreSQL 14.5. For more information about the improvements in Aurora PostgreSQL 14.5, see [Amazon Aurora PostgreSQL updates](#). Babelfish for Aurora PostgreSQL 2.2 adds several new features, enhancements, and fixes. For more information about Babelfish for Aurora PostgreSQL, see [Working with Babelfish for Aurora PostgreSQL](#).

Releases

- [Aurora Babelfish release 2.2.3, October 17, 2023](#)
- [Aurora Babelfish release 2.2.2, March 2, 2023](#)

- [Aurora Babelfish release 2.2.1, December 13, 2022](#)
- [Aurora Babelfish release 2.2.0, November 9, 2022](#)

Aurora Babelfish release 2.2.3, October 17, 2023

High priority stability enhancements

- Fixed issues with SSL handshake failure and added a few other improvements.

Additional improvements and enhancements

- Fixed a memory management issue with `update_DropRoleStmt`.

Aurora Babelfish release 2.2.2, March 2, 2023

Security enhancements

- Fixed buffer overflow due to out of bound array access.

Aurora Babelfish release 2.2.1, December 13, 2022

- Fixed an issue that prevented the use of collations like `Chinese_PRC_CI_AS`, `Japanese_CI_AS` and so on for `babelfishpg_tsqldb.server_collation_name`.

Aurora Babelfish release 2.2.0, November 9, 2022

Security enhancements

- Fixed critical issues in Babelfish due to incorrect handling of user input for some application features. This is tracked in https://github.com/babelfish-for-postgresql/babelfish_extensions/security/advisories/GHSA-m399-rrc8-j6fj.

High priority stability enhancements

- Fixed error handling in `sp_prepare` calls which can cause a server crash when a large number of parameters are sent by the application. Babelfish currently supports a maximum of 100 parameters for a procedure or function.
- Fixed error handling in SSL/TLS handshake for some client drivers.
- Fixed an issue where a login can access the database without creating DB user after the DROP/CREATE of login.
- Fixed an issue where a login isn't dropped if it is logged in on any session.

New features

- Support for data migration using the BCP client and the `bcp` utility now supports `-E` flag (for identity columns) and `-b` flag (for batching inserts).
- Support for cross-database stored procedure execution.
- Support for CROSS APPLY and OUTER APPLY (lateral join).
- Support for built-in functions `SYSTEM_USER`, `HOST_NAME`; the Hostname is visible in the `sys.sysprocesses` T-SQL view; the `SID_BINARY` function is supported but always returns NULL in Babelfish.
- Support for CAST function of numeric expressions to DATETIME.
- Support for @@LANGUAGE variable with constant value as 'us_english'.
- Support for the old-style function calls with ':' preceding the function name.
- Support for the `sp_helpsrvrolemember` stored procedure.
- Support for the `msdb.dbo.fn_sypolicy_is_automation_enabled` system function.
- Support for more catalogs: `assembly_types`, `numbered_procedures`, `triggers`, `spatial_index_tessellations`, `plan_guides`, `synonyms`, `events`, `trigger_events`, `fulltext_indexes`, `dm_hadr_cluster`, `xml_indexes`, `change_tracking_tables`, `key_constraints`, `database_filestream_options`, `filetable_system_defined_objects`, `hash_indexes`, `filegroups`, `master_files`, `assembly_modules`, `change_tracking_databases`, `database_recovery_status`, `fulltext_catalogs`, `fulltext_stoplists`, `fulltext_indexes`, `fulltext_index_columns`, `fulltext_languages`, `selective_xml_index_paths`, `spatial_indexes`, `filetables`, `registered_search_property_lists`, `sypolicy_configuration`, `sypolicy_system_health_state`.
- Support for new INFORMATION_SCHEMA catalogs: `COLUMN_DOMAIN_USAGE`, `CONSTRAINT_COLUMN_USAGE`, `CHECK_CONSTRAINTS`, `ROUTINES`, `VIEWS`.

- Support for new PG-style query plan: escape hatch 'babelfish_pgtsql.escape_hatch_showplan_all'.
 - when set to 'ignore', SET SHOWPLAN_ALL and SET STATISTICS PROFILE behaves as SET BABELFISH_SHOWPLAN_ALL and SET BABELFISH_STATISTICS PROFILE.
 - when set to 'strict', SET SHOWPLAN_ALL and SET STATISTICS PROFILE are silently ignored.
- Support for executing stored procedures with the sp_ prefix in the master database without using a three-part name.

Additional improvements and enhancements

- Fixed an issue where a value of 1900-01-01 00:00:00 was stored when a NULL was inserted or updated into a datetime column. A NULL value is inserted now. Column values in tables created in a previous Babelfish release are not affected.
- TIME datatypes that return 7 digits in SQL Server now returns 7 digits in Babelfish as well, with the 7th digit always being zero. In addition, a rounding issue that sometimes affected the 6th digit has been resolved.
- Increased parameter lengths for @tsql and @params for sp_describe_first_result_set from nvarchar(384) to nvarchar(8000). This increases the number of columns the DMS Babelfish target endpoint can support from 25 to 1000.
- Improved performance for system stored procedures: sys.sp_tablecollations_100, sp_columns_managed, and sp_describe_undeclared_parameters. This fix improves the performance of the DMS Babelfish target endpoint, SQL Server Management Studio import and export wizard, and prevents timeouts.
- Fixed an issue with Bitwise NOT ~ operator and it returns the correct result with BIT data types now.
- Fixed an issue with BCP when it is used for tables that have triggers.
- Fixed an issue of backend failure in INSERT BULK when using Import-Export wizard.
- Fixed an issue where SQL Server Management Studio (SSMS) returns an error while expanding "Triggers" for a table in the Object Explorer view.
- Fixed an issue where the name column in the sys.sysobjects view was using case sensitive collation.
- Fixed an issue to refer SQL objects inside a function and is resolved to the function's schema rather than the default schema of the user.

- Fixed an issue where a backend crash can occur when using the ISNULL function with CONVERT on computed columns.
- Fixed an issue with the DATEPART function when the date argument is a string literal.
- Fixed an issue where a role can be dropped even if it has members.
- Fixed an issue so that the db user can't add to a role or drop from a role.
- Fixed an issue to allow BCP to work correctly with collations other than English collations.
- Fixed an issue to make sp_helpuser procedure show login name for dbo user.
- Fixed an issue to handle NULL and mix-cased inputs correctly for the functions SUSER_SNAME and SUSER_SID.
- Fixed an issue with Babelfish returning an invalid TDS protocol stream when there is a numeric overflow error.
- Fixed an issue where is_fixed_role column returns incorrect value in the sys.server_principals view for the 'sysadmin' role.
- Fixed the transaction error handling in a batch if the string passed to execute contains a USE dbname and fails because the database dbname was not found.
- Fixed the issue with procedures created in master database context with prefix sp_ that are not accessible from other database context.
- Fixed the failure to resolve object name inside a procedure when used with schema name.
- Fixed case-sensitivity issue with arguments to the functions USER_ID and SUSER_ID.
- Fixed an issue where triggers were allowed to be created on Babelfish temporary tables.
- Fixed several performance issues with Import-Export wizard.
- Support for multi-byte client encodings other than UTF-16 for VARCHAR(n).
- Fixed the system compatibility view sys.sysprocesses to show the correct value for hostname provided by the client connection.
- Fixed case sensitivity issue with Polish_CI_AS collation.
- Fixed the @@DBTS function so that value of @@DBTS correctly returns the current transaction id after each DML statement even when used within a transaction.
- Improved performance for queries that refer to the functions SCOPE_IDENTITY and @@IDENTITY.
- Support added for collations Japanese_CS_AS, Japanese_CI_AI and Japanese_CI_AS for fn_helpcollations.

- @@SERVERNAME and SERVERPROPERTY('ServerName') now return the name of the Babelfish instance as specified by the user when the instance is created. This value is also returned by the newly supported properties SERVERPROPERTY('MachineName') and SERVERPROPERTY('InstanceName').
- Function fn_mapped_system_error_list lists the PG error code mapped to @@ERROR codes, as well as the corresponding error message text. This function also exists in previous Babelfish releases but did not include mapping details.
- Fixed DATEADD function to now support milliseconds(ms) time units.
- SET NO_BROWSETABLE {ON|OFF} is now subject to escape hatch escape_hatch_session_settings, so no error is raised when set to ignored.
- SET PARSEONLY {ON|OFF} is now supported. Previously this would raise an error unless escape hatch escape_hatch_session_settings is set to ignored.
- The DATABASE_DEFAULT AND CATALOG_DEFAULT collation is now supported; this refers to the server/instance-level collation that was specified when the Babelfish instance was created, as Babelfish doesn't currently support collations on database level.
- For the functions OBJECTPROPERTY and OBJECTPROPERTYEX, the following properties are now supported: ExecIsAnsiNullsOn, ExecIsQuotedIdentOn, IsDefault, IsDefaultCnst, IsDeterministic, IsIndexed, IsInlineFunction, IsMSShipped, IsPrimaryKey, IsProcedure, IsRule, IsScalarFunction, IsSchemaBound, IsTable, IsTableFunction, IsTrigger, IsUserTable, IsView, OwnerId, TableFulltextPopulateStatus, TableHasVarDecimalStorageFormat.
- OBJECTPROPERTYEX function supports the BaseType property.
- INDEXPROPERTY function supports the following properties: IndexFillFactor, IndexID, IsClustered, IsDisabled, IsHypothetical, IsPadIndex, IsPageLockDisallowed, IsRowLockDisallowed, IsUnique.

Babelfish for Aurora PostgreSQL 2.1

This release of Aurora Babelfish is provided with Aurora PostgreSQL 14.3 and 14.4. For more information about the improvements in Aurora PostgreSQL 14.3 and 14.4, see [Amazon Aurora PostgreSQL updates](#). Babelfish for Aurora PostgreSQL 2.1 adds several new features, enhancements, and fixes. For more information about Babelfish for Aurora PostgreSQL, see [Working with Babelfish for Aurora PostgreSQL](#).

Releases

- [Babelfish for Aurora PostgreSQL release 2.1.2, October 18, 2022](#)

- [Babelfish for Aurora PostgreSQL release 2.1.1, July 6, 2022](#)
- [Babelfish for Aurora PostgreSQL release 2.1.0, June 21, 2022](#)

Babelfish for Aurora PostgreSQL release 2.1.2, October 18, 2022

Security enhancements

- Fixed critical issues in Babelfish due to incorrect handling of user input for some application features. This is tracked in https://github.com/babelfish-for-postgresql/babelfish_extensions/security/advisories/GHSA-m399-rrc8-j6fj.

High priority stability enhancements

- Fixed error handling in `sp_prepare` calls which can cause a server crash when a large number of parameters are sent by the application. Babelfish currently supports a maximum of 100 parameters for a procedure or function.
- Fixed error handling in SSL/TLS handshake for some client drivers.

Babelfish for Aurora PostgreSQL release 2.1.1, July 6, 2022

- Fixed the `babelfishpg_tds` extension to correctly allocate the shared memory size used by the extension.

Babelfish for Aurora PostgreSQL release 2.1.0, June 21, 2022

Babelfish DB clusters running on Aurora PostgreSQL 13.7 or older versions can't be upgraded to Aurora PostgreSQL 14.3 with Babelfish 2.1.0.

New features

- Support for data migration using the `bcp` client utility, as an experimental feature. Some `bcp` options (`-b`, `-C`, `-E`, `-G`, `-h`, `-K`, `-k`, `-q`, `-R`, `-T`, `-V`) are not currently supported.
- Support for connecting with the SSMS object explorer connection dialog (rather than only the Query Editor connection dialog), as well as partial support for the SSMS object explorer itself.
- Improved support for data migration with the SSMS Import/Export Wizard.
- Support for `IS_MEMBER`, `IS_ROLEMEMBER`, and `HAS_PERMS_BY_NAME` functions.

- Support for `syslanguages`, `sys.indexes`, `sys.all_views`, `sys.database_files`, `sys.sql_modules`, `sys.system_sql_modules`, `sys.all_sql_modules`, `sys.xml_schema_collections`, `sys.dm_hadr_database_replica_states`, `sys.data_spaces`, `sys.database_mirroring`, `sys.database_role_members` catalogs.
- Support for `sp_sproc_columns`, `sp_sproc_columns_100`, `sp_helprole`, `sp_helprolemember` system stored procedures.
- Support for `Japanese_CS_AS`, `Japanese_CI_AI`, `Japanese_CI_AS` collations.
- Babelfish now supports `CHARINDEX` substring searches on systems using nondeterministic collations.
- Babelfish now supports `PATINDEX`, and supports arguments to `STRING_SPLIT` that are collated using a case-insensitive collation.
- Query plan output is generated following `SET BABELFISH_SHOWPLAN_ALL ON` (and `OFF`) and `SET BABELFISH_STATISTICS_PROFILE ON` (`OFF`). This will generate PostgreSQL-style query plan information for T-SQL queries in Babelfish. Make sure these `SET` statements are identical to existing T-SQL statements, but with the added `BABELFISH_` prefix.

Additional improvements and enhancements

- Cross-database references outside the current database, with a 3-part object name, for `SELECT`, `SELECT..INTO`, `INSERT`, `UPDATE`, `DELETE`.
- `CREATE ROLE` (`AUTHORIZATION` clause not supported), `DROP ROLE`, `ALTER ROLE`.
- Babelfish now maps the error code for `@@ERROR=213`. For more information on error handling, see [Managing Babelfish error handling](#).
- Fixed an issue with `SUBSTRING(CHARINDEX())` variable assignment that caused Babelfish to become unavailable.
- Fixed an issue with `INSERT INTO...with OUTPUT` clause that resulted in a `Number of given values doesn't match target table definition` error.
- Fixed an issue that caused `DELETE with OUTPUT INTO` temporary table statements to return a `WITH query 'nnnnnnnnnnn' doesn't have a RETURNING clause` error.
- Fixed an issue that caused `LEFT OUTER JOIN` to fail with a `Sqlcmd: Error: Internal error at ReadAndHandleColumnData (Reason: Error reading column data)` error. This issue was a regression introduced in Babelfish 1.1.0. If your Babelfish for Aurora PostgreSQL DB cluster runs Babelfish version 1.1.0 and you get this error, we recommend that you upgrade to Aurora PostgreSQL 13.7 to obtain this fix.

- Fixed an invalid syntax error using the GETUTCDATE() and SYSUTCDATETIME() built-in functions.
- Fixed an issue where numeric overflow conditions using SUM() and AVG() functions caused a TDS error.
- Fixed an issue with .NET applications calling store procedures for a DataTable object that resulted in a datatype mismatch and disallowed implicit casting error.

Babelfish for Aurora PostgreSQL 1.5

This release of Aurora Babelfish is provided with Aurora PostgreSQL 13.9. For more information about the improvements in Aurora PostgreSQL 13.9, see [Amazon Aurora PostgreSQL updates](#).

Babelfish for Aurora PostgreSQL 1.5 adds a new feature and an enhancement. For more information about Babelfish for Aurora PostgreSQL, see [Working with Babelfish for Aurora PostgreSQL](#).

Releases

- [Aurora Babelfish release 1.5.0, January 20, 2023](#)

Aurora Babelfish release 1.5.0, January 20, 2023

New features

- Babelfish now supports Zero-downtime patching (ZDP). For more information, see [Minor release upgrades and zero-downtime patching](#) in the *Amazon Aurora User Guide*.

High priority stability enhancements

- Fixed an issue related to money operator class during minor version upgrade from 13.4 to 13.5 or later due to which the upgrade was failing.

Babelfish for Aurora PostgreSQL 1.4

This release of Aurora Babelfish is provided with Aurora PostgreSQL 13.8. For more information about the improvements in Aurora PostgreSQL 13.8, see [Amazon Aurora PostgreSQL updates](#). The following issues are resolved in Babelfish for Aurora PostgreSQL 1.4 release. For more information about Babelfish for Aurora PostgreSQL, see [Working with Babelfish for Aurora PostgreSQL](#).

Releases

- [Aurora Babelfish release 1.4.1, December 13, 2022](#)
- [Aurora Babelfish release 1.4.0, November 9, 2022](#)

Aurora Babelfish release 1.4.1, December 13, 2022

- Fixed an issue that prevented successful minor version upgrade from Babelfish for Aurora PostgreSQL 13.4 DB cluster to Aurora PostgreSQL 13.8.

Aurora Babelfish release 1.4.0, November 9, 2022

Security enhancements

- Fixed critical issues in Babelfish due to incorrect handling of user input for some application features. This is tracked in https://github.com/babelfish-for-postgresql/babelfish_extensions/security/advisories/GHSA-m399-rrc8-j6fj.

High priority stability enhancements

- Fixed error handling in `sp_prepare` calls which can cause a server crash when a large number of parameters are sent by the application. Babelfish currently supports a maximum of 100 parameters for a procedure or function.
- Fixed error handling in SSL/TLS handshake for some client drivers.

Additional improvements

- Fixed the `babelfishpg_tds` extension to correctly allocate the shared memory size used by the extension.

Babelfish for Aurora PostgreSQL 1.3

This release of Aurora Babelfish is provided with Aurora PostgreSQL 13.7. For more information about the improvements in Aurora PostgreSQL 13.7, see [Amazon Aurora PostgreSQL updates](#). The following issues are resolved in Babelfish for Aurora PostgreSQL 1.3 release. For more information about Babelfish for Aurora PostgreSQL, see [Working with Babelfish for Aurora PostgreSQL](#).

Releases

- [Babelfish for Aurora PostgreSQL release 1.3.3, December 14, 2022](#)
- [Babelfish for Aurora PostgreSQL release 1.3.2, October 18, 2022](#)
- [Babelfish for Aurora PostgreSQL release 1.3.1, July 6, 2022](#)
- [Babelfish for Aurora PostgreSQL release 1.3.0, June 9, 2022](#)

Babelfish for Aurora PostgreSQL release 1.3.3, December 14, 2022

- Fixed an issue that prevented successful minor version upgrade from Babelfish for Aurora PostgreSQL 13.4 DB cluster to Aurora PostgreSQL 13.7.

Babelfish for Aurora PostgreSQL release 1.3.2, October 18, 2022

Security enhancements

- Fixed critical issues in Babelfish due to incorrect handling of user input for some application features. This is tracked in https://github.com/babelfish-for-postgresql/babelfish_extensions/security/advisories/GHSA-m399-rrc8-j6fj.

High priority stability enhancements

- Fixed error handling in sp_prepare calls which can cause a server crash when a large number of parameters are sent by the application. Babelfish currently supports a maximum of 100 parameters for a procedure or function.
- Fixed error handling in SSL/TLS handshake for some client drivers.

Babelfish for Aurora PostgreSQL release 1.3.1, July 6, 2022

- Fixed the babelfishpg_tds extension to correctly allocate the shared memory size used by the extension.

Babelfish for Aurora PostgreSQL release 1.3.0, June 9, 2022

- Fixed an issue with SUBSTRING(CHARINDEX()) variable assignment that caused Babelfish to become unavailable.

- Fixed an issue with INSERT INTO...with OUTPUT clause that resulted in a Number of given values doesn't match target table definition error.
- Fixed an issue that caused DELETE with OUTPUT INTO temporary table statements to return a WITH query 'nnnnnnnnnnn' doesn't have a RETURNING clause error.
- Fixed an issue that caused LEFT OUTER JOIN to fail with a Sqlcmd: Error: Internal error at ReadAndHandleColumnData (Reason: Error reading column data) error. This issue was a regression introduced in Babelfish 1.1.0. If your Babelfish for Aurora PostgreSQL DB cluster runs Babelfish version 1.1.0 and you get this error, we recommend that you upgrade to Aurora PostgreSQL 13.7 to obtain this fix.

Babelfish for Aurora PostgreSQL 1.2 (Deprecated)

This release of Babelfish is provided with Aurora PostgreSQL 13.6. For more information about the improvements in Aurora PostgreSQL 13.6, see [Amazon Aurora PostgreSQL updates](#). The following issues are resolved in Babelfish 1.2 release. For more information about Babelfish, see [Working with Babelfish for Aurora PostgreSQL](#).

Releases

- [Babelfish for Aurora PostgreSQL release 1.2.4, December 15, 2022](#)
- [Babelfish for Aurora PostgreSQL release 1.2.3, October 18, 2022](#)
- [Babelfish for Aurora PostgreSQL release 1.2.2, July 18, 2022](#)
- [Babelfish for Aurora PostgreSQL release 1.2.1, April 27, 2022](#)
- [Babelfish for Aurora PostgreSQL release 1.2.0, March 29, 2022](#)

Babelfish for Aurora PostgreSQL release 1.2.4, December 15, 2022

- Fixed an issue that prevented successful minor version upgrade from Babelfish for Aurora PostgreSQL 13.4 DB cluster to Aurora PostgreSQL 13.6.

Babelfish for Aurora PostgreSQL release 1.2.3, October 18, 2022

Security enhancements

- Fixed critical issues in Babelfish due to incorrect handling of user input for some application features. This is tracked in https://github.com/babelfish-for-postgresql/babelfish_extensions/security/advisories/GHSA-m399-rrc8-j6fj.

Babelfish for Aurora PostgreSQL release 1.2.2, July 18, 2022

- Fixed an issue causing outer join queries to sometimes fail with an internal error message.
- Fixed the babelfishpg_tds extension to correctly allocate the shared memory size used by the extension.

Babelfish for Aurora PostgreSQL release 1.2.1, April 27, 2022

- Fixed an issue that caused Babelfish to become unavailable after working with temporary tables.
- Fixed an issue that prevented successful minor version upgrade from a Babelfish for Aurora PostgreSQL 13.4 or 13.5 DB cluster to Aurora PostgreSQL 13.6.
- Fixed an issue that prevented transferring data to a table with identity columns using the SQL Server Management Studio import and export wizard.

Babelfish for Aurora PostgreSQL release 1.2.0, March 29, 2022

In addition to the new features and improvements in the following list, Babelfish for Aurora PostgreSQL 1.2.0 adds several features that currently have limited implementations. These features are available for use but don't yet have complete parity with T-SQL syntax or Microsoft SQL Server. For more information, see [Features with limited implementation](#).

- Casing (upper-case, lower-case) of column names as created with T-SQL is now retained. That is, `SELECT * FROM table` returns the column names using the same casing as used when the table was created at the TDS endpoint.
- INSTEAD-OF triggers are now supported on tables (tables only, not views).
- Support for system-defined global variables @@DBTS, @@LOCK_TIMEOUT, @@SERVICENAME.
- Support for syntax SET LOCK_TIMEOUT.

- Support for datatypes `TIMESTAMP` and `ROWVERSION`.
- Support for built-in functions `COLUMNS_UPDATED`, `UPDATE`, `FULLTEXTSERVICEPROPERTY`, `ISJSON`, `JSON_QUERY`, `JSON_VALUE`, `HAS_DBACCESS`, `SUSER_SID`, `SUSER_SNAME`, `IS_SRVROLEMEMBER`.
- Full support for the `CHECKSUM` function. This function now supports `*` and multiple columns (`CHECKSUM (* | expression [, ...n])`).
- Full support for the `SCHEMA_ID` function. This function can now be used without any arguments (`SCHEMA_ID ([schema_name])`).
- Support for `DROP IF EXISTS` with `SCHEMA`, `DATABASE`, and `USER` objects.
- Support for these additional values for `CONNECTIONPROPERTY`: `physical_net_transport` and `client_net_address`.
- Support for these `SERVERPROPERTY` values: `EditionID`, `EngineEdition`, `LicenseType`, `ProductVersion`, `ProductMajorVersion`, `ProductMinorVersion`, `IsIntegratedSecurityOnly`, `IsLocalDB`, `IsAdvancedAnalyticsInstalled`, `IsBigDataCluster`, `IsPolyBaseInstalled`, `IsFullTextInstalled`, and `IsXTPSupported`.
- Support for these catalogs: `sys.dm_os_host_info`, `sys.dm_exec_sessions`, `sys.dm_exec_connections`, `sys.endpoints`, `sys.table_types`, `sys.database_principals`, `sys.sysprocesses`, `sys.sysconfigures`, `sys.syscurconfigs`, and `sys.configurations`.
- Support for these `INFORMATION_SCHEMA` catalogs: `TABLES`, `COLUMNS`, `DOMAINS`, and `TABLE_CONSTRAINTS`.
- Support for these system stored procedures: `sp_table_privileges`, `sp_column_privileges`, `sp_special_columns`, `sp_fkeys`, `sp_pkeys`, `sp_stored_procedures`, `xp_qv`, `sp_describe_undeclared_parameters`, and `sp_helpuser`.
- Limited support for creating, altering, and dropping database principals (`USER` objects). Limitations for `CREATE/ALTER/DROP` syntax with `USER` objects are as follows:
 - For `CREATE USER`, you can specify the `FOR/FROM LOGIN` and `DEFAULT_SCHEMA` options only.
 - For `ALTER USER`, you can specify `DEFAULT_SCHEMA` option only.
- Limited support for the `SET FMTONLY ON` command. Setting this command `ON` suppresses the execution of `SELECT` statements only. It doesn't suppress the execution of other statements.
- Support for granting and revoking (`GRANT/REVOKE`) permissions for database principals only (not database roles). Support includes `GRANT OPTION` and `REVOKE..CASCADE` options for `SELECT`, `INSERT`, `UPDATE`, `DELETE`, `REFERENCES`, `EXECUTE`, and `ALL [PRIVILEGES]`.
- Support for `WITH AUTHORIZATION` on `CREATE SCHEMA`.

- Support for the following new escape hatches and escape hatch functionality:
 - Restore all default settings for escape hatches for your Babelfish DB instance by passing `default` as the second argument to the `sp_babelfish_configure` stored procedure.
 - A new escape hatch, `escape_hatch_ignore_dup_key` (default=`strict`) controls the `IGNORE_DUP_KEY` option in `CREATE/ALTER TABLE` and `CREATE INDEX` statements. When `IGNORE_DUP_KEY=ON`, an error is raised unless `escape_hatch_ignore_dup_key` is set to `'ignore'`.
 - Added support for the `ignore` option on the `escape_hatch_storage_options` escape hatch. When set to `ignore`, Babelfish ignores errors raised in the following cases:
 - Ignores errors raised in the `ON` clause in a `CREATE DATABASE` statement.
 - Ignores errors raised by `CREATE INDEX` when used with `SORT_IN_TEMPDB`, `DROP_EXISTING`, or `ONLINE` options.

For details, see [Managing Babelfish error handling](#).

- The `msdb` system database is always present, and has `dbid=4`. For more information, see [Babelfish architecture](#).
- For a list of features supported in each Babelfish release, see [Supported functionality in Babelfish by version](#).

Babelfish for Aurora PostgreSQL 1.1 (Deprecated)

This release of Babelfish is provided with Aurora PostgreSQL 13.5. For more information about the improvements in Aurora PostgreSQL 13.5, see [Amazon Aurora PostgreSQL updates](#). The following issues are resolved in Babelfish 1.1 release. For more information about Babelfish, see [Working with Babelfish for Aurora PostgreSQL](#).

Releases

- [Babelfish for Aurora PostgreSQL release 1.1.2, December 16, 2022](#)
- [Babelfish for Aurora PostgreSQL release 1.1.1, October 18, 2022](#)
- [Babelfish for Aurora PostgreSQL release 1.1.0, February 25, 2022](#)

Babelfish for Aurora PostgreSQL release 1.1.2, December 16, 2022

- Fixed an issue that prevented successful minor version upgrade from Babelfish for Aurora PostgreSQL 13.4 DB cluster to Aurora PostgreSQL 13.5.

Babelfish for Aurora PostgreSQL release 1.1.1, October 18, 2022

Security enhancements

- Fixed critical issues in Babelfish due to incorrect handling of user input for some application features. This is tracked in https://github.com/babelfish-for-postgresql/babelfish_extensions/security/advisories/GHSA-m399-rrc8-j6fj.

Babelfish for Aurora PostgreSQL release 1.1.0, February 25, 2022

Babelfish for Aurora PostgreSQL version 1.1.0 adds support for the following Microsoft SQL Server functionality and T-SQL commands. For more information, see [Working with Babelfish for Aurora PostgreSQL](#).

- Unique indexes or UNIQUE constraints on nullable columns. To use this capability, change the `escape_hatch_unique_constraint` to 'ignore'. For more information, see [Managing Babelfish error handling](#)
- Reference transition tables from triggers with multiple DML actions.
- Identifiers that have leading dot characters.
- The `COLUMNPROPERTY` function (limited to `CharMaxLen` and `AllowsNull` properties).
- System-defined @@ variables: `@@CURSOR_ROWS`, `@@LOCK_TIMEOUT`, `@@MAX_CONNECTIONS`, `@@MICROSOFTVERSION`, `@@NESTLEVEL`, and `@@PROCID`.
- Built-in functions: `CHOOSE`, `CONCAT_WS`, `CURSOR_STATUS`, `DATEFROMPARTS`, `DATETIMEFROMPARTS`, `ORIGINAL_LOGIN`, `SCHEMA_NAME` (now fully supported), `SESSION_USER`, `SQUARE`, and `TRIGGER_NESTLEVEL` supported (but only without arguments).
- System stored procedures: `sp_columns`, `sp_columns_100`, `sp_columns_managed`, `sp_cursor`, `sp_cursor_list`, `sp_cursorclose`, `sp_cursorexecute`, `sp_cursorfetch`, `sp_cursoropen`, `sp_cursoroption`, `sp_cursormaprep`, `sp_cursormapexec`, `sp_cursorunprepare`, `sp_databases`, `sp_datatype_info`, `sp_datatype_info_100`, `sp_describe_cursor`, `sp_describe_first_result_set`, `sp_describe_undeclared_parameters`, `sp_oledb_ro_username`, `sp_pkeys`, `sp_prepare`, `sp_statistics`, `sp_statistics_100`, `sp_tablecollations_100`, `sp_tables`, and `sp_unprepare`.

- For a list of features supported in each Babelfish release, see [Supported functionality in Babelfish by version](#).

Babelfish for Aurora PostgreSQL 1.0 (Deprecated)

This release of Babelfish is provided with Aurora PostgreSQL 13.4. For more information about the improvements in Aurora PostgreSQL 13.5, see [Amazon Aurora PostgreSQL updates](#). The following issues are resolved in Babelfish 1.0 release. For more information about Babelfish, see [Working with Babelfish for Aurora PostgreSQL](#).

Releases

- [Babelfish for Aurora PostgreSQL release 1.0.1, October 18, 2022](#)
- [Babelfish for Aurora PostgreSQL release 1.0.0, October 28, 2021](#)

Babelfish for Aurora PostgreSQL release 1.0.1, October 18, 2022

Security enhancements

- Fixed critical issues in Babelfish due to incorrect handling of user input for some application features. This is tracked in https://github.com/babelfish-for-postgresql/babelfish_extensions/security/advisories/GHSA-m399-rrc8-j6fj.

Babelfish for Aurora PostgreSQL release 1.0.0, October 28, 2021

- Babelfish for Aurora PostgreSQL version 1.0.0 supports Babelfish 1.0.0 which extends your Amazon Aurora PostgreSQL database with the ability to accept database connections from Microsoft SQL Server clients. For more information, see [Working with Babelfish for Aurora PostgreSQL](#).

Extension versions for Amazon Aurora PostgreSQL

Following, you can find version information for each extension supported by currently available Amazon Aurora PostgreSQL releases.

Topics

- [Extensions supported for Aurora PostgreSQL 16](#)
- [Extensions supported for Aurora PostgreSQL 15](#)
- [Extensions supported for Aurora PostgreSQL 14](#)
- [Extensions supported for Aurora PostgreSQL 13](#)
- [Extensions supported for Aurora PostgreSQL 12](#)
- [Extensions supported for Aurora PostgreSQL 11](#)
- [Extensions supported for Aurora PostgreSQL 10](#)
- [Extensions supported for Aurora PostgreSQL 9.6](#)
- [Aurora PostgreSQL apg_plan_mgmt extension versions](#)

To upgrade an extension in your Aurora PostgreSQL DB cluster, see [Upgrading PostgreSQL extensions](#) in the *Amazon Aurora User Guide*.

For information about installing extensions, see [Working with extensions and foreign data wrappers](#) in the *Amazon Aurora User Guide*.

Extensions supported for Aurora PostgreSQL 16

The following table shows the PostgreSQL extension versions that are currently supported on Aurora PostgreSQL 16 versions. "NA" indicates that the extension isn't available for that PostgreSQL version. For more information about PostgreSQL extensions, see [Packaging Related Objects into an Extension](#) in the PostgreSQL documentation.

Extension	16.2	16.1
address_standardizer	3.4.0	3.4.0
address_standardizer_data_us	3.4.0	3.4.0

Extension	16.2	16.1
amcheck	1.3	1.3
apg_plan_mgmt	2.6	2.6
aurora_stat_utils	1.0	1.0
auto_explain	Yes	Yes
autoinc (contrib-spi)	1.0	1.0
aws_commons	1.2	1.2
aws_lambda	1.0	1.0
aws_ml	1.0	1.0
aws_s3	1.2	1.2
bloom	1.0	1.0
bool_plperl	1.3	1.3
btree_gin	1.3	1.3
btree_gist	1.6	1.6
citext	1.6	1.6
cube	1.5	1.5
dblink	1.2	1.2
dict_int	1.0	1.0
dict_xsyn	1.0	1.0
earthdistance	1.1	1.1
fuzzystrmatch	1.1	1.1

Extension	16.2	16.1
h3-pg	4.1.3	4.1.3
h3-postgis	4.1.3	4.1.3
hll	2.18	2.18
hstore	1.8	1.8
hstore_plperl	1.0	1.0
hypopg	1.4.0	1.4.0
ICU module	60.2	60.2
insert_username (contrib-spi)	1.0	1.0
intagg	1.1	1.1
intarray	1.5	1.5
ip4r	2.4	2.4
isn	1.2	1.2
jsonb_plperl	1.0	1.0
lo	1.1	1.1
log_fdw	1.3	1.3
ltree	1.2	1.2
moddatetime (contrib-spi)	1.0	1.0
mysql_fdw	2.9.1	2.9.1
oracle_fdw	2.6.0	2.6.0
orafce	4.6.0	4.6.0

Extension	16.2	16.1
pg_ad_mapping	0.1	0.1
pg_bigm	1.2	1.2
pg_buffercache	1.4	1.4
pg_cron	1.6.0	1.6.0
pg_freespacemap	1.2	1.2
pg_hint_plan	1.6.0	1.6.0
pg_partman	4.7.3	4.7.3
pg_prewarm	1.2	1.2
pg_proctab	0.0.10	0.0.10
pg_repack	1.4.8	1.4.8
pg_similarity	1.0	1.0
pg_stat_statements	1.10	1.10
pg_tle	1.3.4	1.2.0
pg_trgm	1.6	1.6
pg_visibility	1.2	1.2
pgAudit	16.0	16.0
pgcrypto	1.3	1.3
pgdam	1.7	1.7
pglogical	2.4.4	2.4.4
pglogical_origin	1.0.0	1.0.0

Extension	16.2	16.1
pgrouting	3.4.1	3.4.1
pgrowlocks	1.2	1.2
pgstattuple	1.5	1.5
pgtap	1.3.0	1.3.0
pgvector	0.5.1	0.5.1
plcoffee	3.1.6	3.1.6
plls	3.1.6	3.1.6
plperl	1.0	1.0
plpgsql	1.0	1.0
plprofiler	4.2.4	4.2.4
pltcl	1.0	1.0
plv8	3.1.10	3.1.8
PostGIS	3.4.0	3.4.0
postgis_raster	3.4.0	3.4.0
postgis_tiger_geocoder	3.4.0	3.4.0
postgis_topology	3.4.0	3.4.0
postgres_fdw	1.1	1.1
prefix	1.2.1	1.2.1
rdkit	4.4.0 (Release_2023_09_4)	4.4.0
rds_tools	1.0	1.0

Extension	16.2	16.1
refint (contrib-spi)	1.0	1.0
SEG	1.0	1.0
sslinfo	1.2	1.2
tablefunc	1.0	1.0
TCN	1.0	1.0
tds_fdw	2.0.3	2.0.3
tsm_system_rows	1.0	1.0
tsm_system_time	1.0	1.0
unaccent	1.1	1.1
uuid-oss	1.1	1.1
wal2json	2.5	2.5

Extensions supported for Aurora PostgreSQL 15

The following table shows the PostgreSQL extension versions that are currently supported on Aurora PostgreSQL 15 versions. "NA" indicates that the extension isn't available for that PostgreSQL version. For more information about PostgreSQL extensions, see [Packaging Related Objects into an Extension](#) in the PostgreSQL documentation.

Extension	15.6	15.5	15.4	15.3	15.2
address_s tandardizer	3.4.0	3.4.0	3.3.3	3.3.2	3.3.2
address_s tandardiz er_data_us	3.4.0	3.4.0	3.3.3	3.3.2	3.3.2

Extension	15.6	15.5	15.4	15.3	15.2
amcheck	1.3	1.3	1.3	1.3	1.3
apg_plan_mgmt	2.6	2.6	2.5	2.4	2.4
aurora_st at_utils	1.0	1.0	1.0	1.0	1.0
auto_explain	Yes	Yes	Yes	Yes	Yes
autoinc (contrib-spi)	1.0	1.0	1.0	1.0	1.0
aws_commons	1.2	1.2	1.2	1.2	1.2
aws_lambda	1.0	1.0	1.0	1.0	1.0
aws_ml	2.0	2.0	1.0	1.0	1.0
aws_s3	1.2	1.2	1.2	1.1	1.1
bloom	1.0	1.0	1.0	1.0	1.0
bool_plperl	1.3	1.3	1.3	1.3	1.3
btree_gin	1.3	1.3	1.3	1.3	1.3
btree_gist	1.6	1.6	1.6	1.6	1.6
citext	1.6	1.6	1.6	1.6	1.6
cube	1.5	1.5	1.5	1.5	1.5
dblink	1.2	1.2	1.2	1.2	1.2
dict_int	1.0	1.0	1.0	1.0	1.0
dict_xsyn	1.0	1.0	1.0	1.0	1.0

Extension	15.6	15.5	15.4	15.3	15.2
earthdistance	1.1	1.1	1.1	1.1	1.1
fuzzystrmatch	1.1	1.1	1.1	1.1	1.1
h3-pg	4.1.3	4.1.3	N/A	N/A	N/A
h3-postgis	4.1.3	4.1.3	N/A	N/A	N/A
hll	2.17	2.17	2.17	2.17	2.17
hstore	1.8	1.8	1.8	1.8	1.8
hstore_plperl	1.0	1.0	1.0	1.0	1.0
hypopg	1.4.0	1.4.0	N/A	N/A	N/A
ICU module	60.2	60.2	60.2	60.2	60.2
insert_username (contrib-spi)	1.0	1.0	1.0	1.0	1.0
intagg	1.1	1.1	1.1	1.1	1.1
intarray	1.5	1.5	1.5	1.5	1.5
ip4r	2.4	2.4	2.4	2.4	2.4
isn	1.2	1.2	1.2	1.2	1.2
jsonb_plperl	1.0	1.0	1.0	1.0	1.0
lo	1.1	1.1	1.1	1.1	1.1
log_fdw	1.3	1.3	1.3	1.3	1.3
ltree	1.2	1.2	1.2	1.2	1.2

Extension	15.6	15.5	15.4	15.3	15.2
moddatetime (contrib-spi)	1.0	1.0	1.0	1.0	1.0
mysql_fdw	2.9.1	2.9.1	2.9.0	N/A	N/A
oracle_fdw	2.6.0	2.6.0	2.5.0	2.5.0	2.5.0
orafce	4.6.0	4.6.0	4.3.0	4.0.0	4.0.0
pg_ad_map ping	0.1	0.1	N/A	N/A	N/A
pg_bigm	1.2	1.2	1.2	1.2	1.2
pg_buffer cache	1.3	1.3	1.3	1.3	1.3
pg_cron	1.6.0	1.6.0	1.5	1.5	1.4.2
pg_freesp acemap	1.2	1.2	1.2	1.2	1.2
pg_hint_plan	1.5.1	1.5.1	1.5.0	1.5.0	1.5.0
pg_partman	4.7.3	4.7.3	4.7.3	4.7.3	4.6.0
pg_prewarm	1.2	1.2	1.2	1.2	1.2
pg_proctab	0.0.10	0.0.10	0.0.9	0.0.9	0.0.9
pg_repack	1.4.8	1.4.8	1.4.8	1.4.8	1.4.8
pg_similarity	1.0	1.0	1.0	1.0	1.0
pg_stat_s tatements	1.10	1.10	1.10	1.10	1.10
pg_tle	1.3.4	1.2.0	1.1.1	1.0.3	1.0.1

Extension	15.6	15.5	15.4	15.3	15.2
pg_trgm	1.6	1.6	1.6	1.6	1.6
pg_visibility	1.2	1.2	1.2	1.2	1.2
pgAudit	1.7.0	1.7.0	1.7.0	1.7.0	1.7.0
pgcrypto	1.3	1.3	1.3	1.3	1.3
pglogical	2.4.3	2.4.3	2.4.3	2.4.2	2.4.2
pglogical _origin	1.0.0	1.0.0	1.0.0	1.0.0	1.0.0
pgrouting	3.4.1	3.4.1	3.4.1	3.4.1	3.4.1
pgrowlocks	1.2	1.2	1.2	1.2	1.2
pgstattuple	1.5	1.5	1.5	1.5	1.5
pgtap	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0
pgvector	0.5.1	0.5.1	0.5.0	0.4.1	N/A
plcoffee	3.1.8	3.1.8	3.1.6	3.1.6	3.1.4
plls	3.1.8	3.1.8	3.1.6	3.1.6	3.1.4
plperl	1.0	1.0	1.0	1.0	1.0
plpgsql	1.0	1.0	1.0	1.0	1.0
plprofiler	4.1	4.1	4.1	4.1	4.1
pltcl	1.0	1.0	1.0	1.0	1.0
plv8	3.1.10	3.1.8	3.1.6	3.1.6	3.1.4
PostGIS	3.4.0	3.4.0	3.3.3	3.3.2	3.3.2

Extension	15.6	15.5	15.4	15.3	15.2
postgis_raster	3.4.0	3.4.0	3.3.3	3.3.2	3.3.2
postgis_tiger_geocoder	3.4.0	3.4.0	3.3.3	3.3.2	3.3.2
postgis_topology	3.4.0	3.4.0	3.3.3	3.3.2	3.3.2
postgres_fdw	1.1	1.1	1.1	1.1	1.1
prefix	1.2.10	1.2.10	1.2.0	1.2.0	1.2.0
rdkit	4.4.0 (Release_2023_09_4)	4.4.0 (Release_2023_09_1)	4.3	4.2	4.2
rds_activity_stream	1.6	1.6	1.6	1.6	1.6
rds_tools	1.0	1.0	1.0	1.0	1.0
refint (contrib-spi)	1.0	1.0	1.0	1.0	1.0
SEG	1.4	1.4	1.4	1.4	1.4
sslinfo	1.2	1.2	1.2	1.2	1.2
tablefunc	1.0	1.0	1.0	1.0	1.0
TCN	1.0	1.0	1.0	1.0	1.0
tds_fdw	2.0.3	2.0.3	2.0.3	2.0.3	2.0.3
tsm_system_rows	1.0	1.0	1.0	1.0	1.0

Extension	15.6	15.5	15.4	15.3	15.2
tsm_system_time	1.0	1.0	1.0	1.0	1.0
unaccent	1.1	1.1	1.1	1.1	1.1
uuid-oss	1.1	1.1	1.1	1.1	1.1
wal2json	2.5	2.5	2.5	2.5	2.5

Extensions supported for Aurora PostgreSQL 14

The following table shows the PostgreSQL extension versions that are currently supported on Aurora PostgreSQL 14 versions. "NA" indicates that the extension isn't available for that PostgreSQL version. For more information about PostgreSQL extensions, see [Packaging Related Objects into an Extension](#) in the PostgreSQL documentation.

Extension	14.11	14.10	14.9	14.8	14.7	14.6	14.5	14.4	14.3
address_standardizer	3.4.0	3.4.0	3.3.3	3.3.2	3.3.2	3.2.3	3.2.3	3.2.3	3.1.7
address_standardizer_data_s	3.4.0	3.4.0	3.3.3	3.3.2	3.3.2	3.2.3	3.2.3	3.2.3	3.1.7
amcheck	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
apg_planning	2.6	2.6	2.5	2.4	2.4	2.4	2.3	2.2	2.2
aurora_stats_utils	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Extension	14.11	14.10	14.9	14.8	14.7	14.6	14.5	14.4	14.3
<code>auto_explain</code>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
autoinc (contrib-spi)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
<code>aws_commons</code>	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
<code>aws_lambda</code>	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
aws_ml	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
aws_s3	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.1	1.1
bloom	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
<code>bool_plperl</code>	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
btree_gin	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
btree_gist	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
citext	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
cube	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
dblink	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
dict_int	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
dict_xsyn	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
earthdistance	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1

Extension	14.11	14.10	14.9	14.8	14.7	14.6	14.5	14.4	14.3
fuzzystrmatch	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
h3-pg	4.1.3	4.1.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A
h3-postgis	4.1.3	4.1.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A
hll	2.17	2.17	2.17	2.17	2.17	2.16	2.16	2.16	2.16
hstore	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
hstore_perl	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
hypopg	1.4.0	1.4.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ICU module	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2	60.2
insert_username (contrib-spi)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
intagg	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
intarray	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
ip4r	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
isn	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
jsonb_perl	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
lo	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1

Extensio	14.11	14.10	14.9	14.8	14.7	14.6	14.5	14.4	14.3
log_fdw	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
ltree	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
moddate me (contrib- spi)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
mysql_fc	2.9.1	2.9.1	2.9.0	N/A	N/A	N/A	N/A	N/A	N/A
oracle_fc w	2.6.0	2.6.0	2.5.0	2.5.0	2.5.0	2.4.0	2.4.0	2.4.0	2.4.0
orafce	4.6.0	4.6.0	4.3.0	4.0.0	4.0.0	3.16	3.16	3.16	3.16
pg_ad_m ping	0.1	0.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
pg_bigm	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
pg_buffe cache	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
pg_cron	1.6.0	1.6.0	1.5	1.5	1.4.2	1.4	1.4	1.4	1.4
pg_frees acemap	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
pg_hint_ lan	1.4.1	1.4.1	1.4.1	1.4.1	1.4.1	1.4	1.4	1.4	1.4
pg_partr n	4.7.3	4.7.3	4.7.3	4.7.3	4.6.0	4.6.0	4.6.0	4.6.0	4.6.0
pg_prew m	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2

Extension	14.11	14.10	14.9	14.8	14.7	14.6	14.5	14.4	14.3
pg_proc	0.0.10	0.0.10	0.0.9	0.0.9	0.0.9	0.0.9	0.0.9	0.0.9	0.0.9
pg_repack	1.4.7	1.4.7	1.4.7	1.4.7	1.4.7	1.4.7	1.4.7	1.4.7	1.4.7
pg_similarity	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
pg_stat_statements	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
pg_tle	1.3.4	1.2.0	1.1.1	1.0.3	1.0.1	1.0.1	1.0.1	N/A	N/A
pg_trgm	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
pg_visibility	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
pgAudit	1.6.1	1.6.1	1.6.1	1.6.1	1.6.1	1.6.1	1.6.1	1.6.1	1.6.1
pgcrypto	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
pglogical	2.4.3	2.4.3	2.4.3	2.4.2	2.4.2	2.4.1	2.4.1	2.4.1	2.4.1
pglogical_origin	1.0.0	1.0.0	1.0.0	1.0.0	1.0.0	1.0.0	1.0.0	1.0.0	1.0.0
pgRouting	3.4.1	3.4.1	3.4.1	3.4.1	3.4.1	3.2.0	3.2.0	3.2.0	3.2.0
pgrowlocks	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
pgstatstat	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
pgtap	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0
pgvector	0.5.1	0.5.1	0.5.0	0.4.1	N/A	N/A	N/A	N/A	N/A

Extension	14.11	14.10	14.9	14.8	14.7	14.6	14.5	14.4	14.3
plcoffee	3.1.8	3.1.8	3.1.6	3.1.6	3.1.4	3.0.0	3.0.0	3.0.0	2.3.15
plls	3.1.8	3.1.8	3.1.6	3.1.6	3.1.4	3.0.0	3.0.0	3.0.0	2.3.15
plperl	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
plpgsql	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
plprofile	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
pltcl	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
plv8	3.1.10	3.1.8	3.1.6	3.1.6	3.1.4	3.0.0	3.0.0	3.0.0	2.3.15
PostGIS	3.4.0	3.4.0	3.3.3	3.3.2	3.3.2	3.2.3	3.2.3	3.2.3	3.1.7
postgis_aster	3.4.0	3.4.0	3.3.3	3.3.2	3.3.2	3.2.3	3.2.3	3.2.3	3.1.7
postgis_iger_geoder	3.4.0	3.4.0	3.3.3	3.3.2	3.3.2	3.2.3	3.2.3	3.2.3	3.1.7
postgis_topology	3.4.0	3.4.0	3.3.3	3.3.2	3.3.2	3.2.3	3.2.3	3.2.3	3.1.7
postgres_fdw	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
prefix	1.2.10	1.2.10	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0
rdkit	4.4.0 (Release_2023_09)	4.4.0 (Release_2023_09)	4.3	4.2	4.2	4.2	3.8	3.8	3.8

Extension	14.11	14.10	14.9	14.8	14.7	14.6	14.5	14.4	14.3
rds_activity_stream	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
rds_tools	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
refint (contrib-spi)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
SEG	1.4	1.4	1.4	1.4	1.4	NA	NA	NA	NA
sslinfo	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
tablefun	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
TCN	1.0	1.0	1.0	1.0	1.0	NA	NA	NA	NA
tds_fdw	2.0.3	2.0.3	2.0.3	2.0.3	2.0.2	2.0.2	2.0.2	2.0.2	2.0.2
tsm_system_rows	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
tsm_system_time	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
unaccent	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
uuid-ossp	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
wal2json	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4

Extensions supported for Aurora PostgreSQL 13

The following table shows the PostgreSQL extension versions that are currently supported on Aurora PostgreSQL 13 versions. "NA" indicates that the extension isn't available for that

PostgreSQL version. For more information about PostgreSQL extensions, see [Packaging Related Objects into an Extension](#) in the PostgreSQL documentation.

Extens	13.14	13.13	13.12	13.11	13.10	13.9	13.8	13.7	13.6	13.5	13.4
address_standardizer	3.4.0	3.4.0	3.3.3	3.3.2	3.3.2	3.2.3	3.2.3	3.1.7	3.1.7	3.1.7	3.1.7
address_standardizer_data_s	3.4.0	3.4.0	3.3.3	3.3.2	3.3.2	3.2.3	3.2.3	3.1.7	3.1.7	3.1.7	3.1.7
amcheck	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
apg_plmgmt	2.6	2.6	2.5	2.4	2.4	2.4	2.3	2.2	2.2	2.2	2.2
aurora_at_utils	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
autoinc (contrib spi)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
auto_enable_nls_charset_client	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
aws_commons	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
aws_lambda	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
aws_m	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
aws_s3	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
bloom	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Extens	13.14	13.13	13.12	13.11	13.10	13.9	13.8	13.7	13.6	13.5	13.4
bool_prl	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
btree_c	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
btree_c t	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
citext	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
cube	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
dblink	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
dict_in	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
dict_xs	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
earthdi ance	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
fuzzyst atch	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
h3- pg	4.1.3	4.1.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
h3- postgi s	4.1.3	4.1.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
hll	2.17	2.17	2.17	2.17	2.17	2.15	2.15	2.15	2.15	2.15	2.15
hstore	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
hstore_ perl	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.0	1.0
hypopc	1.4.0	1.4.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Extens	13.14	13.13	13.12	13.11	13.10	13.9	13.8	13.7	13.6	13.5	13.4
insert_ername (contrib spi)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
intagg	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
intarray	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
ip4r	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
isn	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
jsonb_erl	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
lo	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	NA	NA	NA
log_fdw	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
ltree	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
modname (contrib spi)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
mysql_	2.9.1	2.9.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
oracle_w	2.6.0	2.6.0	2.5.0	2.5.0	2.5.0	2.3.0	2.3.0	2.3.0	2.3.0	2.3.0	2.3.0
orafce	4.6.0	4.6.0	4.3.0	4.0.0	4.0.0	3.16	3.16	3.16	3.16	3.16	3.16
pg_big	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
pg_buffer_cache	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3

Extens	13.14	13.13	13.12	13.11	13.10	13.9	13.8	13.7	13.6	13.5	13.4
pg_cro	1.6.0	1.6.0	1.5	1.5	1.4.2	1.4	1.4	1.4	1.4	1.4	1.3
pg_free acemaj	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
pg_hin lan	1.3.9	1.3.9	1.3.8	1.3.8	1.3.8	1.3.7	1.3.7	1.3.7	1.3.7	1.3.7	1.3.7
pg_par n	4.7.3	4.7.3	4.7.3	4.7.3	4.5.1	4.5.1	4.5.1	4.5.1	4.5.1	4.5.1	4.5.1
pg_pre m	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
pg_pro b	0.0.10	0.0.10	0.0.9	0.0.9	0.0.9	0.0.9	0.0.9	0.0.9	0.0.9	0.0.9	0.0.9
pg_rep	1.4.7	1.4.7	1.4.7	1.4.7	1.4.7	1.4.6	1.4.6	1.4.6	1.4.6	1.4.6	1.4.6
pg_sim rity	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
pg_star tateme	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
pg_trig	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
pg_visi lity	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
pgAudi	1.5.1	1.5.1	1.5.1	1.5.1	1.5.1	1.5.1	1.5.1	1.5.1	1.5.1	1.5	1.5
pgcryp	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
pglogic	2.4.3	2.4.3	2.4.3	2.4.2	2.4.2	2.4.1	2.4.1	2.4.1	2.4.0	2.4.0	2.4.0
pglogic _origin	1.0.0	1.0.0	1.0.0	1.0.0	1.0.0	1.0.0	1.0.0	1.0.0	1.0.0	1.0.0	1.0.0

Extens	13.14	13.13	13.12	13.11	13.10	13.9	13.8	13.7	13.6	13.5	13.4
pgroul	3.4.1	3.4.1	3.4.1	3.4.1	3.4.1	3.1.3	3.1.3	3.1.3	3.1.3	3.1.3	3.1.0
pgrowl s	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
pgstatt le	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
pgtap	1.1.0	1.1.0	1.1.0	1.1.0	1.1.0	1.1.0	1.1.0	1.1.0	1.1.0	1.1.0	1.1.0
pgvect	0.5.1	0.5.1	0.5.0	0.4.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
plcoffe	3.1.8	3.1.8	3.1.6	3.1.6	3.1.4	3.0.0	3.0.0	2.3.15	2.3.15	2.3.15	2.3.15
plls	3.1.8	3.1.8	3.1.6	3.1.6	3.1.4	3.0.0	3.0.0	2.3.15	2.3.15	2.3.15	2.3.15
plperl	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
plpgsq	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
plprofi r	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
pltcl	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
plv8	3.1.10	3.1.8	3.1.6	3.1.6	3.1.4	3.0.0	3.0.0	2.3.15	2.3.15	2.3.15	2.3.15
PostGIS	3.4.0	3.4.0	3.3.3	3.3.2	3.3.2	3.2.3	3.2.3	3.1.7	3.1.7	3.1.7	3.1.7
postgis aster	3.4.0	3.4.0	3.3.3	3.3.2	3.3.2	3.2.3	3.2.3	3.1.7	3.1.7	3.1.7	3.1.7
postgis iger_ge oder	3.4.0	3.4.0	3.3.3	3.3.2	3.3.2	3.2.3	3.2.3	3.1.7	3.1.7	3.1.7	3.1.7
postgis opolog	3.4.0	3.4.0	3.3.3	3.3.2	3.3.2	3.2.3	3.2.3	3.1.7	3.1.7	3.1.7	3.1.7

Extens	13.14	13.13	13.12	13.11	13.10	13.9	13.8	13.7	13.6	13.5	13.4
postgre fdw	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
prefix	1.2.10	1.2.10	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0
rdkit	4.4.0 (Releas 2023_()	4.4.0 (Releas 2023_()	4.3	4.2	4.2	4.2	3.8	3.8	3.8	3.8	3.8
rds_act ity_stre m	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.3	1.3
rds_toc	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
refint (contri spi)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
SEG	1.3	1.3	1.3	1.3	1.3	NA	NA	NA	NA	NA	NA
sslinfo	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
tablefu	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
TCN	1.0	1.0	1.0	1.0	1.0	NA	NA	NA	NA	NA	NA
tds_fdw	2.0.3	2.0.3	2.0.3	2.0.3	2.0.2	2.0.2	2.0.2	2.0.2	2.0.2	N/A	N/A
tsm_sy m_row	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
tsm_sy m_time	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
unacce	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1

Extens	13.14	13.13	13.12	13.11	13.10	13.9	13.8	13.7	13.6	13.5	13.4
uuid- ossp	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
wal2jso	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4	2.3	2.3	2.3

Extensions supported for Aurora PostgreSQL 12

The following table shows the PostgreSQL extension versions that are currently supported on Aurora PostgreSQL 12 versions. "NA" indicates that the extension isn't available for that PostgreSQL version. For more information about PostgreSQL extensions, see [Packaging Related Objects into an Extension](#) in the PostgreSQL documentation.

Extens	12.18	12.17	12.16	12.15	12.14	12.13	12.12	12.11	12.10	12.9	12.8
address tandem er	3.4.0	3.4.0	3.3.3	3.3.2	3.3.2	3.2.3	3.2.3	3.1.7	3.1.7	3.1.7	3.1
address tandem er_data s	3.4.0	3.4.0	3.3.3	3.3.2	3.3.2	3.2.3	3.2.3	3.1.7	3.1.7	3.1.7	3.1
amcheck	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
apg_pl mgmt	2.6	2.6	2.5	2.4	2.4	2.4	2.3	2.2	2.2	2.2	2.2
aurora_ at_utils	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
auto_e ain	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
aws_co ns	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2

Extens	12.18	12.17	12.16	12.15	12.14	12.13	12.12	12.11	12.10	12.9	12.8
aws_lambda	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
aws_m	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
aws_s3	1.2	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
bloom	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
btree_c	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
btree_c t	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
citext	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
cube	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
dblink	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
dict_in	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
dict_xs	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
earthdi ance	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
fuzzyst atch	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
hll	2.17	2.17	2.17	2.17	2.17	2.14	2.14	2.14	2.14	2.14	2.14
hstore	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
hstore perl	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
intagg	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1

Extens	12.18	12.17	12.16	12.15	12.14	12.13	12.12	12.11	12.10	12.9	12.8
intarray	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
ip4r	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
isn	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
jsonb_1 erl	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
lo	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	NA	NA	NA
log_fdv	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
ltree	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
mysql_	2.9.1	2.9.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
oracle_ w	2.6.0	2.6.0	2.5.0	2.5.0	2.5.0	2.3.0	2.3.0	2.3.0	2.3.0	2.3.0	2.3.0
orafce	4.6.0	4.6.0	4.3.0	4.0.0	4.0.0	3.16	3.16	3.16	3.16	3.16	3.16
pg_big	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
pg_buf cache	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
pg_cro	1.6.0	1.6.0	1.5	1.5	1.4.2	1.4.1	1.4.1	1.4.1	1.4.1	1.4.1	1.3.1
pg_fre acema	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
pg_hin lan	1.3.9	1.3.9	1.3.8	1.3.8	1.3.8	1.3.7	1.3.7	1.3.7	1.3.7	1.3.5	1.3.5
pg_par n	4.7.3	4.7.3	4.7.3	4.7.3	4.5.1	4.5.1	4.5.1	4.5.1	4.5.1	4.5.1	4.5.1

Extens	12.18	12.17	12.16	12.15	12.14	12.13	12.12	12.11	12.10	12.9	12.8
pg_pre m	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
pg_pro b	0.0.10	0.0.10	0.0.9	0.0.9	0.0.9	0.0.9	0.0.9	0.0.9	0.0.9	0.0.9	0.0.9
pg_rep	1.4.7	1.4.7	1.4.7	1.4.7	1.4.7	1.4.5	1.4.5	1.4.5	1.4.5	1.4.5	1.4.5
pg_sim rity	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
pg_sta tate	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
pg_trg	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
pg_visi lity	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
pgAudi	1.4.2	1.4.2	1.4.2	1.4.2	1.4.2	1.4.2	1.4.2	1.4.2	1.4	1.4	1.4
pgcrypt	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
pglogic	2.4.3	2.4.3	2.4.3	2.4.2	2.4.2	2.4.1	2.4.1	2.4.0	2.4.0	2.4.0	2.3.2
pglogic _origin	1.0.0	1.0.0	1.0.0	1.0.0	1.0.0	1.0.0	1.0.0	1.0.0	1.0.0	1.0.0	1.0.0
pgrout	3.4.1	3.4.1	3.4.1	3.4.1	3.4.1	3.0.3	3.0.3	3.0.3	3.0.3	3.0.3	3.0.3
pgrowl s	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
pgstatt le	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
pgTAP	1.1.0	1.1.0	1.1.0	1.1.0	1.1.0	1.1.0	1.1.0	1.1.0	1.1.0	1.1.0	1.1.0
pgvect	0.5.1	0.5.1	0.5.0	0.4.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Extens	12.18	12.17	12.16	12.15	12.14	12.13	12.12	12.11	12.10	12.9	12.8
plcoffe	3.1.8	3.1.8	3.1.6	2.3.15	2.3.15	2.3.15	2.3.15	2.3.15	2.3.14	2.3.14	2.3.14
plls	3.1.8	3.1.8	3.1.6	2.3.15	2.3.15	2.3.15	2.3.15	2.3.15	2.3.14	2.3.14	2.3.14
plperl	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.0	1.0	1.0	1.0
plpgsql	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
plprofil r	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
pltcl	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
plv8	3.1.10	3.1.8	3.1.6	2.3.15	2.3.15	2.3.15	2.3.15	2.3.15	2.3.14	2.3.14	2.3.14
PostGIS	3.4.0	3.4.0	3.3.3	3.3.2	3.3.2	3.2.3	3.2.3	3.1.7	3.1.7	3.1.7	3.1
postgis aster	3.4.0	3.4.0	3.3.3	3.3.2	3.3.2	3.2.3	3.2.3	3.1.7	3.1.7	3.1.7	3.1
postgis iger_ge oder	3.4.0	3.4.0	3.3.3	3.3.2	3.3.2	3.2.3	3.2.3	3.1.7	3.1.7	3.1.7	3.1
postgis opolog	3.4.0	3.4.0	3.3.3	3.3.2	3.3.2	3.2.3	3.2.3	3.1.7	3.1.7	3.1.7	3.1
postgre fdw	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
prefix	1.2.10	1.2.10	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0
rdkit	4.4.0 (Releas 2023_()	4.4.0 (Releas 2023_()	4.3	4.2	4.2	4.2	3.8	3.8	3.8	3.8	3.8

Extens	12.18	12.17	12.16	12.15	12.14	12.13	12.12	12.11	12.10	12.9	12.8
rds_act ity_stre m	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
SEG	1.3	1.3	1.3	1.3	1.3	NA	NA	NA	NA	NA	NA
sslinfo	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
tablefu	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
TCN	1.0	1.0	1.0	1.0	1.0	NA	NA	NA	NA	NA	NA
tds_fdv	2.0.3	2.0.3	2.0.3	2.0.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A
tsm_sy m_row	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
tsm_sy m_time	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
unacce	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
uuid- ossp	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
wal2jsc	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.3	2.3	2.3

Extensions supported for Aurora PostgreSQL 11

The following table shows PostgreSQL extension versions currently supported on Aurora PostgreSQL 11 versions. "NA" indicates that the extension isn't available for that PostgreSQL version. For more information about PostgreSQL extensions, see [Packaging Related Objects into an Extension](#).

Extension	11.21	11.20	11.19	11.18	11.17	11.16	11.15	11.14	11.13
address_standardizer	3.3.3	3.3.2	3.3.2	3.2.3	3.2.3	3.1.7	3.1.7	3.1.7	3.1
address_standardizer_data_us	3.3.3	3.3.2	3.3.2	3.2.3	3.2.3	3.1.7	3.1.7	3.1.7	3.1
amcheck	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
apg_plan_mgmt	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
aurora_statistics_utils	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
auto_explain	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
aws_commons	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
aws_lambda	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
aws_ml	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
aws_s3	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
bloom	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
btree_gin	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
btree_gist	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
citext	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
cube	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
dblink	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
dict_int	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Extension	11.21	11.20	11.19	11.18	11.17	11.16	11.15	11.14	11.13
dict_xsyn	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
earthdistance	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
fuzzystrmatch	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
hll	2.17	2.17	2.17	2.11	2.11	2.11	2.11	2.11	2.11
hstore	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
hstore_plperl	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
intagg	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
intarray	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
ip4r	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
isn	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
jsonb_plperl	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
lo	1.1	1.1	1.1	1.1	1.1	1.1	NA	NA	NA
log_fdw	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
ltree	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
orafce	4.3.0	4.0.0	4.0.0	3.16	3.16	3.16	3.16	3.16	3.16
pg_bigm	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
pg_buffer_cache	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
pg_freesp acemap	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
pg_hint_plan	1.3.8	1.3.8	1.3.8	1.3.7	1.3.7	1.3.7	1.3.7	1.3.7	1.3.5

Extension	11.21	11.20	11.19	11.18	11.17	11.16	11.15	11.14	11.13
pg_prewarm	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
pg_proctab	0.0.9	0.0.9	0.0.9	0.0.9	0.0.9	0.0.9	0.0.9	0.0.9	0.0.9
pg_repack	1.4.6	1.4.6	1.4.6	1.4.4	1.4.4	1.4.4	1.4.4	1.4.4	1.4.4
pg_similarity	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
pg_stat_s tatements	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
pg_trgm	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
pg_visibility	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
pgAudit	1.3.3	1.3.3	1.3.3	1.3.3	1.3.3	1.3.3	1.3.3	1.3.1	1.3.1
pgcrypto	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
pglogical	2.4.3	2.4.2	2.4.2	2.4.1	2.4.1	2.4.1	2.4.0	2.4.0	2.4.0
pglogical _origin	1.0.0	1.0.0	1.0.0	1.0.0	1.0.0	1.0.0	1.0.0	1.0.0	1.0.0
pgrouting	3.4.1	3.4.1	3.4.1	2.6.3	2.6.3	2.6.3	2.6.3	2.6.3	2.6.3
pgrowlocks	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
pgstattuple	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
pgTAP	1.1.0	1.1.0	1.1.0	1.1.0	1.1.0	1.1.0	1.1.0	1.1.0	1.1.0
plcoffee	3.1.6	2.3.15	2.3.15	2.3.15	2.3.15	2.3.15	2.3.14	2.3.14	2.3.14
plls	3.1.6	2.3.15	2.3.15	2.3.15	2.3.15	2.3.15	2.3.14	2.3.14	2.3.14
plperl	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
plpgsql	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Extension	11.21	11.20	11.19	11.18	11.17	11.16	11.15	11.14	11.13
plprofiler	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
pltcl	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
plv8	3.1.6	2.3.15	2.3.15	2.3.15	2.3.15	2.3.15	2.3.14	2.3.14	2.3.14
PostGIS	3.3.3	3.3.2	3.3.2	3.2.3	3.2.3	3.1.7	3.1.7	3.1.7	3.1
postgis_tiger_geocoder	3.3.3	3.3.2	3.3.2	3.2.3	3.2.3	3.1.7	3.1.7	3.1.7	3.1
postgis_topology	3.3.3	3.3.2	3.3.2	3.2.3	3.2.3	3.1.7	3.1.7	3.1.7	3.1
postgres_fdw	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
prefix	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0
rdkit	4.3	4.2	4.2	4.2	3.8	3.8	3.8	3.8	3.8
rds_activity_stream	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
SEG	1.0	1.0	1.0	NA	NA	NA	NA	NA	NA
sslinfo	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
tablefunc	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
TCN	1.0	1.0	1.0	NA	NA	NA	NA	NA	NA
tds_fdw	2.0.3	2.0.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A
tsm_system_rows	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
tsm_system_time	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Extension	11.21	11.20	11.19	11.18	11.17	11.16	11.15	11.14	11.13
unaccent	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
uuid-oss	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
wal2json	2.5	2.5	2.5	2.4	2.4	2.4	2.3	2.3	2.3

Extensions supported for Aurora PostgreSQL 10

The following table shows PostgreSQL extension versions currently supported on Aurora PostgreSQL 10 versions. "NA" indicates that the extension isn't available for that PostgreSQL version. For more information about PostgreSQL extensions, see [Packaging Related Objects into an Extension](#).

Note

- The `adminpack` extension is no longer supported because it accesses the file system.
- The `plperl` extension is no longer supported because it is an untrusted language extension.
- The `pltclu` extension is no longer supported because it is an untrusted language extension.

Extension	10.2	10.2	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.7	10.6	10.5	10.4
address_s tandardizer	3.1.7	3.1.7	3.1.7	3.1	2.4.7	2.4.4	2.4.4	2.4.4	2.4.4	2.4.4	2.4.4	2.4.4	2.4.4	2.4.4
address_s tandardiz er_data_us	3.1.7	3.1.7	3.1.7	3.1	2.4.7	2.4.4	2.4.4	2.4.4	2.4.4	2.4.4	2.4.4	2.4.4	2.4.4	2.4.4
adminpack	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.1	1.1	1.1
amcheck	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Extension	10.2	10.2	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.7	10.6	10.5	10.4
apg_plan_mgmt	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0.1	1.0.1	1.0.1	0.1
aurora_stats_utils	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
auto_explain	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
aws_commons	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.0	1.0	NA	NA	
aws_ml	1.0	1.0	1.0	1.0	1.0	1.0	1.0	NA	NA	NA	NA	NA	NA	NA	NA
aws_s3	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0	NA	NA	
bloom	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
btree_gin	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
btree_gist	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
chckpass	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
citext	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
cube	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
dblink	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
dict_int	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
dict_xsyn	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
earthdistance	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
fuzzystrmatch	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
hll	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10
hstore	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4

Extension	10.2	10.2	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.7	10.6	10.5	10.4
hstore_plperl	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
hstore_plperlu	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
intagg	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
intarray	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
ip4r	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
isn	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
lo	1.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
log_fdw	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
ltree	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
orafce	3.16	3.16	3.16	3.16	3.16	3.8	3.8	3.8	3.8	3.6	3.6	3.6	3.6	3.6	3.6
pg_buffer_cache	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
pg_freesp_acemap	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
pg_hint_plan	1.3.6	1.3.6	1.3.6	1.3.5	1.3.5	1.3.5	1.3.5	1.3.5	1.3.5	1.3.3	1.3.3	1.3.1	1.3.1	1.3.1	1.3.0
pg_prewarm	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
pg_repack	1.4.3	1.4.3	1.4.3	1.4.3	1.4.3	1.4.3	1.4.3	1.4.3	1.4.3	1.4.3	1.4.3	1.4.3	1.4.3	1.4.3	1.4.3
pg_similarity	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	NA
pg_stat_statements	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.5	1.5
pg_trgm	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
pg_visibility	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2

Extension	10.2	10.2	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.7	10.6	10.5	10.4
pgAudit	1.2.3	1.2.3	1.2.1	1.2.1	1.2.1	1.2.1	1.2.1	1.2.1	1.2	1.2	1.2	1.2	1.2	1.2
pgcrypto	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
pglogical	2.4.1	2.4.0	2.4.0	2.4.0	2.2.2	2.2.2	2.2.2	2.2.2	NA	NA	NA	NA	NA	NA
pglogical_origin	1.0.0	1.0.0	1.0.0	1.0.0	1.0.0	1.0.0	1.0.0	1.0.0	NA	NA	NA	NA	NA	NA
pgrouting	2.5.2	2.5.2	2.5.2	2.5.2	2.5.2	2.5.2	2.5.2	2.5.2	2.5.2	2.5.2	2.5.2	2.5.2	2.5.2	2.5.2
pgrowlocks	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
pgstattuple	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
plcoffee	2.3.1	2.3.1	2.3.1	2.3.1	2.3.1	2.3.1	2.3.1	2.3.1	2.1.2	2.1.2	2.1.2	2.1.2	2.1.2	2.1.2
plls	2.3.1	2.3.1	2.3.1	2.3.1	2.3.1	2.3.1	2.3.1	2.3.1	2.1.2	2.1.2	2.1.2	2.1.2	2.1.2	2.1.2
plperl	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
plperlu	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0	1.0	1.0
plpgsql	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
plprofiler	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	NA	NA	NA	NA
pltcl	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
pltclu	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0	1.0	1.0
plv8	2.3.1	2.3.1	2.3.1	2.3.1	2.3.1	2.3.1	2.3.1	2.3.1	2.1.2	2.1.2	2.1.2	2.1.2	2.1.2	2.1.2
PostGIS	3.1.7	3.1.7	3.1.7	3.1	2.4.7	2.4.4	2.4.4	2.4.4	2.4.4	2.4.4	2.4.4	2.4.4	2.4.4	2.4.4
postgis_tiger_geocoder	3.1.7	3.1.7	3.1.7	3.1	2.4.7	2.4.4	2.4.4	2.4.4	2.4.4	2.4.4	2.4.4	2.4.4	2.4.4	2.4.4
postgis_topology	3.1.7	3.1.7	3.1.7	3.1	2.4.7	2.4.4	2.4.4	2.4.4	2.4.4	2.4.4	2.4.4	2.4.4	2.4.4	2.4.4

Extension	10.2	10.2	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.7	10.6	10.5	10.4
postgres_fdw	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
prefix	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0
rdkit	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	NA	NA	NA	NA	NA
rds_activity_stream	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	NA
sslinfo	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
tablefunc	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
tsearch2	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
tsm_system_rows	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
tsm_system_time	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
unaccent	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
uuid-osspl	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
wal2json	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.1	2.1	NA	NA

Extensions supported for Aurora PostgreSQL 9.6

The following table shows PostgreSQL extension versions supported on Aurora PostgreSQL 9.6 versions. "NA" indicates that the extension isn't available for that PostgreSQL version. For more information about PostgreSQL extensions, see [Packaging Related Objects into an Extension](#).

Note

- The apgcc RDS for PostgreSQL internal extension is no longer supported.
- The apgunitt RDS for PostgreSQL internal extension is no longer supported.

- The `pageinspect` extension is no longer publicly supported by RDS for PostgreSQL.
- The `xml2` extension is no longer supported by PostgreSQL.

Extension	9.6.2	9.6.2	9.6.1	9.6.1	9.6.1	9.6.1	9.6.1	9.6.1	9.6.1	9.6.0	9.6.8	9.6.6	9.6.3
<u>address_standardizer</u>	2.3.9	2.3.7	2.3.7	2.3.7	2.3.7	2.3.7	2.3.7	2.3.7	2.3.7	2.3.7	2.3.4	2.3.4	2.3.4
<u>address_standardizer_data_us</u>	2.3.9	2.3.7	2.3.7	2.3.7	2.3.7	2.3.7	2.3.7	2.3.7	2.3.7	2.3.7	2.3.4	2.3.4	2.3.4
<u>apg_plan_mgmt</u>	1.0.1	1.0.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	NA	NA	NA	0.1
apgcc	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0	1.0
apgunit	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.0	1.0
aurora_stat_utils	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
auto_explain	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<u>bloom</u>	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
<u>btree_gin</u>	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
<u>btree_gist</u>	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
<u>chkpass</u>	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
<u>citext</u>	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
<u>cube</u>	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
<u>dblink</u>	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
<u>dict_int</u>	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
<u>dict_xsyn</u>	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
<u>earthdistance</u>	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1

Extension	9.6.2	9.6.2	9.6.1	9.6.1	9.6.1	9.6.1	9.6.1	9.6.1	9.6.0	9.6.8	9.6.6	9.6.3
fuzzystrmatch	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
hll	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10	NA
hstore	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
hstore_plperl	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
intagg	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
intarray	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
ip4r	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0	2.0
isn	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
log_fdw	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
ltree	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
orafce	3.6	3.6	3.6	3.6	3.6	3.6	3.8	3.8	3.8	3.8	3.16	NA
pageinspect	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.5	1.5
pg_buffercache	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
pg_freespacemap	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
pg_hint_plan	1.2.2	1.2.2	1.2.3	1.2.3	1.2.5	1.2.5	1.2.6	1.2.6	1.2.6	1.2.6	1.1.3	1.1.3
pg_prewarm	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
pg_repack	1.4.3	1.4.3	1.4.3	1.4.3	1.4.3	1.4.3	1.4.3	1.4.3	1.4.3	1.4.2	1.4.2	1.4.0
pg_similarity	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	NA	NA	NA	NA
pg_stat_statements	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
pg_trgm	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3

Extension	9.6.2	9.6.2	9.6.1	9.6.1	9.6.1	9.6.1	9.6.1	9.6.1	9.6.0	9.6.8	9.6.6	9.6.3
pg_visibility	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
pgAudit	1.1.1	1.1.1	1.1.1	1.1.1	1.1.1	1.1.1	1.1.2	1.1.2	1.1.2	1.0	1.0	1.0
pgcrypto	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
pgrouting	2.4.2	2.4.2	2.4.2	2.4.2	2.4.2	2.4.2	2.4.2	2.4.2	2.4.2	2.4.2	2.4.2	2.4.2
pgrowlocks	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
pgstattuple	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
plcoffee	2.3.1	2.3.1	2.3.1	2.3.1	2.1.2	2.1.2	2.1.2	2.1.2	2.1.2	2.1.0	1.5.3	1.5.3
plls	2.3.1	2.3.1	2.3.1	2.3.1	2.1.2	2.1.2	2.1.2	2.1.2	2.1.2	2.1.0	1.5.3	1.5.3
plperl	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
plpgsql	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
pltcl	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
plv8	2.3.1	2.3.1	2.3.1	2.3.1	2.1.2	2.1.2	2.1.2	2.1.2	2.1.2	2.1.0	1.5.3	1.5.3
PostGIS	2.3.9	2.3.7	2.3.7	2.3.7	2.3.7	2.3.7	2.3.7	2.3.7	2.3.7	2.3.4	2.3.4	2.3.4
postgis_tiger_geocoder	2.3.9	2.3.7	2.3.7	2.3.7	2.3.7	2.3.7	2.3.7	2.3.7	2.3.7	2.3.4	2.3.4	2.3.4
postgis_topology	2.3.9	2.3.7	2.3.7	2.3.7	2.3.7	2.3.7	2.3.7	2.3.7	2.3.7	2.3.4	2.3.4	2.3.4
postgres_fdw	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
prefix	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	NA
sslinfo	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
tablefunc	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
tsearch2	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Extension	9.6.2	9.6.2	9.6.1	9.6.1	9.6.1	9.6.1	9.6.1	9.6.1	9.6.1	9.6.0	9.6.8	9.6.6	9.6.3
tsm_system_rows	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
tsm_system_time	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
unaccent	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
uuid-osspl	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
xml2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.1	1.1

Aurora PostgreSQL apg_plan_mgmt extension versions

The AWS `apg_plan_mgmt` extension provides your Aurora PostgreSQL DB cluster with the query plan management feature. It allows you to manage the query execution plans generated by the optimizer for your SQL applications for better stability and to prevent regressions. For more information, see [Managing query execution plans for Aurora PostgreSQL](#) in the *Amazon Aurora User Guide*.

Topics

- [Version 2.6 of the Aurora PostgreSQL apg_plan_mgmt extension](#)
- [Version 2.5 of the Aurora PostgreSQL apg_plan_mgmt extension](#)
- [Version 2.4 of the Aurora PostgreSQL apg_plan_mgmt extension](#)
- [Version 2.3 of the Aurora PostgreSQL apg_plan_mgmt extension](#)
- [Version 2.1 of the Aurora PostgreSQL apg_plan_mgmt extension](#)
- [Version 2.0 of the Aurora PostgreSQL apg_plan_mgmt extension](#)
- [Version 1.0.1 of the Aurora PostgreSQL apg_plan_mgmt extension](#)

Version 2.6 of the Aurora PostgreSQL apg_plan_mgmt extension

Improvements to the `apg_plan_mgmt` extension in version 2.6 include the following:

New extension features in Aurora PostgreSQL 16.2, 15.6, 14.11, and 13.14

- QPM can enforce plans having Aggregate operators.

Extension improvements in Aurora PostgreSQL 16.2, 15.6, 14.11, and 13.14

- Fixed an issue where dropping a database did not remove associated captured plans from shared memory.
- Fixed an issue with enforcement of plans containing views.
- Improvements in Parallel Append plan enforcement.
- Fixed an issue related to plan capture.
- Fixed an issue with enforcement of plans containing gather nodes.

Extension improvements in Aurora PostgreSQL 12.18

- Fixed an issue related to plan capture.

New extension features in Aurora PostgreSQL 16.1, 15.5 and 14.10

- Plan outlines will be updated to the latest format version as part of the `update_plan_hash` action for `apg_plan_mgmt.validate_plans` function.
- Added support for parallel Append enforcement as a part of Parallel Query Enforcement. To enforce parallel append nodes correctly, you must do the following:
 1. Set `apg_plan_mgmt.plan_hash_version` to 5.
 2. Call `apg_plan_mgmt.validate_plans('update_plan_hash')`.

Extension improvements in Aurora PostgreSQL 16.1, 15.5 and 14.10

- Performance improvement in plan hash calculation.
- Enhanced memory utilization for plan outlines that contain repetitive subplans.
- Fixed an issue in parallel query enforcement where `GatherMerge` could not be enforced.
- Fixed an issue where estimated cost of enforced plan was incorrect.
- Fixed an issue in enforcement of approved plans where the outline contains partitioned tables and subplans.

New extension features in Aurora PostgreSQL 13.13

- Plan outlines will be updated to the latest format version as part of the `update_plan_hash` action for `apg_plan_mgmt.validate_plans` function.

- Added support for parallel Append enforcement as a part of Parallel Query Enforcement. To enforce parallel append nodes correctly, you must do the following:
 1. Set `apg_plan_mgmt.plan_hash_version` to 5.
 2. Call `apg_plan_mgmt.validate_plans('update_plan_hash')`.

Extension improvements in Aurora PostgreSQL 13.13

- Enhanced memory utilization for plan outlines that contain repetitive subplans.
- Fixed an issue in parallel query enforcement where `GatherMerge` could not be enforced.
- Fixed an issue where estimated cost of enforced plan was incorrect.
- Fixed an issue in enforcement of approved plans where the outline contains partitioned tables and subplans.

New extension features in Aurora PostgreSQL 12.17

- Plan outlines will be updated to the latest format version as part of the `update_plan_hash` action for `apg_plan_mgmt.validate_plans` function.

Version 2.5 of the Aurora PostgreSQL `apg_plan_mgmt` extension

Improvements to the `apg_plan_mgmt` extension in version 2.5 include the following:

New extension features in Aurora PostgreSQL 15.4 and 14.9

- QPM can enforce query plans to have parallel operators except Parallel Append node. To enforce parallel query plans correctly, you must do the following after upgrading to 15.4 or 14.9:
 - Set `apg_plan_mgmt.plan_hash_version` to 4 or above.
 - Call `apg_plan_mgmt.validate_plans('update_plan_hash')`.
 - Re-capture approved plans that has `Gather` node in `plan_outline`.
- QPM can enforce query plans with Materialize nodes. To enforce Materialize nodes, you must do the following after upgrading to 15.4 or 14.9:
 - Set `apg_plan_mgmt.plan_hash_version` to 4 or above.
 - Call `apg_plan_mgmt.validate_plans('update_plan_hash')`.
- To capture query plans from Replicas, you must update `apg_plan_mgmt` extension by calling `ALTER EXTENSION apg_plan_mgmt UPDATE`.

- You need to specify `apg_plan_mgmt.plan_capture_threshold` in order to not allow QPM to capture any query plans.

Extension improvements in Aurora PostgreSQL 15.4 and 14.9

- Performance improvement on `plan_hash` calculation

New extension features in Aurora PostgreSQL 13.12

- QPM can enforce query plans to have parallel operators except Parallel Append node. To enforce parallel query plans correctly, you must do the following after upgrading to 15.4 or 14.9:
 - Set `apg_plan_mgmt.plan_hash_version` to 4 or above.
 - Call `apg_plan_mgmt.validate_plans('update_plan_hash')`.
 - Re-capture approved plans that has Gather node in `plan_outline`.
- To capture query plans from Replicas, you must update `apg_plan_mgmt` extension by calling `ALTER EXTENSION apg_plan_mgmt UPDATE`.
- You need to specify `apg_plan_mgmt.plan_capture_threshold` in order to not allow QPM to capture any query plans.

New extension features in Aurora PostgreSQL 12.16

- To capture query plans from Replicas, you must update `apg_plan_mgmt` extension by calling `ALTER EXTENSION apg_plan_mgmt UPDATE`.
- You need to specify `apg_plan_mgmt.plan_capture_threshold` in order to not allow QPM to capture any query plans.

Version 2.4 of the Aurora PostgreSQL `apg_plan_mgmt` extension

Improvements to the `apg_plan_mgmt` extension in version 2.4 include the following:

New extension features in Aurora PostgreSQL 15.3 and 14.8

- Introduced a new GUC `auto_explain.hashes`. When it is set to true (default: false), `sql_hash` and `plan_hash` are shown at the end of auto explain result.
- Introduced a new GUC `apg_plan_mgmt.explain_hashes`. When it is set to true (default: false), `EXPLAIN` result shows `sql_hash` and `plan_hash` even without `hashes true` option.

- Introduced a new GUC `apg_plan_mgmt.log_plan_enforcement_result`. Depending on its value (default: none), plan enforcement results are written to Postgres log files.
- Introduced a new plan hash calculation version to support partitioned tables. Users need to set `apg_plan_mgmt.plan_hash_version` to 3 and call `apg_plan_mgmt.validate_plans('update_plan_hash')` in each database with `apg_plan_mgmt` installed and entries in the plans table.
- QPM can enforce query plans with Memoize nodes.

Extension improvements in Aurora PostgreSQL 15.3 and 14.8

- Fixed an issue with JDBC prepared statements plan enforcement.
- Improved parity regarding queryid between `pg_stat_statements` and `apg_plan_mgmt.dba_plans`.
- Fixed a plan enforcement issue when index names end with digits.

New extension features in Aurora PostgreSQL 13.11

- Introduced a new GUC `auto_explain.hashes`. When it is set to true (default: false), `sql_hash` and `plan_hash` are shown at the end of auto explain result.
- Introduced a new GUC `apg_plan_mgmt.explain_hashes`. When it is set to true (default: false), EXPLAIN result shows `sql_hash` and `plan_hash` even without `hashes true` option.
- Introduced a new GUC `apg_plan_mgmt.log_plan_enforcement_result`. Depending on its value (default: none), plan enforcement results are written to Postgres log files.
- Introduced a new plan hash calculation version to support partitioned tables. Users need to set `apg_plan_mgmt.plan_hash_version` to 3 and call `apg_plan_mgmt.validate_plans('update_plan_hash')` in each database with `apg_plan_mgmt` installed and entries in the plans table.

Extension improvements in Aurora PostgreSQL 13.11

- Fixed an issue with JDBC prepared statements plan enforcement.
- Fixed a plan enforcement issue when index names end with digits.

New extension features in Aurora PostgreSQL 12.15

- Introduced a new GUC `auto_explain.hashes`. When it is set to true (default: false), `sql_hash` and `plan_hash` are shown at the end of auto explain result.
- Introduced a new GUC `apg_plan_mgmt.explain_hashes`. When it is set to true (default: false), EXPLAIN result shows `sql_hash` and `plan_hash` even without `hashes true` option.
- Introduced a new GUC `apg_plan_mgmt.log_plan_enforcement_result`. Depending on its value (default: none), plan enforcement results are written to Postgres log files.

Extension improvements in Aurora PostgreSQL 12.15

- Fixed an issue with JDBC prepared statements plan enforcement.
- Fixed a plan enforcement issue when index names end with digits.

Improvements to the `apg_plan_mgmt` extension in version 2.4 prior to Aurora PostgreSQL 15.3, 14.8, 13.11, and 12.15 includes the following:

New extension features

- The `apg_plan_mgmt.copy_outline` function can take a new 5th argument, `force_update_target_plan_hash`. If it is set to true, the target plan hash will be updated even though the source plan isn't reproducible for the target `sql_hash`.

Extension improvements

- The `apg_plan_mgmt.copy_outline` function now copies `environment_variables`.
- The minimum value of `apg_plan_mgmt.plan_retention_period` changes to 1 from 32.
- The query plan management can now save plans for queries in read-only transactions from the writer nodes.
- Fixed an issue in the `apg_plan_mgmt.evolve_plan_baselines` function.
- Fixed an issue that could cause unavailability when the `apg_plan_mgmt` is enabled.

To learn how to install, upgrade, and use the `apg_plan_mgmt` extension, see [Managing query execution plans for Aurora PostgreSQL](#) in the *Amazon Aurora User Guide*.

Version 2.3 of the Aurora PostgreSQL `apg_plan_mgmt` extension

Improvements to the `apg_plan_mgmt` extension in version 2.3 includes the following:

New extension features

- Support for a new function, the `apg_plan_mgmt.copy_outline` function. This function allows you to copy a plan hash and a plan outline from one SQL hash and plan hash to another. Use this function when you want to copy a plan that uses hints to other similar statements without using the in-line hint statement at every occurrence. If the update to the query results in an invalid plan, the function raises an error and rolls back the update. For more information, see [Function reference for Aurora PostgreSQL query plan management](#) in the *Amazon Aurora User Guide*.

Extension improvements

- The query plan management feature now saves plans for queries that are inside procedures and DO-blocks. For versions of `apg_plan_mgmt` older than version 2.3, this has been a limitation.

To learn how to install, upgrade, and use the `apg_plan_mgmt` extension, see [Managing query execution plans for Aurora PostgreSQL](#) in the *Amazon Aurora User Guide*.

Version 2.1 of the Aurora PostgreSQL `apg_plan_mgmt` extension

Improvements to the `apg_plan_mgmt` extension in version 2.1 for Aurora PostgreSQL 11.20 includes the following:

New extension features in Aurora PostgreSQL 11.20

- Introduced a new GUC `apg_plan_mgmt.log_plan_enforcement_result`. Depending on its value (default: none), plan enforcement results are written to Postgres log files.

Extension improvements in Aurora PostgreSQL 11.20

- Fixed an issue with JDBC prepared statements plan enforcement.

To learn how to install, upgrade, and use the `apg_plan_mgmt` extension, see [Managing query execution plans for Aurora PostgreSQL](#) in the *Amazon Aurora User Guide*.

Version 2.0 of the Aurora PostgreSQL `apg_plan_mgmt` extension

The `apg_plan_mgmt` extension changes for version 2.0 include the following:

New extension features

1. You can now manage all queries inside SQL functions, whether they have parameters or not.
2. You can now manage all queries inside PL/pgSQL functions, whether they have parameters or not.
3. You can now manage queries in generic plans, whether they have parameters or not. To learn more about generic plans versus custom plans, see the PREPARE statement in the [PostgreSQL documentation](#).
4. You can now use query plan management to enforce the use of specific types of aggregate methods in query plans.

Extension improvements

1. You can now save plans with a size up to 8KB times the setting of the `max_worker_processes` parameter. Previously the maximum plan size was 8KB.
2. Fixed bugs for unnamed prepared statements such as those from JDBC.
3. Previously, when you tried to do `CREATE EXTENSION apg_plan_mgmt` when it is not loaded in the `shared_preload_libraries`, the PostgreSQL backend connection was dropped. Now, an error message prints and the connection is not dropped.
4. The default value of the `cardinality_error` in the `apg_plan_mgmt.plans` table is `NULL`, but it can be set to `-1` during the `apg_plan_mgmt.evolve_plan_baselines` function. `NULL` is now used consistently.
5. Plans are now saved for queries that refer to temporary tables.
6. The default maximum number of plans is increased from 1000 to 10000.
7. The following `pgss` parameters are deprecated because the automatic plan capture mode should be used instead of those parameters.
 - `apg_plan_mgmt.pgss_min_calls`
 - `apg_plan_mgmt.pgss_min_mean_time_ms`
 - `apg_plan_mgmt.pgss_min_stddev_time_ms`
 - `apg_plan_mgmt.pgss_min_total_time_ms`

Version 1.0.1 of the Aurora PostgreSQL `apg_plan_mgmt` extension

The `apg_plan_mgmt` extension changes for version 1.0.1 include the following:

New extension features

1. The `validate_plans` function has a new action value called `update_plan_hash`. This action updates the `plan_hash` ID for plans that can't be reproduced exactly. The `update_plan_hash` value also allows you to fix a plan by rewriting the SQL. You can then register the good plan as an Approved plan for the original SQL. Following is an example of using the `update_plan_hash` action.

```
UPDATE apg_plan_mgmt.plans SET plan_hash = new_plan_hash, plan_outline
= good_plan_outline
WHERE sql_hash = bad_plan_sql_hash AND plan_hash = bad_plan_plan_hash;
SELECT apg_plan_mgmt.validate_plans(bad_plan_sql_hash, bad_plan_plan_hash,
'update_plan_hash');
SELECT apg_plan_mgmt.reload();
```

2. A new `get_explain_stmt` function is available that generates the text of an EXPLAIN statement for the specified SQL statement. It includes the parameters `sql_hash`, `plan_hash` and `explain_options`.

The parameter `explain_options` can be any comma-separated list of valid EXPLAIN options, as shown following.

```
analyze,verbose,buffers,hashes,format json
```

If the parameter `explain_options` is NULL or an empty string, the `get_explain_stmt` function generates a simple EXPLAIN statement.

To create an EXPLAIN script for your workload or a portion of it, use the `\a`, `\t`, and `\o` options to redirect the output to a file. For example, you can create an EXPLAIN script for the top-ranked (top-K) statements by using the PostgreSQL `pg_stat_statements` view sorted by `total_time` in DESC order.

3. The precise location of the Gather parallel query operator is determined by costing, and may change slightly over time. To prevent these differences from invalidating the entire plan, query plan management now computes the same `plan_hash` even if the Gather operators move to different places in the plan tree.

4. Support is added for nonparameterized statements inside pl/pgsql functions.
5. Overhead is reduced when the `apg_plan_mgmt` extension is installed on multiple databases in the same cluster while two or more databases are being accessed concurrently. Also, this release fixed a bug in this area that caused plans to not be stored in shared memory.

Extension improvements

1. Improvements to the `evolve_plan_baselines` function.
 - a. The `evolve_plan_baselines` function now computes a `cardinality_error` metric over all nodes in the plan. Using this metric, you can identify any plan where the cardinality estimation error is large, and the plan quality is more doubtful. Long-running statements with high `cardinality_error` values are high-priority candidates for query tuning.
 - b. Reports generated by `evolve_plan_baselines` now include `sql_hash`, `plan_hash`, and the plan status.
 - c. You can now allow `evolve_plan_baselines` to approve previously Rejected plans.
 - d. The meaning of `speedup_factor` for `evolve_plan_baselines` is now always relative to the baseline plan. For example, a value of 1.1 now means 10 percent faster than the baseline plan. A value of 0.9 means 10 percent slower than the baseline plan. The comparison is made using running time alone instead of total time.
 - e. The `evolve_plan_baselines` function now warms the cache in a new way. It does this by running the baseline plan, then running the baseline plan one more time, and then running the candidate plan once. Previously, `evolve_plan_baselines` ran the candidate plan twice. This approach added significantly to running time, especially for slow candidate plans. However, running the candidate plan twice is more reliable when the candidate plan uses an index that isn't used in the baseline plan.
2. Query plan management no longer saves plans that refer to system tables or views, temporary tables, or the query plan management's own tables.
3. Bug fixes include caching a plan immediately when saved and fixing a bug that caused the back end to terminate.

Document history for the Aurora PostgreSQL Release Notes

The following table describes Aurora PostgreSQL releases.

Change	Description	Date
Aurora PostgreSQL releases versions 16.2, 15.6, 14.11, 13.14, and 12.18	Amazon Aurora PostgreSQL-Compatible Edition releases Aurora PostgreSQL 16.2 , Aurora PostgreSQL 15.6 , Aurora PostgreSQL 14.11 , Aurora PostgreSQL 13.14 , and Aurora PostgreSQL 12.18 , including Babelfish 4.1.0 , Babelfish 3.5.0 , Babelfish 2.8.0 , Aurora PostgreSQL apg_plan_mgmt extension version 2.6 , compatible with PostgreSQL 16.2, 15.6, 14.11, 13.14, and 12.18.	April 29, 2024
Aurora PostgreSQL releases versions 16.1.3, 15.5.3, 14.10.3, 13.13.3, and 12.17.3	Amazon Aurora PostgreSQL-Compatible Edition releases Aurora PostgreSQL 16.1.3 , Aurora PostgreSQL 15.5.3 , Aurora PostgreSQL 14.10.3 , Aurora PostgreSQL 13.13.3 , and Aurora PostgreSQL 12.17.3 , compatible with PostgreSQL 16.1, 15.5, 14.10, 13.13, and 12.17.	March 13, 2024
Aurora PostgreSQL releases versions 15.4.6, 14.9.6, 13.12.6, 12.16.6 and 11.21.6	Amazon Aurora PostgreSQL-Compatible Edition releases Aurora PostgreSQL 15.4.6 ,	March 13, 2024

[Aurora PostgreSQL 14.9.6](#),
[Aurora PostgreSQL 13.12.6](#),
[Aurora PostgreSQL 12.16.6](#),
and [Aurora PostgreSQL 11.21.6](#), compatible with PostgreSQL 15.4, 14.9, 13.12, 12.16, and 11.21.

[Aurora PostgreSQL releases versions 15.3.5, 14.8.5, 13.11.5, and 12.15.5](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 15.3.5](#), [Aurora PostgreSQL 14.8.5](#), [Aurora PostgreSQL 13.11.5](#), and [Aurora PostgreSQL 12.15.5](#), compatible with PostgreSQL 15.3, 14.8, 13.11, and 12.15.

March 13, 2024

[Aurora PostgreSQL releases versions 15.2.7, 14.7.7, 13.10.7, and 12.14.7](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 15.2.7](#), [Aurora PostgreSQL 14.7.7](#), [Aurora PostgreSQL 13.10.7](#), and [Aurora PostgreSQL 12.14.7](#), compatible with PostgreSQL 15.2, 14.7, 13.10, and 12.14.

March 13, 2024

[Aurora PostgreSQL releases versions 14.6.8, 13.9.8, and 12.13.8](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 14.6.8](#), [Aurora PostgreSQL 13.9.8](#), and [Aurora PostgreSQL 12.13.8](#), compatible with PostgreSQL 14.6, 13.9, and 12.13.

March 13, 2024

[Aurora PostgreSQL releases versions 14.5.6, 13.8.6, and 12.12.6](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 14.5.6](#), [Aurora PostgreSQL 13.8.6](#), and [Aurora PostgreSQL 12.12.6](#), compatible with PostgreSQL 14.5, 13.8, and 12.12.

March 13, 2024

[Aurora PostgreSQL releases versions 14.4.9, 14.3.9, 13.7.9, and 12.11.9](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 14.4.9](#), [Aurora PostgreSQL 14.3.9](#), [Aurora PostgreSQL 13.7.9](#), and [Aurora PostgreSQL 12.11.9](#), compatible with PostgreSQL 14.4, 14.3, 13.7, and 12.11.

March 13, 2024

[Aurora PostgreSQL releases versions 12.9.11](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 12.9.11](#), compatible with PostgreSQL 12.9.

March 13, 2024

[Aurora PostgreSQL releases versions 11.9.11](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 11.9.11](#), compatible with PostgreSQL 11.9.

March 13, 2024

[Aurora PostgreSQL releases versions 16.1.2, 15.5.2, 14.10.2, 13.13.2, and 12.17.2](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 16.1.2](#), [Aurora PostgreSQL 15.5.2](#), [Aurora PostgreSQL 14.10.2](#), [Aurora PostgreSQL 13.13.2](#), and [Aurora PostgreSQL 12.17.2](#), compatible with PostgreSQL 16.1, 15.5, 14.10, 13.13, and 12.17.

February 22, 2024

[Aurora PostgreSQL releases versions 15.4.5, 14.9.5, 13.12.5, 12.16.5, and 11.21.5](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 15.4.5](#), [Aurora PostgreSQL 14.9.5](#), [Aurora PostgreSQL 13.12.5](#), [Aurora PostgreSQL 12.16.5](#), and [Aurora PostgreSQL 11.21.5](#), compatible with PostgreSQL 15.4, 14.9, 13.12, 12.16 and 11.21.

February 22, 2024

[Aurora PostgreSQL releases version 16.1](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 16.1](#), including [Babelfish 4.0.0](#), compatible with PostgreSQL 16.1.

January 31, 2024

[Aurora PostgreSQL releases version 12.9.10](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 12.9.10](#), compatible with PostgreSQL 12.9.

December 27, 2023

Aurora PostgreSQL releases version 11.9.9	Amazon Aurora PostgreSQL-Compatible Edition releases Aurora PostgreSQL 11.9.9 , compatible with PostgreSQL 11.9.	December 27, 2023
Aurora PostgreSQL releases versions 14.4.8, 14.3.8, 13.7.8, and 12.11.8	Amazon Aurora PostgreSQL-Compatible Edition releases Aurora PostgreSQL 14.4.8 , Aurora PostgreSQL 14.3.8 , Aurora PostgreSQL 13.7.8 , and Aurora PostgreSQL 12.11.8 , compatible with PostgreSQL 14.4, 14.3, 13.7, and 12.11.	December 22, 2023
Aurora PostgreSQL releases versions 15.5.0, 14.10.0, 13.13.0, and 12.17.0	Amazon Aurora PostgreSQL-Compatible Edition releases Aurora PostgreSQL 15.5.0 including Babelfish 3.4.0 , Aurora PostgreSQL 14.10.0 , Aurora PostgreSQL 13.13.0 , and Aurora PostgreSQL 12.17.0 , compatible with PostgreSQL 15.5, 14.10, 13.13, and 12.17.	December 21, 2023
Aurora PostgreSQL releases versions 14.5.5, 13.8.5, and 12.12.5	Amazon Aurora PostgreSQL-Compatible Edition releases Aurora PostgreSQL 14.5.5 , Aurora PostgreSQL 13.8.5 , and Aurora PostgreSQL 12.12.5 , compatible with PostgreSQL 14.5, 13.8, and 12.12.	December 18, 2023

[Aurora PostgreSQL releases versions 15.4.3 and 14.9.3](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 15.4.3](#), [Aurora PostgreSQL 14.9.3](#), compatible with PostgreSQL 15.4 and 14.9.

December 15, 2023

[Aurora PostgreSQL releases versions 15.2.6, 14.7.6, 13.10.6, and 12.14.6](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 15.2.6](#), [Aurora PostgreSQL 14.7.6](#), [Aurora PostgreSQL 13.10.6](#), and [Aurora PostgreSQL 12.14.6](#), compatible with PostgreSQL 15.2, 14.7, 13.10, and 12.14.

December 15, 2023

[Aurora PostgreSQL releases versions 14.6.7, 13.9.7, and 12.13.7](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 14.6.7](#), [Aurora PostgreSQL 13.9.7](#), and [Aurora PostgreSQL 12.13.7](#), compatible with PostgreSQL 14.6, 13.9, and 12.13.

December 15, 2023

[Aurora PostgreSQL releases versions 15.3.4, 14.8.4, 13.11.4, and 12.15.4](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 15.3.4](#), [Aurora PostgreSQL 14.8.4](#), [Aurora PostgreSQL 13.11.4](#), [Aurora PostgreSQL 12.15.4](#), compatible with PostgreSQL 15.3, 14.8, 13.11, and 12.15.

December 14, 2023

[Aurora PostgreSQL releases versions 15.4.2, 14.9.2, 13.12.2, 12.16.2, and 11.21.2](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 15.4.2](#), [Aurora PostgreSQL 14.9.2](#), [Aurora PostgreSQL 13.12.2](#), [Aurora PostgreSQL 12.16.2](#), and [Aurora PostgreSQL 11.21.2](#), compatible with PostgreSQL 15.4, 14.9, 13.12, 12.16, and 11.21.

December 13, 2023

[Aurora PostgreSQL releases versions 14.5.4, 13.8.4, and 12.12.4](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 14.5.4](#), [Aurora PostgreSQL 13.8.4](#), and [Aurora PostgreSQL 12.12.4](#), compatible with PostgreSQL 14.5, 13.8, and 12.12.

November 17, 2023

[Aurora PostgreSQL releases versions 14.4.7, 14.3.7, 13.7.7, and 12.11.7](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 14.4.7](#), [Aurora PostgreSQL 14.3.7](#), [Aurora PostgreSQL 13.7.7](#), and [Aurora PostgreSQL 12.11.7](#), compatible with PostgreSQL 14.4, 14.3, 13.7, and 12.11.

November 17, 2023

[Aurora PostgreSQL releases version 12.9.9](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 12.9.9](#), compatible with PostgreSQL 12.9.

November 17, 2023

[Aurora PostgreSQL releases versions 14.6.6, 13.9.6, and 12.13.6](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 14.6.6](#), [Aurora PostgreSQL 13.9.6](#), and [Aurora PostgreSQL 12.13.6](#), compatible with PostgreSQL 14.6, 13.9, and 12.13.

November 15, 2023

[Aurora PostgreSQL releases version 16.0 Preview](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 16.0](#) in the Amazon RDS Preview environment, compatible with PostgreSQL 16.0.

November 15, 2023

[Aurora PostgreSQL releases versions 15.3.3, 14.8.3, 13.11.3, and 12.15.3](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 15.3.3](#), [Aurora PostgreSQL 14.8.3](#), [Aurora PostgreSQL 13.11.3](#), [Aurora PostgreSQL 12.15.3](#), compatible with PostgreSQL 15.3, 14.8, 13.11, and 12.15.

November 14, 2023

[Aurora PostgreSQL releases versions 15.2.5, 14.7.5, 13.10.5, and 12.14.5](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 15.2.5](#), [Aurora PostgreSQL 14.7.5](#), [Aurora PostgreSQL 13.10.5](#), and [Aurora PostgreSQL 12.14.5](#), compatible with PostgreSQL 15.2, 14.7, 13.10, and 12.14.

November 14, 2023

[Aurora PostgreSQL releases versions 15.4.1, 14.9.1, 13.12.1, 12.16.1, and 11.21.1](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 15.4.1](#), [Aurora PostgreSQL 14.9.1](#), [Aurora PostgreSQL 13.12.1](#), [Aurora PostgreSQL 12.16.1](#), and [Aurora PostgreSQL 11.21.1](#), compatible with PostgreSQL 15.4, 14.9, 13.12, 12.16, and 11.21.

November 8, 2023

[Aurora PostgreSQL releases versions 15.4.0, 14.9.0, 13.12.0, 12.16.0, and 11.21.0](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 15.4.0](#) including [Babelfish 3.3.0](#), [Aurora PostgreSQL 14.9.0](#) including [Babelfish 2.6.0](#), [Aurora PostgreSQL 13.12.0](#), [Aurora PostgreSQL 12.16.0](#), and [Aurora PostgreSQL 11.21.0](#), compatible with PostgreSQL 15.4, 14.9, 13.12, 12.16, and 11.21.

October 24, 2023

[Aurora PostgreSQL releases versions 14.4.6, 14.3.6, 13.7.6, 12.11.6, and 11.16.6](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 14.4.6](#), [Aurora PostgreSQL 14.3.6](#), [Aurora PostgreSQL 13.7.6](#), [Aurora PostgreSQL 12.11.6](#), and [Aurora PostgreSQL 11.16.6](#), compatible with PostgreSQL 14.4, 14.3, 13.7, 12.11, and 11.16.

October 19, 2023

[Aurora PostgreSQL releases
version 12.9.8](#)

Amazon Aurora PostgreSQL-
Compatible Edition releases
[Aurora PostgreSQL 12.9.8](#),
compatible with PostgreSQL
12.9.

October 19, 2023

[Aurora PostgreSQL releases
versions 14.5.3, 13.8.3,
12.12.3 and 11.17.3](#)

Amazon Aurora PostgreSQL-
Compatible Edition releases
[Aurora PostgreSQL 14.5.3](#)
including [Babelfish 2.2.3](#),
[Aurora PostgreSQL 13.8.3](#),
[Aurora PostgreSQL 12.12.3](#)
and [Aurora PostgreSQL
11.17.3](#), compatible with
PostgreSQL 14.5, 13.8, 12.12
and 11.17.

October 17, 2023

[Aurora PostgreSQL releases
version 11.9.8](#)

Amazon Aurora PostgreSQL-
Compatible Edition releases
[Aurora PostgreSQL 11.9.8](#),
compatible with PostgreSQL
11.9.

October 10, 2023

[Aurora PostgreSQL releases
versions 15.2.4, 14.7.4,
13.10.4 12.14.4 and 11.19.4](#)

Amazon Aurora PostgreSQL-
Compatible Edition releases
[Aurora PostgreSQL 15.2.4](#)
including [Babelfish 3.1.3](#),
[Aurora PostgreSQL 14.7.4](#)
including [Babelfish 2.4.3](#),
[Aurora PostgreSQL 13.10.4](#),
[Aurora PostgreSQL 12.14.4](#),
and [Aurora PostgreSQL
11.19.4](#), compatible with
PostgreSQL 15.2, 14.7, 13.10,
12.14 and 11.19.

October 5, 2023

[Aurora PostgreSQL releases versions 15.3.2, 14.8.2, 13.11.2, 12.15.2 and 11.20.2](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 15.3.2](#) including [Babelfish 3.2.1](#), [Aurora PostgreSQL 14.8.2](#) including [Babelfish 2.5.1](#), [Aurora PostgreSQL 13.11.2](#), [Aurora PostgreSQL 12.15.2](#), and [Aurora PostgreSQL 11.20.2](#), compatible with PostgreSQL 15.3, 14.8, 13.11, 12.15 and 11.20.

October 4, 2023

[Aurora PostgreSQL releases versions 14.6.5, 13.9.5, 12.13.5, and 11.18.5](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 14.6.5](#), [Aurora PostgreSQL 13.9.5](#), [Aurora PostgreSQL 12.13.5](#), and [Aurora PostgreSQL 11.18.5](#), compatible with PostgreSQL 14.6, 13.9, 12.13 and 11.18.

October 4, 2023

[Aurora PostgreSQL releases versions 14.6.4, 13.9.4, 12.13.4 and 11.18.4](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 14.6.4](#) including [Babelfish 2.3.3](#), [Aurora PostgreSQL 13.9.4](#), [Aurora PostgreSQL 12.13.4](#), and [Aurora PostgreSQL 11.18.4](#), compatible with PostgreSQL 14.6, 13.9, 12.13 and 11.18.

September 13, 2023

[Aurora PostgreSQL releases versions 13.5.7, 12.9.7, and 11.14.7](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 13.5.7](#), [Aurora PostgreSQL 12.9.7](#), and [Aurora PostgreSQL 11.14.7](#), compatible with PostgreSQL 13.5, 12.9, and 11.14.

August 24, 2023

[Aurora PostgreSQL releases versions 15.2.3, 14.7.3, 13.10.3, 12.14.3, and 11.19.3](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 15.2.3](#) including [Babelfish 3.1.2](#), [Aurora PostgreSQL 14.7.3](#) including [Babelfish 2.4.2](#), [Aurora PostgreSQL 13.10.3](#), [Aurora PostgreSQL 12.14.3](#), and [Aurora PostgreSQL 11.19.3](#), compatible with PostgreSQL 15.2, 14.7, 13.10, 12.14, and 11.19.

July 25, 2023

[Aurora PostgreSQL releases versions 15.3.0, 14.8.0, 13.11.0, 12.15.0, and 11.20.0](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 15.3.0](#) including [Babelfish 3.2.0](#), [Aurora PostgreSQL 14.8.0](#) including [Babelfish 2.5.0](#), [Aurora PostgreSQL 13.11.0](#), [Aurora PostgreSQL 12.15.0](#), and [Aurora PostgreSQL 11.20.0](#), compatible with PostgreSQL 15.3, 14.8, 13.11, 12.15, and 11.20.

July 13, 2023

[Aurora PostgreSQL releases versions 15.2.2, 14.7.2, 13.10.2, 12.14.2, and 11.19.2](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 15.2.2](#) including [Babelfish 3.1.1](#), [Aurora PostgreSQL 14.7.2](#) including [Babelfish 2.4.1](#), [Aurora PostgreSQL 13.10.2](#), [Aurora PostgreSQL 12.14.2](#), and [Aurora PostgreSQL 11.19.2](#), compatible with PostgreSQL 15.2, 14.7, 13.10, 12.14, and 11.19.

May 10, 2023

[Aurora PostgreSQL releases versions 15.2.1, 14.7.1, 13.10.1, 12.14.1, and 11.19.1](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 15.2.1](#) including [Babelfish 3.1.0](#) that has new features and several enhancements, [Aurora PostgreSQL 14.7.1](#) including [Babelfish 2.4.0](#) that has new features and several enhancements, [Aurora PostgreSQL 13.10.1](#), [Aurora PostgreSQL 12.14.1](#) and [Aurora PostgreSQL 11.19.1](#), compatible with PostgreSQL 15.2, 14.7, 13.10, 12.14, and 11.19.

April 5, 2023

[Aurora PostgreSQL releases versions 14.6.2, 13.9.2, 12.13.2, and 11.18.2](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 14.6.2](#) including [Babelfish 2.3.2](#) that has an enhancement, [Aurora PostgreSQL 13.9.2](#), [Aurora PostgreSQL 12.13.2](#) and [Aurora PostgreSQL 11.18.2](#), compatible with PostgreSQL 14.6, 13.9, 12.13, and 11.18.

March 3, 2023

[Aurora PostgreSQL releases versions 14.5.2, 13.8.2, 12.12.2, and 11.17.2](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 14.5.2](#), [Aurora PostgreSQL 13.8.2](#), [Aurora PostgreSQL 12.12.2](#) and [Aurora PostgreSQL 11.17.2](#), compatible with PostgreSQL 14.5, 13.8, 12.12, and 11.17.

March 2, 2023

[Aurora PostgreSQL releases version 14.6.1](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 14.6.1](#), compatible with PostgreSQL 14.6.

February 17, 2023

[Aurora PostgreSQL releases versions 14.6.0, 13.9.0, 12.13.0, and 11.18.0](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 14.6.0](#) including Babelfish update 2.3.0 that has new features and several enhancements, [Aurora PostgreSQL 13.9.0](#) including Babelfish update 1.5.0 that has a new feature and an enhancement, [Aurora PostgreSQL 12.13.0](#), and [Aurora PostgreSQL 11.18.0](#), compatible with PostgreSQL 14.6, 13.9, 12.13, and 11.18.

January 20, 2023

[Aurora PostgreSQL releases versions 13.3.5, 12.7.5, 11.12.5, and 10.17.5](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 13.3.5](#), [Aurora PostgreSQL 12.7.5](#), [Aurora PostgreSQL 11.12.5](#), and [Aurora PostgreSQL 10.17.5](#), compatible with PostgreSQL 13.3, 12.7, 11.12, and 10.17.

December 30, 2022

[Aurora PostgreSQL releases version 11.9.7](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 11.9.7](#), compatible with PostgreSQL 11.9.

December 22, 2022

[Aurora PostgreSQL releases versions 13.4.6, 12.8.6, 11.13.6, and 10.18.6](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 13.4.6](#), [Aurora PostgreSQL 12.8.6](#), [Aurora PostgreSQL 11.13.6](#), and [Aurora PostgreSQL 10.18.6](#), compatible with PostgreSQL 13.4, 12.8, 11.13, and 10.18.

December 19, 2022

[Aurora PostgreSQL releases versions 13.6.6, 12.10.6, 11.15.6, and 10.20.6](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 13.6.6](#), [Aurora PostgreSQL 12.10.6](#), [Aurora PostgreSQL 11.15.6](#), and [Aurora PostgreSQL 10.20.6](#), compatible with PostgreSQL 13.6, 12.10, 11.15, and 10.20.

December 16, 2022

[Aurora PostgreSQL releases versions 13.5.6, 12.9.6, 11.14.6, and 10.19.6](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 13.5.6](#), [Aurora PostgreSQL 12.9.6](#), [Aurora PostgreSQL 11.14.6](#), and [Aurora PostgreSQL 10.19.6](#), compatible with PostgreSQL 13.5, 12.9, 11.14, and 10.19.

December 16, 2022

[Aurora PostgreSQL releases versions 14.4.5, 14.3.5, 13.7.5, 12.11.5, 11.16.5, and 10.21.5](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 14.4.5](#), [Aurora PostgreSQL 14.3.5](#), [Aurora PostgreSQL 13.7.5](#), [Aurora PostgreSQL 12.11.5](#), [Aurora PostgreSQL 11.16.5](#) and [Aurora PostgreSQL 10.21.5](#), compatible with PostgreSQL 14.4, 13.7, 12.11, 11.16, and 10.21.

December 14, 2022

[Aurora PostgreSQL releases versions 14.5.1, 13.8.1, 12.12.1, and 11.17.1](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 14.5.1](#), [Aurora PostgreSQL 13.8.1](#), [Aurora PostgreSQL 12.12.1](#), [Aurora PostgreSQL 11.17.1](#), compatible with PostgreSQL 14.5, 13.8, 12.12, and 11.17.

December 13, 2022

[Aurora PostgreSQL releases versions 14.4.4, 14.3.4, 13.7.4, 12.11.4, 11.16.4, and 10.21.4](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 14.4.4](#), [Aurora PostgreSQL 14.3.4](#), [Aurora PostgreSQL 13.7.4](#), [Aurora PostgreSQL 12.11.4](#), [Aurora PostgreSQL 11.16.4](#) and [Aurora PostgreSQL 10.21.4](#), compatible with PostgreSQL 14.4, 14.3, 13.7, 12.11, 11.16, and 10.21.

November 17, 2022

[Aurora PostgreSQL releases versions 14.5, 13.8, 12.12, and 11.17](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 14.5](#) including BabelFish updates 2.2.0 and 2.2.1 that has new features and several enhancements, [Aurora PostgreSQL 13.8](#), [Aurora PostgreSQL 12.12](#), and [Aurora PostgreSQL 11.17](#), compatible with PostgreSQL 14.5, 13.8, 12.12, and 11.17.

November 9, 2022

[Aurora PostgreSQL releases versions 13.6.5, 13.5.5, and 13.4.5](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 13.6.5](#), [Aurora PostgreSQL 13.5.5](#), [Aurora PostgreSQL 13.4.5](#), compatible with PostgreSQL 13.6, 13.5, and 13.4.

October 18, 2022

[Aurora PostgreSQL releases versions 14.4, 14.3.3, 13.7.3, 12.11.3, 11.16.3, and 10.21.3](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 14.4](#), [Aurora PostgreSQL 14.3.3](#), [Aurora PostgreSQL 13.7.3](#), [Aurora PostgreSQL 12.11.3](#), [Aurora PostgreSQL 11.16.3](#), and [Aurora PostgreSQL 10.21.3](#), compatible with PostgreSQL 14.4, 14.3, 13.7, 12.11, 11.16, and 10.21.

October 13, 2022

[Aurora PostgreSQL releases versions 13.5.4, 12.9.4, 11.14.4, and 10.19.4](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 13.5.4](#), [Aurora PostgreSQL 12.9.4](#), [Aurora PostgreSQL 11.14.4](#), and [Aurora PostgreSQL 10.19.4](#), compatible with PostgreSQL 13.5, 12.9, 11.14, and 10.19.

July 20, 2022

[Aurora PostgreSQL releases versions 13.6.4, 12.10.4, 11.15.4, and 10.20.4](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 13.6.4](#), [Aurora PostgreSQL 12.10.4](#), [Aurora PostgreSQL 11.15.4](#), and [Aurora PostgreSQL 10.20.4](#), compatible with PostgreSQL 13.6, 12.10, 11.15, and 10.20.

July 18, 2022

[Aurora PostgreSQL releases versions 13.3.4, 12.7.4, 11.12.4, and 10.17.4](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 13.3.4](#), [Aurora PostgreSQL 12.7.4](#), [Aurora PostgreSQL 11.12.4](#), and [Aurora PostgreSQL 10.17.4](#), compatible with PostgreSQL 13.3, 12.7, 11.12, and 10.17.

July 14, 2022

[Aurora PostgreSQL releases version 11.9.6](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 11.9.6](#), compatible with PostgreSQL 11.9.

July 8, 2022

[Aurora PostgreSQL releases versions 14.3.1, 13.7.1, 12.11.1, 11.16.1, and 10.21.1](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 14.3.1](#), Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 13.7.1](#), [Aurora PostgreSQL 12.11.1](#), [Aurora PostgreSQL 11.16.1](#), and [Aurora PostgreSQL 10.21.1](#), compatible with PostgreSQL 14.3, 13.7, 12.11, 11.16, and 10.21.

July 6, 2022

[Aurora PostgreSQL releases versions 13.4.4, 12.8.4, 11.13.4, and 10.18.4](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 13.4.4](#), [Aurora PostgreSQL 12.8.4](#), [Aurora PostgreSQL 11.13.4](#), and [Aurora PostgreSQL 10.18.4](#), compatible with PostgreSQL 13.4, 12.8, 11.13, and 10.18.

July 6, 2022

[Aurora PostgreSQL releases version 14.3](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 14.3](#), compatible with PostgreSQL 14.3.

June 21, 2022

[Aurora PostgreSQL releases versions 13.7, 12.11, 11.16, and 10.21](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 13.7](#), [Aurora PostgreSQL 12.11](#), [Aurora PostgreSQL 11.16](#), and [Aurora PostgreSQL 10.21](#), compatible with PostgreSQL 13.7, PostgreSQL 12.11, PostgreSQL 11.16, and PostgreSQL 10.21.

June 9, 2022

[Aurora PostgreSQL releases versions 11.13.3 and 10.18.3](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 11.13.3](#) and [Aurora PostgreSQL 10.18.3](#), compatible with PostgreSQL 11.13 and PostgreSQL 10.18.

June 6, 2022

[Aurora PostgreSQL releases version 13.6.3](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 13.6.3](#), compatible with PostgreSQL 13.6.

June 2, 2022

[Aurora PostgreSQL releases version 13.6.2](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 13.6.2](#), compatible with PostgreSQL 13.6.

May 12, 2022

[Aurora PostgreSQL releases versions 13.6.1, 12.10.1, 11.15.1, and 10.20.1](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 13.6.1](#) including Babelfish update 1.2.1 which resolves several minor issues, [Aurora PostgreSQL 12.10.1](#), [Aurora PostgreSQL 11.15.1](#), and [Aurora PostgreSQL 10.20.1](#), compatible with PostgreSQL 13.6, PostgreSQL 12.10, PostgreSQL 11.15, and PostgreSQL 10.20.

April 27, 2022

[Aurora PostgreSQL releases versions 13.5.3, 12.9.3, 11.14.3, and 10.19.3](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 13.5.3](#), [Aurora PostgreSQL 12.9.3](#), [Aurora PostgreSQL 11.14.3](#), and [Aurora PostgreSQL 10.19.3](#), compatible with PostgreSQL 13.5, PostgreSQL 12.9, PostgreSQL 11.14, and PostgreSQL 10.19.

April 13, 2022

[Aurora PostgreSQL releases versions 13.4.2, 12.8.2, 11.13.2, and 10.18.2](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 13.4.2](#), [Aurora PostgreSQL 12.8.2](#), [Aurora PostgreSQL 11.13.2](#), and [Aurora PostgreSQL 10.18.2](#), compatible with PostgreSQL 13.4, PostgreSQL 12.8, PostgreSQL 11.13, and PostgreSQL 10.18.

April 12, 2022

[Aurora PostgreSQL releases versions 13.3.3, 4.2.3, and 4.1.2](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 13.3.3](#), [Aurora PostgreSQL 4.2.3](#), and [Aurora PostgreSQL 4.1.2](#), compatible with PostgreSQL 13.3, 12.7, and PostgreSQL 12.6.

April 7, 2022

[Aurora PostgreSQL releases versions 13.6, 12.10, 11.15, and 10.20](#)

Amazon Aurora PostgreSQL-Compatible Edition releases [Aurora PostgreSQL 13.6](#), [Aurora PostgreSQL 12.10](#), [Aurora PostgreSQL 11.15](#), and [Aurora PostgreSQL 10.20](#), compatible with PostgreSQL 13.6, 12.10, 11.15, and 10.20.

March 29, 2022

[Initial release](#)

Initial release of the *Release Notes for Aurora PostgreSQL*.

March 22, 2022

Earlier updates

The following table describes the important changes in each release of the *Release Notes for Aurora PostgreSQL* before March 22, 2022.

Change	Description	Date changed
Aurora PostgreSQL releases 13.5, 12.9, 11.14, and 10.19	New releases of Amazon Aurora PostgreSQL-Compatible Edition support compatibility with PostgreSQL 13.5, PostgreSQL 12.9, PostgreSQL 11.14, and PostgreSQL 10.19.	February 25, 2022
Aurora PostgreSQL releases 13.4,	New releases of Amazon Aurora PostgreSQL-Compatible Edition support compatibility with PostgreSQL	October 28, 2021

Change	Description	Date changed
12.8, 11.13, and 10.18	L 13.4, PostgreSQL 12.8, PostgreSQL 11.13, and PostgreSQL 10.18.	
Aurora PostgreSQL releases 13.3	A new release of Aurora PostgreSQL supports compatibility with 13.3.	August 26, 2021
Aurora PostgreSQL releases 12.7, 11.12, 10.17, and 9.6.22	New releases of Amazon Aurora PostgreSQL-Compatible Edition support compatibility with PostgreSQL 12.7, PostgreSQL 11.12, PostgreSQL 10.17, and PostgreSQL 9.6.22.	August 19, 2021
Aurora PostgreSQL releases 4.1.0, 3.5.0, 2.8.0, and 1.10.0 compatible with PostgreSQL 12.6, 11.11, 10.16, and 9.6.21	New versions of Amazon Aurora PostgreSQL-Compatible Edition include 4.1.0 (compatible with PostgreSQL 12.6), 3.5.0 (compatible with PostgreSQL 11.11), 2.8.0 (compatible with PostgreSQL 10.16), and 1.10.0 (compatible with PostgreSQL 9.6.21).	June 17, 2021
Aurora PostgreSQL patch releases 3.2.7, 2.5.7, 1.7.7 compatible with PostgreSQL 11.7, 10.12, 9.6.17	New patch releases of Amazon Aurora PostgreSQL-Compatible Edition include release 3.2.7 compatible with PostgreSQL 11.7, release 2.5.7 compatible with PostgreSQL 10.12, and release 1.7.7 compatible with PostgreSQL 9.6.17.	May 11, 2021
Aurora PostgreSQL patch releases 3.1.4, 2.4.4, 1.6.4 compatible with PostgreSQL 11.6, 10.11, 9.6.16	New patch releases of Amazon Aurora PostgreSQL-Compatible Edition include release 3.1.4 compatible with PostgreSQL 11.6, release 2.4.4 compatible with PostgreSQL 10.11, and release 1.6.4 compatible with PostgreSQL 9.6.16.	May 11, 2021

Change	Description	Date changed
Aurora PostgreSQL patch releases 4.0.2, 3.4.2, 2.7.2, 1.9.2 compatible with PostgreSQL 12.4, 11.9, 10.14, 9.6.19	New patch releases of Amazon Aurora PostgreSQL-Compatible Edition include release 4.0.2 compatible with PostgreSQL 12.4, release 3.4.2 compatible with PostgreSQL 11.9, release 2.7.2 compatible with PostgreSQL 10.14, and release 1.9.2 compatible with PostgreSQL 9.6.19.	April 23, 2021
Aurora PostgreSQL patch releases 4.0.1, 3.4.1, 2.7.1, 1.9.1 compatible with PostgreSQL 12.4, 11.9, 10.14, 9.6.19	New patch releases of Amazon Aurora PostgreSQL-Compatible Edition include release 4.0.1 compatible with PostgreSQL 12.4, release 3.4.1 compatible with PostgreSQL 11.9, release 2.7.1 compatible with PostgreSQL 10.14, and release 1.9.1 compatible with PostgreSQL 9.6.19.	March 12, 2021
Aurora PostgreSQL patch releases 3.3.2, 2.6.2, 1.8.2 compatible with PostgreSQL 11.8, 10.13, 9.6.18	New patch releases of Amazon Aurora PostgreSQL-Compatible Edition include release 3.3.2 compatible with PostgreSQL 11.8, release 2.6.2 compatible with PostgreSQL 10.13, and release 1.8.2 compatible with PostgreSQL 9.6.18.	February 12, 2021
Aurora PostgreSQL release 4.0 compatible with PostgreSQL 12.4	Amazon Aurora PostgreSQL release 4.0 is available and compatible with PostgreSQL 12.4.	January 28, 2021
Aurora PostgreSQL releases 3.4.0, 2.7.0, and 1.9.0	New releases of Amazon Aurora PostgreSQL-Compatible Edition include release 3.4.0 (compatible with PostgreSQL 11.9), release 2.7.0 (compatible with PostgreSQL 10.14), and release 1.9.0 (compatible with PostgreSQL 9.6.19).	December 11, 2020

Change	Description	Date changed
Aurora PostgreSQL releases 3.2.6, 2.5.6, and 1.7.6	New releases of Amazon Aurora PostgreSQL-Compatible Edition include release 3.2.6 (compatible with PostgreSQL 11.7), release 2.5.6 (compatible with PostgreSQL 10.12), and release 1.7.6 (compatible with PostgreSQL 9.6.17).	November 13, 2020
Aurora PostgreSQL supports the <code>pglogical</code> extension	Aurora PostgreSQL now supports the PostgreSQL <code>pglogical</code> extension version 2.2.2.	September 22, 2020
Aurora PostgreSQL bug fix for very specific queries that use NOT EXISTS	Fixed a bug for very specific queries that use the NOT EXISTS operator on Aurora PostgreSQL releases that were released on or after May 24, 2020. The fix is available in Aurora PostgreSQL 2.5.4 , Aurora PostgreSQL 2.6.1 , Aurora PostgreSQL 3.2.4 , and Aurora PostgreSQL 3.3.1 .	September 17, 2020
Aurora PostgreSQL releases 3.3.0, 2.6.0, and 1.8.0	New releases of Amazon Aurora PostgreSQL-Compatible Edition include Aurora PostgreSQL release 3.3.0 (compatible with PostgreSQL 11.8), Aurora PostgreSQL release 2.6.0 (compatible with PostgreSQL 10.13), and Aurora PostgreSQL release 1.8.0 (compatible with PostgreSQL 9.6.18).	September 3, 2020
Aurora PostgreSQL releases 3.2.3, 2.5.3, and 1.7.3	New releases of Amazon Aurora PostgreSQL-Compatible Edition include Aurora PostgreSQL release 3.2.3 (compatible with PostgreSQL 11.7), Aurora PostgreSQL release 2.5.3 (compatible with PostgreSQL 10.12), and Aurora PostgreSQL release 1.7.3 (compatible with PostgreSQL 9.6.17).	August 27, 2020

Change	Description	Date changed
Aurora PostgreSQL releases 3.1.3, 2.4.3, and 1.6.3	New patch releases of Aurora PostgreSQL include Aurora PostgreSQL release 3.1.3 (compatible with PostgreSQL 11.6), Aurora PostgreSQL release 2.4.3 (compatible with PostgreSQL 10.11), and Aurora PostgreSQL release 1.6.3 (compatible with PostgreSQL 9.6.16).	July 27, 2020
Aurora PostgreSQL releases 3.2.2, 2.5.2, and 1.7.2	New releases of Amazon Aurora PostgreSQL-Compatible Edition include Aurora PostgreSQL release 3.2.2 (compatible with PostgreSQL 11.7), Aurora PostgreSQL release 2.5.2 (compatible with PostgreSQL 10.12), and Aurora PostgreSQL release 1.7.2 (compatible with PostgreSQL 9.6.17).	July 9, 2020
Aurora PostgreSQL releases 3.2.1, 2.5.1, and 1.7.1	New releases of Amazon Aurora PostgreSQL-Compatible Edition include Aurora PostgreSQL release 3.2.1 (compatible with PostgreSQL 11.7), Aurora PostgreSQL release 2.5.1 (compatible with PostgreSQL 10.12), and Aurora PostgreSQL release 1.7.1 (compatible with PostgreSQL 9.6.17).	June 4, 2020
Aurora PostgreSQL releases 3.1.2, 2.4.2, and 1.6.2	New patch releases of Aurora PostgreSQL include Aurora PostgreSQL release 3.1.2 (compatible with PostgreSQL 11.6), Aurora PostgreSQL release 2.4.2 (compatible with PostgreSQL 10.11), and Aurora PostgreSQL release 1.6.2 (compatible with PostgreSQL 9.6.16).	April 17, 2020
Aurora PostgreSQL releases 3.1.1, 2.4.1, and 1.6.1	New patch releases of Aurora PostgreSQL include Aurora PostgreSQL release 3.1.1 (compatible with PostgreSQL 11.6), Aurora PostgreSQL release 2.4.1 (compatible with PostgreSQL 10.11), and Aurora PostgreSQL release 1.6.1 (compatible with PostgreSQL 9.6.16).	April 16, 2020

Change	Description	Date changed
Aurora PostgreSQL releases 3.1, 2.4, and 1.6	New releases of Amazon Aurora PostgreSQL-Compatible Edition include Aurora PostgreSQL release 3.1 (compatible with PostgreSQL 11.6), Aurora PostgreSQL release 2.4 (compatible with PostgreSQL 10.11), and Aurora PostgreSQL release 1.6 (compatible with PostgreSQL 9.6.16).	February 11, 2020
Aurora PostgreSQL release 3.0	Amazon Aurora PostgreSQL release 3.0 is available and compatible with PostgreSQL 11.4. Supported AWS Regions include us-east-1, us-east-2, us-west-2, eu-west-1, ap-northeast-1, and ap-northeast-2.	November 26, 2019
Aurora PostgreSQL releases 2.3.3 and 1.5.2	Amazon Aurora PostgreSQL-Compatible Edition release 2.3.3 is available and compatible with PostgreSQL 10.7. Amazon Aurora PostgreSQL-Compatible Edition release 1.5.2 is available and compatible with PostgreSQL 9.6.12.	July 3, 2019
Aurora PostgreSQL releases 2.3.1 and 1.5.1	Amazon Aurora PostgreSQL-Compatible Edition release 2.3.1 is available and compatible with PostgreSQL 10.7. Amazon Aurora PostgreSQL-Compatible Edition release 1.5.1 is available and compatible with PostgreSQL 9.6.12.	July 2, 2019
Aurora PostgreSQL release 2.3	Release 2.3 of Amazon Aurora PostgreSQL-Compatible Edition is available and compatible with PostgreSQL 10.7.	May 30, 2019
Aurora PostgreSQL releases 1.2.2, 1.3.2, 2.0.1, 2.1.1, 2.2.1	The following patch releases for Amazon Aurora PostgreSQL-Compatible Edition are now available and include releases 1.2.2, 1.3.2, 2.0.1, 2.1.1, and 2.2.1.	May 21, 2019
Aurora PostgreSQL release 1.4	Release 1.4 of Amazon Aurora PostgreSQL-Compatible Edition is available and compatible with PostgreSQL 9.6.11.	May 9, 2019

Change	Description	Date changed
Aurora PostgreSQL release 2.2.0	Release 2.2.0 of Aurora PostgreSQL is available and compatible with PostgreSQL 10.6.	February 13, 2019
Aurora PostgreSQL version 2.1	Aurora PostgreSQL version 2.1 is available and compatible with PostgreSQL 10.5.	November 20, 2018
Aurora PostgreSQL version 2.0	Aurora PostgreSQL version 2.0 is available and compatible with PostgreSQL 10.4.	September 25, 2018
Aurora PostgreSQL version 1.3	Aurora PostgreSQL version 1.3 is now available and is compatible with PostgreSQL 9.6.9.	September 11, 2018