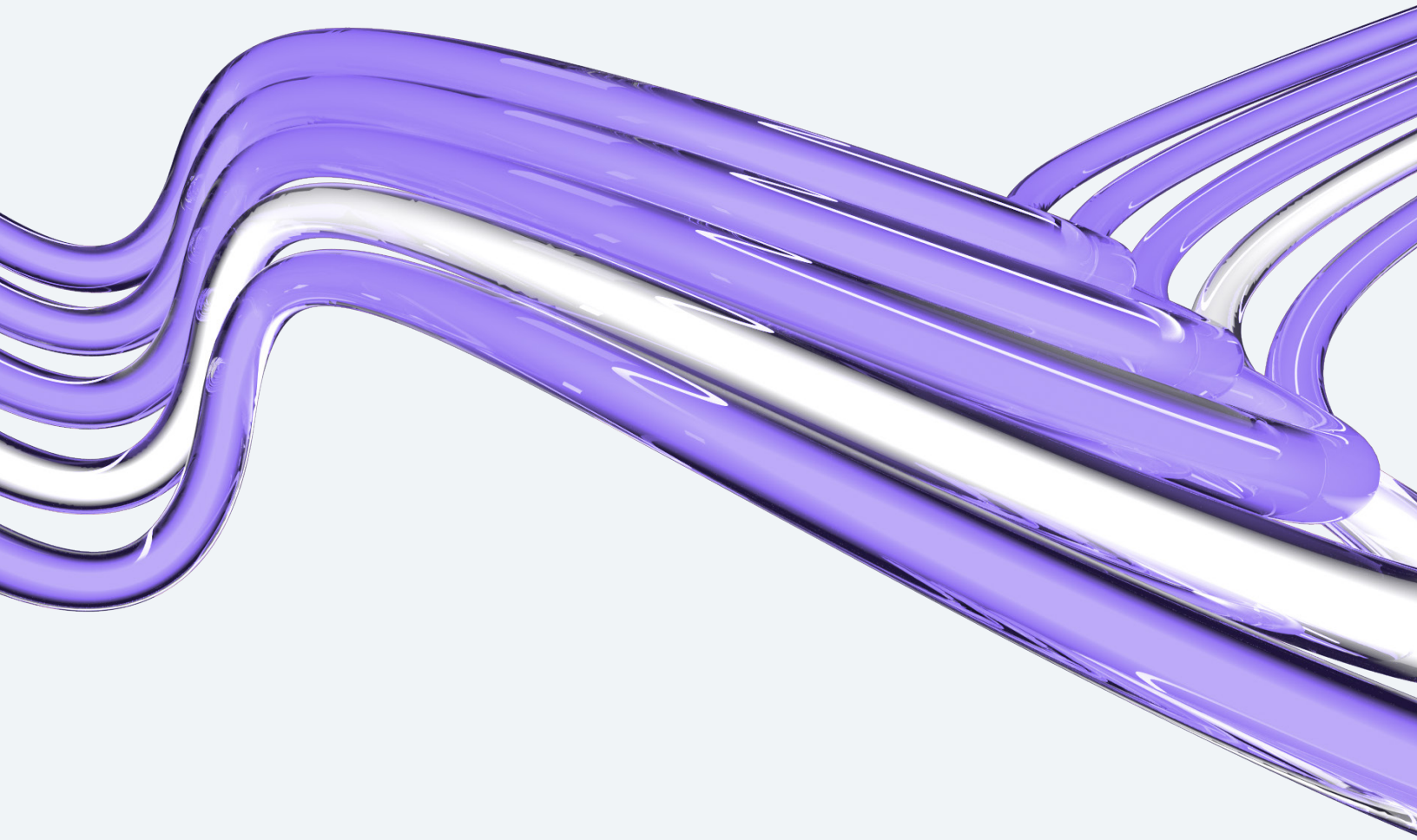


Five Cool Things to Look for in EDB Postgres Advanced Server 14



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PostgreSQL® 14 was released on September 30, 2021. EDB will be releasing its new version of EDB Postgres Advanced Server, v14. It will incorporate all the new features, functions, and enhancements that came with PostgreSQL 14. In addition, a significant number of other improvements are being added for the benefit of customers of EDB Postgres Advanced Server.

The enhancements coming in Advanced Server 14 can be classified in different ways. In this paper, we chose to highlight three kinds of enhancements and provide deeper insight in these categories. **The categories are:**

- Advanced Server enhancements
- Advanced Server enhancements for full support of Postgres-BDR®
- Postgres 14 enhancements

Advanced Server 14 Enhancements

One of the reasons companies choose to run EDB Postgres Advanced Server is for the additional security and auditing capabilities it provides beyond standard Postgres. These added capabilities can support the critical compliance needs evident in highly regulated industries.

Advanced Server 14 includes a few new features that will be of interest to those who are relying on Advanced Server for its auditing capability. **Two of these features are:**

Object-Level Auditing (Cool thing #1)

Advanced Server provides an audit logging capability above and beyond what Postgres provides. It puts records into a separate log and you can specify what types of statements get logged.

When this audit logging capability was added to Advanced Server, it was “all or nothing” — all statements of a given type were logged — and it has remained that way until now. With Advanced Server 14, other options are added so you can more specifically target what statements get logged, such as operations on specific tables.

Object Creation and Last DDL Time (Cool thing #2)

Auditing features are important for maintaining security in a database. Audit trails allow database administrators to have a clear view of what users are doing or trying to do in a database and to provide guidance on implementing controls around those actions. An audit trail can also help with diagnostics of issues as the DBA can easily see which changes could have contributed to a new issue.

In Advanced Server 14, the system now records the creation time and the last DDL time for every object in the system — that includes tables, functions, and schemas. That information can be accessed via the `all_objects` view.

Advanced Server 14 Enhancements for Full Support for Postgres-BDR

EDB Postgres-BDR, or BDR (Bi-Directional Replication) is a Postgres extension that allows Postgres to run always on, with up to 99.999% (five 9's) availability. Five nines of availability can make a crucial difference in uptime for mission-critical applications.

For BDR to provide full functionality as a Postgres extension, there are some enhancements that are needed in the server code to support it. Advanced Server 14 includes those enhancements, thus unlocking BDR's full capabilities. **There are several BDR features that become usable with the release of Advanced Server 14 and we will touch on two of them here:**

Commit At Most Once (Cool thing #3)

For distributed transactional systems, care must be taken to ensure that different nodes agree on all the data that is shared across them, making sure that they all “see” the same values for all the fields they hold in common. This can be very challenging in multi-master active-active architectures, where data is being written to various nodes within the same period of time. The situation is further complicated by the potential for a node to go down in the middle of the writing or the replication with other nodes.

If your application loses the connection to the database server while COMMIT is in progress, it might be hard to know whether or not the COMMIT was processed. With the CAMO feature, your application can find out what happened, even if your new database connection is to a different node than your previous connection. This is a critical capability for some applications, such as those performing financial transactions.

Eager Replication (Cool thing #4)

In replication, there is a tradeoff between application/database performance and data consistency or accuracy. For read-heavy workloads, this tradeoff may not be very important but for write-intensive workloads, it can be.

By default, BDR uses asynchronous replication between its nodes to allow for the best performance. For applications where data consistency is more important and where performance is not critical, eager replication can be turned on.

Eager replication is an optional feature that seeks to prevent replication conflicts. Every transaction is applied on all nodes simultaneously, and commits only if no replication conflicts are detected. This feature does reduce performance, but provides very strong consistency guarantees.

PostgreSQL 14 Features

As Advanced Server is built on Postgres, it includes the benefits of new Postgres enhancements that are released with each new version of Postgres. One of the new features in Postgres 14 that we think will impact the future of Postgres in a big way is Asynchronous Append.

Asynchronous Append (Cool thing #5)

If you use foreign tables as partitions, and query them all at once via the partition root, and if they're all on different servers, the remote queries can be run simultaneously rather than consecutively.

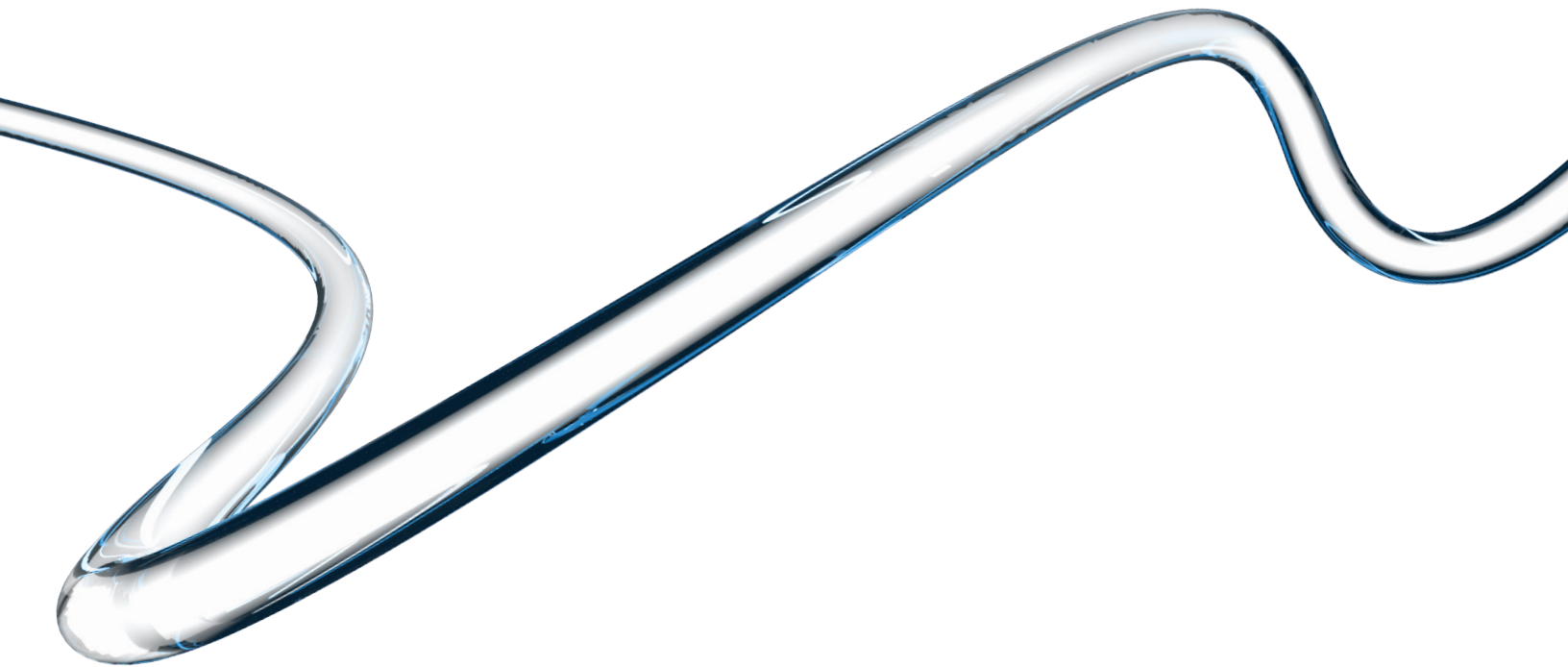
This enhancement may sound pretty boring but it hints at some potentially wonderful capabilities for Postgres in the future.

As Postgres continues to add capabilities to improve its scalability, one topic that continues to garner attention in the Postgres community is sharding. Sharding is a form of horizontal partitioning that seeks to improve scalability by distributing the database load across multiple servers. We see that capability today in distributed databases. Sharding is particularly useful for write-heavy applications because it has the potential for spreading the writes across multiple servers.

This new feature will allow queries to foreign tables to be handled asynchronously in parallel rather than sequentially, thus considerably improving the speed of execution of those queries. If you can treat those foreign tables as shards, you can see the possibilities for this feature to expand the sharding capabilities of Postgres.

Summary

This curated list is just a sample of the new features and enhancements that are in EDB Postgres Advanced Server 14. Users will have their own ideas of the most impactful improvements, but this paper gives you an overview of some of the notable Advanced Server 14 changes.





About EDB

PostgreSQL is increasingly the database of choice for organizations looking to boost innovation and accelerate business. EDB's enterprise-class software extends PostgreSQL, helping our customers get the most out of it both on premises and in the cloud. And our 24x7 global support, professional services, and training help our customers control risk, manage costs, and scale efficiently. With 16 offices worldwide, EDB serves over 5,000 customers, including leading financial services, government, media and communications, and information technology organizations. To learn about PostgreSQL for people, teams, and enterprises, visit [EDBpostgres.com](https://www.edbpostgres.com).

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