



JPMorganChase

EPAS Technical Deep Dive: Architecting for Portability, Performance, and Resiliency

January 2026

Speaker Introduction



Nick Ivanov

Resident Architect

Nick is a seasoned solutions architect at EDB. Since April 2022 he has brought extensive expertise in database architecture and analytics from a notable tenure at IBM from May 2010 to March 2022.

He holds a Dipl.-Ing. degree in computing systems and networks from Bauman Moscow State Technical University.



Connect on [**LinkedIn**](#)

Speaker Introduction



Matthew Chaddock

Snr Lead Software Engineer

Matt is a Senior Lead Software Engineer on the Infrastructure Platforms – Cloud Relational Databases team. He currently leads the Gaia Postgres Service software engineering team, based in Bournemouth, UK.

Matt joined JPMC in 2006 through the Graduate Programme after graduating from Bournemouth University. Over his tenure, he has worked extensively with a variety of database technologies, including Sybase, Oracle, MS SQL, and—most notably—Postgres, which remains his favorite.

Speaker Introduction



Sunita Behera

Lead Software Engineer

Sunita is a Lead Software Engineer with nearly 10 years of experience, specializing in Python, Django, and database platforms. She leads the Gaia Postgres Service within JPMorgan Chase's Infrastructure Platforms – Cloud Relational Databases team in Bournemouth, UK.

Since joining JPMC in 2019, Sunita has worked across the bank's database products—including Dbasnow, Moonraker, DBPortal, and now Gaia Postgres—delivering scalable, secure, high-performance services that enable teams across the firm.

Agenda

- Gaia Postgres Service Details
- PostgreSQL vs. EDB Postgres Advanced Server
- Extensions
- EPAS vs. AWS Aurora
- GPS and EPAS Roadmap for 2026

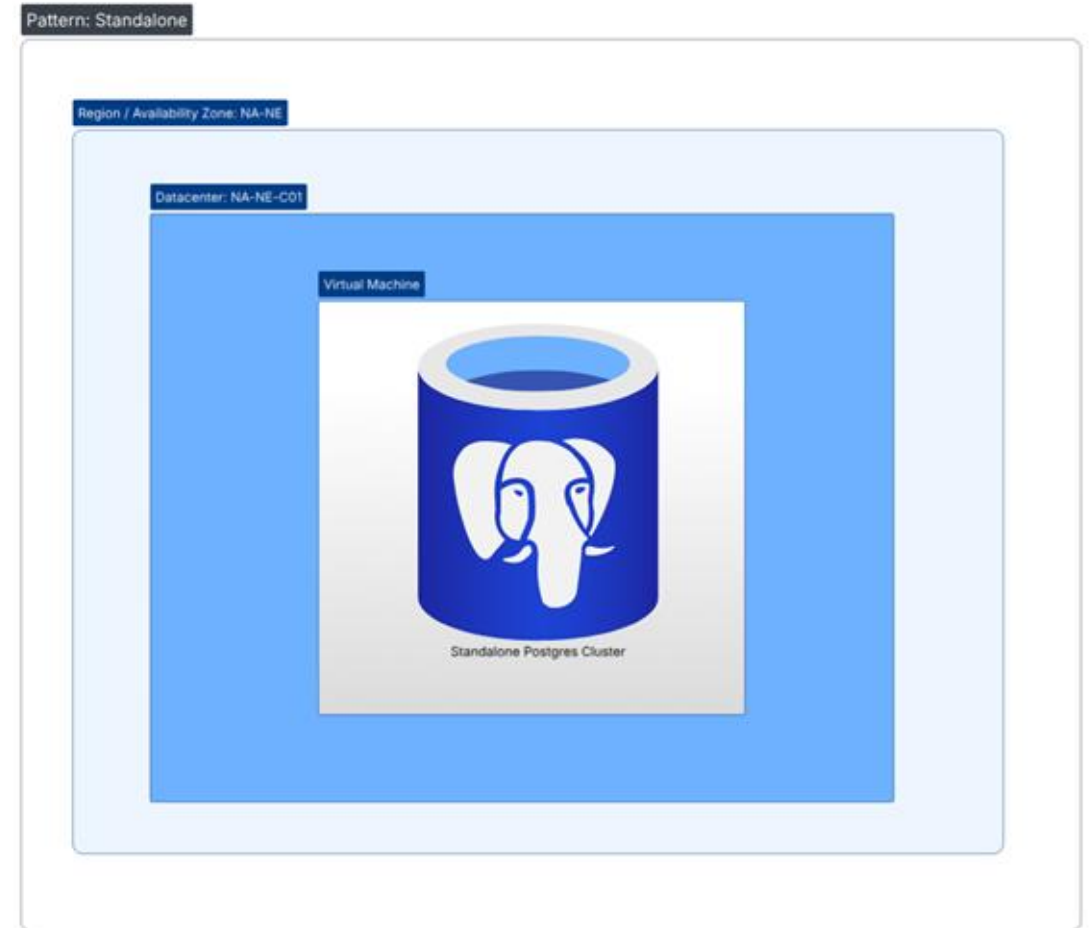
Gaia Postgres Service



JPMorganChase

Resiliency Patterns – Standalone (SA)

- **Available in DEV/UAT environments**
- **Single Data Centre deployment**
- **No resiliency required, for non-prod workload**
- **Perfect for spinning up a development environment with minimal footprint**

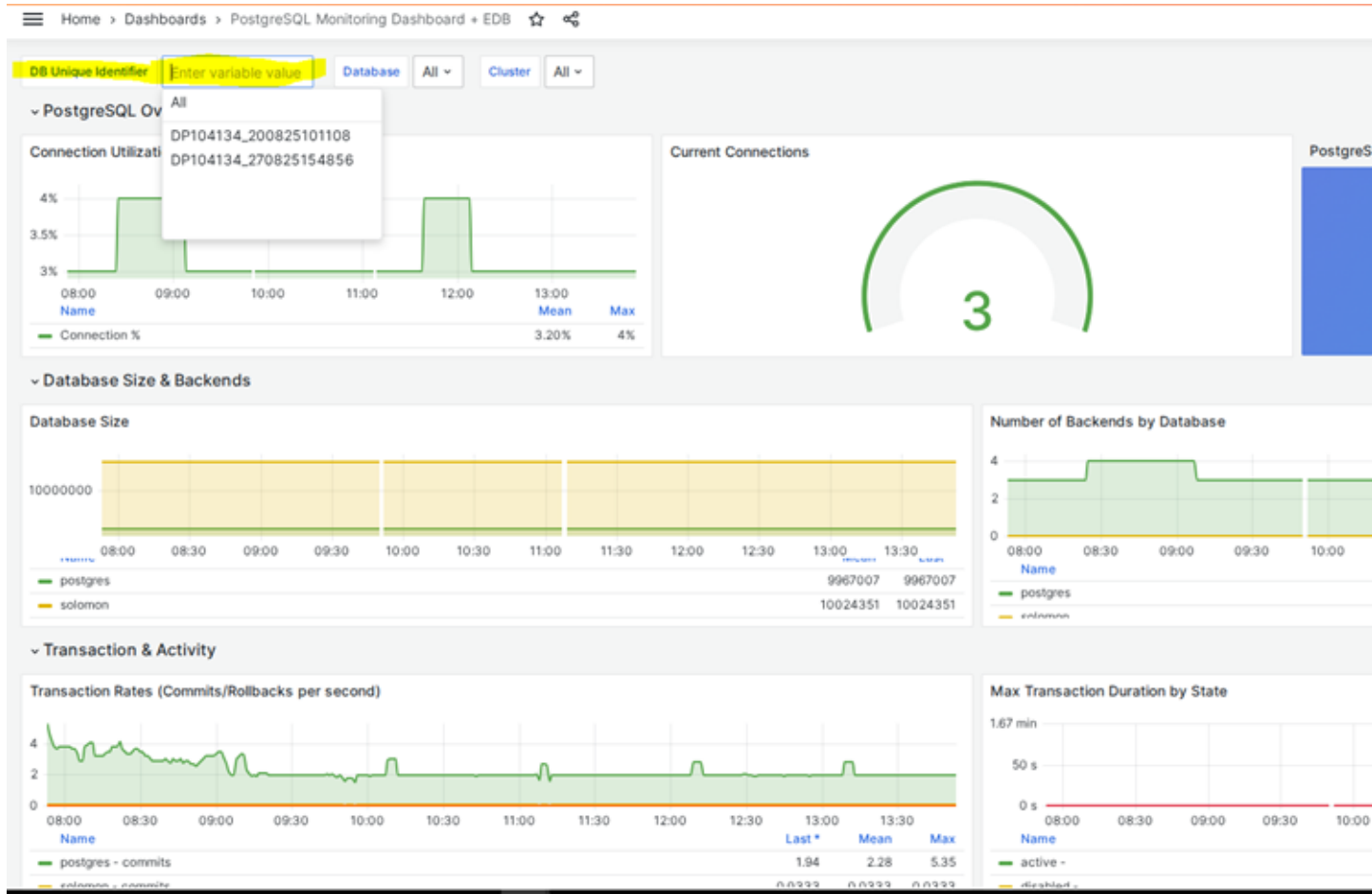


Gaia Postgres – Monitoring / Observability

- **Postgres Enterprise Manager (PEM)**



Performance Monitoring – Grafana Dashboards



- **Time series metrics published to Cortex**
- **Dashboard provided to download/import into Grafana to visualize key performance metrics**

EDB Postgres Advanced Server vs. PostgreSQL



JPMorganChase

Enterprise Postgres



- **Oracle compatibility:** Compatibility for schemas, data types, indexes, users, roles, partitioning, packages, views, PL/SQL triggers, stored procedures, functions, and utilities
- **Enterprise security:** Transparent Data Encryption, virtual private databases, password policy management, built-in auditing, data redaction, SQL injection protection, and procedural language code obfuscation
- **Developer productivity:** More than 200 prepackaged utility functions, user-defined object types, autonomous transactions, SPL debugger
- **DBA productivity:** Resource Manager (throttle CPU and I/O at the session level), instance and session wait event history, declarative policy management, automatic table partitioning
- **Performance:** Query optimizer hints, SQL Profiler, Query Advisor, dynamic resource tuning
- **Replication enhancements:** Enables EDB Postgres Distributed functionality such as Group Commit, Commit at Most Once, Eager replication, etc.

Extending Postgres Functionality



JPMorganChase

Postgres Extensions: Modern Functionality

Apache AGE	Graph database inside Postgres, fully ACID-compliant; use SQL and Cypher queries simultaneously
pgvector	Popular mechanism for storing vectors, such as ML model embeddings, for in-database similarity search
VectorChord	An alternative to pgvector with more dimensions, more efficient storage, and better indexing and search performance
EDB Analytics Accelerator	Query both Postgres and lakehouse data simultaneously; transparent tiered storage; extreme scalability with Spark
pg_search	Text search, loosely based on Apache Lucene
PostgreSQL Anonymizer	Declarative static and dynamic data redaction, data generalization

Postgres Extensions: Observability

EDB Wait States	Collect historical wait state statistics per session, per query.
EDB Query Advisor	Recommend indexes and multicolumn statistics based on the current workload.
EDB Stat Monitor, SQL Profiler	Collect and compare historical query execution statistics, detect execution plan drift.

Private and Public Cloud Integration



JPMorganChase

Postgres

- Applies to most Postgres-based DBaaSes
- Data migration
 - Dump/restore
 - Native logical replication (no downtime)
- Data synchronization
 - Native logical replication
 - Third-party CDC

Non-Postgres

- Oracle, MySQL, SQL Server
- Data migration
 - EDB Migration Toolkit
 - EDB Replication Server (CDC)
- Data synchronization
 - EDB Replication Server (CDC)
 - Third-party CDC

PostgreSQL, EPAS, and Amazon Aurora Compared

	PostgreSQL	EDB Postgres AI: Advanced Server	Amazon Aurora PostgreSQL
Deployment Flexibility and Portability	The most flexibility: Public and private cloud, bare metal, k8s		Platform lock-in, no self-managed deployments
TCO	\$ – Open source software, support by EDB	\$\$ – Up to 5x lower TCO than Aurora	\$\$\$ – High cost for enterprise features
High Availability	Standard HA – 99.99% uptime	Extreme HA with 99.999% uptime and 90+% PostgreSQL feature support using EDB Postgres Distributed	Standard HA – 99.99% uptime; 99.999% uptime possible with Aurora DSQL at the price of limited PostgreSQL compatibility
Security	Requires additional security tools and integrations	Enterprise security built in: Transparent Data Encryption (TDE) support, SQL injection protection, data redaction, password policies, etc.	Requires additional security tools and integrations
Database Modernization	EDB Migration Toolkit with limited compatibility	Fastest on-ramp to Postgres from legacy databases Oracle Compatibility Mode Migration Portal with SQL conversion tooling and AI-assisted chat interface	Self-service migration tooling with limited compatibility No Oracle compatibility mode; limited compatibility is available via open source extensions AWS Database Migration Service (DMS) and Schema Conversion Tool (SCT)
Postgres Support	True Postgres IQ 24/7 production-level break-fix Postgres support that differentiates database issues from cloud concerns		Support for service levels, not the database No break/fix support for the underlying database; support is only for the managed service itself

PostgreSQL, EPAS, and Amazon Aurora Compared

	PostgreSQL	EDB Postgres Advanced Server	Amazon Aurora PostgreSQL
Architecture	Tightly coupled compute and storage resources		Distributed, shared storage architecture, decoupled compute and storage resources
High Availability	Physical and logical replication (sync and async), limited bidirectional replication, open source failover automation	Physical and logical replication (sync and async), full-featured bidirectional replication (PGD), open source and EDB failover automation	Shared storage with physical replication (sync), logical replication (async), limited bidirectional replication, built-in failover automation
Maintenance	Open source tools must be scripted	Open source tools, Ansible-based automation platform (TPA)	Managed service provides software and OS patching and upgrades, backups, blue-green deployment, etc.
Extensibility	Open source extensions	Open source and EDB extensions	Limited list of supported open source extensions

GPS and EPAS Roadmap for 2026



JPMorganChase

Roadmap: Postgres 18

- Asynchronous read I/O support
 - Two to three times (2x–3x) better read performance
- OAuth
 - Client protocol support and server-side validators (Keycloak, Okta, etc.)
- SQL compatibility
 - Temporal primary keys, unique constraints, and foreign keys
 - Virtual generated (computed) columns
- Performance enhancements
 - B-tree index skip scan, new optimizer tricks
- Oracle compatibility enhancements
 - Extended SQL and built-in packages support

Thank You