



Agentic Engineering, Agentic Analytics and Agentic Operations with Postgres

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About Me

- ✓ Former engineer; founder and CEO across six startups
- ✓ Co-invented web services and web APIs at webMethods
- ✓ Java /C developer to public company CEO (for 20 quarters)
- ✓ Co-founder and chairman at EnterpriseDB
- ✓ Co-founder and CEO at pgEdge



About pgEdge

- ✓ Provider of Postgres infrastructure for Agentic AI and enterprise applications, especially those needing:
 - High availability
 - Data sovereignty and/or flexible deployment across cloud and on-premises
- ✓ 100% Postgres, no forks, no “Postgres compatible”
- ✓ All pgEdge Postgres-related IP is open source (Postgres license)
- ✓ Strong engineering team, includes 8 Postgres contributors

Agentic AI Tooling for Postgres: Our Approach

Agentic Engineering

pgEdge Agentic AI Toolkit:
(MCP server, RAG server, pgvector,
Vectorizer, hybrid search)

Agentic Analytics

pgEdge Coldfront:
Unified hot & cold storage across
Postgres and Iceberg (on S3)

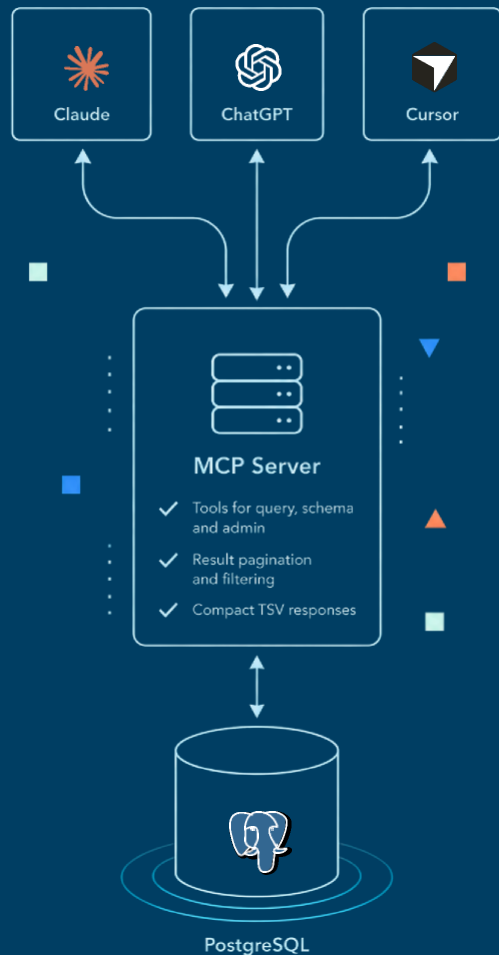
Agentic Operations

pgEdge AI DBA Workbench:
Agentic database monitoring and
administration

All are open source (PostgreSQL license) and work with any standard Postgres (v15+)

pgEdge Postgres MCP Server

- ✓ Fully functional Postgres MCP Server – works with any Postgres V14+
- ✓ Tools for query execution, schema analysis, advanced hybrid search (BM25 + MMR), resource reading, and more
- ✓ Security: TLS support, user and token auth, read-only transactions by default, lots of additional hardening
- ✓ Reduced token usage
- ✓ Actively developed and supported by a 100% Postgres company



pgEdge SafeSession: Guaranteed Read-only Access

- ✓ Enforces read-only access for specified database roles
- ✓ Configurable protection layers via SUSET GUCs
- ✓ Blocks DML, DDL, COPY FROM, GRANT/REVOKE, VACUUM/ANALYZE and more
- ✓ SET ROLE and SECURITY DEFINER functions cannot escape restrictions
- ✓ Supports Postgres V14+

Example

```
> safe_session.sql

CREATE EXTENSION pgedge_safesession;
ALTER SYSTEM SET pgedge_safesession.roles =
    'readonly_user, reporting_role';
SELECT pg_reload_conf();

-- As readonly_user:
SELECT * FROM orders;           -- OK
INSERT INTO orders VALUES (1); -- ERROR
CREATE TABLE tmp (id int);     -- ERROR
```

pgEdge Postgres MCP Server: Reducing token usage

- ✓ Compact result format: query results and schema info returned as TSV (tab separated values) versus JSON (major savings!)
- ✓ Server enforced results pagination: 100 rows by default
- ✓ Steering the model: tool descriptions say when to use (and not use) each tool, with guidance on row limits and filters.
- ✓ Progressive schema discovery: `get_schema_info` returns a summary and suggests narrower calls. Filters include `schema_name`, `table_name`, and `vector_tables_only`.

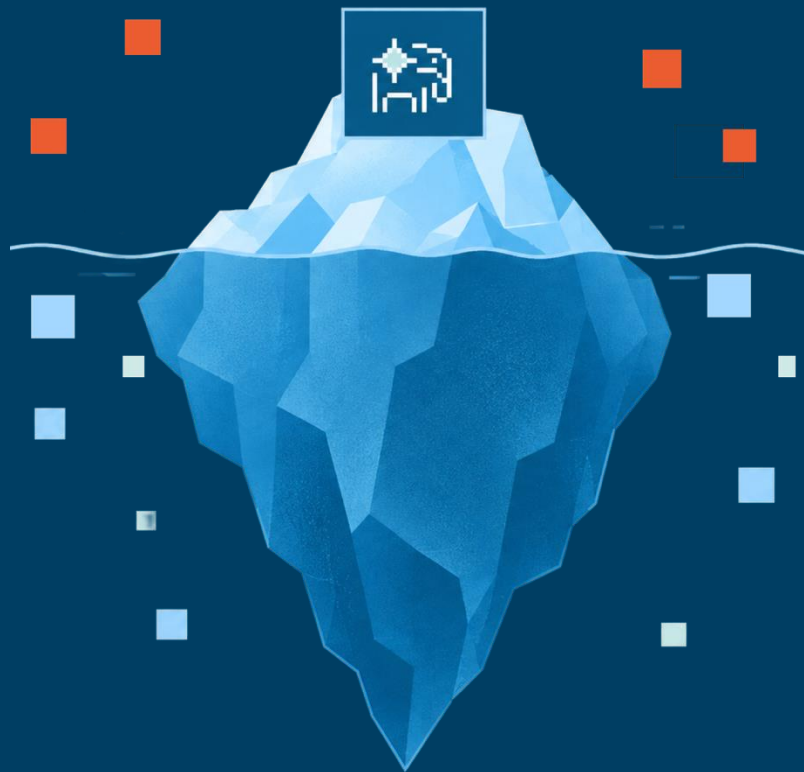
All this can reduce
MCP Server token
usage by up to 60%
(YMMV!)

Agentic Analytics: Some considerations

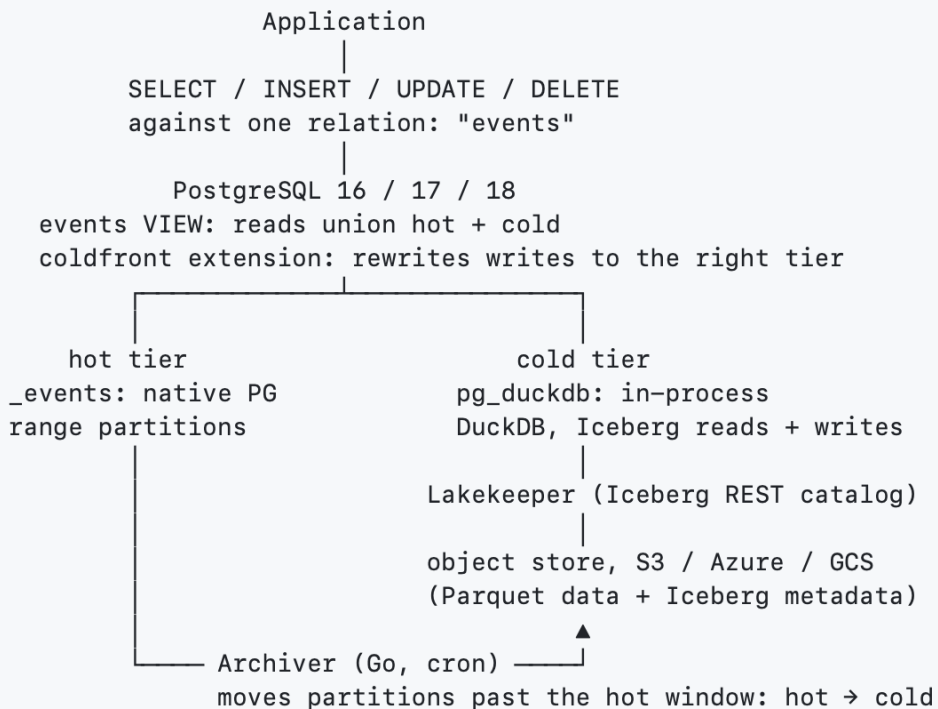
- ✓ Agents often need access to extensive historical data BUT it is archived or even ultimately deleted
- ✓ Keeping historical data around balloons storage costs. Best to have it on cheaper commodity storage.
- ✓ Coding agents know Postgres well . Big advantage if agents can access historical and current live data via the same single Postgres interface.
 - Combining analytical, transactional and new AI workloads on a single Postgres platform

Agentic Analytics with pgEdge Coldfront

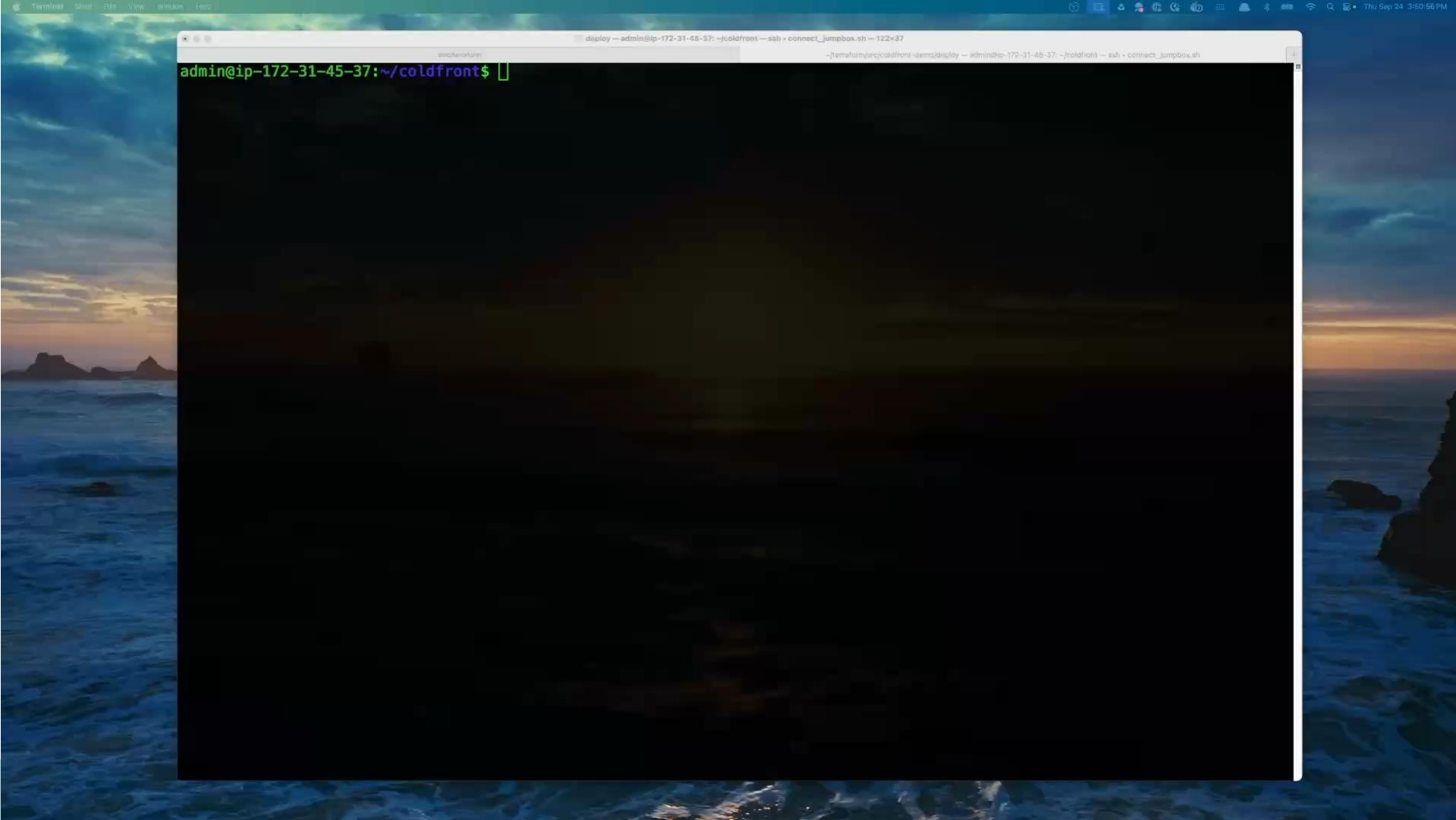
- ✓ Seamlessly manages hot and cold storage across Postgres and Iceberg (on S3 or equivalent)
- ✓ Hot and cold data accessible through same single set of Postgres table names: no code changes
- ✓ Cold data is fully writable
- ✓ Automatically moves aged data from Postgres working set to Iceberg tables (configurable `hot_period` and `retention_period`). No ETL pipelines!
- ✓ DuckDB used for cold data access, for columnar analytics performance



pgEdge Coldfront: How It Works



pgEdge Coldfront: Demo



```
Terminal  Shell  Edit  View  Window  Help
deploy -- admin@ip-172-31-45-37: ~/coldfront -- ssh - connect_jumpbox.sh -- 122x37
~/coldfront
admin@ip-172-31-45-37:~/coldfront$
```

Agentic Operations: pgEdge AI DBA Workbench

- ✓ Addresses explosion in number of databases to be managed, via agentic database monitoring and administration.
- ✓ Nobody quite ready to let agents autonomously manage production databases just yet. Need to build trust over time.
- ✓ Ellie (pgEdge agent) monitors your database estate, detects and diagnoses problems, and creates resolutions for human review
- ✓ Works with multiple different LLMs, including local models. Also has “no AI” option for monitoring with statistical anomaly detection only.



pgEdge AI DBA Workbench: How It Works

Three tier anomaly detection system:

Tier 1: Statistical Analysis (z-score)

- Fast, runs on every evaluation cycle
- Creates candidates for values exceeding threshold

|

v

Tier 2: Embedding Similarity (pgvector)

- Generates vector embeddings for anomaly context
- Searches for similar past anomalies
- May suppress based on similarity to false positives

|

v

Tier 3: LLM Classification

- Analyzes anomaly context with reasoning model
- Determines alert or suppress decision
- Provides reasoning for the decision

pgEdge AI DBA Workbench: Demo

pgEdge

AI DBA Workbench

17 online of 17 servers

Search servers...

SERVERS/CLUSTERS

17/17

AI Workbench Datastore

Postgres 14 Standalone

Postgres 15

3/3

Primary

Standby 1

Standby 2

Postgres 16

3/3

Primary

Standby 1

Standby 2

Postgres 17

3/3

Node 1

Node 2

Node 3

Postgres 18

6/6

Spock 1

Spock 1 - Standby 1

Spock 1 - Standby 2

Spock 2

Spock 2 - Standby 1

Spock 2 - Standby 2

1 groups - 6 clusters

Updated just now

SERVER

Primary

Primary

AI Overview

Server "Primary" is currently in a warning state with no servers reporting online status. Seven active alerts are present, consisting of four warnings and three informational alerts that require review. No critical alerts are currently active. There are no active maintenance blackouts and none scheduled within the next 24 hours. No events have been recorded in the past 24 hours, but the lack of online server status combined with multiple warning-level alerts indicates potential connectivity or monitoring issues that require immediate investigation.

Updated just now

HOST	PORT	DATABASE	USER	POSTGRESQL	OS	ROLE
pg16-primary	5432	postgres	postgres	16.15 (Debian 16.15-1.trixie)	Debian GNU/Linux 13 (trixie)	Standalone

Event Timeline

6

Config HBA Ident Restart Alert Cleared Acked Extension Blackouts

1h 6h 24h 7d 30d Custom

07:29 AM

08:59 AM

10:29 AM

11:59 AM

01:29 PM

XID AGE

postgres 0.3%

template1 0.3%

template0 0.3%

testdb 0.3%

CACHE HIT RATIO

26.5 % (testdb)

100%

80%

60%

40%

20%

0%

03:53 PM

10:41 PM

05:29 AM

12:17 PM

TRANSACTIONS

1,200

900

600

300

0

03:53 PM

10:17 PM

04:41 AM

11:05 AM

CHECKPOINTS

1,500,000

1,000,000

500,000

0

03:53 PM

11:29 PM

07:05 AM

Active Alerts

7

Temporary Files Created

testdb

Threshold

3,705 files/hour exceeds threshold of 100 files/hour

Last updated just now

30 min ago

WARNING

High CPU Usage

Threshold

100 percent exceeds threshold of 80 percent

Last updated just now

9 hours ago

WARNING

Low Cache Hit Ratio

testdb

Threshold

26.39 percent below threshold of 80 percent

Last updated just now

19 hours ago

WARNING

Introducing pgEdge Starfleet ...

Postgres at AI speed. Anywhere it needs to run.

Enterprise-grade and AI-first Postgres from first prototype to production, wherever you need to deploy.



Start your free trial today
at app.pgedge.com

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- ✓ Build fast on cloud, deploy anywhere:
 - Our cloud, your cloud, on-premises, air-gapped
- ✓ Comprehensive AI tooling:
 - MCP server, RAG server, PostgREST API
- ✓ Fast copy-on-write database branching
 - Without a replacement or proprietary storage layer
- ✓ Start with a 14 day free trial, scale with a credit card
- ✓ Upgrade path includes highly available multi-region clusters



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