Tipps für Migration, Management und Automatisierung in der modernen App-Entwicklung -

Wie Sie Datenbank-Performance steigern

Dirk Möller

Sales Modern Apps and Data
Nutanix

Borys Neselovskyi

Sr. Sales Engineer
EDB

Postgres - the top choice for developers

Postgres is the **top choice** as…
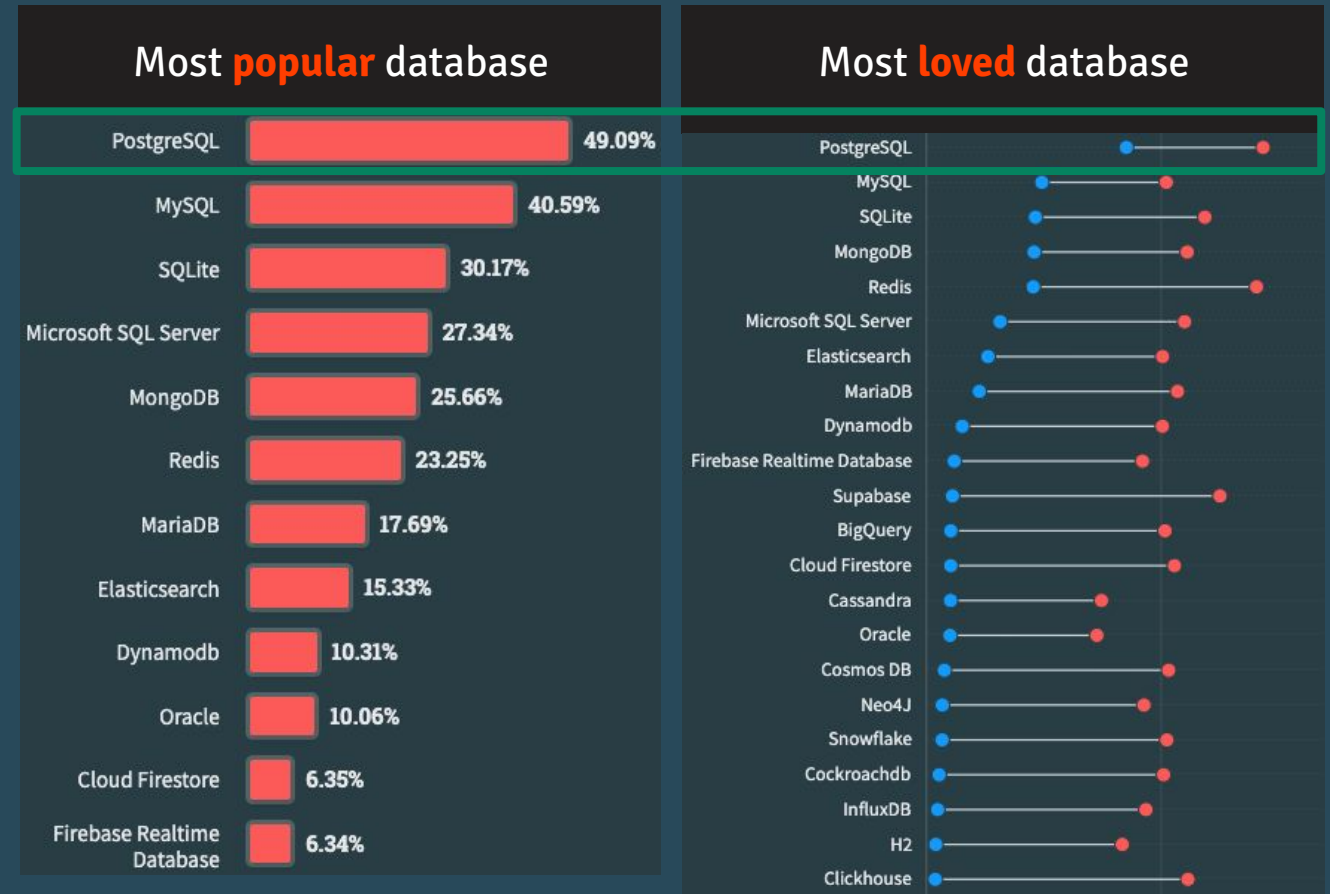
- most wanted
- most loved
- most used

…database among developers

Proprietary vendor databases are on decline
Open Source is on the rise

…90 % of companies today use OSS*

*Source: GitHub Octoverse Survey

Most **popular** database

PostgreSQL	49.09%
MySQL	40.59%
SQLite	30.17%
Microsoft SQL Server	27.34%
MongoDB	25.66%
Redis	23.25%
MariaDB	17.69%
Elasticsearch	15.33%
Dynamodb	10.31%
Oracle	10.06%
Cloud Firestore	6.35%
Firebase Realtime Database	6.34%

Most **loved** database

PostgreSQL
MySQL
SQLite
MongoDB
Redis
Microsoft SQL Server
Elasticsearch
MariaDB
Dynamodb
Firebase Realtime Database
Supabase
BigQuery
Cloud Firestore
Cassandra
Oracle
Cosmos DB
Neo4J
Snowflake
Cockroachdb
InfluxDB
H2
Clickhouse

Source: Stack Overflow 2024 Developer Survey

Who is EDB?

1500+ **Enterprises and Growing**
Long-term customers and deep Postgres capabilities.

79 **Countries around the World**
Global footprint and employee base.

Millions **of people using Postgres in the world**
EDB deeply understands Enterprise Postgres needs.

3 of 7 **Postgres Core Team Members,**
7 Committers, 40+ Contributors
EDB is the leading Postgres community contributor.

27% **of Postgres Code Contributed in 2023**
Driving the innovation and foundation of Postgres.

>300 **Dedicated Postgres engineers**
Unparalleled expertise in Postgres.

Nutanix At-A-Glance

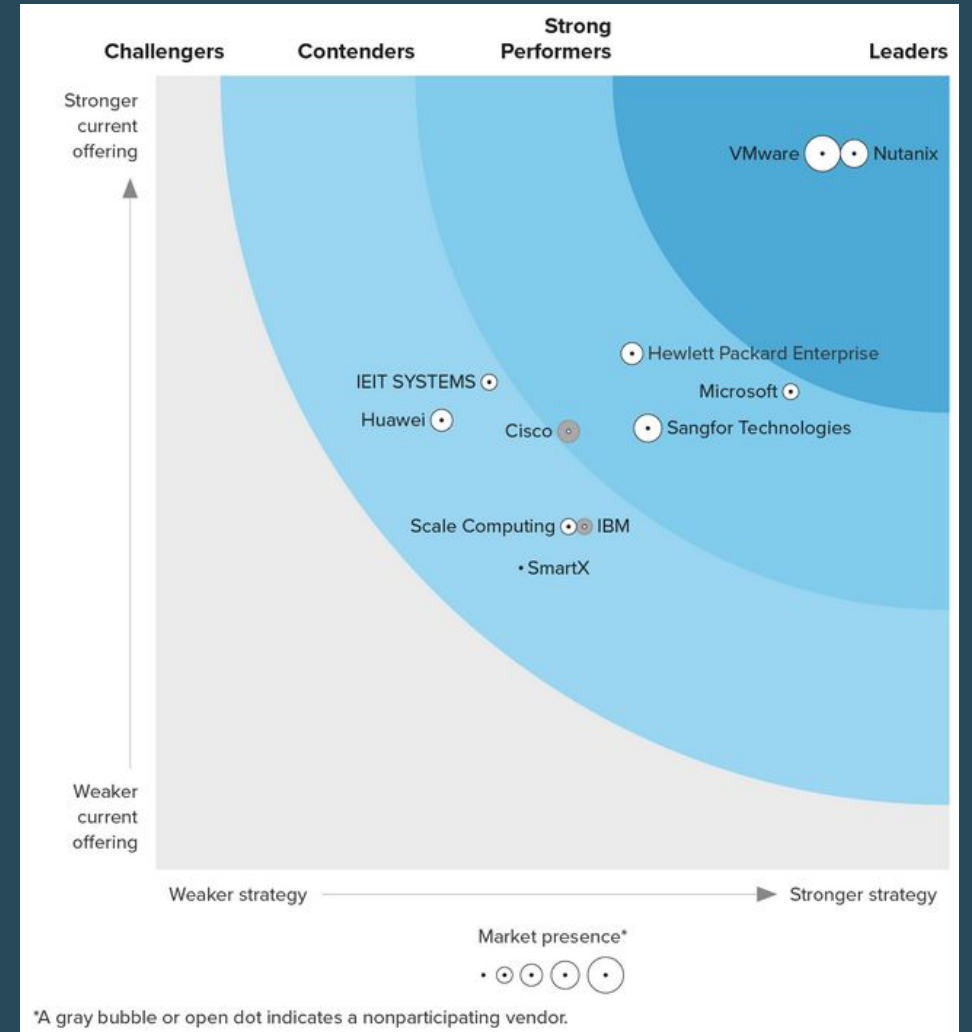**FY24 Revenue: $2.15B**

Employees: 7.500+

26.5K+ Global Customers
57% of Fortune 500 are NTNX customers

Focused on Top Vertical Markets
Including Finserv, Healthcare, Government, Education, and Retail

90+: Best-In-Class Net Promoter Score (NPS) Dedicated to customer success

Source: Forrester Wave™: Hyperconverged Infrastructure, Q4 2023

Nutanix Cloud Platform:
One Platform for Hybrid Multicloud

Enterprise Apps	Modern Apps	Analytics AI/ML	Databases	Desktops

Unified Control Plane

Federated Management
APIs | LCM | IAM

Nutanix Cloud Manager
Intelligent Operations | Self-Service | Cost | Security Operations

Data Governance
Security | Privacy | Compliance

Storage Services
(Files, Objects, Block)

Data Services for K8s

Database Services

Hyperconverged Infrastructure (HCI) – Software-Defined

Virtual Compute, Block Storage, Networking; Data Protection and Disaster Recovery; Security

Choice of hypervisor: Nutanix AHV, VMware, Hyper-V   Choice of Kubernetes

AI Enabled Edge   Private Cloud   Hosted Cloud

Extension to Public Cloud

Application and data portability

Nutanix software is hardware agnostic

aws   Azure   MSPs

Databases Are Essential to Digital Success

Databases can be an **Enabler** or an **Obstacle** to…

Modern AppDev > **Time-to-Market** > **Happy Customers**

But Databases Are Hard…

Developers Slowed Down

Rely on others for database access, stifling innovation and encouraging shadow IT
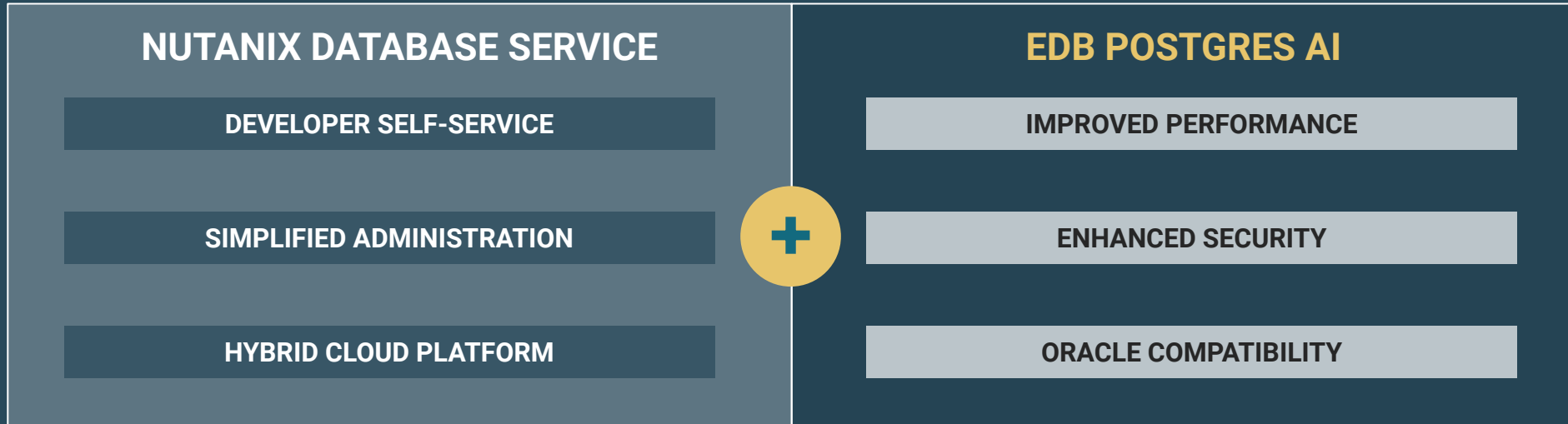
DBAs and Ops Teams Overwhelmed

Majority of time spent on routine administrative tasks and fire fighting, just trying to keep head above water

Database License Costs Skyrocketing

Expensive proprietary database license costs growing, straining already strained budgets

NDB + EDB Postgres AI
Multicloud Platform for the #1 database

NUTANIX DATABASE SERVICE

DEVELOPER SELF-SERVICE

SIMPLIFIED ADMINISTRATION

HYBRID CLOUD PLATFORM

+

EDB POSTGRES AI

IMPROVED PERFORMANCE

ENHANCED SECURITY

ORACLE COMPATIBILITY

Key use cases

App Modernization: Accelerate and de-risk migrations from Oracle to Postgres

Secure Open Source: Provide easy access to enterprise-grade Postgres
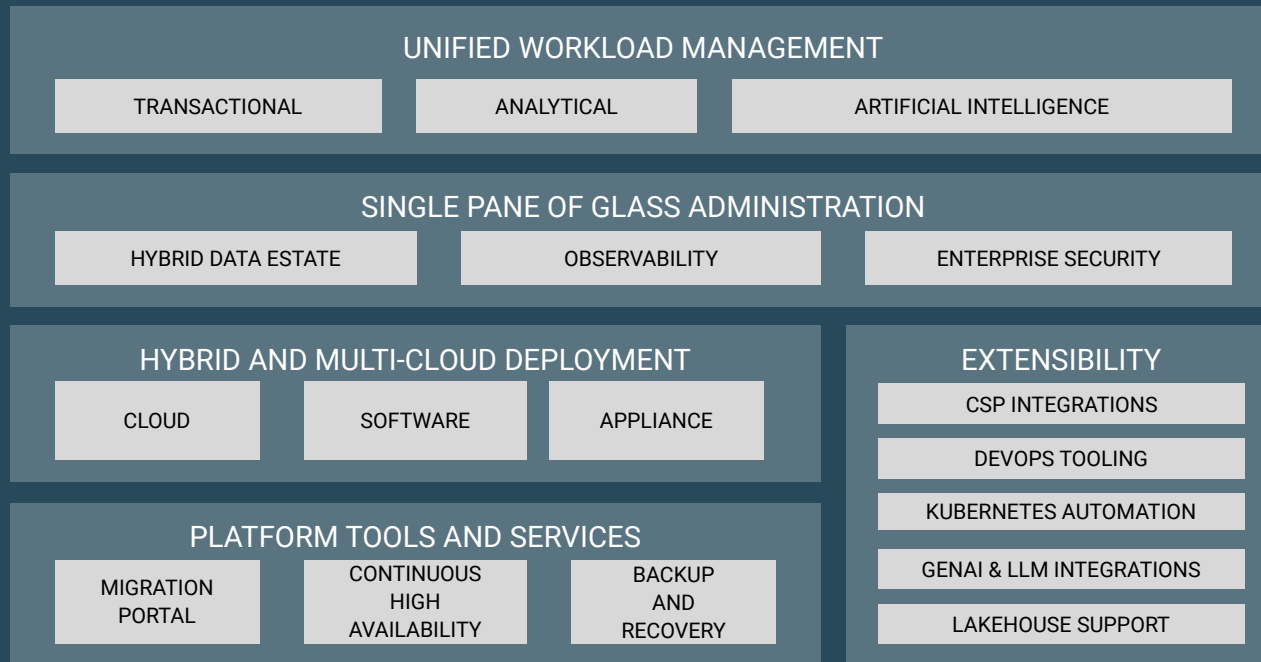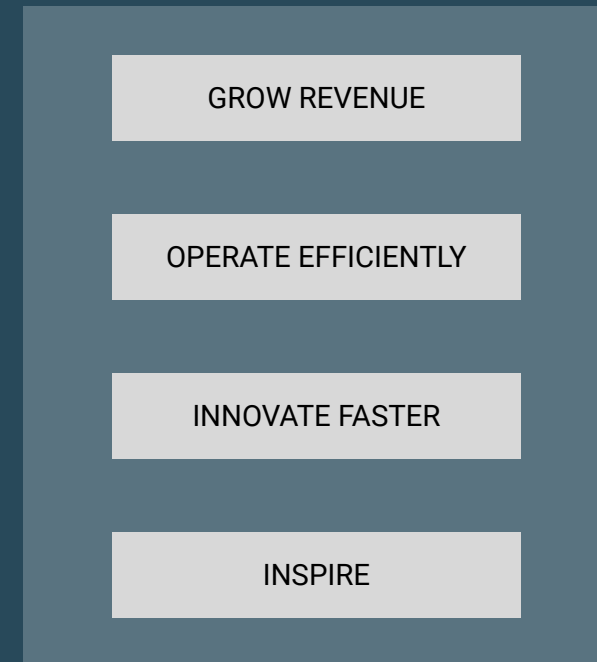
EDB Postgres AI

Helping customers grow revenue, operate efficiently, innovate faster, and inspire their industries
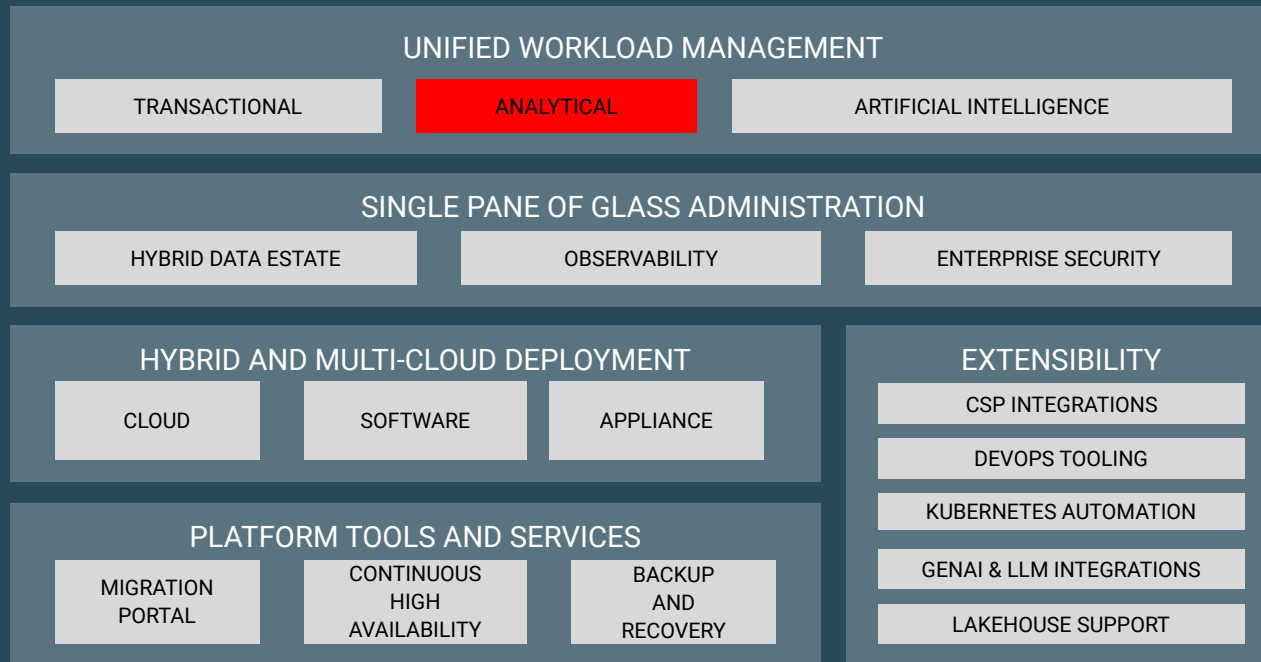
Sovereign Data & AI Platform

UNIFIED WORKLOAD MANAGEMENT

| TRANSACTIONAL | ANALYTICAL | ARTIFICIAL INTELLIGENCE |

SINGLE PANE OF GLASS ADMINISTRATION

| HYBRID DATA ESTATE | OBSERVABILITY | ENTERPRISE SECURITY |

HYBRID AND MULTI-CLOUD DEPLOYMENT

| CLOUD | SOFTWARE | APPLIANCE |

EXTENSIBILITY

- CSP INTEGRATIONS
- DEVOPS TOOLING
- KUBERNETES AUTOMATION
- GENAI & LLM INTEGRATIONS
- LAKEHOUSE SUPPORT

PLATFORM TOOLS AND SERVICES

| MIGRATION PORTAL | CONTINUOUS HIGH AVAILABILITY | BACKUP AND RECOVERY |

Value Drivers

- GROW REVENUE
- OPERATE EFFICIENTLY
- INNOVATE FASTER
- INSPIRE

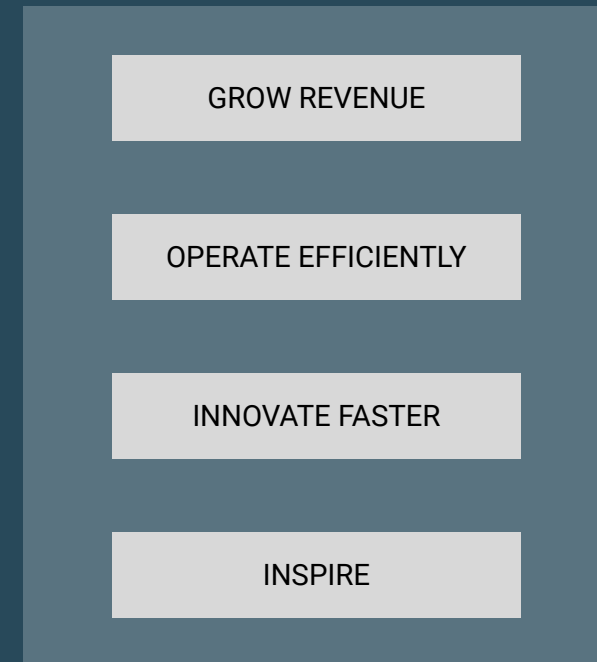# EDB Postgres AI

Helping customers grow revenue, operate efficiently, innovate faster, and inspire their industries

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EDB Postgres Lakehouse — Lowered Complexity

5X to 100X Faster Versus Classical Postgres
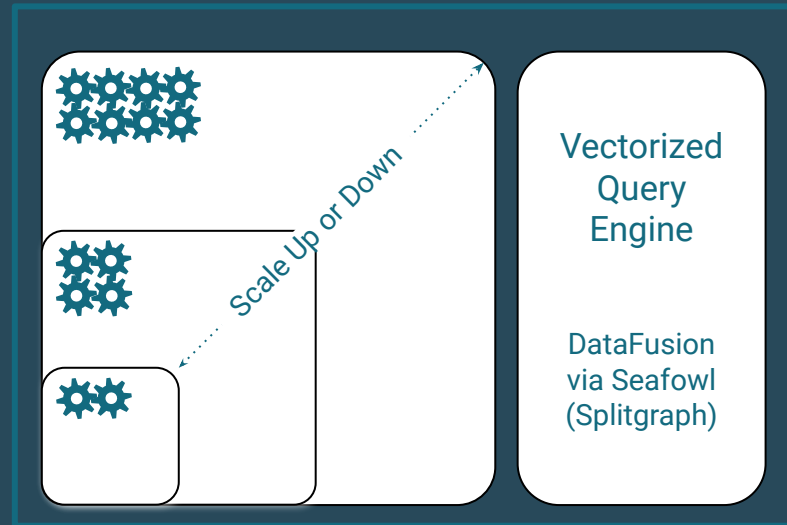
Easy to Query

TIBCO

Power BI

Dashboards

Reporting

Query via SQL

tableau

Qlik

IBM Cognos Analytics

Discover

Analysts

COMPUTE
100% Postgres

Scale Up or Down

Vectorized Query Engine

DataFusion via Seafowl (Splitgraph)

STORAGE
5X Compression, 18X Cheaper

Object Storage

Lakehouse Tables

Easy to Import

Data Sources

Sync

CSV

Oracle

Postgres

Metastore
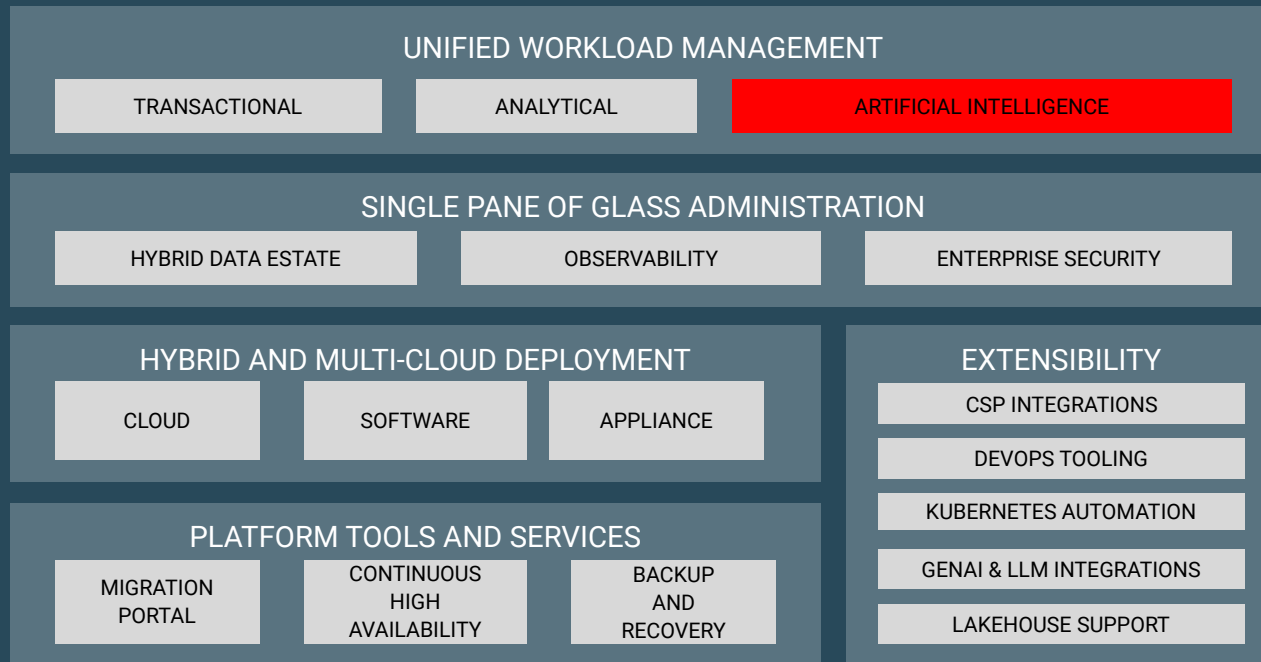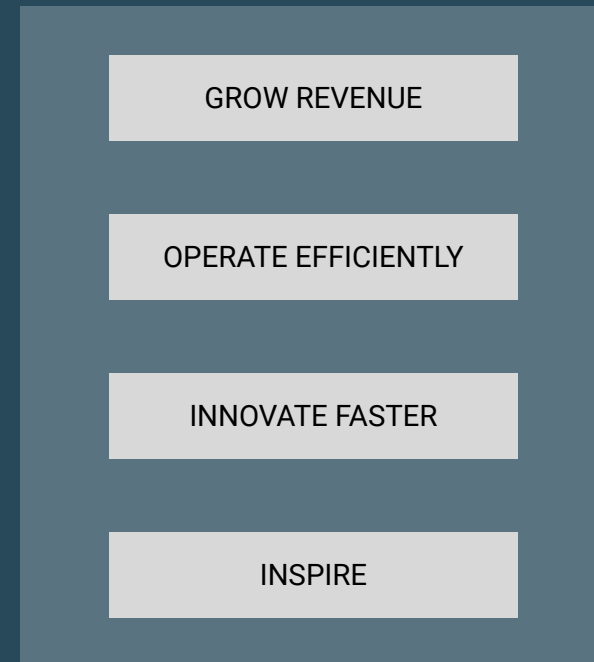Data Catalog + Supporting Infrastructure
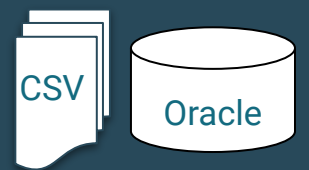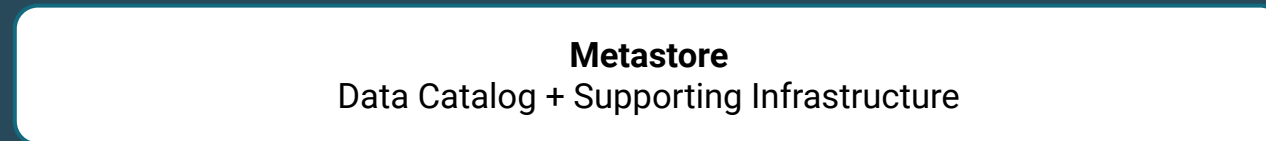
Easy to Find

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MIGRATION PORTAL	CONTINUOUS HIGH AVAILABILITY	BACKUP AND RECOVERY

Value Drivers

GROW REVENUE

OPERATE EFFICIENTLY

INNOVATE FASTER

INSPIRE

What is AIDB?
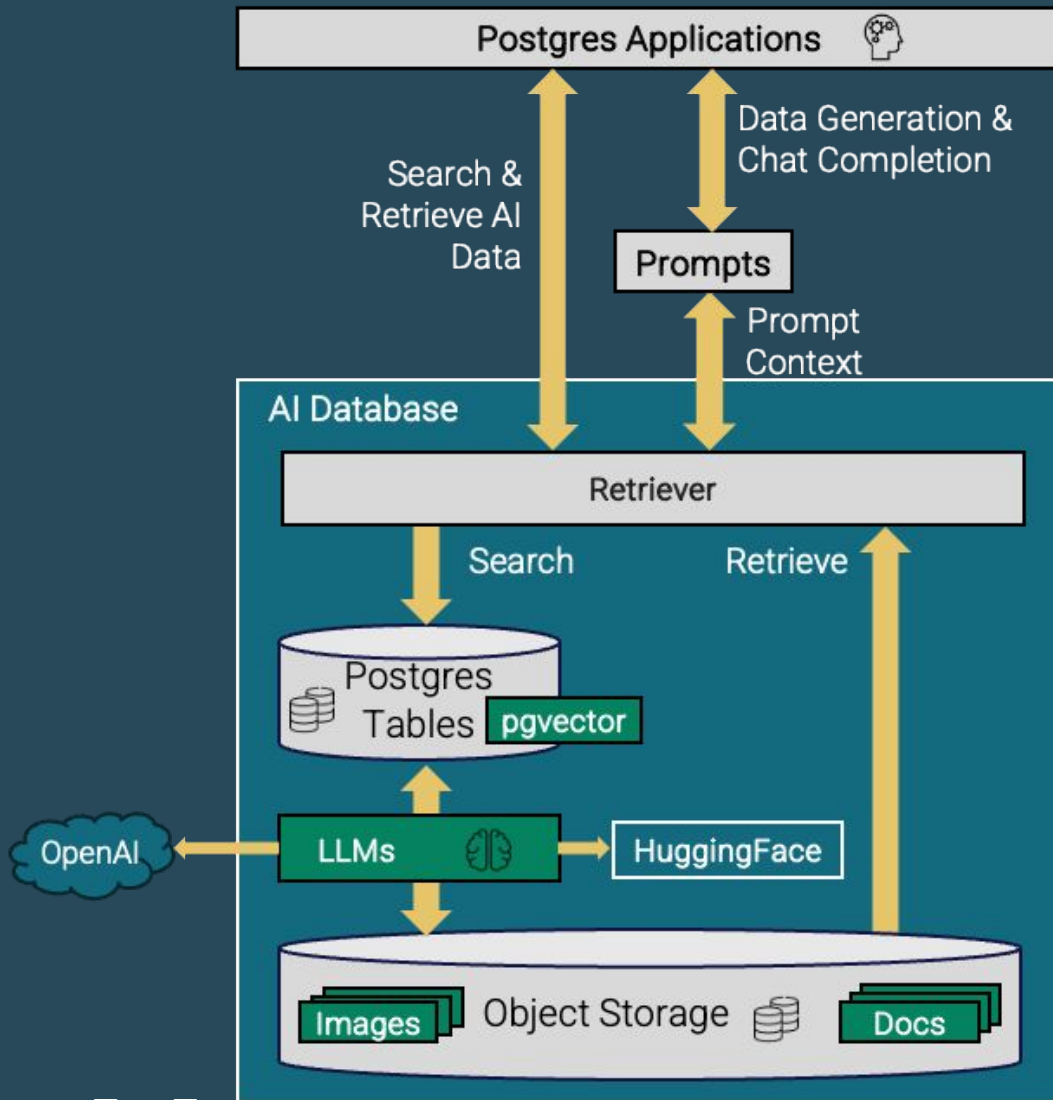
AIDB introduces the retriever function aidb.create_retriever() that facilitate advanced similarity searches by creating embeddings for AI data stored either in PostgreSQL tables or in S3-compatible object storage.

This enables AI data management within the database, allowing the storage, searching, and retrieval of AI data, including text and images.
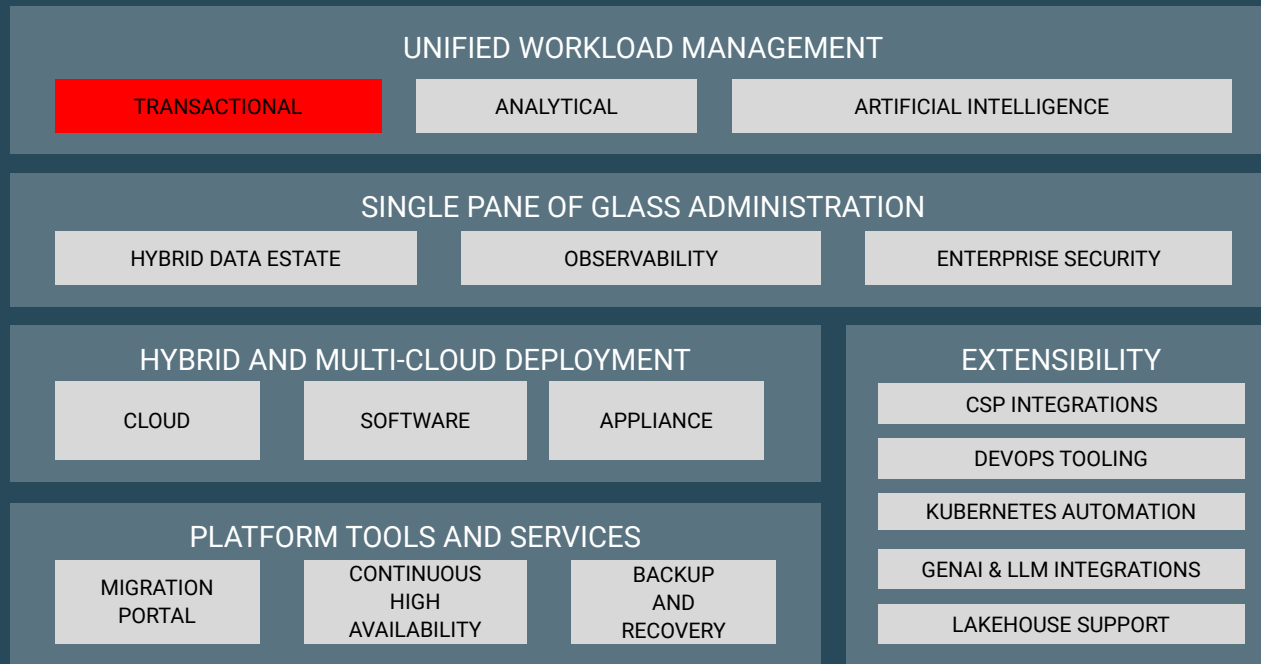
Value proposition:

- AiDB reduces code complexity and bug probability e.g 132 lines of code without AiDB vs 5 lines of code with AiDB

- Simplicity: Instead of customers having to piece together various solutions, we're offering a single, integrated enterprise solution for AI data management.
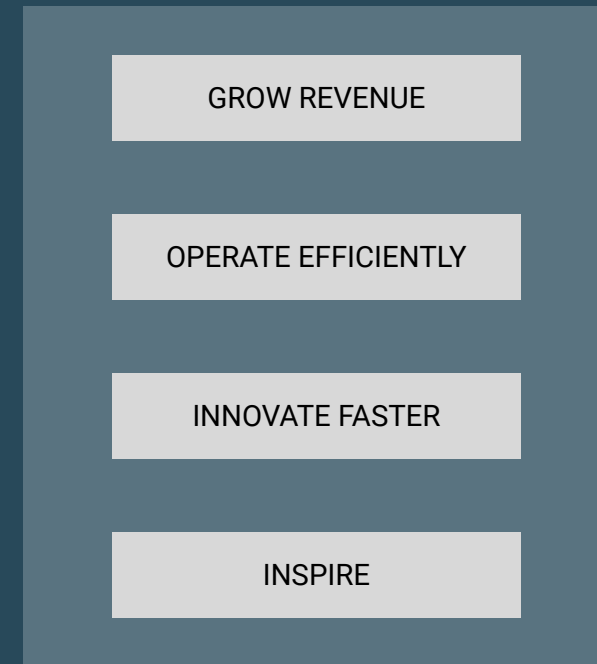
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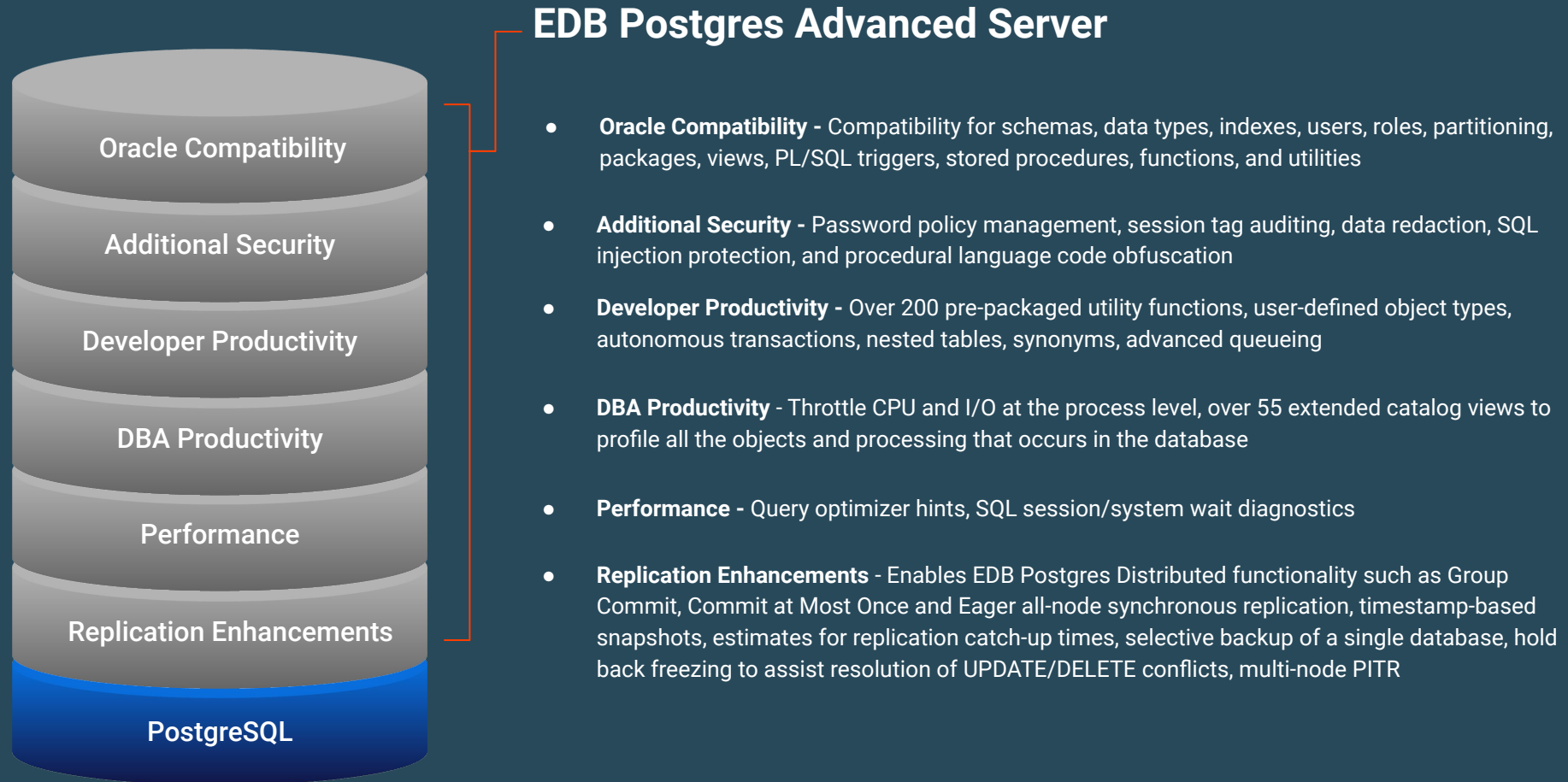
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EDB POSTGRES ADVANCED SERVER

EDB Postgres Advanced Server

- **Oracle Compatibility -** Compatibility for schemas, data types, indexes, users, roles, partitioning, packages, views, PL/SQL triggers, stored procedures, functions, and utilities

- **Additional Security -** Password policy management, session tag auditing, data redaction, SQL injection protection, and procedural language code obfuscation

- **Developer Productivity -** Over 200 pre-packaged utility functions, user-defined object types, autonomous transactions, nested tables, synonyms, advanced queueing

- **DBA Productivity -** Throttle CPU and I/O at the process level, over 55 extended catalog views to profile all the objects and processing that occurs in the database

- **Performance -** Query optimizer hints, SQL session/system wait diagnostics

- **Replication Enhancements -** Enables EDB Postgres Distributed functionality such as Group Commit, Commit at Most Once and Eager all-node synchronous replication, timestamp-based snapshots, estimates for replication catch-up times, selective backup of a single database, hold back freezing to assist resolution of UPDATE/DELETE conflicts, multi-node PITR

The stacked cylinder diagram shows from top to bottom: Oracle Compatibility, Additional Security, Developer Productivity, DBA Productivity, Performance, Replication Enhancements, PostgreSQL.

Oracle Compatibility

Database Oracle compatibility support

SQL extension support

Decode, NVL, Substr, NVL2, Date/time functions

DDL syntax support

PL/SQL support – native language

REF Cursors, Implicit and explicit cursors

Looping, variable declarations, conditional statements

Collections: Associative Arrays, Varrays, Nested tables

Pragmas

Named parameters

User Defined Exceptions

Explicit Transaction Control (within sp)

Tools

EDB*Plus – SQL*Plus look-a-like

EDB*Loader – SQL*Loader equivalent

Oracle-like Data Dictionary

ALL_, DBA_, USER_ views

Wait Events

System and session waits

Statspack-like reporting

PL/SQL supplied packages

18 DBMS

7 UTL

Data types

Blobs, Clobs, XMLTYPE, VARCHAR2, NUMBER, CHAR, Integer

Drivers

JDBC, ODBC, .NET with Oracle extensions

OCI & ProC compatible drivers

Features

Packages

Stored procedures

Functions

Triggers

Hints

Hierarchical Queries

Synonyms – Public and Private

Sequences

Rownum

Users/Roles

Dynamic SQL

Materialized Views

Partitioning

SECURITY ENHANCEMENTS AND FEATURES

Password policy management
DBA managed password profiles, compatible with Oracle profiles

Audit compliance
Track and analyze database activities and user connections

Virtual private databases
Fine grained access control limits user views

EDB/SQL protect
SQL firewall, screens queries for common attack profiles

Data redaction
Protect sensitive information for GDPR, PCI and HIPAA compliance

Code protection
Protects sensitive IP, algorithms or financial policies

Transparent Data Encryption

Encryption on the database level

- It encrypts any user data stored in the database system.
- This encryption is transparent to the user.
- User data includes the actual data stored in tables and other objects as well as system catalog data such as the names of objects.
- Does not require changes to application code
- The transparent part increases adoption but in the case of customers who prefer community PostgreSQL, their application could migrate from Extended to PostgreSQL just fine, they would just lose TDE
- Required in certain regulated industries
- More likely that prospects ask EDB if TDE is available
- Helps in strategic expansions where EDB is not currently used for sensitive applications

NDB -Building Blocks

Database VM

Software → **Base Software** - OS/DB SW "gold image" (provisioning/cloning/patching)

Compute → **VM Configuration** – vCPUs & Memory

Network → **NIC Configuration** – Enforce VLANs / Network Security

DB Parameters → **DB Instance Settings** – Engine-specific config

Time Machine

| SLA | → **Data Protection Retention** - How long to keep snapshots/logs
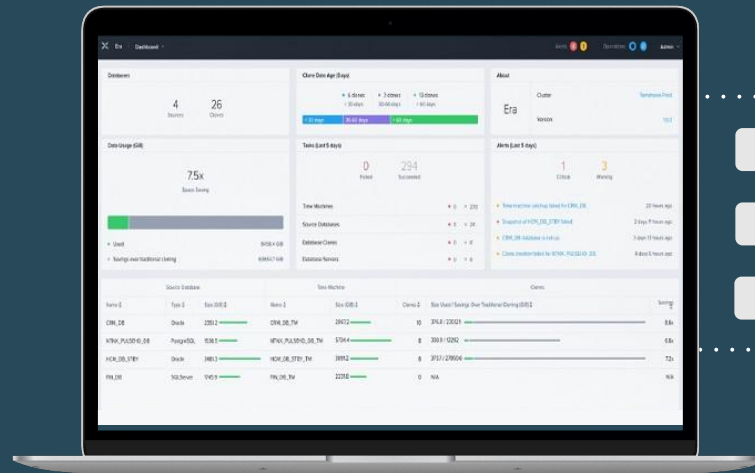
| Schedule | → **Frequency & Timing** - When to take snapshots/logs
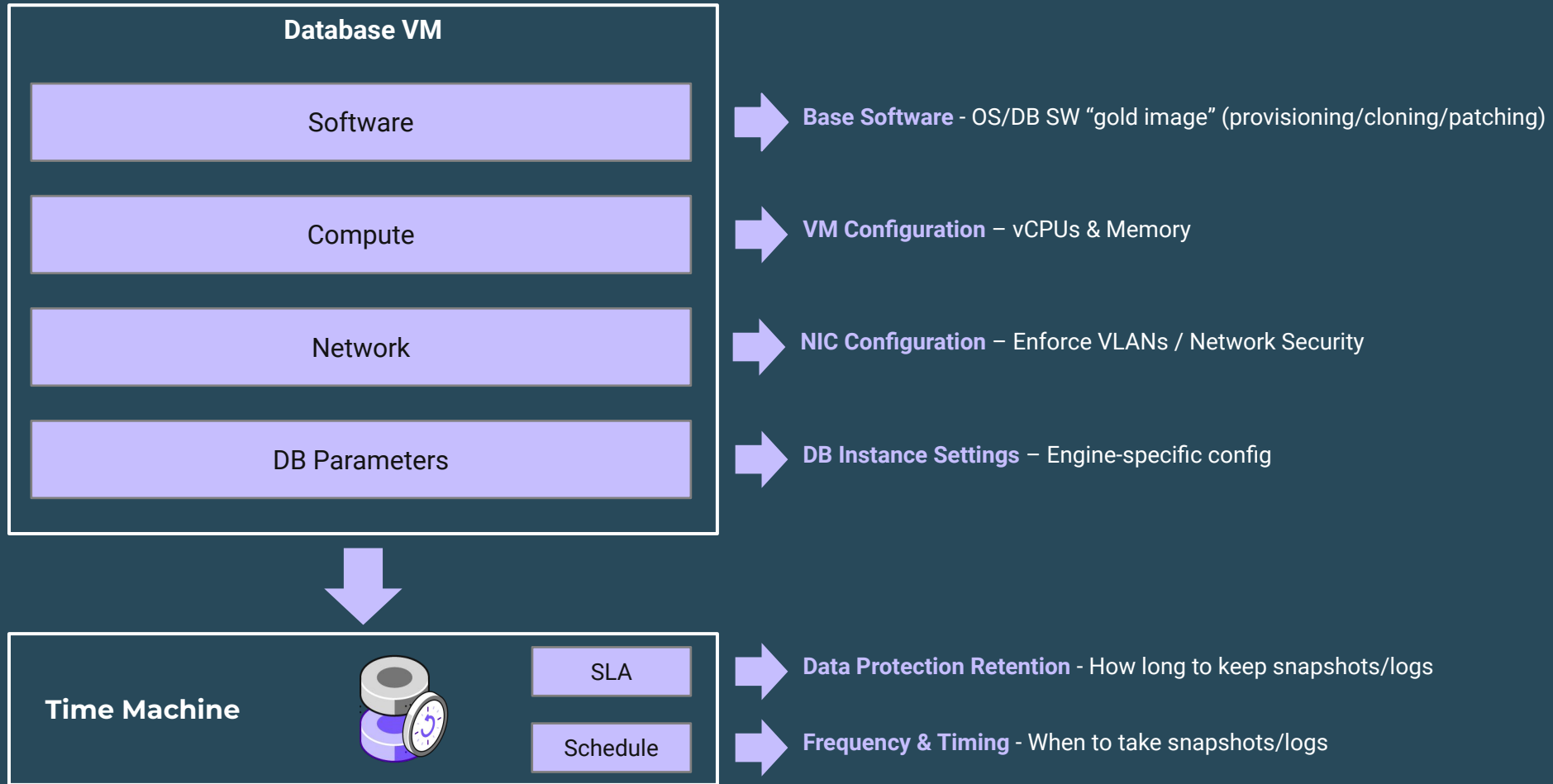
NOTE: Showing single DB per DB VM for simplicity

Typical Processes

Requests DB → DB consumer → Receives DB

Database Team → Infrastructure Team → Storage Team → Network Team → Backup Team
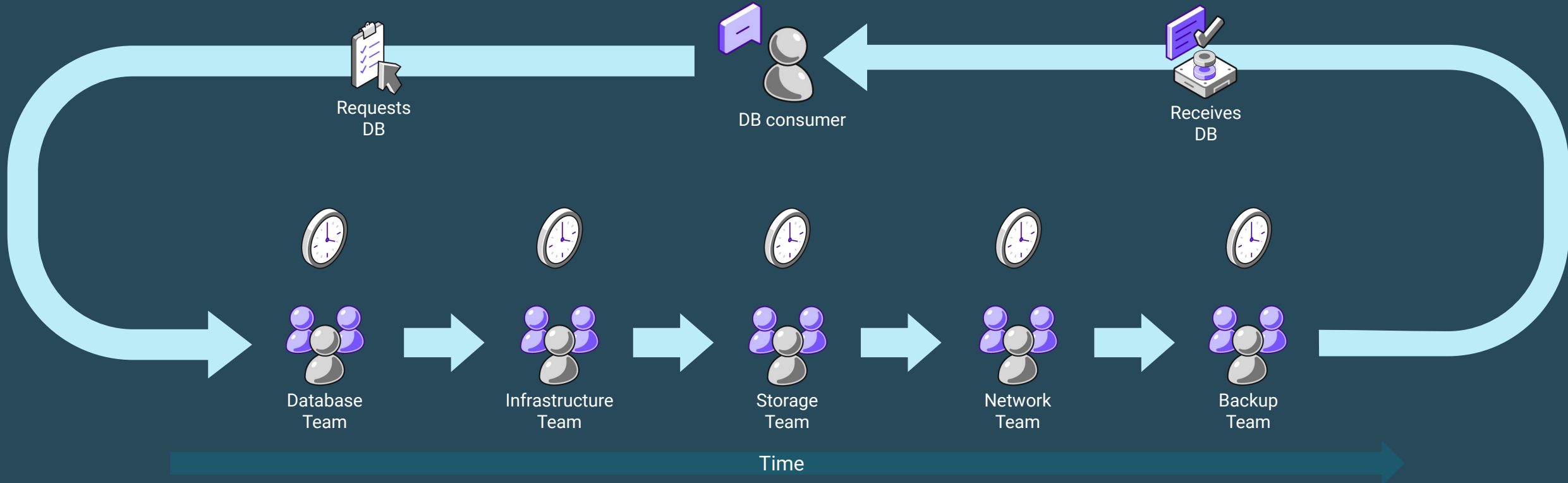
Time

- Unpredictable - hours, days, or weeks
- Multiple steps & teams
- Introduces friction & complex process

- Lowers business agility
- Decreases innovation rate
- Increases time to market

Simplified <u>and</u> Automated Processes with NDB

Requests
DB

DB consumer

Receives
DB

Fully Automated Process

API

CLI

Provision/Clone

Configure

Protect

Time

Time saved
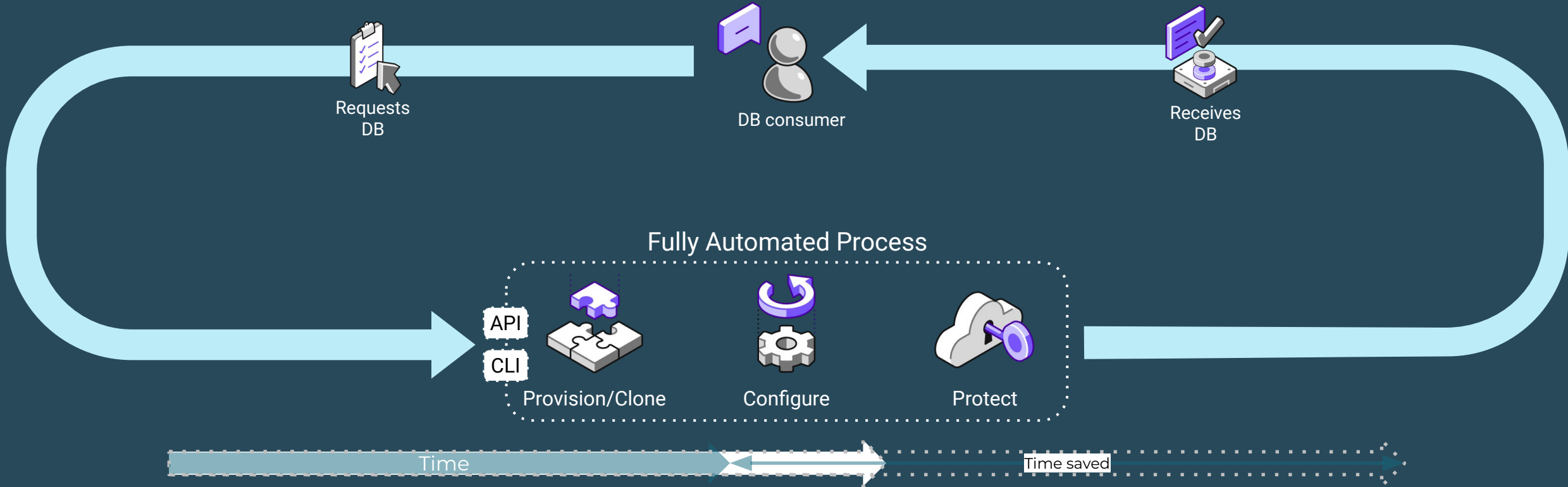
- Cloud-like self-service

- No provisioning required by IT teams

- CI/CD pipeline integration

- Empowers IT users

- Avoid human delays

- Integrate with existing platforms

Automate Database Provisioning

- Provision both Single instance and High Availability database clusters with best practices

- Easy integration with existing provisioning processes through REST APIs and script call outs

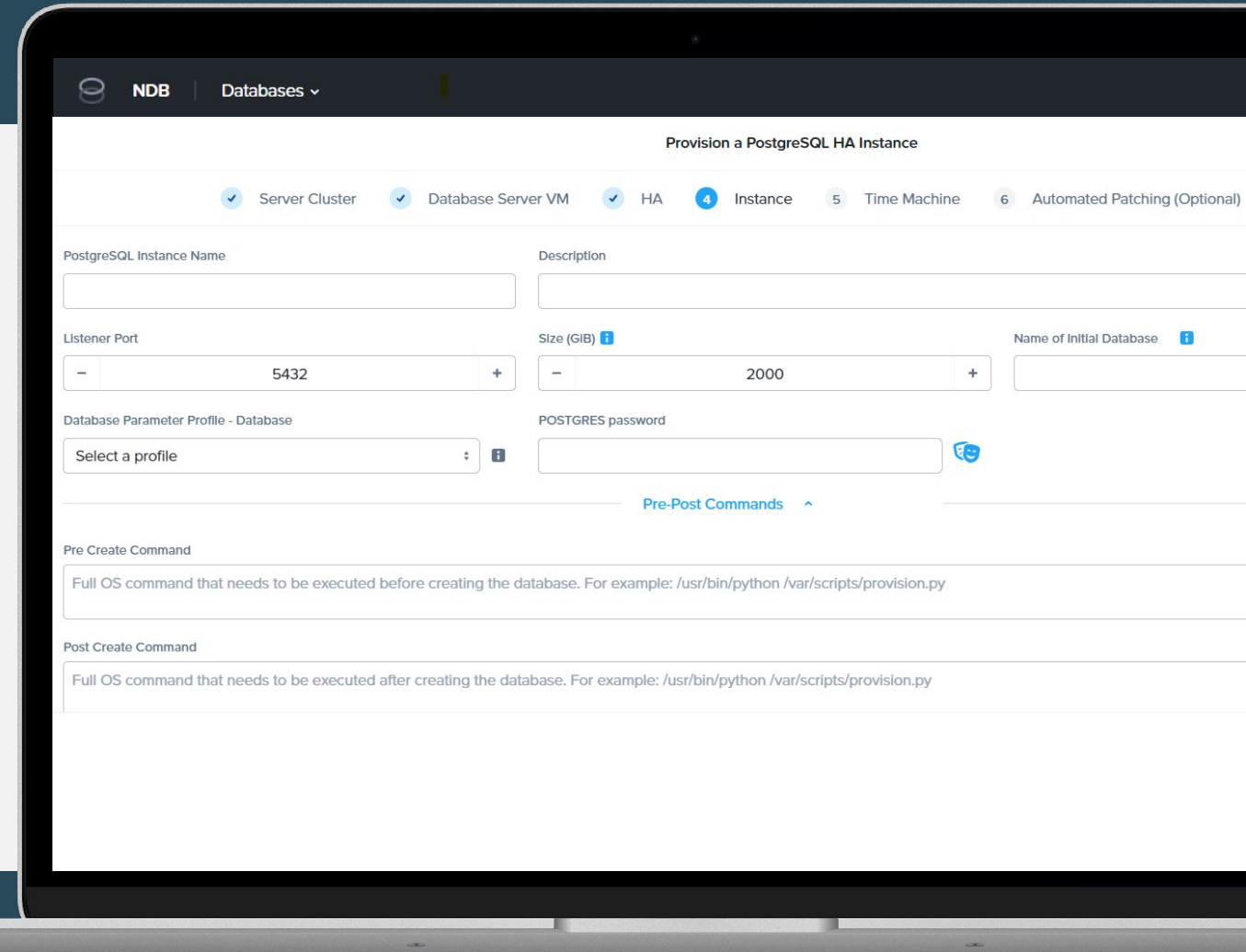- Maintain control with ability to customize your database images
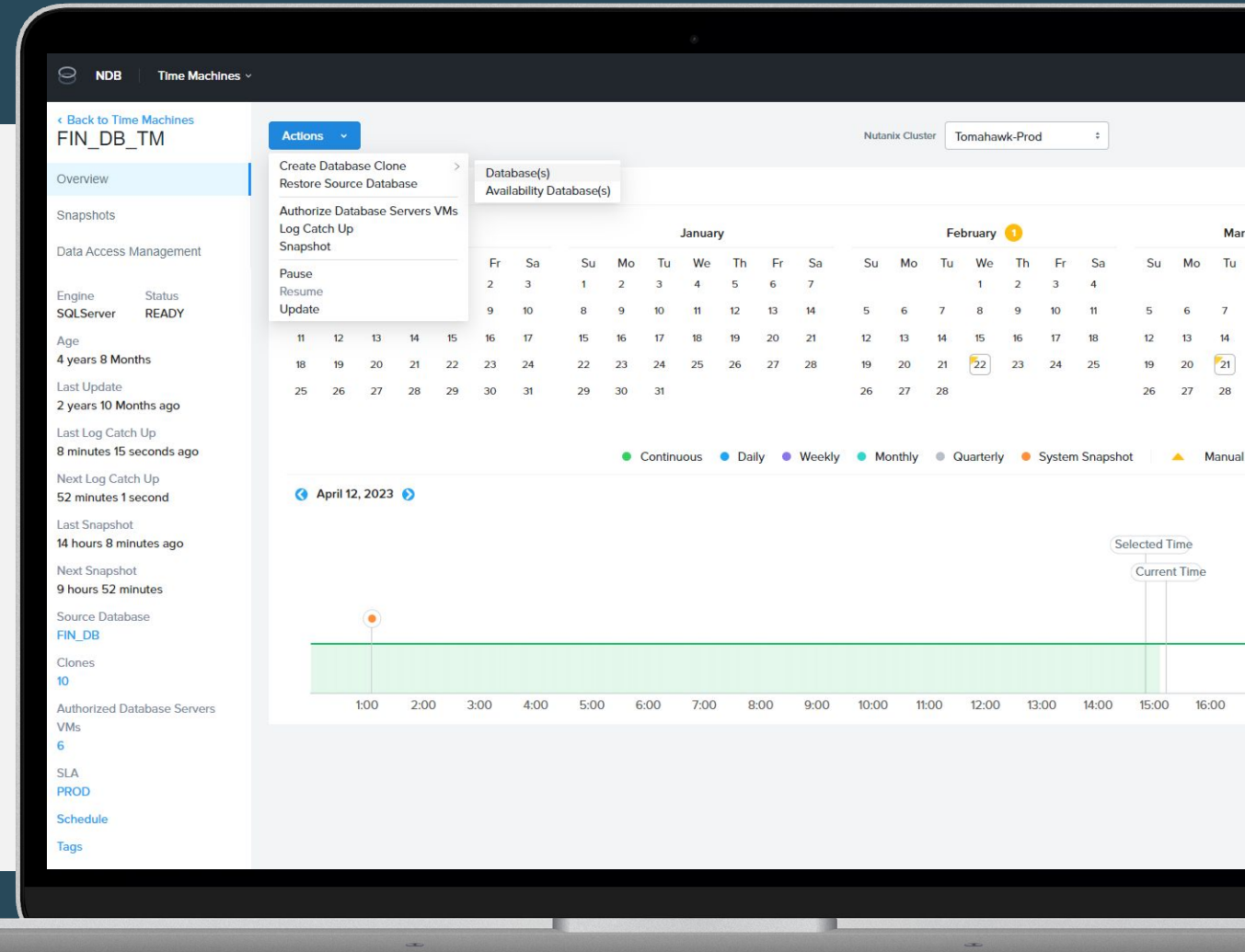
Power Modern Apps with EDB Postgres

- Developer self-service for EDB Postgres to accelerate application development

- Simplified EDB Postgres management, including automated patching, cloning, and backups.

- End-to-end support – from hardware through EDB Postgres software - from experts you can trust

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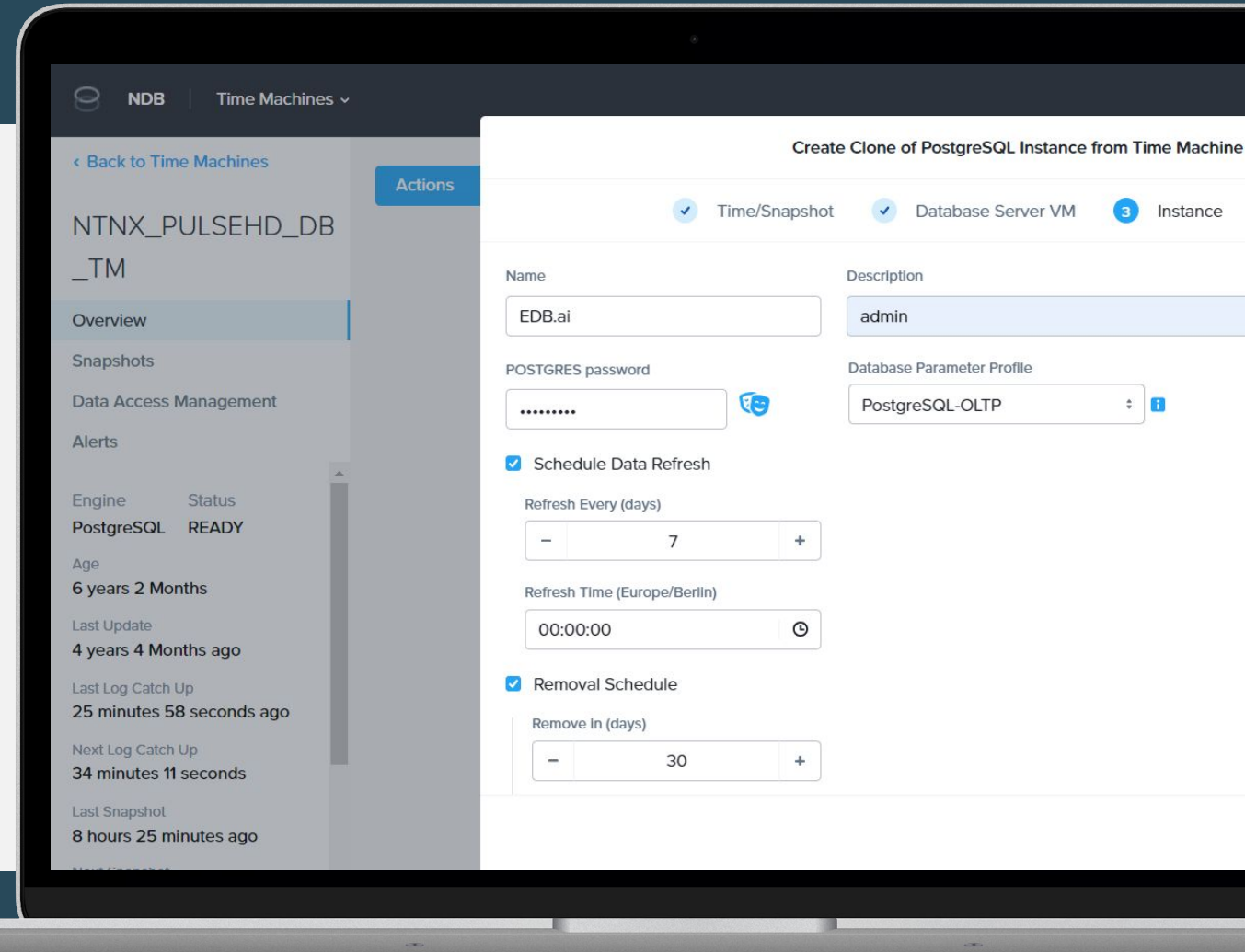
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Speed up Database Backup and Cloning

- Automated snapshot backups out-of-the-box with point-in-time-recovery (PITR)

- Create database clones quickly (few minutes)

- Create clones with minimal storage overhead across one or more Nutanix clusters

- Refresh clones to any point in time with an automated schedule

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Simplify Patching with Maintenance Windows

- Enable scheduled Operating System and Database patching maintenance windows

- Optionally opt into Operating system or Database patching

- Define a maintenance window and choose which DB servers are a part of that schedule
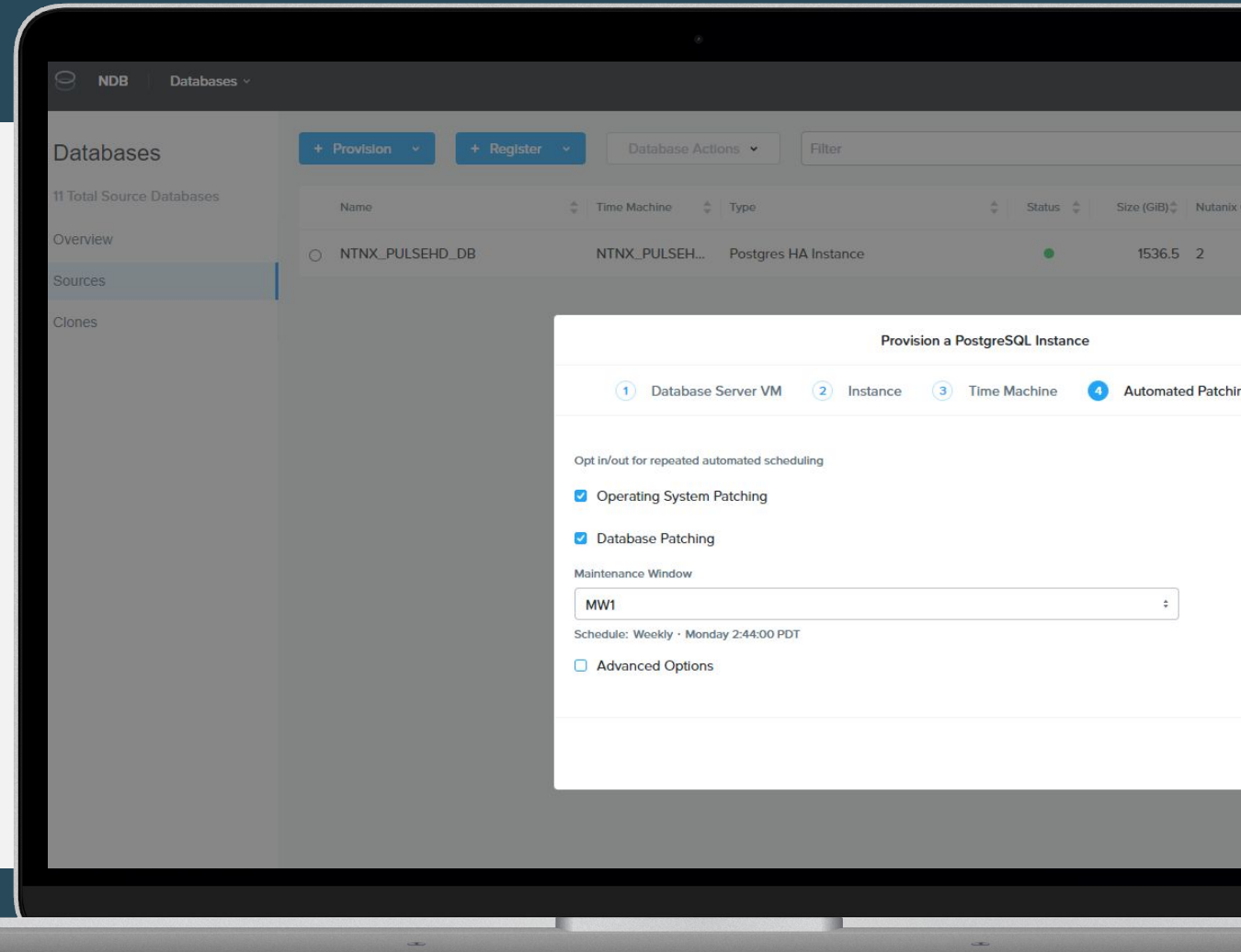
Database-as-Code

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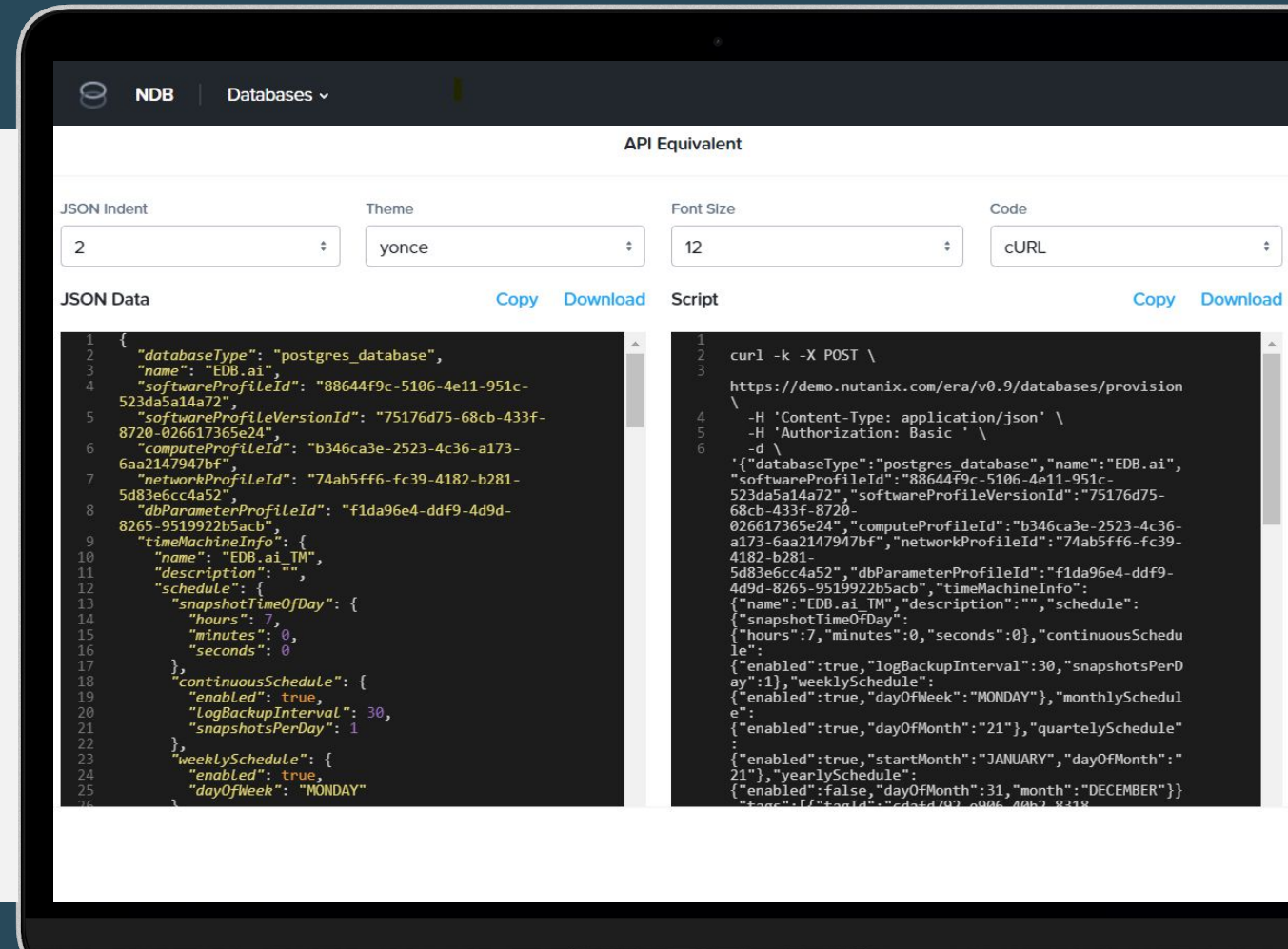
Summary: Make Databases an Enabler to Digital Success

Simplify Data Management and Speed Up Software Development with NDB and EDB Postgres AI

Reliable, secure operations for all your databases

Empower developers and speed up time-to-market

Allow DBAs and ops teams to focus on high-value activities

Make open-source databases enterprise-ready and cost-effective

Q & A

Vielen Dank!

Mehr Informationen:

www.enterprisedb.com/partners/nutanix

Noch Fragen?

emeamarketing-team@enterprisedb.com