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Field CTO Financial Services

WHY POSTGRES IS
BECOMING THE
STANDARD IN
FINANCIAL SERVICES



OVERVIEW

AGENDA:

- Brief introduction to your host
- The rise of OSS and Postgres
- Running mission critical applications on OSS
- How EDB can help you succeed and scale
- Q&A

Julian Moffett: Field CTO Financial Services @EnterpriseDB

Description / Bio

Julian has 15+ years of experience working in the Financial Services sector in various different roles:

- **Infrastructure:** Engineering, Product and Service Management
- **Business Application** Delivery Lead
- **CTO / Enterprise Architect**

Most recently responsible for designing and building out enterprise scale Postgres managed services on premise and in cloud and program managing the large scale exit of incumbent database provider and the adoption of the new platforms.

Academically Julian comes from a Legal background (LLB, LPC) but has worked in technology all his professional career. Julian is TOGAF 9 certified.



Financial Services: Why Change, Typical Initiatives and Technology Impact

Drivers for Change¹



Remaining
Competitive



Reputation + **Talent**
attraction / retention



Desire to
improve **Agility**



Technology led/enabled
new Markets



Cost Reduction

Initiatives We See

- Application **Modernization**
- Process **Digitalization**
- Move to **Agile methodologies**
- Technology **Simplification** / Consolidation / Technical debt reduction
- EOL / Op **Risk Remediation**
- **Data Center** downsizing / consolidation

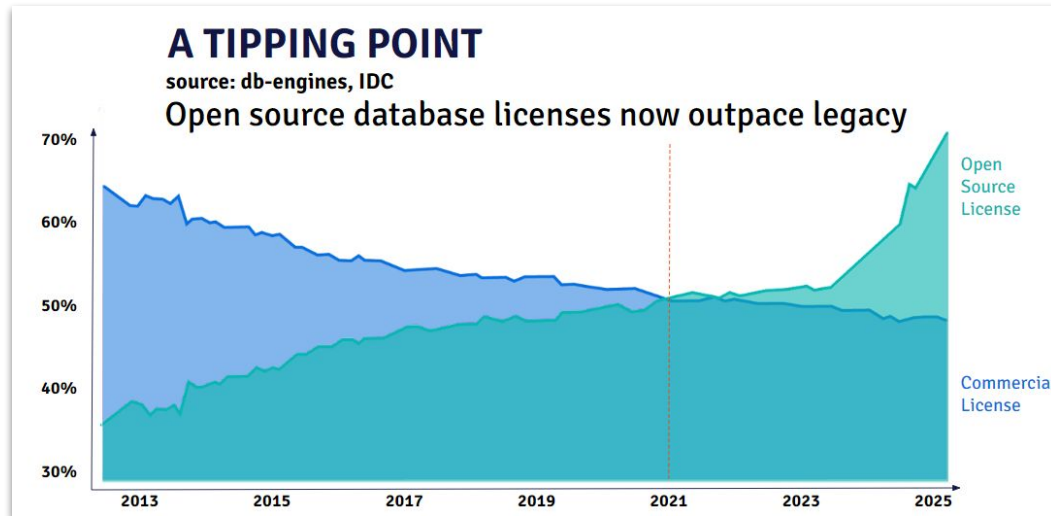
Implications on Technology Teams

- **Cloud + As a Service** Adoption
- Staff reskilling
 - **Rise of DEVOPS / IAC**
- Application **Refactoring**
 - Monolith deconstruction
 - The rise of **modularization** / microservices
 - **New technology** adoption
- Exit of incumbent vendors
 - **Enter OSS and Postgres!**

Open Source is mainstream and Postgres, the leader in the Database Space

- The **rise of Open Source** software is well documented
 - Many articles on global adoption across industries
[CNBC](#), [Forbes](#), [Techcrunch](#), [TechNewsWorld](#)

- Popularity of **proprietary database vendors in decline**



- **Postgres is hugely popular**



- DB-Engines.com, Cloud Native Computing Foundation (CNCF), Stackoverflow
- Cost is a factor but also flexibility, avoidance of lock-in
- No longer just for DEV. Applications in PROD run Postgres

Open Source and Postgres in Financial Services

- “Historically **banks have been hesitant** to adopt open source software” - [Finextra](#)
- **Times have changed!** From the same article above:
 - “Significant Open Source company acquisitions by large established corporate tech-vendors”

Acquisition	Date	Amt.
SalesForce bought MuleSoft	Mar 2018	\$6.5B
Microsoft bought GitHub	Oct 2018	\$7.5B
IBM purchased RedHat	2019	\$34 B

- “...incumbent tech players are adopting a true open source strategy themselves. E.g. Microsoft...”
- Emergence of [FINOS](#): “...Open-Source Solutions for Financial Services”
 - Accenture, [Goldman Sachs](#), JP Morgan, UBS, [Capital One](#), Fannie Mae, HSBC, Wells Fargo, RBC, [Deutsche Bank](#) +more



EDB in Financial Services



[ABN AMRO](#) Clearing is a recognized global leader in derivatives and equity clearing



[Mastercard](#) has long used PostgreSQL to support disaster recovery on its primary payment gateway, TNS



[ACI](#) - Global payments solutions processing more than \$14 trillion in payments + securities transactions daily

- Uses EDB’s BDR for multi-master replication for very high-availability across multiple geographies

Financial Services Enterprise Readiness

Not always a walk in the park...

Reliability

- Uptime! Requires HA / DR solutions to meet required RTO / RPO
- Support for Application Tiers up to Mission Critical. “Zero-downtime”
- Cross Availability Zone | Data center OR Cross Region

Performance

- Different workloads will have different e.g. TPS requirements
- Sizing the compute resources that the DB platform consumes is key

Scalability

- Repeatable deployment of 1000’s of databases requires orchestration and automation
- Monitor / operate / patch at scale

Security

- Data protection / encryption / redaction
- “need to know” data access and RBAC

and the elephant in the room...

Control requirements² on:

Control Topic
Authentication and Authorisation requirements
Access Management
Backup and Restore
Disaster Recovery Obligations
Infrastructure / DB Capacity Monitoring
IT Asset Management
Operational DB monitoring / alerting
Security Vulnerability / malware scanning
Security Patch management
Security Compliance Monitoring
Temporary Privileged Access Management



² Typically derived from the 100’s of global regulations that FS companies must adhere to on cyber security, data protection etc. See this [Worldbank.org](https://www.worldbank.org) link for an overview

Where to start? Find the Right **Partner**



EDB looks at the whole solution...

Looking beyond just the database engine and the ability to get incident support, we shape the **front-to-back database solution** to meet your goals

A Database **Solution** has many components

Service Request / DB Provisioning

DB deployment patterns to match RPO/RT0 reqs.

(Integration) Compute / Storage

(Integration) Identity and Access Management

Backup / monitoring

Day to day operations

Patching / Upgrades

...to develop your **solution journey**

We take a simple **plan, build and run** approach, deploying relevant SMEs at each stage

EDB IN SUMMARY

EDB is the world's largest software, support, and services company focused exclusively on PostgreSQL. With over 5,000 customers, we are proud to serve some of the world's leading financial services, government, media & communications, and information technology organisations. Our 16 offices worldwide enable us to deploy our global expertise in all your business locations.

POSTGRES SQL **COMMUNITY** LEADERSHIP

- **30%** of Postgres code contributed
- **>300** Dedicated Postgres engineers
- **3 of 7** Postgres Core Team Members

EDB **SUPPORT**

- 24/7 world-class support
- Experienced support engineers, with the world's leading Postgres contributors
- Cloud/Remote DBA Service, Technical Account Management, CTO Office

EDB **PLATFORM** (SOFTWARE & TOOLS)

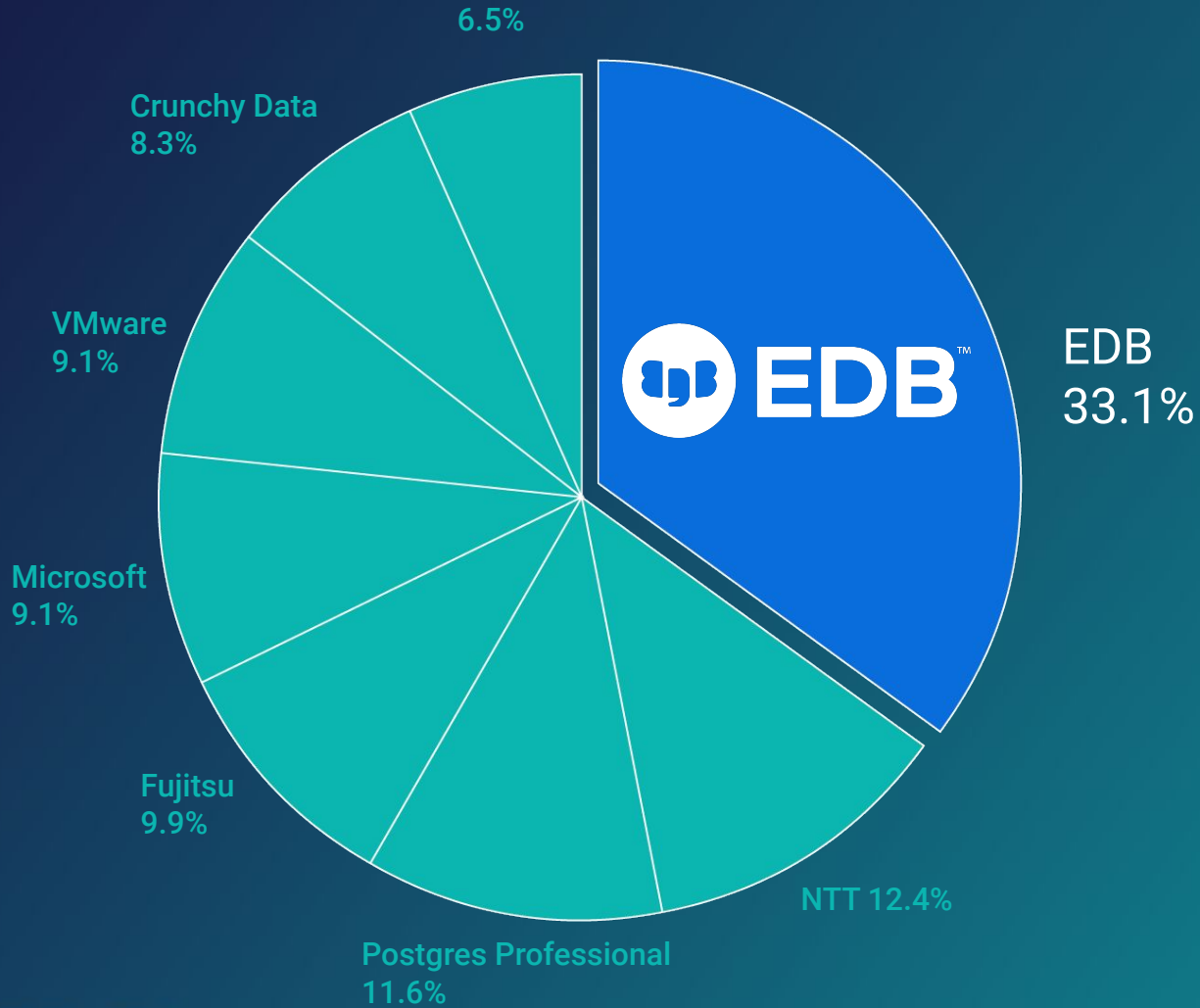
- Databases: PostgreSQL, EPAS
- Tools: Variety of supported open source and proprietary tools for High availability, backup, monitoring and migration

EDB **SERVICES**

- Services offerings and packages:
 - PostgreSQL deployment, design, migration
 - Postgres Optimization: Best practices
 - Enterprise Strategy: Use-case driven PostgreSQL architectures
 - Embedded PostgreSQL experts



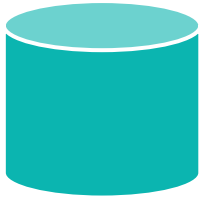
THE LEADING POSTGRES 14 CONTRIBUTOR



>2.5x
more contributors
than any other
company

EDB: MORE THAN JUST A DATABASE

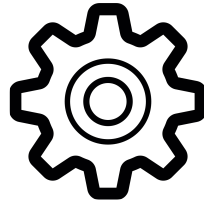
DATABASE(S)



Community
Postgres

EDB Postgres
Advanced Server

TOOLS



EDB Backup and
Recovery

EDB Monitoring

EDB High Availability

EDB Postgres
Distributed

EDB Migration
Tooling

EDB Postgres for
Kubernetes

EXPERTISE



24/7 365 Global
Support

Remote / Cloud DBA

Technical Account
Manager

Professional
Services

Training

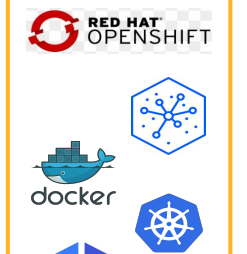
DEPLOYABLE ANYWHERE

Self-Managed

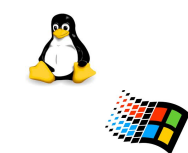
Virtualized
aws



Containerized



Bare Metal



Fully-Managed



Wrap Up

Postgres in Financial Services Today

- Significant **growth in usage of OSS** generally over last few years
- Financial Services are **no longer hesitant** to embrace
- **Postgres** one of the **leading** OSS technologies
- BUT...there's still a significantly **high bar to manage data** in Financial Services
- Recommend customers **find a strong partner** to work with

Why EDB?

- **Expertise not found elsewhere.**
 - Our [experts](#) have literally contributed to the development + direction of the technology **since its inception**
- We focus on **holistic** database **solutions**
 - We understand the **database ecosystem** and apply best practice to help you meet your goals
- Our **SMEs, tooling** and **deployment flexibility**
 - We **enable** customers to design / deploy / operate Postgres at an **Enterprise level** on platforms of choice
- Deeply **embedded in the community**
 - We actively help drive PostgreSQL **development**
 - We support Postgres **community** continued **success** through conference involvement and education



THANK YOU

GLOBAL SUPPORT SERVICES

Outcomes Matter

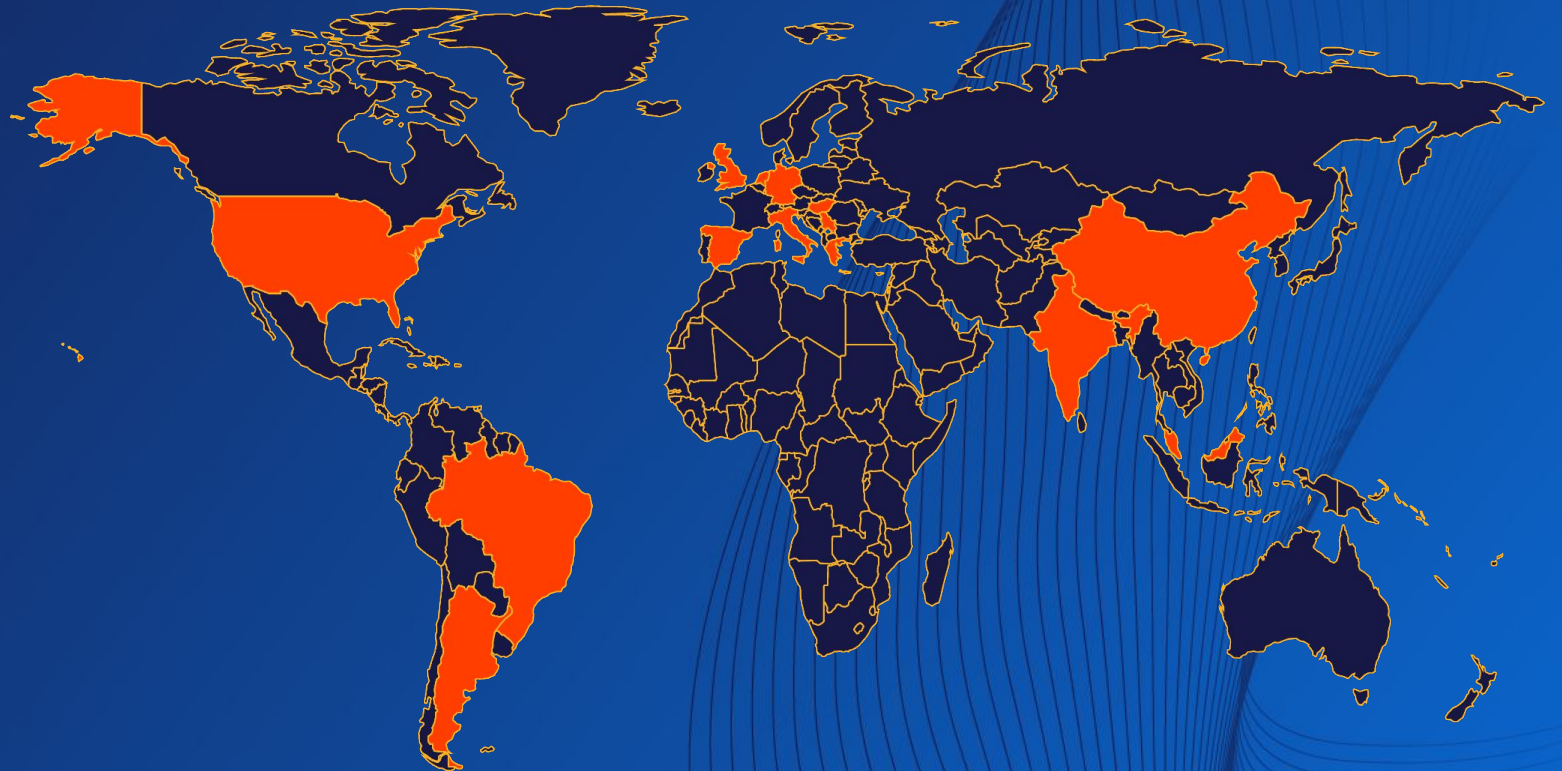
- >92% Satisfaction
- Shaped to customer need across Technical Support, RemoteDBA, and BigAnimal Support

Always-On

- Available 24x7 for all offerings
- Support Centers in Boston, Pune, Prato and London

From Database to Ecosystem

- Expertise where you are & where you're going - bare metal or in the cloud, from VMs to k8s
- Direct development voices for PostgreSQL, Barman, RepMgr, Lasso, LiveCompare and Insights



SUPPORT PLANS

		Support Plans		
		Severity		
			Premium	
			Production	
Availability:			24 hours x 7 days	24 hours x 7 days
Initial Response Service Level Objective	Severity-1		15 minutes	30minutes
	Severity-2		30 minutes	30 minutes
	Severity-3		60 minutes	60 minutes
	Severity-4		1 business day	1 business day
Remedy Service Level Objective	Severity-1		4 hours	24 hours
	Severity-2		8 hours	48 hours
	Severity-3		10 business days	15 business days
	Severity-4		30 business days	45 business days
Resolution Service Level Objective	Severity-1		24 hours	N/A
	Severity-2		5 days	N/A
Resolution Service Level Agreement	Severity-1		24 hours	N/A
	Severity-2		5 days	N/A

EDB SUBSCRIPTIONS

	Community 360	Standard	Enterprise
EDB Postgres Advanced Server			✓
Postgres	✓	✓	✓
EDB Postgres Distributed		Optional	Optional
EDB Tools		✓	✓
Open Source Tools	✓	✓	✓
Technical Support	✓	✓	✓

HOLISTIC DATABASE SOLUTIONS

Example: Typical Customer Requirements

- Request to deliver a **Managed PostgreSQL Service** in private and public cloud
- We understand drivers to be:
 - **Cost Reduction**
 - Enablement of greater **agility**
 - Improvement of DB **risk position**
- Detailed requirements often break down as follows:
 - **Operational Support Services**
 - Provisioning **automation** and enablement of **DEVOPS / IAC**
 - **Tiered Service Design** driven by RPO | RTO
 - DB Service **Control obligations**, including authentication / authorization, TPA (temporary privileged access), breakglass.
 - **Integration** into a **common ecosystem**
- We are **confident we have the capability to meet the requirements**

Managed PostgreSQL: **Building Blocks**

Service Request / DB Provisioning

Service Request portal to **capture user input** on required DB / cluster / life cycle env, HA configurations and other configurable deployment items. **Initiates the provisioning execution.**

Related: Many teams are interested in **self-service / IAC options** to allow developers to directly provision from the command line vs. point and click (service request) portal options.

DB deployment patterns to match RPO/RTO reqs.

Where necessary, **segmentation of the DB estate** according to e.g. criticality, workloads and required performance, RTO/RPO requirements, HA patterns and **mapping to a small set of DB Service tiers** where provisioning is automated, to aid consistency repeatability and minimize custom builds (and effort)

Compute / Storage

In private cloud we integrate with + can advise on **applicability of compute / storage** for desired use-cases.

IdP/Authentication/Authorization

Human and technical DB **users authentication/authorization**. Integration with customer systems

Backup / monitoring

DB Backup / restore and operational monitoring are critical for any service

Day to day operations

Operational support of DBs for application team consumers.

Patching / Upgrades

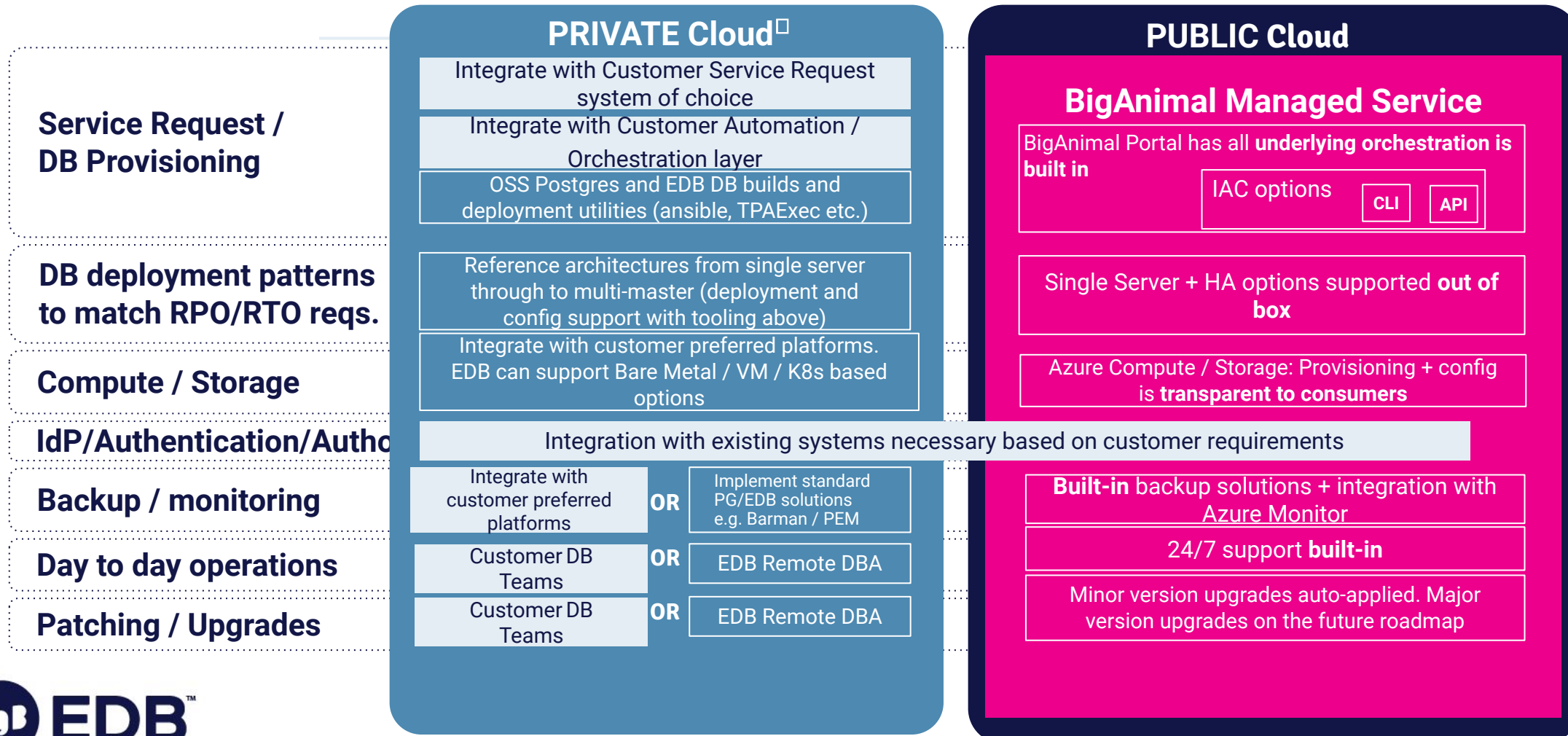
Planned maintenance / upgrade activities

Managed PostgreSQL: Implementation Options

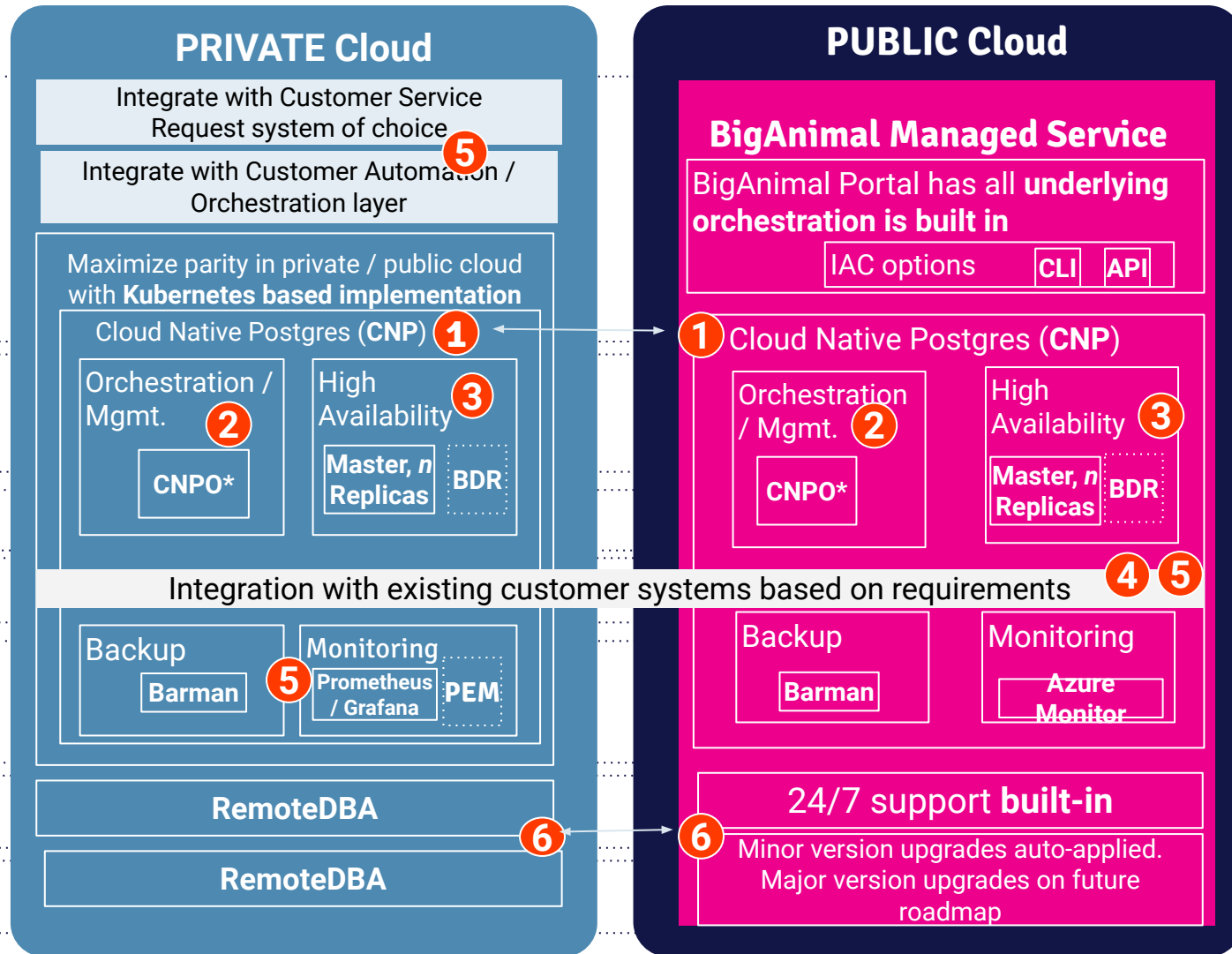
Customer Choice

OSS Postgres / EDB artefact

Built-into BigAnimal



Managed PostgreSQL: Example Solution



Mapping to Key Outcomes

- 1** Maximize **parity** between **private and public cloud** with CNPO
- 2** Enable provisioning **automation / consistency + IAC** / Devops
- 3** EDB utilities support different **tiers of service driven by RPO/RT0**. Orchestration enables repeatable deployments
- 4** **Satisfaction** of customer **control obligations**
- 5** **Ecosystem integration** where required
- 6** **Follow the sun** Operational **support** available + **proactive support** for best practices, capacity planning etc.



□ [CNPO \(Cloud native Postgres Operator\)](#) is a Kubernetes Operator we can deploy on premise and is used in our Public Cloud offering

SOLUTION JOURNEY

HOW DO WE HELP YOU?

SOLUTION JOURNEY

Three Primary Phases

- Plan
- Build
- Run

EDB TEAM DELIVERABLES

Experienced team of experts that we deploy for each phase of the project

SOLUTION JOURNEY

EDB TEAM DELIVERABLES

Plan

- Understand control requirements, target consumer use-cases, public vs. private cloud strategy
- Review technical solution implications
- Agree priorities and delivery timelines



TAM, Project Lead (Solution Architect), CTO

- Requirements validation and solution design for: Control obligations and system integration, patterns / service tiers based RPO / RTO
- Agreed project prioritization

SOLUTION JOURNEY

EDB TEAM DELIVERABLES

Build

- Build platform and integrations with:
 - Service Request
 - Compute / Storage
 - IdP / Entitlements Systems
 - Backup
 - Monitoring

Plan

- Understand control requirements, target consumer use-cases, public vs. private cloud strategy
- Review technical solution implications
- Agree priorities and delivery timelines



TAM, Project Lead / SA, Technical SMEs

- Implemented provisioning automation framework
- Deployed reference architectures / tiered service offering
- Integration with customer ecosystem
- Satisfaction of customer control obligations

TAM, Project Lead (Solution Architect), CTO

- Requirements validation and solution design for: Control obligations and system integration, patterns / service tiers based RPO / RTO
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SOLUTION JOURNEY

Run

- Ongoing Enterprise Support
- *Performance tuning*
- *Migration Expertise*

Build

- Build platform and integrations with:
 - Service Request
 - Compute / Storage
 - IdP / Entitlements Systems
 - Backup
 - Monitoring

Plan

- Understand control requirements, target consumer use-cases, public vs. private cloud strategy
- Review technical solution implications
- Agree priorities and delivery timelines



EDB TEAM DELIVERABLES

EDB Customer Support, TAM, Technical SMEs, *RemoteDBA*



- Proactive monitoring and DB mgmt.
- Prioritized Product Requests + Strategic Planning
- *Oracle Migration, Public<->Private workload migration expertise*

TAM, Project Lead / SA, Technical SMEs



- Implemented provisioning automation framework
- Deployed reference architectures / tiered service offering
- Integration with customer ecosystem
- Satisfaction of customer control obligations

TAM, Project Lead (Solution Architect), CTO



- Requirements validation and solution design for: Control obligations and system integration, patterns / service tiers based RPO / RTO
- Agreed project prioritization

Business Value Focused

- We understand **organizational drivers** for **Postgres**, for **managed offerings** and **cloud** adoption and we have expertise in:
 - Tiered **service design** in line with RPO / RTO requirements
 - **Automation** and repeatability in service provisioning and operations + tools to enable
 - HA Reference **architectures** + **tools** to enable
 - **Devops enablers** in both private/public cloud offerings
 - **Hybrid cloud** scenarios
- Beyond Postgres on premise, we deliver **Managed PostgreSQL** in public cloud.
- EDB is **familiar with the control requirements** of Financial Services companies
- We have a strong understanding of the complexities of **managing sensitive financial services data**
- We have a track record of **operating at scale**

MIGRATION CONSIDERATIONS

Migration Considerations

Introduction

- This is not intended as a playbook but a peek at key topics to factor into planning for large scale adoption of new platforms (and migration away from existing)
- Reality is the **technical migration activities are only a fraction of the work** involved.
- Key challenges to overcome:
 - Getting **buy-in** with application teams
 - Demonstrating the **business case**
 - Getting into application teams release cycles and maintaining their **commitment** to see this through
 - Having the support to react to the **technical challenges** that will arise

Migration Considerations

Multiple paths to reduce or exit legacy platforms

Where to begin?

Legacy RDBMS Estate

App Decom / DB Clean up

Low hanging fruit

Non RDBMS solution e.g, Big Data, NoSQL

Help your app teams by developing decision trees to map workloads to products / services

RDBMS - Postgres

- Build this to **scale**
- Think about **tiered offering** for different performance / SLA reqs.
- High degree of **automation** for improved provisioning time / repeatability / reliability
- Built-in **monitoring / alerting**
- Get **operational support** in place
- Maintain **currency** in minor and major versions
- **Educate** consumers on platform / service offerings
- **Incentivise** consumers (e.g. cost, DB and service features / version currency, time to market etc.)

RDBMS - Postgres not a fit?

Don't put a square peg in a round hole

Residual estate

Accept that there may be apps you just cannot move and **develop plans to address**

Partner with **other initiatives?** e.g. EOL remediation ?

Application Migration Approach

Stakeholders and Governance?

???



Enablers and Incentives

Business Case and Funding

Mobilize **Technical Migration Process**

Socialize process, new platform capabilities. Build **pipeline.**

Define **metrics, set targets + implement tracking.**

Migration Considerations: **Are you ready? 1/2**

Target Platforms

- Platforms **decided?**
 - Is there a mapping of use-case to target platform? (decision trees for app teams?)
 - What's the **criteria / rules** for app teams for one platform vs. another?
- Are target platforms **GA / control compliant?**
 - Across all lifecycle environments?
- Are they **bedded-in / stable?**
 - Do you have DB Infra level Operational Support (vendor and internal staff) to react when things break?

Migration Approach

- Decision made on **push vs. pull** approach?
 - Is adoption planned to happen organically or will you mobilize a program to drive?
 - Are key stakeholders comfortable with the implications of each path?
- **Business Case** and Funding?
 - Who's paying for migration efforts?
 - Are you able to cost migration effort?
 - Are you able to cost application team allocated cost [internal chargeback] saves?
- **Process** defined / socialized?

Migration Considerations: **Are you ready? 2/2**

Governance

- Do you have **visibility / support**?
 - From **leadership** in Infrastructure and Application Development
 - **Champions** per LOB / AppDev Group?
 - How will you hold App teams to account? (governance forums?)
 - Is the end goal / **priority** understood?
 - Can **this work be prioritized** above other app team deliverables?
- Other initiatives you can partner with?
 - E.g. EOL remediation, modernization, data center space optimization?
 - Opportunity to prohibit new deployment of legacy DBs / implement exception-only?

Obstacles / Enablers

- Are application team obstacles **understood**?
 - E.g. sufficient information available on new platforms, technical or procedural barriers, sometimes non DB related yet can all contribute to slow adoption.
 - Have a process to capture and work through / enablers in place?
- **Incentives**
 - What makes this appealing for consumers?
- **Support / tooling / education** required?
 - Data migration support?
 - Performance tuning?

Migration Considerations: **Practical Considerations**

- Agree a Database **inventory to track movement**
 - Ideally use one your consumers are familiar with and can view.
 - Agree metrics for success
- **Set + agree** Oracle Exit **targets** with stakeholders
 - Validate Oracle contractual position to ensure that migration effort results in direct cost save.
 - Sufficiently senior stakeholders to make commitments and move the dial?
- Help your stakeholders with information to **suggest candidates** for migration
 - Segment your estate (L/M/H complexity)
 - Identify metrics (lines PL/SQL, # objects etc.)
- Understand that your existing **Oracle** can be **reduced via several paths**
 - % reduction via clean-up/ app decom
 - % reduction via movement to other non RDBMS tech (big data, no SQL)
 - % reduction via going to Postgres (make sure you have compute / storage to accommodate this demand)
 - % that is not a fit for Postgres
 - % of your residual estate and how do you manage? (accept, outsource support, look at Oracle resellers?)