



# How Public Sector Organizations Can Achieve **Extreme High Availability** with Postgres

June 14, 2023



# POLL QUESTION:

## **What is your current experience with Postgres?**

1. I am skeptical of Postgres
2. I am exploring but I have not implemented
3. I like Postgres and I am interested in adopting it at my organization
4. I love Postgres and I have already adopted it at my organization

# OUR SPEAKERS

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# AGENDA

- **About EDB**
- **Public Sector Trends**
- **Public Sector Adoption**
- **Compliance & Security**
- **Why Extreme High Availability**
- **Intro to EDB Postgres Distributed**
- **Questions & Answers**

# ABOUT EDB

## Expertise

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- Largest **Postgres** company
- Postgres **community leader**
- 700+ Postgres contributors & database technologists
- Eliminate Oracle licenses, **saving over 80% of total costs**

## Experience

- 1000+ employees
- 80+ countries
- **5000+ customers**
- **1000's of workloads**
- **700+ contributors**
- 55,000+ commits

## Trust

- **US Army SATCOM** powered by EDB
- **FBI Criminal Justice Information System (CJIS)** runs on EDB Postgres
- Public Sector is ~20% of EDB's business
- EDB has a presence in **every cabinet level agency within the United States Government**

## Solutions

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- Advanced Postgres server & tools
- **Mission critical apps** support
- **Public, private, or multi-cloud**
- **On-prem, VM, or bare metal**
- **Container** deployments

## Features

- Distributed **database & replication** capabilities
- Backup and recovery
- Extreme HA – **↑99.999%**
- Enterprise **management and monitoring**

## Services

- Oracle **migration assessment & implementation services**
- Consulting services
- 24x7 technical support
- **Remote DBA** services



# PUBLIC SECTOR INNOVATION TRENDS

## Drivers of Change<sup>1</sup>



Remaining  
**Competitive**



**Reputation + Talent**  
attraction / retention



Improve **Agility**



**Cost Reduction**

## Technology Initiatives

- Application **Modernization**
- Process **Digitalization**
- Move to **Agile Methodologies**
- Technology **Simplification** / Consolidation / Technical Debt Reduction
- EOL / Op **Risk Remediation**
- **Data Center** Downsizing / Consolidation

## Staffing Implications

- **New Technology** Adoption
- **Staff Reskilling**
  - Rise of DevOps
  - Infrastructure as Code
- **Exit** of Incumbent Vendors
- Application **Refactoring**
  - Monolith Deconstruction
  - Rise of **Modularization** and **Microservices**



# PUBLIC SECTOR POSTGRES ADOPTION



**Forward-thinking** Public Sector organizations are already powering their **most demanding** modern enterprise applications with Postgres

# COMPLIANCE & SECURITY

## Compliance Standards:

- Validated National Institute of Standards and Technology (NIST) **Federal Information Processing Standard (FIPS) 140-2**
- Approved Defense Information Systems Agency (DISA) **Security Technical Information Guide (STIG)**
- Section 508 Compliant with active **Voluntary Product Accessibility Template (VPAT)**
- Multiple **Authority to Operate (ATOs)** granted on Defense and Intel classified networks
- And more...

## Enhanced Security Features:

- **Zero Trust Framework “Ready”**
- Role Based Access Control
- **Transparent Data Encryption (TDE)**
- **Column & Row Level Encryption**
- Advanced Audit Logging
- **SQL Injection Protection**
- Password Policy Enforcement
- Advanced Data Redaction
- And more...





# POLL QUESTION:

**What is your top database concern at your organization right now?**

1. Security posture and loss of data
2. Downtime during maintenance windows
3. Building an architecture that can manage organizational growth
4. High cost of proprietary database software
5. Data localization, data sovereignty and latency

# Why Extreme High Availability?

# DOWNTIME IS NO LONGER AN OPTION

Organizations have Tier 1 apps that cannot go down



## Government/ Public Sector

- Federal/State/DoD
- Critical Infrastructure
- Emergency Services
- National Security



## Information Technology

- Human Resource Apps
- Public Service Apps
- Mission Critical Defense Operations Apps



## Security and Telecom

- Data Protection
- Access Control
- Contact Center



## Financial Services

- Payment Systems
- Banking Ecosystem
- High Frequency Trading

# DOWNTIME IMPLICATIONS ARE INCREASING

How much downtime can your organization afford?

## Data Center Outages

over the past 3 years

**60%**

## Cost of Downtime

over \$100k+ in losses

**70%**

## Productivity Disruption

4+ to >48 hours

**60%**



# MISSION CRITICAL APPS NEED EXTREME HA

“Always On” is the hallmark of digital transformation & operational resiliency



**Planned  
Maintenance**



**Geo-Distributed  
Workloads**



**Data Compliance  
and Security**

Customers expect services to be always on – 365 days a year, 24 hours a day. Extreme HA goes beyond protecting users from hardware and network failures and ensures near-zero downtime maintenance and operational resiliency.

# JOURNEY TO EXTREME HA

Categories 3–5 cause impacts beyond service disruptions

## 1. NEGLIGIBLE

Recordable outage observed however **little or no obvious** impact on users

## 2. MINIMAL

Services are **temporarily disrupted**. Minimal effect and/or impact on users, organization, and reputation

## 3. SIGNIFICANT

User service **disruptions**, mostly of limited scope, duration or effect.

Minimal data loss with some **reputational** or **security and compliance** impact(s)

## 4. SERIOUS

**Disruption** of service and/or operation.

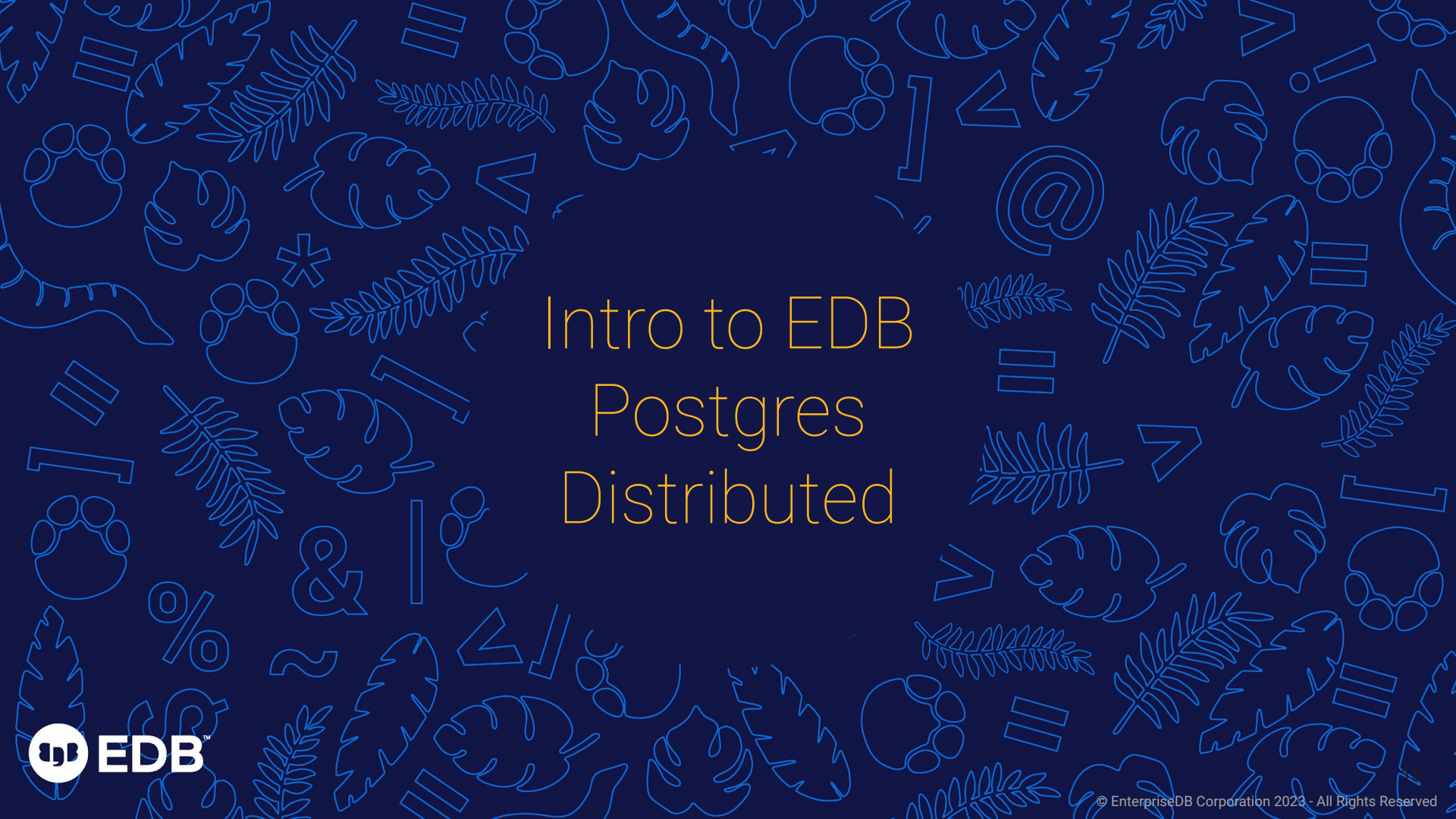
Ramifications include **data losses, compliance and security** breaches, **reputational damage** and possibly safety concerns.

## 5. SEVERE

Major and **damaging disruption** of services and/or operations with **severe ramifications**

**Large confidential data losses**, Public safety issues, **National/State security breaches** and **reputational damage**.

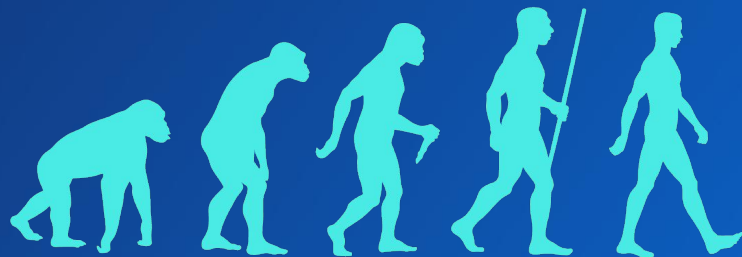




# Intro to EDB Postgres Distributed

# EVOLUTION OF POSTGRES REPLICATION

Trigger-based Replication	Slony, Londiste	2004
Physical File-based Replication	PG 8.2	2006
Physical Streaming Replication	PG 9.0	2010
Logical Decoding	PG 9.4	2014
Logical Streaming Replication	PG 10	2017



**EDB Postgres Distributed** is built from experience and user input by the **same developers** that worked on earlier technologies. It provides the **latest technology** to improve clustering & replication for Postgres applications, including **Active-Active replication** and **data distribution** with advanced conflict management, data-loss protection, with throughput up to 5X faster than Postgres Native Logical Replication.



# INVEST FOR ACCELERATION

## Postgres Journey



## EDB Postgres Distributed (PGD)

- Leading solution with ↑**99.999% availability**
- **5X** faster than native logical replication
- For **Tier 1** production apps that cannot fail
- Always **ON** Architectures for Automation
- **Data Localization** + Oracle Compatibility

## Legacy Postgres Native Logical Replication

- Legacy HA 99.99% only
- Logical replication from 5+ years ago
- For non mission-critical apps
- Still susceptible to numerous limitations (DDL)
- No TDE - Postgres Transparent Data Encryption



# THE NINES=AVAILABILITY

Postgres with Five 9s availability

## EDB POSTGRES DISTRIBUTED

### EXTREME HA

- Five 9s (99.999%)
- ~5 minutes maximum of downtime annually

### TRADITIONAL HA

- Four 9s (99.99%)
- ~52 minutes of downtime annually



# EDB POSTGRES DISTRIBUTED

Postgres Five 9s for all your Extreme HA use cases



## ENABLE ROLLING UPGRADES

No other Postgres solution can eliminate the downtime required for major version upgrades and routine maintenance



## MAINTAIN EXTREME HIGH AVAILABILITY

Highly resilient architecture keeps your mission critical applications safe from unplanned infrastructure issues and database outages.



## DISTRIBUTE WORKLOAD GEOGRAPHICALLY

Reduce latency and meet data localization compliance laws by making data geographically available, meeting international cyber-security requirements



# PGD EXTREME HA FEATURES

- ✓ Active-Active Replication
- ✓ Flexible Architectures
- ✓ Efficient Logical Replication
- ✓ Choice of Consistency
- ✓ Industry Leading Tooling
- ✓ Compliance, Security and Scalability





# GEOGRAPHICALLY DISTRIBUTED



## Active-Active Replication Enables:

- Logical replication of data and schema enabled via standard Postgres extension
- Data consistency options that span from immediate to eventual consistency
- Robust tooling to manage conflicts, monitor performance, and validate consistency
- Deploy natively to cloud, virtual, or bare metal environments
- Geo-fencing, selectively replicating data for security compliance and jurisdiction

# ENABLE ROLLING UPGRADES

## Planned Maintenance with Zero Downtime

### Routine Maintenance and Planned System Upgrades

**Maintenance** is the **single largest source** of downtime. There is a constant need to proactively secure software and deploy new features

- Security/maintenance releases - 4 times/year
- Unscheduled bugs ~1/year
- Parameter changes, hardware changes



Full Version  
Upgrades

Patch Set  
Updates

Database  
Maintenance

Application  
Updates

DB Host  
Maintenance

# MAINTAIN EXTREME HIGH AVAILABILITY

**RESPOND QUICKLY TO UNPLANNED OUTAGES:** EDB Postgres Distributed ensures your data is available so you can protect your organization from unplanned outages.

## Maintain Extreme High Availability

- Keeps your mission critical **applications safe** from unplanned infrastructure issues.
- Failovers are almost **imperceptible** to your applications and customers.

## Improve Operational Resiliency

- Highly **resilient** “active - active” architecture that provides **automated failover**
- Keeps mission critical applications running across sites and regions with **near-zero switch-over time**

## Cross-version Compatibility & Support

- Works **on a combination of major / minor releases** of Postgres and EDB Postgres Distributed
- The **same** Postgres solution works across all of your sites, regions or locations



# GEO DISTRIBUTED WORKLOADS

**BUSINESS AGILITY AND DATA COMPLIANCE:** Store data where it needs to be and keep it there when it can't leave. EDB Postgres Distributed ensures your data is available where and when you need it.

## Distribute Workloads Geographically

- For global applications, keep data close to your users for performance and data sovereignty
- EDB's **active-active solution** ensures your data is where and when you need it

## Improve & Optimize Business Agility

- Geo-distributed data redundancy, seamless data availability, and real-time data access
- Solve **global performance and scalability** challenges with geographical data distribution

## Ensure Data Continuity & Compliance

- Keep regional data local, without making copies across boundaries.
- Enables **data localization** compliance reducing compliance exposure





# MAKE THE MOVE WITH EDB

- Enterprise-grade DBMS capabilities
- Superior innovation
- Immensely better economics
- Flexible deployment models
- The full power of the Postgres community
- Unmatched expertise at every stage in the journey
- Support included in all plans and subscriptions



# Next Steps and Resources

[Contact us](#) for a demo, workshop  
or lunch and learn

- See the EDB [plans](#) offering EDB Postgres Distributed
- Check out EDB Postgres Distributed on our [website](#)
- Test drive [PGD](#) using a 60-day free trial
- Review the EDB Postgres Distributed [documentation](#)
- Read “The Next Generation of High Availability”  
[whitepaper](#)



# Questions & Answers