

# Fujitsu Enterprise Postgres on IBM Power® Datasheet



## Fujitsu Enterprise Postgres on IBM Power® - Postgres to the power of Fujitsu

### Fujitsu's contribution to PostgreSQL

PostgreSQL is one of the most advanced and widely used open source relational database management systems (RDBMS) in the world.

Fujitsu has been involved in the PostgreSQL community since 2003.

Fujitsu is a Major Sponsor of the PostgreSQL community, contributing to the development of various features.

Major Sponsors are selected by the Sponsorship Committee and indicate organizations that have provided significant and/or sustaining contributions over many years.

### Fujitsu Enterprise Postgres

Fujitsu Enterprise Postgres is a mission critical RDMS on PostgreSQL that is ideal for hybrid, multi-cloud.

Fujitsu Enterprise Postgres is designed to be fully compatible with the feature-rich, open-source PostgreSQL used by millions of users worldwide.

Fujitsu Enterprise Postgres builds on the strengths of open-source PostgreSQL with enhanced enterprise features such as high performance, reliability, and security.

Fujitsu Enterprise Postgres enables integration with a wide range of software, information use systems, development tools, and application runtime environments.

Database systems remain free from vendor lock-in, while achieving advanced security and high reliability. Fujitsu's strong track record in mission-critical enterprise systems supports this technology.

The improved advanced security and high reliability has created substantial benefits to further compliment intelligent business data systems for enterprises.

### IBM Power®

IBM Power® is designed to scale cost-effectively for virtual machine-based or containerized, mission-critical, data-intensive applications.

### Fujitsu Enterprise Postgres on IBM Power®

Open source native PostgreSQL with enterprise features on IBM Power®.

The combination of Fujitsu Enterprise Postgres, which is enhanced to deliver high performance in hybrid cloud environments, with IBM Power® provides an enterprise infrastructure for high performance.

### What Fujitsu Enterprise Postgres on IBM Power® has to offer

- Digital transformation
- Business continuity/containerization

#### Digital transformation

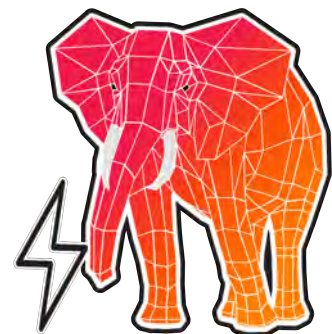
Build applications on a high-performance OCP Power 10 infrastructure.

Accelerate DX and provide a great developer experience.

#### Business continuity/containerization

Leverage open container technologies built on-premises or in the cloud to refactor applications into containerized microservices. Leverage globally without platform or vendor dependencies.

Choose from on-premises, cloud and OpenShift environments, and subscription licenses can be converted across platforms.



Fujitsu Enterprise Postgres  
on IBM Power®

Enterprise infrastructure combined with enhanced Postgres database designed to deliver superior performance in hybrid cloud environments

# Features and benefits

| Main features   | Benefits   |
|---|--|
| <b>PostgreSQL-based RDBMS</b>   |  |
| <ul style="list-style-type: none"> <li>• 100% compatible with PostgreSQL</li> <li>• Compatible with other PostgreSQL databases</li> <li>• Extends open source PostgreSQL</li> <li>• Simple migration from proprietary databases</li> </ul>  | <ul style="list-style-type: none"> <li>• No vendor lock-in</li> <li>• Supports Zabbix, Apache, Tomcat</li> <li>• Enterprise quality</li> <li>• Low migration cost</li> </ul>   |
| <b>Security</b>   |  |
| <ul style="list-style-type: none"> <li>• Transparent Data Encryption</li> <li>• Data Masking</li> <li>• Dedicated Audit Log</li> <li>• Key management for Transparent Data Encryption</li> <li>• Cloud-based key management</li> <li>• Confidentiality management</li> <li>• Policy-based login security</li> </ul> | <ul style="list-style-type: none"> <li>• Increased security with PCI DSS-compliant 256-bit encryption</li> <li>• Protects production data</li> <li>• Efficient and accurate monitoring of audit log</li> <li>• Reduced risk of data leakage; lower operational costs</li> <li>• Improved security by storing keys in secure external services</li> <li>• Easier and more efficient security operations</li> <li>• Login security policies simplify management and improve DB security</li> </ul> |
| <b>Performance</b>  |  |
| <ul style="list-style-type: none"> <li>• Vertical Clustered Index†</li> <li>• Global Meta Cache</li> <li>• High-speed data load</li> </ul>  | <ul style="list-style-type: none"> <li>• Improved performance for large data sets</li> <li>• Reduced overall memory usage with little performance degradation</li> <li>• Loads large volumes of data using parallelism according to available CPU</li> </ul>   |
| <b>Reliability and High Availability</b>  |  |
| <ul style="list-style-type: none"> <li>• Mirroring Controller</li> <li>• Connection Manager</li> <li>• Database Mirroring</li> <li>• Database Transaction Log Mirroring</li> <li>• WAL duplication</li> </ul>   | <ul style="list-style-type: none"> <li>• Automated instant failover</li> <li>• Business continuity and fast failover without SQL relay</li> <li>• Two copies of a single database reside on different server instances</li> <li>• Transaction records are continuously streamed to the standby database</li> <li>• Solves PostgreSQL's single point of failure</li> </ul>  |
| <b>DevOps</b>   |  |
| <ul style="list-style-type: none"> <li>• System usage statistics</li> <li>• WebAdmin</li> <li>• Enhanced GUI for cluster management</li> </ul>  | <ul style="list-style-type: none"> <li>• Users can access database's utilization metrics and statistics</li> <li>• Easily manage database and its contents saving time and money</li> <li>• Management tool makes setup and cluster management simpler</li> </ul>  |
| <b>Ease of use</b>  |  |
| <ul style="list-style-type: none"> <li>• Easy installation, setup and management</li> <li>• Web-based and command line interfaces</li> <li>• One-click backup and recovery</li> </ul>   | <ul style="list-style-type: none"> <li>• Reduced technical staff overheads</li> <li>• Simplified operation management</li> <li>• Easily performed high-level tasks</li> </ul>  |
| <b>Fujitsu support options</b>  |  |
| <ul style="list-style-type: none"> <li>• Version compatibility</li> <li>• Provides patches following PostgreSQL updates</li> <li>• Guaranteed support from end of sales period</li> </ul>   | <ul style="list-style-type: none"> <li>• Low migration cost due to compatibility verification</li> <li>• Guaranteed standard support</li> <li>• Optional extended support period; extendable</li> </ul>  |

† Fujitsu's implementation of In-Memory Columnar Index by Fujitsu Laboratories Limited

# Topics

## PostgreSQL-based database system

Fujitsu Enterprise Postgres is based on PostgreSQL, the world's most advanced feature-rich open source database system. PostgreSQL, used by millions of users globally, enables integration with a wide range of software, information utilization systems, development tools, and application runtime environments.

## Easy and cost-effective migration

Fujitsu Enterprise Postgres has been designed to be fully compatible with open source PostgreSQL databases and also offers enhanced compatibility when migrating from existing Oracle® systems.

The solution significantly reduces migration time so that budget restraints and business disruption are no longer a concern; the migration process has now become much more streamlined.

## Enhanced system integration

The utilization of PostgreSQL technology enables integration with a wide range of software, information utilization systems, development tools, and application runtime environments. Investing in additional software systems and high migration costs are no longer considerations. User disruption is also avoided due to the ability to retain software products that users are already familiar with.

## Ease of use

### Reduced expenditure for database design and implementation

Fujitsu Enterprise Postgres employs a minimal setup process based on optimized resource deployment. The setup process performs dynamic hardware resource detection during installation and the software is automatically tuned with the customer's server configuration. Using this method, the parameter and backup settings are all completed during the deployment of the system.

Fujitsu's innovative development methodology has been a key factor in producing an installation process that takes just three simple steps to perform:

1. Launch the installer (the installation is completed using automatically tuned values).
2. Launch WebAdmin (GUI management tool).
3. Use WebAdmin to create new instances and configure backup and recovery options.

This simplified installation and setup process allows Fujitsu Enterprise Postgres to be implemented within a very efficient time frame.

### Reduced reliance on technical staff

Many operational tasks can be carried out by non-technical staff. For example, to back up or restore instances, simply click to backup and click to restore.

## Fujitsu support

### High-level support

Standard support and extended support options available to customers for ongoing assurance, so that future support and system confidence is a guaranteed business outcome.

## Security

### Transparent Data Encryption

Secure 256-bit transparent data encryption (PCI-DSS compliant) and redundancy for high reliability and asset protection that is aligned with your data management strategy.

### Data Masking

Redacts data using masking policies to obscure data returned from queries, making it available for reference without exposing the actual data. Data masking makes it safe to use production data in a test or development environment.

### Key management for Transparent Data Encryption

By storing the encryption key outside the database, you can securely store the master encryption key and reduce the risk of data leakage. The database administrator is released from the operation and management of the master encryption key.

### Cloud-based key management

Supports plug-ins to call communication adapters in the cloud and to share encryption keys. Key management services in the cloud can reduce operational costs and increase security.

### Confidentiality management

Simpler operations for role-based access control (RBAC) setting and audit. Easier and efficient security operations, and reduced human errors, minimizing security risks.

### Policy-based login security

Prevent unauthorized logins and improve security by setting password expiration dates and locking users who repeatedly fail to log in or are dormant to restrict access to their accounts.

## Performance

### Vertical Clustered Index

The VCI engine integrated with Fujitsu Enterprise Postgres provides significantly faster analytical query processing by storing a columnar representation of row-oriented data in memory. Tests show that for a 280 GB dataset on a 56-core Linux node, this results in almost 5 times the throughput of analytical queries while maintaining equivalent transaction volumes.

### Global Meta Cache

System catalog and table information is cached in shared memory instead of in per-process memory. Memory usage of the overall system is reduced to enhance system performance.

## Reliability and High Availability

### Mirroring Controller

Constantly checks the status of database processes, and if a problem is detected, automatically redirects operations to the standby server, without the need for human intervention.

### Connection Manager keeps your business running

Heartbeat monitoring is performed between client and server, so business can be resumed immediately from the application side in case a failure occurs. Applications can connect to an instance without being aware of which server the instance is running on. Fast failover without SQL relay.

### WAL duplication for simple, reliable recovery

If a database problem occurs or if data is accidentally deleted, recovery of the WAL (Write-Ahead Log) can be performed with a single click.

# Technical details

| Item                           |  | Fujitsu Enterprise Postgres   |  |                          |                  |  |
|--------------------------------|--|---|--|--------------------------|------------------|--|
| Basic architecture             | Max. database capacity   | Unlimited   |  |                          |                  |  |
|                                | Max. number of columns in table  | 1,600   |  |                          |                  |  |
|                                | Max. row length in table   | 1.6 TB  |  |                          |                  |  |
|                                | Max. number of rows in table   | Unlimited   |  |                          |                  |  |
|                                | Max. number of indexes per table   | Unlimited   |  |                          |                  |  |
|                                | Index storage format in table  | B-tree  | GiST/SP-GiST                             |                          |                  |  |
|                                |  | hash  | GIN                                      |                          |                  |  |
|                                |  | BRIN  | VCI (Fujitsu's In-Memory Columnar Index) |                          |                  |  |
|                                | Data types   | Character types   | CHARACTER                                |                          | NCHAR            |  |
|                                |  |   | CHARACTER VARYING                        |                          | NCHAR VARYING    |  |
| Numeric types                  |  | bigint  | integer                                  | smallint                 |                  |  |
|                                |  | bigserial   | numeric                                  | smallserial              |                  |  |
|                                |  | decimal   | real                                     | serial                   | double precision |  |
| Datetime types                 |  | date  | time                                     | time with time zone      |                  |  |
|                                |  | interval  | timestamp                                | timestamp with time zone |                  |  |
| Binary data types              |  | bytea   | Large object                             |                          |                  |  |
| XML                            |  | Yes   |  |                          |                  |  |
| JSON                           |  | Yes   |  |                          |                  |  |
| Character set                  | UNICODE  | Yes   |  |                          |                  |  |
| Multilingual support           | Yes (149 locales)  |   |  |                          |                  |  |
| Security                       | Transparent data encryption  | 256-bit (compliant with PCI-DSS)  |  |                          |                  |  |
|                                | Data masking   | Full masking / Partial masking / Regular expression masking             |  |                          |                  |  |
|                                | Dedicated audit log  | Yes (compliant with PCI-DSS)  |  |                          |                  |  |
|                                | Key management for Transparent Data Encryption   |   |  |                          |                  |  |
|                                | Cloud-based key management   |   |  |                          |                  |  |
|                                | Confidentiality management   |   |  |                          |                  |  |
| Policy-based login security    |  |   |  |                          |                  |  |
| Reliability/ High Availability | Standby  | Yes   |  |                          |                  |  |
|                                | Split brain control  | Yes   |  |                          |                  |  |
| Instant failover               | Instant failover   | Yes   |  |                          |                  |  |
|                                | Transparent connection   | Yes (ability to connect to a database server without knowing its stage) |  |                          |                  |  |
| Performance                    | In-Memory Columnar Index   | Yes (implemented via Fujitsu's Vertical Clustered Index)                |  |                          |                  |  |
|                                | High-speed data load   | Yes   |  |                          |                  |  |
| Application development        | SQL standard   | Compliant with ANSI/ISO SQL:2016  |  |                          |                  |  |
|                                | Oracle-compatible SQL  | Outer join operator   |  |                          |                  |  |
|                                |  | DUAL table  |  |                          |                  |  |
|                                |  | Functions (SUBSTR   NVL   DECODE)                                       |  |                          |                  |  |
|                                | Built-in packages (UTL_FILE   DBMS_OUTPUT   DBMS_SQL   DBMS_ALERT   DBMS_ASSERT   DBMS_PIPE   DBMS_RANDOM   DBMS_UTILITY   PLUNIT   PLVCHR   PLVDATE   PLVLEX   PLVSTR   PLVSUBST) |   |  |                          |                  |  |
|                                | Language   | C   |  |                          |                  |  |
|                                | Interface  | ODBC  | JDBC                                     |                          |                  |  |
|                                | Stored procedures / functions  | Yes   |  |                          |                  |  |
|                                | Access control   | Deadlock automatic detection  |  |                          |                  |  |
|                                |  | Query by other transactions during updates (Multiversion control)       |  |                          |                  |  |
| Support                        | High quality long-term support   | Guaranteed  |  |                          |                  |  |

# Supported environments

|                         | Server operating system   | Client operating system   |
|-------------------------|---|---|
| on IBM Power® (ppc64le) | <ul style="list-style-type: none"><li>• Red Hat Enterprise Linux 9.2 or later minor version</li><li>• Red Hat Enterprise Linux 8.4 or later minor version</li><li>• SUSE Linux Enterprise 15 SP3 or later minor version</li></ul> | <ul style="list-style-type: none"><li>• Red Hat Enterprise Linux 9.2 or later minor version</li><li>• Red Hat Enterprise Linux 8.4 or later minor version</li><li>• SUSE Linux Enterprise 15 SP3 or later minor version</li></ul> |