

# FUJITSU Enterprise Postgres 9.4



## General Description

Windows/Linux

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# Preface

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## Purpose of This Document

This document explains the Enterprise Postgres concepts to those who are to operate databases using it.

This document explains the features of Enterprise Postgres.

## Intended Readers

This document is intended for people who are:

- Considering installing Enterprise Postgres
- Using Enterprise Postgres for the first time
- Wanting to learn about the concept of Enterprise Postgres
- Wanting to see a functional overview of Enterprise Postgres

Readers of this document are also assumed to have general knowledge of:

- Computers
- Jobs
- Linux
- Windows(R)

## Structure of This Document

This document is structured as follows:

### [Chapter 1 Enterprise Postgres Basic](#)

Explains the features of Enterprise Postgres.

### [Appendix A List of Features](#)

Explains the lists of the main features provided by Enterprise Postgres.

## Export Control Restrictions

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# Contents

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Chapter 1 Enterprise Postgres Basic.....	1
1.1 Flexible Database Recovery.....	1
1.2 Simple GUI-Based Installation and Operation Management.....	2
1.3 Seamless Migration from Oracle Databases.....	4
1.4 Linkage with Integrated Development Environment.....	4
1.5 Storage Data Protection using Transparent Data Encryption.....	4
1.6 Enhanced Query Plan Stability.....	5
Appendix A List of Features.....	6
Index.....	7

# Chapter 1 Enterprise Postgres Basic

Enterprise Postgres is a database that is fully compatible with PostgreSQL. The reliability, operability, and usability of Enterprise Postgres can be further improved by extending the PostgreSQL functionality.

This chapter explains the functionality extended by Enterprise Postgres.

Enterprise Postgres has the following features:

- Flexible database recovery  
Not only does Enterprise Postgres recover data to its most recent form when a failure occurs, which is essential for databases, but it can also recover to any point in time.
  
- Simple GUI-based installation and operation management  
Enterprise Postgres uses GUI to simplify cumbersome database operations, and allows databases to be used intuitively.
  
- Seamless migration from Oracle databases  
Enterprise Postgres provides a compatibility feature with Oracle databases that localizes the correction of existing applications and allows easy migration to Enterprise Postgres.
  
- Linkage with integrated development environment  
Enterprise Postgres links with Visual Studio, thereby allowing a standard framework to be used to create applications and construct a database server.
  
- Storage Data Protection using Transparent Data Encryption  
Information can be protected from data theft by encrypting data to be stored in the database.
  
- Enhanced query plan stability  
The following features can control SQL statement query plans:
  - Optimizer hints
  - Locked statistics

These features are used for curbing performance deterioration caused by changes in SQL statement query plans, such as with mission-critical jobs that emphasize performance stability over improved SQL statement processing performance.

## 1.1 Flexible Database Recovery

Threats such as data corruption due to disk failure and incorrect operations are unavoidable in systems that use databases. The ability to reliably recover corrupted databases without extensive damage to users when such problems occur is an essential requirement in database systems.

Enterprise Postgres provides the following recovery features that flexibly respond to this requirement:

- Media recovery, which recovers up to the most recent point in time
- Point-in-time recovery, which can recover up to a specific point in time

### Media recovery, which recovers up to the most recent point in time

When a disk failure occurs, media recovery can recover data to how it was immediately before the failure.

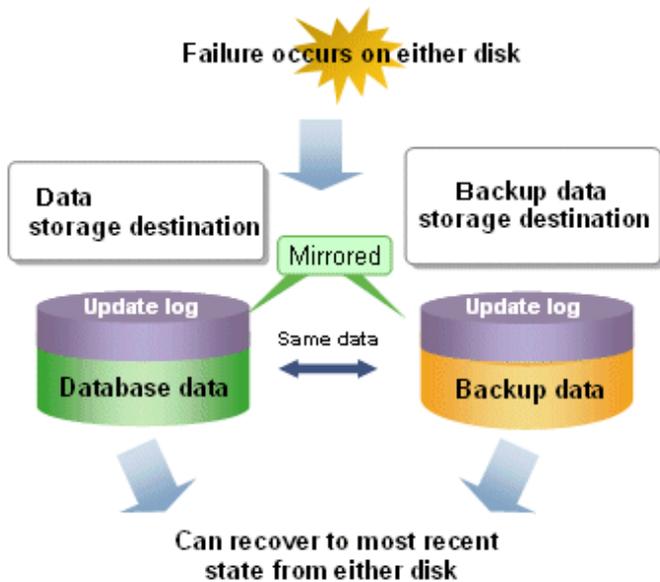
In order to recover the database, Enterprise Postgres accumulates a history of database update operations, such as data additions and deletions, as an update log.

Enterprise Postgres retains a duplicate (mirror image) of the update log after backup execution on the data storage destination and on the backup data storage destination. Therefore, the data on one disk can be used to recover to the most recent state of the database even if a disk failure has occurred on the other.

Media recovery is executed using either a GUI tool provided with Enterprise Postgres (WebAdmin) or server commands.

 **Information**

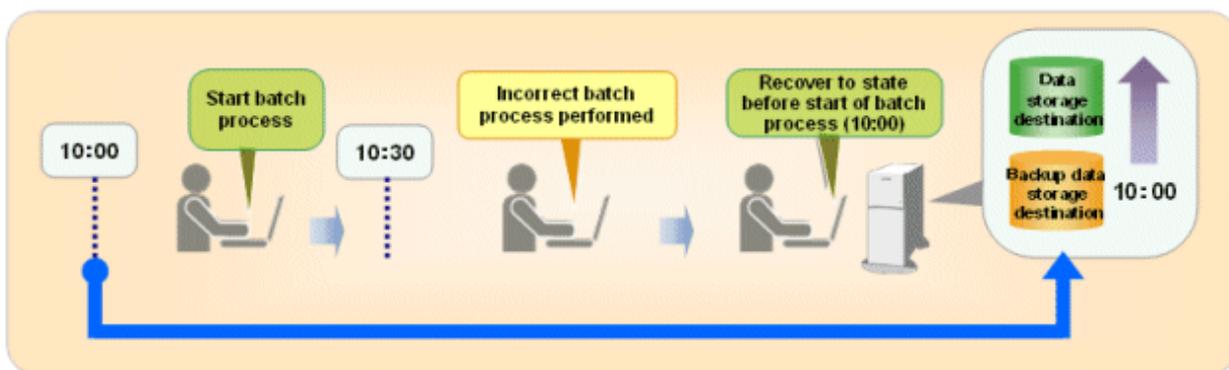
Recovery using WebAdmin requires less time and effort, since WebAdmin automatically determines the scope of the operation.



**Point-in-time recovery, which can recover up to a specific point in time**

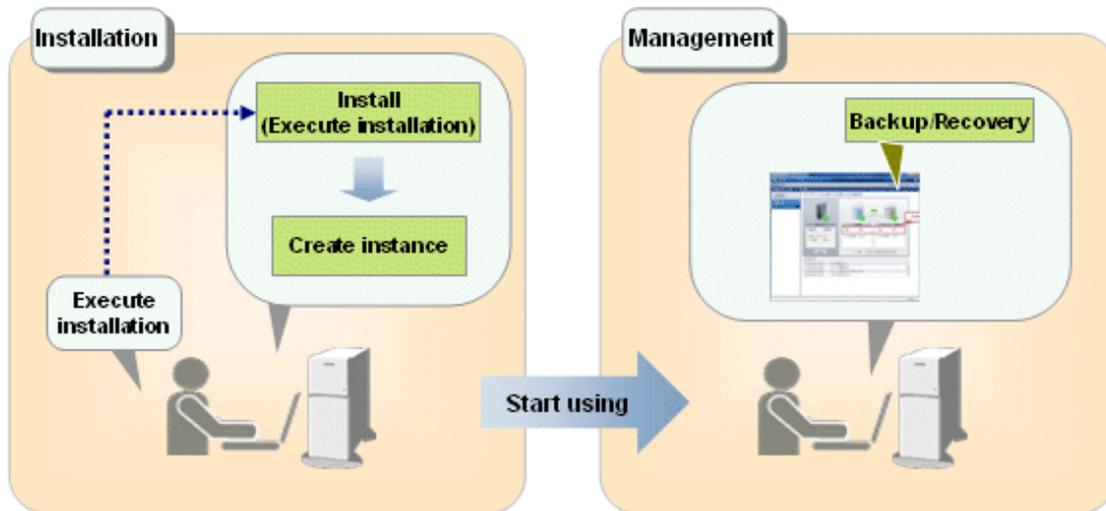
Point-in-time recovery can be used to recover a database that has been updated by an incorrect operation, for example, by specifying any date and time before the incorrect operation.

Point-in-time recovery is executed using Enterprise Postgres server commands.



**1.2 Simple GUI-Based Installation and Operation Management**

Enterprise Postgres provides WebAdmin, which is a GUI tool for a range of tasks, from database installation to operation management. This allows the databases to be used simply and intuitively.



WebAdmin can be used for Enterprise Postgres setup, database backups, and for recovery.

- Setup

To perform setup using WebAdmin, you must create an instance. Instances can be created easily and with only minimal required input, because the tool automatically determines the optimal settings for operation.

- Database backup/recovery

Database backup and recovery can be performed using simple GUI operations.

In particular, Enterprise Postgres can automatically identify and isolate the location of errors. This simplifies the recovery process and enables faster recovery.



In addition, Enterprise Postgres provides the following expanded features in pgAdmin:

- NCHAR type
- Expanded trigger definition
  - REPLACE feature
  - Function call feature

## 1.3 Seamless Migration from Oracle Databases

Enterprise Postgres provides the features compatible with Oracle databases.

Using the compatibility feature reduces the cost of correcting existing applications and results in easy database migration.

The table below shows the compatibility features provided.

Category		Features compatible with Oracle databases	
		Item	Overview
SQL	Queries	Outer join operator (+)	Operator for outer joining
		DUAL table	Tables provided by the system
	Functions	DECODE	Compares and converts values
		SUBSTR	Extracting part of a character string
		NVL	NULL value conversion
Package	DBMS_OUTPUT	Message sending	
	UTL_FILE	File operation	
	DBMS_SQL	Dynamic SQL execution	

### Information

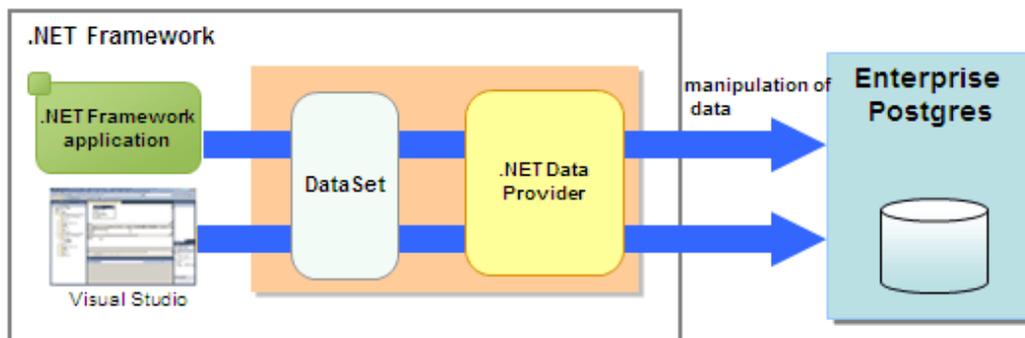
The features compatible with Oracle databases are enabled by default. Note that because some features differ from the external specifications, however, the features must be selected using compatibility mode. Refer to section "Notes on SUBSTR" in the Application Development Guide for details.

## 1.4 Linkage with Integrated Development Environment

You can link with Microsoft Visual Studio to create application. And, you can automatically generate applications to access database resources by linking to Visual Studio.

### Relationship between .NET Framework and Enterprise Postgres

Enterprise Postgres provides .NET Data Provider, which is an interface for ADO.NET of .NET Framework. This enables you to select Enterprise Postgres as the connection destination database of ADO.NET and use the intuitive and efficient application development features of Visual Studio.

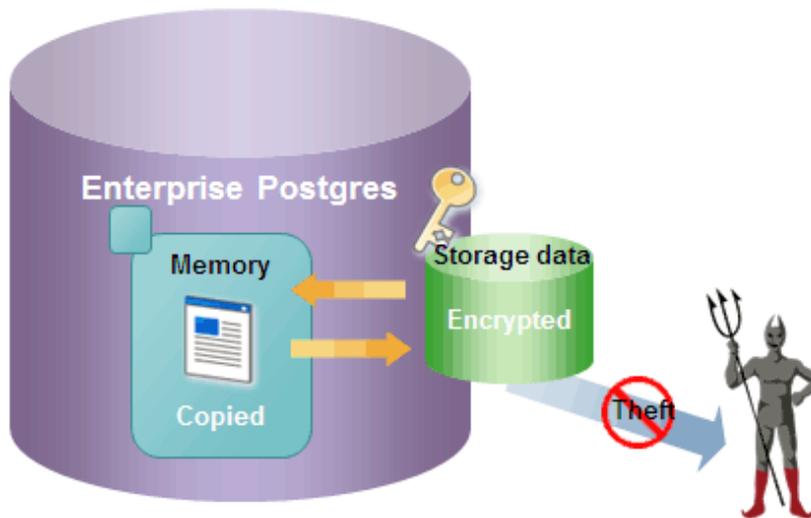


## 1.5 Storage Data Protection using Transparent Data Encryption

The encryption of data to be stored in a database is essential under the following encryption requirements of PCI DSS (Payment Card Industry Data Security Standard), the data security standard of the credit industry:

- Confidential information (such as credit card numbers) can be encrypted.
- The encryption key and data are managed as separate entities.
- The encryption key is replaced at regular intervals.

To satisfy these requirements, Enterprise Postgres provides a transparent data encryption feature. Note that PostgreSQL uses an encryption feature called pgcrypto, which can also be used in Enterprise Postgres, but requires applications to be modified. Therefore, we recommend using Enterprise Postgres's transparent data encryption feature.



 See

Refer to "Protecting Storage Data Using Transparent Data Encryption" in the Operation Guide for information on stored data encryption.

## 1.6 Enhanced Query Plan Stability

Enterprise Postgres estimates the cost of query plans based on SQL statements and database statistical information, and selects the least expensive query plan. However, like other databases, Enterprise Postgres does not necessarily select the most suitable query plan. For example, it may suddenly select unsuitable query plan due to changes in the data conditions.

In mission-critical systems, stable performance is more important than improved performance, and changes in query plans case to be avoided. In this situation, the following features can stabilize query plans:

- Optimizer hints
  - You can use `pg_hint_plan` to specify a query plan in each individual SQL statement.
- Locked statistics
  - You can use `pg_dmbs_stats` to lock statistical information per object, such as a database, schema, or table.

 See

Refer to "Optimizer Hints" in the Application Development Guide for information on optimizer hints.

Refer to "Locked Statistics" in the Application Development Guide or information on locked statistics.

 Note

Use the features provided when Enterprise Postgres is installed for optimizer hints and locked statistical information. Enterprise Postgres does not support other similar open-source features.

## Appendix A List of Features

The following table lists the main features provided by Enterprise Postgres.

Category	Feature	Linux	Windows
		SE	SE
Fujitsu-developed software technology	WebAdmin (Rapid setup, One-click recovery)	Y	Y
Application development	Embedded SQL integration Java integration ODBC integration .NET Framework integration	Y	Y
	Features compatible with Oracle databases	Y	Y
Security	Storage data encryption	Y	Y
Performance tuning	Optimizer hints	Y	Y
	Fixed statistical information	Y	Y

Y: Provided

N: Not provided

# Index

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[Special characters]	
.NET Framework.....	4
[F]	
Flexible Database Recovery.....	1
[L]	
Linkage with Integrated Development Environment.....	4
[M]	
Media recovery.....	1
[O]	
Oracle Database.....	4
[P]	
Point-in-time recovery.....	2
[T]	
Transparent Data Encryption.....	4