FUJITSU Enterprise Postgres 11

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FUJITSU Enterprise Postgres 11

Release Notes
(Linux)

Preface

Purpose of this document

This document provides release information for FUJITSU Enterprise Postgres.

Structure of this document

This document is structured as follows:

Chapter 1 New Features and Improvements

> Explains the new features and improvements in this version.

Chapter 2 Compatibility Information

> Provides information regarding compatibility.

Chapter 3 Program Updates

> Explains updates incorporated in this version.

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Issue date and version

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Chapter 1 New Features and Improvements

This chapter explains FUJITSU Enterprise Postgres new features and improvements added in this version.

Table 1.1 New features and improvements

Version and level	Classification	Feature	Provided in AE	Provided in SE
11	OSS	PostgreSQL rebase	Y	Y
		Update of OSS provided	Y	Y
	Platform enhancement	Additional operating system support for client feature	Y	Y
		Additional operating system support for server assistant feature	Y	N

1.1 Features Added in 11

This section explains new features and improvements in FUJITSU Enterprise Postgres 11.

1.1.1 OSS

This section explains the new feature related to OSS:

- PostgreSQL rebase

- Update of OSS provided

1.1.1.1 PostgreSQL Rebase

The PostgreSQL version that FUJITSU Enterprise Postgres is based on is 11.1.

See
....
Refer to "PostgreSQL Version Used for FUJITSU Enterprise Postgres" in the Installation and Setup Guide for Server for details.
....

1.1.1.2 Update of OSS Provided

The OSS provided by FUJITSU Enterprise Postgres have been updated.

See
....
Refer to "OSS Supported by FUJITSU Enterprise Postgres" in the General Description for details.
....

1.1.2 Platform Enhancement

This section explains the new features related to platform enhancement:

- Additional operating system support for client

- Additional operating system support for server assistant

1.1.2.1 Additional Operating System Support for Client Feature

The following additional operating system is supported:

- Windows Server(R) 2019

See
. . . .

Refer to "Required Operating System" in the Installation and Setup Guide for Client for details.
. . . .

1.1.2.2 Additional Operating System Support for Server Assistant Feature

The following additional operating system is supported:

- Windows Server(R) 2019

 See
. . . .

Refer to "Required Operating System" in the Installation and Setup Guide for Server Assistant for details.
. . . .

Chapter 2 Compatibility Information

This chapter explains incompatible items and actions required when migrating from an earlier version to FUJITSU Enterprise Postgres 11. Check compatibility before migrating and take the appropriate action.

Item	Pre-migration version		
	9.5	9.6	10
Changing the features targeted for installation in a 64-bit environment	Y	Y	N
Changing the access permissions of the Windows client installation folder	Y	Y	N
Changing the method of specifying the application connection switch feature	Y	Y	N
PostgreSQL compatibility of embedded SQL applications in C and COBOL	Y	Y	N
Changing Vertical Clustered Index (VCI)	Y	Y	N
Changing the maximum number of connections per server	Y	Y	N
Changing the encryption settings using the ALTER TABLESPACE statement	Y	Y	N
Changing the default configuration of the cluster system using database multiplexing	Y	N	N
Changing the default operation when mc_ctl command options are omitted	Y	N	N
Changing the connection settings when Mirroring Controller connects to an instance	Y	N	N
Changing the status display of the Mirroring Controller server	Y	N	N
Changing the operation when the synchronous_standby_names parameter is changed during database multiplexing operation	Y	N	N
Changing the WebAdmin installation method	Y	N	N
Changing how to use the features compatible with Oracle databases	Y	N	N
Changing masking policy definition for unsupported data types	Y	N	N

Y: Incompatibility exists

N: Incompatibility does not exist

2.1 Installation/Setup Incompatibility

2.1.1 Changing the Features Targeted for Installation in a 64-bit Environment

Incompatibility

FUJITSU Enterprise Postgres Client (32bit) can no longer be installed on RHEL7.

Note: FUJITSU Enterprise Postgres Client (32bit) is supported on RHEL6.

Action method

None.

2.1.2 Changing the Access Permissions of the Windows Client Installation Folder

Incompatibility

When specifying a particular installation destination for installing the Windows client, the access permissions of the installed files and folder are the same as when the Windows client is installed in the default installation destination, which is the Program Files folder.

This incompatibility occurs with all supported Windows client operating systems. Refer to "Required Operating System" in the Installation and Setup Guide for Client for information on the operating environment.

Action method

This change was made simply to enhance security, therefore, no action is normally required.

However, if existing access permissions are required, this change can be reverted by running *installDir*\setup\revert_cacls.bat as an administrator after installation.

2.1.3 Changing the WebAdmin Installation Method

Incompatibility

In FUJITSU Enterprise Postgres 9.6 or later, WebAdmin is not installed automatically during server installation. Therefore, install WebAdmin separately.

Action method

None.

2.2 Application Migration Incompatibility

2.2.1 Changing the Method of Specifying the Application Connection Switch Feature

Incompatibility

The target server specified using the application connection switch feature is changed to the same name as that of PostgreSQL.

Action method

Use the FUJITSU Enterprise Postgres 10 or later client to execute applications that have the target server specified as the application connection switch feature after changing the target server and specified value as listed below and recompiling.

Specified name of the target server

Usage target	Before correction	After correction
JDBC driver	No change	
ODBC driver	TargetServer	target_session_attrs
.NET Data Provider	target_server	TargetServerType
Connection service file	target_server	target_session_attrs
Library (libpq) for C	target_server	target_session_attrs
	Environment variable (PGXTARGETSERVER)	Environment variable (PGTARGETSESSIONATTRS)
Embedded SQL	target_server	target_session_attrs
psql	Environment variable (PGXTARGETSERVER)	Environment variable (PGTARGETSESSIONATTRS)

Specified value for the target server

Server selection order	JDBC driver	.NET Data Provider		Other driver	
		Before correction	After correction	Before correction	After correction
Primary server	No change	primary	master	primary	read-write
Standby server	No change	-	slave	-	-
Priority given to a standby server	No change	prefer_standby	preferSlave	prefer_standby	prefer-read
Any	No change	-	any	-	any

2.2.2 PostgreSQL Compatibility of Embedded SQL Applications in C and COBOL

Incompatibility

Embedded SQL applications in C and COBOL that were compiled with FUJITSU Enterprise Postgres 9.6 or earlier cannot be used in the FUJITSU Enterprise Postgres 10 client.

Action method

Use the FUJITSU Enterprise Postgres 10 or later client to execute the applications only after recompiling them with the FUJITSU Enterprise Postgres 10 or later client.

2.2.3 Changing Vertical Clustered Index (VCI)

Incompatibility

The functions below have been added to the functions for which VCI is not used.

Type	Function
Date/time functions	age(timestamp)
	current_date
	current_timestamp
	current_time
	localtime
	localtimestamp
Session information functions	current_user
	current_role

Action method

To use VCI, specify the second argument when using the age function, and specify other functions as subqueries.

[Example]

Before: select age(column A), current_date from table

After: select age(column A, **now()**), **(select current_date)** from table

2.2.4 Changing how to Use the Features Compatible with Oracle Databases

Incompatibility

In FUJITSU Enterprise Postgres 9.6 or later, to use the features compatible with Oracle databases, create a new instance and execute the following command for the "postgres" and "template1" databases:

CREATE EXTENSION oracle_compatible

Action method

None.

2.3 Operation Migration Incompatibility

2.3.1 Changing the Maximum Number of Connections per Server

Incompatibility

The maximum number of connections per server is changed from 262,143 to 65,535.

Action method

None.

2.3.2 Changing the Encryption Settings Using the ALTER TABLESPACE Statement

Incompatibility

The ALTER TABLESPACE statement can be used to change the tablespace encryption settings if data is not stored in the tablespace.

Action method

None.

2.3.3 Changing the Default Configuration of the Cluster System Using Database Multiplexing

Incompatibility

In FUJITSU Enterprise Postgres 10, a split brain will not occur if heartbeat monitoring using an admin network times out, so the default is changed to a system configuration requiring an arbitration server acting as a third party.

FUJITSU Enterprise Postgres 9.6 or earlier

A cluster system comprises two database servers.

FUJITSU Enterprise Postgres 10 or later

By default, a cluster system comprises two database servers and an arbitration server.

Action method

If selecting the same system configuration as that in FUJITSU Enterprise Postgres 9.6 or earlier, set the parameters below in the server configuration file to perform automatic degradation unconditionally when a heartbeat abnormality is detected during OS/server heartbeat monitoring.

- Parameter: heartbeat_error_action

- Value: fallback

2.3.4 Changing the Default Operation when mc_ctl Command Options are Omitted

Incompatibility

In FUJITSU Enterprise Postgres 10, the default operation when the mc_ctl command options below are omitted has been changed:

- The -f option during start mode

- The -w option during start mode

FUJITSU Enterprise Postgres 9.6 or earlier

- If the -f option is omitted, automatic switching and disconnection immediately after the startup of Mirroring Controller will not be enabled.

- If the -w option is omitted, the system will not wait for operations to finish.

FUJITSU Enterprise Postgres 10 or later

- Even if the -f option is omitted, automatic switching and disconnection immediately after the startup of Mirroring Controller will be enabled.

- Even if the -w option is omitted, the system will wait for operations to finish.

Action method

If selecting the same operation as that in FUJITSU Enterprise Postgres 9.6 or earlier, take the action below when executing start mode of the mc_ctl command.

- If the -f option is omitted, specify the -F option.

- If the -w option is omitted, specify the -W option.

2.3.5 Changing the Connection Settings when Mirroring Controller Connects to an Instance

Incompatibility

In FUJITSU Enterprise Postgres 10, Mirroring Controller changes the connection setting below when connecting to an instance to detect failure of each database element.

- Application name

FUJITSU Enterprise Postgres 9.6 or earlier

- The application name is an empty string.

FUJITSU Enterprise Postgres 10 or later

- The application name is 'mc_agent'.

Action method

There is no method for changing the application name.

Therefore, if there is an application that identifies a database connection session of Mirroring Controller with the application name being an empty string, modify the process so that identification is performed using 'mc_agent'.

2.3.6 Changing the Status Display of the Mirroring Controller Server

Incompatibility

In FUJITSU Enterprise Postgres 10, the condition for displaying an abnormality for the process (WAL receive process) that receives transaction logs has been changed in regard to the server status display performed in status mode of the mc_ctl command of Mirroring Controller.

- Role of the applicable server (host_role): standby (standby)

- Display item: DBMS process status (db_proc_status)

- Display content: abnormal (abnormal process name)
  The applicability for incompatibility is determined based on whether 'wal_receiver' is included in the abnormality process name.

FUJITSU Enterprise Postgres 9.6 or earlier

Displays an abnormality when Mirroring Controller detects that the WAL send process has stopped.

FUJITSU Enterprise Postgres 10 or later

Displays an abnormality when Mirroring Controller detects that a streaming replication connection has not been established with the primary server using the WAL receive process.

Action method

If there is an application that determines the WAL receive process status from the display content retrieved using status mode of the mc_ctl command, modify as below to determine at the same level of accuracy as previously. However, this is not recommended due to incompatibilities accompanying the improvement in accuracy.

- If 'wal_sender' is included in the abnormal process name displayed in the 'abnormal' db_proc_status item of the 'primary' host_role, it is determined that an abnormality has occurred in the WAL receive process.

- If 'wal_sender' is not included in the abnormal process name displayed in the 'abnormal' db_proc_status item of the 'primary' host_role, it is determined that an abnormality has not occurred in the WAL receive process.

2.3.7 Changing the Operation when the synchronous_standby_names Parameter is Changed during Database Multiplexing Operation

Incompatibility

In FUJITSU Enterprise Postgres 9.6 or earlier, Mirroring Controller periodically accesses the database to retrieve the synchronous_standby_names parameter value using the SHOW command, and automatically recovers if changes are detected, in case the user accidentally changes the synchronous_standby_names parameter in postgresql.conf during database multiplexing mode. However, because this process uses the CPU of the database server for redundancy and SQL statements are executed with high frequency, these processes are not executed by default in FUJITSU Enterprise Postgres 10.

FUJITSU Enterprise Postgres 9.6 or earlier

Mirroring Controller checks if the synchronous_standby_names parameter in postgresql.conf has been mistakenly changed by the user.

FUJITSU Enterprise Postgres 10 or later

By default, Mirroring Controller does not check if the synchronous_standby_names parameter in postgresql.conf has been mistakenly changed by the user.

Action method

If selecting the same operation as that in FUJITSU Enterprise Postgres 9.6 or earlier, set the parameter below in the server definition file.

- Parameter: check_synchronous_standby_names_validation

- Value: 'on'

2.3.8 Changing Masking Policy Definition for Unsupported Data Types

Incompatibility

The data masking feature of FUJITSU Enterprise Postgres is updated so that an error occurs when a masking policy is defined for a column of an unsupported data type (array type or timestamp with timezone type).

FUJITSU Enterprise Postgres 9.5

The definition of a masking policy for a column of array type or timestamp with timezone type ends normally, but an error occurs when accessing a column of a table for which the policy is defined.

FUJITSU Enterprise Postgres 9.6 or later

An error occurs when defining a masking policy for a column of array type or timestamp with timezone type.

Action method

If a policy that was defined in FUJITSU Enterprise Postgres 9.5 includes masking of a column of an unsupported data type (array type or timestamp with timezone type), perform one of the following in FUJITSU Enterprise Postgres 9.6 or later:

- Ignore the error if the masking policy contains columns of only these data types, or delete the policy with the pgx_drop_confidential_policy system administration function.

- If the masking policy target contains columns of these data types and a supported data type, delete the problematic columns with the pgx_alter_confidential_policy system function.

Chapter 3 Program Updates

This version incorporates the updates implemented in PostgreSQL 11, and 11.1.

See

. . . .

Refer to the PostgreSQL Global Development Group website for information on the updates implemented in the following releases:

[PostgreSQL 11]

```
https://www.postgresql.org/docs/11/release-11.html
```

[PostgreSQL 11.1]

```
https://www.postgresql.org/docs/11/release-11-1.html
```

. . . .

In addition, this version incorporates the following updates to address multiple vulnerabilities of Apache Tomcat.

- CVE-2018-1336: An improper handing of overflow in the UTF-8 decoder with supplementary characters can lead to an infinite loop in the decoder causing a Denial of Service.

- CVE-2018-8034: The host name verification when using TLS with the WebSocket client was missing.

Issues that occurred in previous versions and levels are also fixed.

Refer to the following table for details of the program fixes included in this version and level.

Table 3.1 Program fixes in FUJITSU Enterprise Postgres 11

No.	Version and level	P number	Issue
1	11	PH14122	[Issue] When logging in to WebAdmin, the message "Root is specified, or the user name or the password is incorrect" is output, and login fails. [Environment] Environment of condition 1 The following operating system is used: - Linux Environment of condition 2 One of the following operating systems is used: - Oracle Solaris - Linux [Conditions] Condition 1 1. The total size of the following information in the operating system user information exceeds 248 bytes, and - User name - User ID - Group ID of the main group the user belongs to - Comment - Home directory path - Login shell path

No.	Version and level	P number	Issue
			2. The user in 1 logs in to WebAdmin.
			Condition 2
			1. The user logs in to WebAdmin.
			Internal condition of condition 2
			The operating system function getpwnam_r used by WebAdmin returns one of the following errors:
			- ESRCH
			- EBADF
			- EIO
			- EMFILE
			- ENFILE
			- ENOMEM
2		PH14817	[Issue]
			The end of column data retrieved for host variables in applications that use embedded SQL in COBOL may be padded with NULL characters.
			[Environment]
			One of the following operating systems is used:
			- Linux
			- Windows
			- Oracle Solaris
			[Conditions]
			1. Column data of a table is retrieved for a host variable of a Japanese item in a COBOL application, and
			2. The length (*1) of the host variable of the Japanese item in 1 is larger than the retrieved column data.
			*1: The length of the host variable of the Japanese item differs depending on the value specified for the ECOBPG_NCHAR environment variable.
			- SJIS, UTF16BE/LE, COBOL_EUC: Defined length of the Japanese item x 2 bytes
			- UTF32BE/LE: Defined length of the Japanese item x 4 bytes
3		PH14880	[Issue]
			When retrieving data with a 0 for the integer part of numeric type using the SQLDA descriptor area in embedded SQL(ECPG) in C, loss of significance occurs.
			[Environment]
			One of the following operating systems is used:
			- Linux
			- Oracle Solaris
			- Windows
			[Conditions]
			1. An embedded SQL(ECPG) application in C is used, and
			2. The SQLDA descriptor area is used to retrieve numeric type data, and

No.	Version and level	P number	Issue
			3. The integer part of the retrieved numeric type data is 0.
			Note:
			The number of digits for which loss of significance occurs varies according to the number of zeros following the decimal point.
			In the case of 0.1234, the last digit is lost, to become 0.123.
			In the case of 0.0123, the last two digits are lost, to become 0.01.
4		PH15259	[Issue] Even when a scan is performed for a table that has a masking policy defined, some of the column data may not be masked. [Environment] One of the following operating systems is used: - Linux - Windows [Conditions] 1. The data masking (*1) feature is enabled, and 2. A masking policy is set in the table, and 3. Columns targeted for masking are specified for the selection items of the SELECT statement that performs a scan for the table in 2, and 4. Two or more columns targeted for masking are included in the selection items in the SQL statement in 3, and 5. Columns targeted for masking are specified in the GROUP BY clause in the SQL statement in 3, and 6. A parallel scan is selected in the SQL statement in 3. Below is an example in the applicable SQL statement. Example: SELECT id, id, id FROM foo WHERE id < 2 GROUP BY id; In this case, the columns other than the last selected column will not be masked. *1: pgx_datamasking is added to shared_preload_libraries, and CREATE EXTENSION pgx_datamasking is executed in the database.
5		PH15294	[Issue] An instance crashes when the pgx_loader command is executed in load mode while the pg_hint_plan extension is enabled. [Environment] One of the following operating systems is used: -Windows - Linux [Conditions] 1.The pg_hint_plan extension is enabled (*1) in all sessions, and 2. The pgx_loader command is executed in load mode. *1: "pg_hint_plan" is specified for the shared_preload_libraries parameter in postgresql.conf, and the instance is started.

No.	Version and level	P number	Issue
6		PH15340	[Issue] When the client feature is reinstalled, the dialog box below may be output and installation may fail. <Dialog box> The client products cannot be installed because the software below was detected. To install the client products, click [Cancel] to exit the installer. Then uninstall the software before installing FUJITSU Enterprise Postgres. If you want to continue installing the server product only, click [Back], and then select and install only the server product. psqlODBC_x64 (version:10.01.0000) Npgsql 3.2.6 (version:3.2.6) [Environment] The following operating system is used: - Windows [Conditions] 1. FUJITSU Enterprise Postgres Client is installed, and 2. The software in 1 is reinstalled.
7		PH15342	[Issue] The message below is output and installation fails when FUJITSU Enterprise Postgres is installed: <Message> Version 6.1 of OS is not supported. [Environment] The following operating system is used: - Linux [Conditions] 1. The applicable operating system is Red Hat(R) Enterprise Linux(R) 6.10, and 2. One of the following is installed in the environment in 1: - FUJITSU Enterprise Postgres Client - FUJITSU Enterprise Postgres Standard Edition - FUJITSU Enterprise Postgres Advanced Edition - FUJITSU Enterprise Postgres WebAdmin - FUJITSU Enterprise Postgres Server Assistant
8		PH15666	[Issue] Restarting fails for crash recovery. [Environment] One of the following operating systems is used: - Linux - Oracle Solaris - Windows

No.	Version and level	P number	Issue
			[Conditions]
			1. The restart_after_crash parameter is configured to on in postgresql.conf, and
			2. A tablespace is configured to be encrypted, and
			3. A keystore is configured to automatically open, and
			4. A backend process crashes, and
			5. Crash recovery is performed during a restart after 4.
9		PH15671	[Issue]
			When scanning is performed using a Vertical Clustered Index (VCI), the message below may be output and SQL statements may end abnormally.
			< SQLSTATE >
			XX000
			<Message>
			ERROR: badly formatted node string "} :righttree {INDEXSCAN :startup"...
			[Environment]
			One of the following operating systems is used:
			- Linux
			- Windows
			[Conditions]
			1. A VCI is created in a table, and
			2. Scanning is performed using the SQL statement query expression that performed the join operation on the table in 1.
			As an internal condition, the plan nodes below are included in the execution plan for the SQL statement in 2:
			- Gather nodes or Gather Merge nodes where parallel queries operate, and
			- Hash Join nodes or Merge Join nodes
			The conditions can be checked using the EXPLAIN ANALYZE command.
10		PH15721	[Issue]
			<Linux>
			When installing FUJITSU Enterprise Postgres Client (32-bit), the message below is output and installation fails.
			- Message: "Version 6.10 of OS is not supported."
			<Windows>
			Installation of FUJITSU Enterprise Postgres Client (32-bit) cannot be selected.
			[Environment]
			One of the following operating systems is used:
			- Linux
			- Windows
			[Conditions]
			1. The target architecture is a 64-bit environment, and

No.	Version and level	P number	Issue
			2. The client product below is installed in the environment in 1. - FUJITSU Enterprise Postgres Client(32bit) (*1) *1: Including client products that are installed as an extension of server product installations.
11		PH16075	[Issue] When a trigger definition is changed in pgAdmin, an error notification message may be output and the operation may end abnormally. Error message "can't execute an empty query" [Environment] The following operating system is used: - Windows [Conditions] 1. The database is connected to from pgAdmin, and 2. A defined trigger included in the "Triggers" icon is searched from the "Tables" icon, and 3. The icon of the trigger in 2 is right-clicked, and "Properties..." is selected, and 4. The [Definition] tab or the [Events] tab is selected, and 5. Any setting value of the tab selected in 4 is changed, and 6. [Save] is clicked.
12		PH16068	[Issue] When an application using the ProviderFactory class with "FUJITSU.Npgsql" explicitly described for the provider name in Npgsql, the error message below is output and the connection to the database failed. Error message: Failed to find or load the registered .Net Framework Data Provider. [Environment] The following operating system is used: - Windows [Conditions] 1. The .NET Data Provider is registered to machine.config and the Global Assembly Cache (GAC) using one of the following methods, and 1-1. The Windows client of Enterprise Postgres 10 Standard Edition/Advanced Edition has been installed, or 1-2. Npgsql-3.2.6.msi is executed as registration of .NET Data Provider. 2. The following is described in the application, using the ProviderFactory class, which has "FUJITSU.Npgsql" explicitly described for the provider name, as the method of connecting to the database. DbProviderFactory fct = DbProviderFactories.GetFactory("FUJITSU.Npgsql");
13		PH16259	[Issue] After [Join replication cluster] is clicked in WebAdmin, WebAdmin repository information may be inconsistent. As a result, the following event will occur:

No.	Version and level	P number	Issue
			(Event)
			The logged in session is disconnected, a message is output on the login window, and you cannot log in again.
			<Steps>
			1. Click [Join replication cluster], and delete the instance in which [Join replication cluster] is clicked.
			<Message>
			Your session may have timed out or an unexpected error has occurred.
			Please log in again.
			[Environment]
			One of the following operating systems is used:
			- Linux
			- Windows
			[Conditions]
			1. Mirroring Controller is set up using WebAdmin, and
			2. The primary instance in 1 is joined as a standby instance of another instance using [Join replication cluster].

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FUJITSU

FUJITSU Enterprise Postgres 11

Release Notes
(Windows)

Preface

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Issue date and version

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Chapter 1 New Features and Improvements

This chapter explains FUJITSU Enterprise Postgres new features and improvements added in this version.

Table 1.1 New features and improvements

Version and level	Classification	Feature	Provided in AE	Provided in SE
11	OSS	PostgreSQL rebase	Y	Y
		Update of OSS provided	Y	Y
	Platform enhancement	Additional operating system support for server feature	Y	Y
		Additional operating system support for client feature	Y	Y
		Additional operating system support for server assistant feature	Y	N

1.1 Features Added in 11

This section explains new features and improvements in FUJITSU Enterprise Postgres 11.

1.1.1 OSS

This section explains the new feature related to OSS:

- PostgreSQL rebase

- Update of OSS provided

1.1.1.1 PostgreSQL Rebase

The PostgreSQL version that FUJITSU Enterprise Postgres is based on is 11.1.

See
....
Refer to "PostgreSQL Version Used for FUJITSU Enterprise Postgres" in the Installation and Setup Guide for Server for details.
....

1.1.1.2 Update of OSS Provided

The OSS provided by FUJITSU Enterprise Postgres have been updated.

See
....
Refer to "OSS Supported by FUJITSU Enterprise Postgres" in the General Description for details.
....

1.1.2 Platform Enhancement

This section explains the new features related to platform enhancement:

- Additional operating system support for server

- Additional operating system support for client

- Additional operating system support for server assistant

1.1.2.1 Additional Operating System Support for Server Feature

The following additional operating system is supported:

- Windows Server(R) 2019

 See

Refer to "Required Operating System" in the Installation and Setup Guide for Server for details.

1.1.2.2 Additional Operating System Support for Client Feature

The following additional operating system is supported:

- Windows Server(R) 2019

 See

Refer to "Required Operating System" in the Installation and Setup Guide for Client for details.

1.1.2.3 Additional Operating System Support for Server Assistant Feature

The following additional operating system is supported:

- Windows Server(R) 2019

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Refer to "Required Operating System" in the Installation and Setup Guide for Server Assistant for details.

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Changing the WebAdmin installation method	Y	N	N
Changing how to use the features compatible with Oracle databases	Y	N	N
Changing masking policy definition for unsupported data types	Y	N	N

Y: Incompatibility exists

N: Incompatibility does not exist

2.1 Installation/Setup Incompatibility

2.1.1 Changing the Features Targeted for Installation in a 64-bit Environment

Incompatibility

FUJITSU Enterprise Postgres Client (32bit) can no longer be installed on RHEL7.

Note: FUJITSU Enterprise Postgres Client (32bit) is supported on RHEL6.

Action method

None.

2.1.2 Changing the Access Permissions of the Windows Client Installation Folder

Incompatibility

When specifying a particular installation destination for installing the Windows client, the access permissions of the installed files and folder are the same as when the Windows client is installed in the default installation destination, which is the Program Files folder.

This incompatibility occurs with all supported Windows client operating systems. Refer to "Required Operating System" in the Installation and Setup Guide for Client for information on the operating environment.

Action method

This change was made simply to enhance security, therefore, no action is normally required.

However, if existing access permissions are required, this change can be reverted by running *installDir*\setup\revert_cacls.bat as an administrator after installation.

2.1.3 Changing the WebAdmin Installation Method

Incompatibility

In FUJITSU Enterprise Postgres 9.6 or later, WebAdmin is not installed automatically during server installation. Therefore, install WebAdmin separately.

Action method

None.

2.2 Application Migration Incompatibility

2.2.1 Changing the Method of Specifying the Application Connection Switch Feature

Incompatibility

The target server specified using the application connection switch feature is changed to the same name as that of PostgreSQL.

Action method

Use the FUJITSU Enterprise Postgres 10 or later client to execute applications that have the target server specified as the application connection switch feature after changing the target server and specified value as listed below and recompiling.

Specified name of the target server

Usage target	Before correction	After correction
JDBC driver	No change	
ODBC driver	TargetServer	target_session_attrs
.NET Data Provider	target_server	TargetServerType
Connection service file	target_server	target_session_attrs
Library (libpq) for C	target_server	target_session_attrs
	Environment variable (PGXTARGETSERVER)	Environment variable (PGTARGETSESSIONATTRS)
Embedded SQL	target_server	target_session_attrs
psql	Environment variable (PGXTARGETSERVER)	Environment variable (PGTARGETSESSIONATTRS)

Specified value for the target server

Server selection order	JDBC driver	.NET Data Provider		Other driver	
		Before correction	After correction	Before correction	After correction
Primary server	No change	primary	master	primary	read-write
Standby server	No change	-	slave	-	-
Priority given to a standby server	No change	prefer_standby	preferSlave	prefer_standby	prefer-read
Any	No change	-	any	-	any

2.2.2 PostgreSQL Compatibility of Embedded SQL Applications in C and COBOL

Incompatibility

Embedded SQL applications in C and COBOL that were compiled with FUJITSU Enterprise Postgres 9.6 or earlier cannot be used in the FUJITSU Enterprise Postgres 10 client.

Action method

Use the FUJITSU Enterprise Postgres 10 or later client to execute the applications only after recompiling them with the FUJITSU Enterprise Postgres 10 or later client.

2.2.3 Changing Vertical Clustered Index (VCI)

Incompatibility

The functions below have been added to the functions for which VCI is not used.

Type	Function
Date/time functions	age(timestamp)
	current_date
	current_timestamp
	current_time
	localtime
	localtimestamp
Session information functions	current_user
	current_role

Action method

To use VCI, specify the second argument when using the age function, and specify other functions as subqueries.

[Example]

Before: select age(column A), current_date from table

After: select age(column A, **now()**), **(select current_date)** from table

2.2.4 Changing how to Use the Features Compatible with Oracle Databases

Incompatibility

In FUJITSU Enterprise Postgres 9.6 or later, to use the features compatible with Oracle databases, create a new instance and execute the following command for the "postgres" and "template1" databases:

CREATE EXTENSION oracle_compatible

Action method

None.

2.3 Operation Migration Incompatibility

2.3.1 Changing the Maximum Number of Connections per Server

Incompatibility

The maximum number of connections per server is changed from 262,143 to 65,535.

Action method

None.

2.3.2 Changing the Encryption Settings Using the ALTER TABLESPACE Statement

Incompatibility

The ALTER TABLESPACE statement can be used to change the tablespace encryption settings if data is not stored in the tablespace.

Action method

None.

2.3.3 Changing the Default Configuration of the Cluster System Using Database Multiplexing

Incompatibility

In FUJITSU Enterprise Postgres 10, a split brain will not occur if heartbeat monitoring using an admin network times out, so the default is changed to a system configuration requiring an arbitration server acting as a third party.

FUJITSU Enterprise Postgres 9.6 or earlier

A cluster system comprises two database servers.

FUJITSU Enterprise Postgres 10 or later

By default, a cluster system comprises two database servers and an arbitration server.

Action method

If selecting the same system configuration as that in FUJITSU Enterprise Postgres 9.6 or earlier, set the parameters below in the server configuration file to perform automatic degradation unconditionally when a heartbeat abnormality is detected during OS/server heartbeat monitoring.

- Parameter: heartbeat_error_action

- Value: fallback

2.3.4 Changing the Default Operation when mc_ctl Command Options are Omitted

Incompatibility

In FUJITSU Enterprise Postgres 10, the default operation when the mc_ctl command options below are omitted has been changed:

- The -f option during start mode

- The -w option during start mode

FUJITSU Enterprise Postgres 9.6 or earlier

- If the -f option is omitted, automatic switching and disconnection immediately after the startup of Mirroring Controller will not be enabled.

- If the -w option is omitted, the system will not wait for operations to finish.

FUJITSU Enterprise Postgres 10 or later

- Even if the -f option is omitted, automatic switching and disconnection immediately after the startup of Mirroring Controller will be enabled.

- Even if the -w option is omitted, the system will wait for operations to finish.

Action method

If selecting the same operation as that in FUJITSU Enterprise Postgres 9.6 or earlier, take the action below when executing start mode of the mc_ctl command.

- If the -f option is omitted, specify the -F option.

- If the -w option is omitted, specify the -W option.

2.3.5 Changing the Connection Settings when Mirroring Controller Connects to an Instance

Incompatibility

In FUJITSU Enterprise Postgres 10, Mirroring Controller changes the connection setting below when connecting to an instance to detect failure of each database element.

- Application name

FUJITSU Enterprise Postgres 9.6 or earlier

- The application name is an empty string.

FUJITSU Enterprise Postgres 10 or later

- The application name is 'mc_agent'.

Action method

There is no method for changing the application name.

Therefore, if there is an application that identifies a database connection session of Mirroring Controller with the application name being an empty string, modify the process so that identification is performed using 'mc_agent'.

2.3.6 Changing the Status Display of the Mirroring Controller Server

Incompatibility

In FUJITSU Enterprise Postgres 10, the condition for displaying an abnormality for the process (WAL receive process) that receives transaction logs has been changed in regard to the server status display performed in status mode of the mc_ctl command of Mirroring Controller.

- Role of the applicable server (host_role): standby (standby)

- Display item: DBMS process status (db_proc_status)

- Display content: abnormal (abnormal process name)
  The applicability for incompatibility is determined based on whether 'wal_receiver' is included in the abnormality process name.

FUJITSU Enterprise Postgres 9.6 or earlier

Displays an abnormality when Mirroring Controller detects that the WAL send process has stopped.

FUJITSU Enterprise Postgres 10 or later

Displays an abnormality when Mirroring Controller detects that a streaming replication connection has not been established with the primary server using the WAL receive process.

Action method

If there is an application that determines the WAL receive process status from the display content retrieved using status mode of the mc_ctl command, modify as below to determine at the same level of accuracy as previously. However, this is not recommended due to incompatibilities accompanying the improvement in accuracy.

- If 'wal_sender' is included in the abnormal process name displayed in the 'abnormal' db_proc_status item of the 'primary' host_role, it is determined that an abnormality has occurred in the WAL receive process.

- If 'wal_sender' is not included in the abnormal process name displayed in the 'abnormal' db_proc_status item of the 'primary' host_role, it is determined that an abnormality has not occurred in the WAL receive process.

2.3.7 Changing the Operation when the synchronous_standby_names Parameter is Changed during Database Multiplexing Operation

Incompatibility

In FUJITSU Enterprise Postgres 9.6 or earlier, Mirroring Controller periodically accesses the database to retrieve the synchronous_standby_names parameter value using the SHOW command, and automatically recovers if changes are detected, in case the user accidentally changes the synchronous_standby_names parameter in postgresql.conf during database multiplexing mode. However, because this process uses the CPU of the database server for redundancy and SQL statements are executed with high frequency, these processes are not executed by default in FUJITSU Enterprise Postgres 10.

FUJITSU Enterprise Postgres 9.6 or earlier

Mirroring Controller checks if the synchronous_standby_names parameter in postgresql.conf has been mistakenly changed by the user.

FUJITSU Enterprise Postgres 10 or later

By default, Mirroring Controller does not check if the synchronous_standby_names parameter in postgresql.conf has been mistakenly changed by the user.

Action method

If selecting the same operation as that in FUJITSU Enterprise Postgres 9.6 or earlier, set the parameter below in the server definition file.

- Parameter: check_synchronous_standby_names_validation

- Value: 'on'

2.3.8 Changing Masking Policy Definition for Unsupported Data Types

Incompatibility

The data masking feature of FUJITSU Enterprise Postgres is updated so that an error occurs when a masking policy is defined for a column of an unsupported data type (array type or timestamp with timezone type).

FUJITSU Enterprise Postgres 9.5

The definition of a masking policy for a column of array type or timestamp with timezone type ends normally, but an error occurs when accessing a column of a table for which the policy is defined.

FUJITSU Enterprise Postgres 9.6 or later

An error occurs when defining a masking policy for a column of array type or timestamp with timezone type.

Action method

If a policy that was defined in FUJITSU Enterprise Postgres 9.5 includes masking of a column of an unsupported data type (array type or timestamp with timezone type), perform one of the following in FUJITSU Enterprise Postgres 9.6 or later:

- Ignore the error if the masking policy contains columns of only these data types, or delete the policy with the pgx_drop_confidential_policy system administration function.

- If the masking policy target contains columns of these data types and a supported data type, delete the problematic columns with the pgx_alter_confidential_policy system function.

Chapter 3 Program Updates

This version incorporates the updates implemented in PostgreSQL 11, and 11.1.

See

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Refer to the PostgreSQL Global Development Group website for information on the updates implemented in the following releases:

[PostgreSQL 11]

```
https://www.postgresql.org/docs/11/release-11.html
```

[PostgreSQL 11.1]

```
https://www.postgresql.org/docs/11/release-11-1.html
```

....

In addition, this version incorporates the following updates to address multiple vulnerabilities of Apache Tomcat.

- CVE-2018-1336: An improper handing of overflow in the UTF-8 decoder with supplementary characters can lead to an infinite loop in the decoder causing a Denial of Service.

- CVE-2018-8034: The host name verification when using TLS with the WebSocket client was missing.

Issues that occurred in previous versions and levels are also fixed.

Refer to the following table for details of the program fixes included in this version and level.

No.	Version and level	P number	Issue
1	11	PH12554	[Issue] Issue 1 When an instance is created using WebAdmin, it is possible to connect to the database, however, when checking the operating status of an instance by using the [Instances] tab in WebAdmin, the status indicating "The resource is stopped" is displayed. Issue 2 When an instance is backed up using WebAdmin, the message "Backup failed." is output. [Environment] The following operating system is used: - Windows [Conditions] Conditions for issue 1 1. An instance is created using WebAdmin, and 2. Halfwidth spaces are included in the data storage path specified when creating the instance. Conditions for issue 2 1. An instance is created using WebAdmin, and 2. Halfwidth spaces are included in the data storage path specified when creating the instance, and 3. An error caused by insufficient space or other cause occurs when the background process backs up the WAL log after 1, and 4. The instance is backed up using WebAdmin.
2		PH14817	[Issue]

No.	Version and level	P number	Issue
			The end of column data retrieved for host variables in applications that use embedded SQL in COBOL may be padded with NULL characters.
			[Environment]
			One of the following operating systems is used:
			- Linux
			- Windows
			- Oracle Solaris
			[Conditions]
			1. Column data of a table is retrieved for a host variable of a Japanese item in a COBOL application, and
			2. The length (*1) of the host variable of the Japanese item in 1 is larger than the retrieved column data.
			*1: The length of the host variable of the Japanese item differs depending on the value specified for the ECOBPG_NCHAR environment variable.
			- SJIS, UTF16BE/LE, COBOL_EUC: Defined length of the Japanese item x 2 bytes
			- UTF32BE/LE: Defined length of the Japanese item x 4 bytes
3		PH14880	[Issue]
			When retrieving data with a 0 for the integer part of numeric type using the SQLDA descriptor area in embedded SQL(ECPG) in C, loss of significance occurs.
			[Environment]
			One of the following operating systems is used:
			- Linux
			- Oracle Solaris
			- Windows
			[Conditions]
			1. An embedded SQL(ECPG) application in C is used, and
			2. The SQLDA descriptor area is used to retrieve numeric type data, and
			3. The integer part of the retrieved numeric type data is 0.
			Note:
			The number of digits for which loss of significance occurs varies according to the number of zeros following the decimal point.
			In the case of 0.1234, the last digit is lost, to become 0.123.
			In the case of 0.0123, the last two digits are lost, to become 0.01.
4		PH15092	[Issue]
			When an instance is created using WebAdmin, the message below is output to the window, and creation of the instance fails.
			"Error occurred when creating instance "xxxx". Detail: Backup failed. Please check the system log for details and do the creation again after the problem has been solved."
			xxxx: instance name
			[Environment]
			The following operating system is used:

No.	Version and level	P number	Issue
			- Windows
			[Conditions]
			1. PGPASSFILE has been set for a system environment variable, and
			2. The following has not been set for PGPASSFILE in 1, and
			Symfoware Server V12.3.0, FUJITSU Enterprise Postgres 9.5 to 9.6:
			userProfileFolder\localSetupFolder\Fujitsu
			\fsep_*version\instanceNamePortNo*\pgpass.conf
			FUJITSU Enterprise Postgres 9.4:
			userProfileFolder\localSetupFolder\Fujitsu
			\fsep_*version\instanceName*\pgpass.conf
			Symfoware Server V12.0.0 to V12.2.0:
			userProfileFolder\localSetupFolder\Fujitsu
			\symfo_*version\InstanceName*\pgpass.conf
			3. An instance is created using WebAdmin.
5		PH15297	[Issue]
			Instances cannot be created using WebAdmin.
			[Environment]
			The following operating system is used:
			- Windows
			[Conditions]
			1. An instance is created using WebAdmin, and
			2. A locale other than Japanese or English is used on the server where the instance is deployed.
6		PH15666	[Issue]
			Restarting fails for crash recovery.
			[Environment]
			One of the following operating systems is used:
			- Linux
			- Oracle Solaris
			- Windows
			[Conditions]
			1. The restart_after_crash parameter is configured to on in postgresql.conf, and
			2. A tablespace is configured to be encrypted, and
			3. A keystore is configured to automatically open, and
			4. A backend process crashes, and
			5. Crash recovery is performed during a restart after 4.
7		PH15671	[Issue]
			When scanning is performed using a Vertical Clustered Index (VCI), the message below may be output and SQL statements may end abnormally.

No.	Version and level	P number	Issue
			< SQLSTATE > XX000 <Message> ERROR: badly formatted node string "} :righttree {INDEXSCAN :startup"... [Environment] One of the following operating systems is used: - Linux - Windows [Conditions] 1. A VCI is created in a table, and 2. Scanning is performed using the SQL statement query expression that performed the join operation on the table in 1. As an internal condition, the plan nodes below are included in the execution plan for the SQL statement in 2: - Gather nodes or Gather Merge nodes where parallel queries operate, and - Hash Join nodes or Merge Join nodes The conditions can be checked using the EXPLAIN ANALYZE command.
8		PH16068	[Issue] When an application using the ProviderFactory class with "FUJITSU.Npgsql" explicitly described for the provider name in Npgsql, the error message below is output and the connection to the database failed. Error message: Failed to find or load the registered .Net Framework Data Provider. [Environment] The following operating system is used: - Windows [Conditions] 1. The .NET Data Provider is registered to machine.config and the Global Assembly Cache (GAC) using one of the following methods, and 1-1. The Windows client of Enterprise Postgres 10 Standard Edition/Advanced Edition has been installed, or 1-2. Npgsql-3.2.6.msi is executed as registration of .NET Data Provider. 2. The following is described in the application, using the ProviderFactory class, which has "FUJITSU.Npgsql" explicitly described for the provider name, as the method of connecting to the database. DbProviderFactory fct = DbProviderFactories.GetFactory("FUJITSU.Npgsql");
9		PH16075	[Issue] When a trigger definition is changed in pgAdmin, an error notification message may be output and the operation may end abnormally. Error message "can't execute an empty query" [Environment]

No.	Version and level	P number	Issue
			The following operating system is used:
			- Windows
			[Conditions]
			1. The database is connected to from pgAdmin, and
			2. A defined trigger included in the "Triggers" icon is searched from the "Tables" icon, and
			3. The icon of the trigger in 2 is right-clicked, and "Properties..." is selected, and
			4. The [Definition] tab or the [Events] tab is selected, and
			5. Any setting value of the tab selected in 4 is changed, and
			6. [Save] is clicked.
10		PH16259	[Issue]
			After [Join replication cluster] is clicked in WebAdmin, WebAdmin repository information may be inconsistent.
			As a result, the following event will occur:
			(Event)
			The logged in session is disconnected, a message is output on the login window, and you cannot log in again.
			<Steps>
			1. Click [Delete instance], and delete the instance in which [Join replication cluster] is clicked.
			<Message>
			Your session may have timed out or an unexpected error has occurred.
			Please log in again.
			[Environment]
			One of the following operating systems is used:
			- Linux
			- Windows
			[Conditions]
			1. Mirroring Controller is set up using WebAdmin, and
			2. The primary instance in 1 is joined as a standby instance of another instance using [Join replication cluster].

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