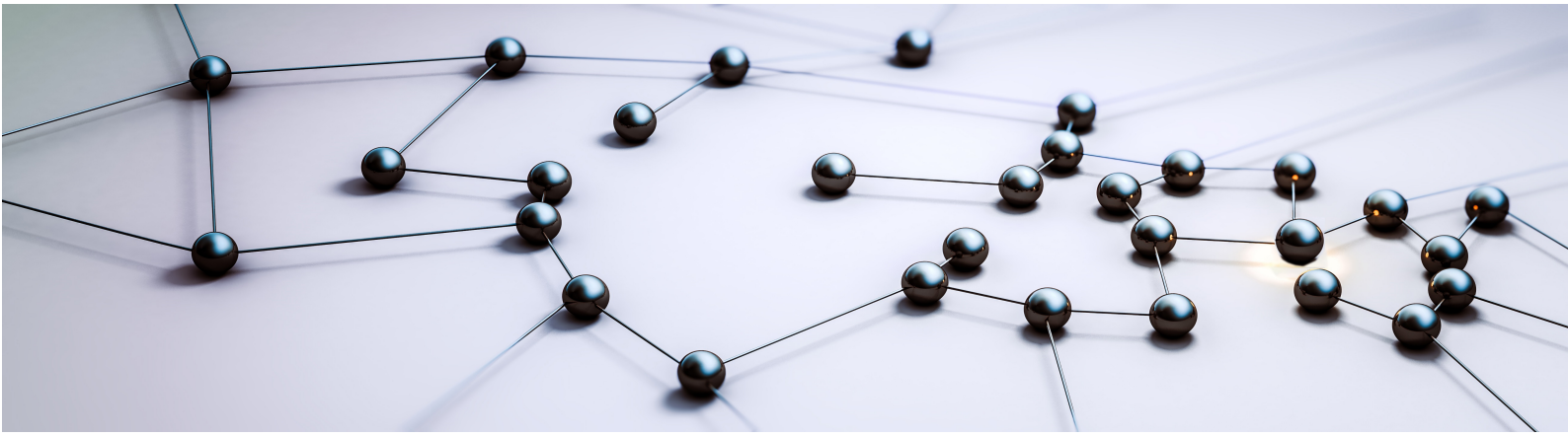
FUJITSU

FUJITSU Enterprise Postgres 10



Release Notes

Linux

J2UL-2375-01ENZ0(00)
August 2018

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.

Export restrictions

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Issue date and version

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Edition 1.0: August 2018
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Contents

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
10	Operations	Improved database multiplexing	Y	N
		Backup/recovery using user exits	Y	N
		Integration with PRIMECLUSTER	Y	Y
		Improvements to the GUI	Y	(*1)
	Security	Audit logs	Y	N
	Performance	High-speed data load	Y	N
	Application development	Support for variable format source code in COBOL programs	Y	(*1)
		Support for Visual Studio 2015	Y	(*1)
		Support for Visual Studio 2017	Y	Y
	Platform enhancement	Additional operating system support for server feature	Y	Y
		Additional operating system support for client feature	Y	Y
	OSS	PostgreSQL rebase	Y	Y
		Additional supported OSS	Y	Y

*1: Already provided in FUJITSU Enterprise Postgres 9.6 SE.

1.1 Features Added in 10

This section explains new features and improvements in FUJITSU Enterprise Postgres 10.

1.1.1 Operations

This section explains the new features related to operation.

- Improved database multiplexing
- Backup/recovery using user exits
- Integration with PRIMECLUSTER
- Improvements to the GUI

1.1.1.1 Improved Database Multiplexing

The new features and improvements below have been incorporated into database multiplexing.

- Added operations for use when a heartbeat abnormality is detected during heartbeat monitoring of the operating system or server

  You can now select from the following operations when a heartbeat abnormality is detected during heartbeat monitoring of the operating system or server.

  - Use the arbitration server to perform automatic degradation (switch/disconnect)
  - Call a user exit to determine degradation, and perform automatic degradation if required

  - Notify messages
  - Perform automatic degradation unconditionally after a heartbeat abnormality (FUJITSU Enterprise Postgres 9.6 or earlier operation)

Refer to "Monitoring Using Database Multiplexing Mode" in the Cluster Operation Guide (Database Multiplexing) for details.

- Added tuning of abnormality monitoring

  For abnormality monitoring performed by Mirroring Controller, it is now possible to select tuning for each monitoring target and behavior when an abnormality is detected.

  - Database process heartbeat monitoring

    Heartbeat monitoring tuning can now be configured individually:

    - Interval time
    - Timeout
    - Number of retries

    It is now possible to select from the following behaviors when unresponsiveness is detected:

    - Do not perform monitoring
    - Notify messages
    - Automatic degradation

  - Disk abnormality monitoring

    Abnormality monitoring tuning can now be configured individually:

    - Interval time
    - Number of retries

  - Tablespace disk abnormality monitoring

    It is now possible to select from the following behaviors when an abnormality is detected:

    - Notify messages
    - Automatic degradation

Refer to "Server Configuration File for the Database Servers" in the Cluster Operation Guide (Database Multiplexing) for details.

- Disconnection of the standby server on the primary server

  Supports a detach mode, which enables the standby server to be disconnected from the primary server at any time using the mc_ctl command.

Refer to "mc_ctl" in the Reference for details.

- Integration with reference jobs on the standby server

  Supports the features below for improved operability of reference jobs on the standby server.

  - User exit (for the state transition commands)

- Instance stoppage feature for use during disconnection

See

Refer to "Referencing on the Standby Server" in the Cluster Operation Guide (Database Multiplexing) for details.

- Mirroring Controller monitoring process

  If the Mirroring Controller process that performs abnormality monitoring on the database server is down or unresponsive, abnormality detection of the Mirroring Controller monitoring process enables you to restart the Mirroring Controller process and maintain availability.

See

Refer to "Mirroring Controller Processes" in the Cluster Operation Guide (Database Multiplexing) for details.

- Selection of instance connection settings for the Mirroring Controller process

  Some connection settings can now be changed when the Mirroring Controller process connects to an instance to detect failure of each component.

  - Connection destination database name
    Either of the database names 'postgres' or 'template1' can now be selected. This makes it possible for the SQL statements issued by Mirroring Controller to perform abnormality monitoring to identify target logs from the audit logs or server logs.
  - Connection user name
    The user name of any superuser can be specified. This enables instance administrator users and superusers who operate the Mirroring Controller commands to run database multiplexing mode in different environments.

See

Refer to "Server Configuration File for the Database Servers" in the Cluster Operation Guide (Database Multiplexing) for details.

1.1.1.2 Backup/Recovery Using User Exits

The pgx_dmpall command and the pgx_rcvall command can now perform backup/recovery using user exits. Database clusters and tablespaces can be backed up to any backup destination using a user exit (for the copy command) by any copy method.

Additionally, by using the high-speed copy feature of the storage device with the copy command, the processing time for backup of large databases can be greatly reduced.

See

Refer to "Backup/Recovery Using the Copy Command" in the Operation Guide for details.

1.1.1.3 Integration with PRIMECLUSTER

Cluster operation integrated with PRIMECLUSTER is now possible. Accordingly, a highly reliable system using failover can be achieved.

See

Refer to the Cluster Operation Guide (PRIMECLUSTER) for details.

1.1.1.4 Improvements to the GUI

The WebAdmin GUI incorporates the following new features and improvements:

- Import instance

  Instances created via the command line using the initdb command can be imported into and subsequently managed by WebAdmin.

  Refer to "Importing Instances" in the Installation and Setup Guide for Server for details.

- Edit instance

  The following items for an instance can now be modified: Instance name, Port number, and Backup storage path.

  Refer to "Editing instance information" in the Installation and Setup Guide for Server for details.

- Anomaly processing

  WebAdmin now detects external changes to the port and backup_destination parameters in postgresql.conf, and provides the ability to synchronize these parameters with the corresponding items in WebAdmin.

  WebAdmin also detects external changes to Mirroring Controller configuration of cluster replication added via WebAdmin, and disables Mirroring Controller functionality for the instance for which the anomaly is detected.

  Refer to "Anomaly Detection and Resolution" in the Operation Guide for details.

- Interoperability support

  WebAdmin can now be used to manage FUJITSU Enterprise Postgres 9.5 or later instances.

  Refer to "[Server product type]" in "Creating an Instance" in the Installation and Setup Guide for Server for details.

- Optional backup

  Backup and restore functionality can now be disabled for an instance.

  Refer to "[Backup]" in "Creating an Instance" in the Installation and Setup Guide for Server for details.

- Auto-refresh

  The auto-refresh feature automatically refreshes the status of all instances at set intervals.

  Refer to "Using the WebAdmin Auto-Refresh Feature" in the Installation and Setup Guide for Server for details.

- Performance improvements

  Performance has been significantly improved for various operations.

1.1.2 Security

This section explains the new feature related to security.

- Audit logs

1.1.2.1 Audit Logs

Details relating to database access can be retrieved in audit logs. Audit logs can be used to counter security threats such as unauthorized access to the database and misuse of privileges.

See

Refer to "Audit Log Feature" in the Security Operation Guide for details.

1.1.3 Performance

This section explains the new feature added to improve performance:

- High-speed data load

1.1.3.1 High-Speed Data Load

High-speed data load executes COPY FROM commands using multiple parallel workers. Accordingly, data from files can be loaded at high speed into FUJITSU Enterprise Postgres tables.

 See

Refer to "High-Speed Data Load" in the Operation Guide for details.

1.1.4 Application Development

This section explains the new features related to application development:

- Support for variable format source code in COBOL programs
- Support for Visual Studio 2015

1.1.4.1 Support for Variable Format Source Code in COBOL Programs

For embedded SQL in COBOL, variable format source code is now supported in COBOL programs. This makes it possible to precompile existing COBOL programs that use variable format source code as is.

 See

Refer to "Embedded SQL in COBOL" in the Application Development Guide for details.

1.1.4.2 Support for Visual Studio 2015

Visual Studio 2015 is supported as a development environment of the FUJITSU Enterprise Postgres client feature for Windows(R).

 See

Refer to "Related Software" in the Installation and Setup Guide for Client for details.

1.1.4.3 Support for Visual Studio 2017

Visual Studio 2017 is supported as a development environment of the FUJITSU Enterprise Postgres client feature for Windows(R).

 See

Refer to "Related Software" in the Installation and Setup Guide for Client for details.

1.1.5 Platform Enhancement

This section explains the new features related to platform enhancement:

- Additional operating system support for server
- Additional operating system support for client

1.1.5.1 Additional Operating System Support for Server Feature

The following additional operating systems are supported:

- SLES 12 SP2 or later

See

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

1.1.5.2 Additional Operating System Support for Client Feature

The following additional operating systems are supported:

- SLES 12 SP2 or later

See

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

1.1.6 OSS

This section explains the new feature related to OSS:

- PostgreSQL rebase
- Additional supported OSS

1.1.6.1 PostgreSQL Rebase

The PostgreSQL version that FUJITSU Enterprise Postgres is based on is 10.3.

See

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

1.1.6.2 Additional Supported OSS

The OSS below are newly supported:

- Pgpool-II
- oracle_fdw
- pg_statsinfo
- pg_repack
- pg_rman
- pgBadger
- pg_bigm

See

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

Chapter 2 Compatibility Information

This chapter explains incompatible items and actions required when migrating from an earlier version to FUJITSU Enterprise Postgres 10. Check compatibility before migrating and take the appropriate action.

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

In a 64-bit environment, only the 64-bit client can be installed.

Action method

If a 32-bit application is to be used, prepare a 32-bit environment and install the 32-bit client.

2.1.2 Changing the Access Permissions of the Windows Client Installation Directory

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 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 Environment variable (PGXTARGETSERVER)	target_session_attrs 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	-	-

Server selection order	JDBC driver	.NET Data Provider		Other driver	
		Before correction	After correction	Before correction	After correction
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

The method of managing the nchar data type has been enhanced to enable use of embedded SQL applications in C that are compiled with PostgreSQL.

Action method

Use the FUJITSU Enterprise Postgres 10 client to execute embedded SQL applications in C and COBOL that were compiled with FUJITSU Enterprise Postgres 9.6 or earlier, after recompiling them with the FUJITSU Enterprise Postgres 10 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.

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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.

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- 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.

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- 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.

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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.

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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 10, 10.1, 10.2, and 10.3.

See

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

[PostgreSQL 10]

```
https://www.postgresql.org/docs/10/static/release-10.html
```

[PostgreSQL 10.1]

```
https://www.postgresql.org/docs/10/static/release-10-1.html
```

[PostgreSQL 10.2]

```
https://www.postgresql.org/docs/10/static/release-10-2.html
```

[PostgreSQL 10.3]

```
https://www.postgresql.org/docs/10/static/release-10-3.html
```

Furthermore, this version incorporates the following security update that was fixed in PostgreSQL 10.4:

- CVE-2018-1115: Too-permissive access control list on function pg_logfile_rotate()

See

Refer to the URL below for information on PostgreSQL security updates:

PostgreSQL Global Development Group website:

```
https://www.postgresql.org/about/news/1851/
```

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 10

No.	Version and level	P number	Issue
1	10	PH11764	[Issue] The hugepages feature of Linux cannot be used. An error occurs when the instance is started. FATAL: huge pages not supported on this platform [Environment] The following operating system is used: - Linux [Conditions] 1. The huge_pages parameter is set to "on" in postgresql.conf, and 2. An instance is started.
2	10	PH13672	[Issue] If preferSlave is specified for the targetServerType connection string parameter, the connection destination becomes the primary server instead of the standby server.

No.	Version and level	P number	Issue
			[Environment] One of the following operating systems is used: - Linux - Oracle Solaris - Windows [Conditions] 1. The JDBC driver is used, and 2. Multiple hosts are specified for the connection string, and 3. preferSlave is specified for the targetServerType connection string parameter, and 4. When connecting to the database, the status of the connection string host name is in the following order: primary server, standby server
3	10	PH13782	[Issue] Information may be tampered with on the database server using WebAdmin. [Environment] One of the following operating systems is used: - Oracle Solaris - Linux - Windows [Conditions] 1. WebAdmin is used, and 2. A malicious program is used to access the database server port (*1). *1: Port number specified in the WebAdmin setup. For Symfoware Server, the default value is 26515. For FUJITSU Enterprise Postgres, the default value is 27515.
4	10	PH13850	[Issue] If a multibyte string is specified for the rpad function compatible with Oracle databases and the specified output length is such that a fullwidth fill (padding) character cannot be added to the specified string because there is only space available for one halfwidth character, a halfwidth space will be inserted at the beginning of the resultant string. [Environment] One of the following operating systems is used: - Linux - Oracle Solaris - Windows [Conditions] [Condition 1] 1. The rpad function (*1) compatible with Oracle databases is used, and 2. The length (*2) of the specified string is shorter than the specified output length, and 3. The *fill* parameter contains a fullwidth character, and

No.	Version and level	P number	Issue

			4. A fullwidth fill character is added to the specified string, which then exceeds the specified output length, because each fullwidth character is recognized as having a length of 2.
			Example of [Condition 1]
			`oracle.rpad('a b c',11,'Z')`
			`|a b c Z Z_|` becomes
			`|_a b c Z Z|.  (*3)`
			[Condition 2]
			1. The rpad function compatible with Oracle databases is used, and
			2. The *string* parameter contains fullwidth characters, and
			3. The length of the specified string is longer than the specified output length, and padding is added to the specified multibyte string.
			Example of [Condition 2]
			`oracle.rpad('a b c',5,'Z')`
			`| a b_|` becomes
			`|_a b|.  (*3)`
			*1: oracle.rpad(*string*, *length* [, *fill*])
			*2: In the case of halfwidth characters and characters with a width of 1 (such as ±, and ×) as defined in the Unicode definitions, the character width will be counted as 1, and in the case of fullwidth characters, the character width will be counted as 2.
			*3: "_" indicates a halfwidth space

5	10	PH14386	[Issue] An error occurs when connecting from the ODBC driver to the database. Error message: invalid connection option "target_server" [Environment] The following operating system is used: - Windows [Conditions] 1. The ODBC driver connects to the database, and 2. libpq.dll exists in one of the following locations: 2.1 The folder where the application to be executed is stored 2.2 The Windows system folder 2.3 The Windows directory 2.4 The folder that has been set earlier than the product installation folder in the PATH environment variable
6	10	PH14703	[Issue] The WebAdmin start window is not displayed after WebAdmin is set up again. [Environment]

No.	Version and level	P number	Issue
			The following operating system is used: - Linux [Conditions] 1. WebAdmin setup is performed, and then 2. WebAdmin setup is removed, and then 3. WebAdmin setup is performed, and then 4. WebAdmin is started, and then 5. The WebAdmin startup URL is accessed in the browser.
7	10	PH15226	[Issue] This update is to apply the updates for the security issues (*1) incorporated in PostgreSQL10.4 to FUJITSU Enterprise Postgres, so there is no specific symptom. *1: The applicable security issue is as follows: - CVE-2018-1115 [Environment] The following operating system is used: - Linux [Conditions] This update is to apply the updates for the security issues incorporated in PostgreSQL10.4 to this product, so there are no specific conditions. Refer to the URL below for information on security issues fixed in this update: https://www.postgresql.org/docs/10/static/release-10-4.html

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FUJITSU Enterprise Postgres 10

Release Notes

Windows

B1WS-1365-01ENZ0(00)
September 2018

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

Edition 1.0: September 2018

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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
10	Operations	Improved database multiplexing	Y	N
		Backup/recovery using user exits	Y	N
		Improvements to the GUI	Y	(*1)
	Security	Audit logs	Y	N
	Performance	High-speed data load	Y	N
	Application development	Support for variable format source code in COBOL programs	Y	(*1)
		Support for Visual Studio 2015	Y	(*1)
		Support for Visual Studio 2017	Y	Y
	Platform enhancement	Additional operating system support for client feature	Y	Y
	OSS	PostgreSQL rebase	Y	Y
		Additional supported OSS	Y	Y

*1: Already provided in FUJITSU Enterprise Postgres 9.6 SE.

1.1 Features Added in 10

This section explains new features and improvements in FUJITSU Enterprise Postgres 10.

1.1.1 Operations

This section explains the new features related to operation.

- Improved database multiplexing
- Backup/recovery using user exits
- Improvements to the GUI

1.1.1.1 Improved Database Multiplexing

The new features and improvements below have been incorporated into database multiplexing.

- Added operations for use when a heartbeat abnormality is detected during heartbeat monitoring of the operating system or server

  You can now select from the following operations when a heartbeat abnormality is detected during heartbeat monitoring of the operating system or server.

  - Use the arbitration server to perform automatic degradation (switch/disconnect)
  - Call a user exit to determine degradation, and perform automatic degradation if required
  - Notify messages
  - Perform automatic degradation unconditionally after a heartbeat abnormality (FUJITSU Enterprise Postgres 9.6 or earlier operation)

See

Refer to "Monitoring Using Database Multiplexing Mode" in the Cluster Operation Guide (Database Multiplexing) for details.

- Added tuning of abnormality monitoring

  For abnormality monitoring performed by Mirroring Controller, it is now possible to select tuning for each monitoring target and behavior when an abnormality is detected.

  - Database process heartbeat monitoring

    Heartbeat monitoring tuning can now be configured individually:

    - Interval time
    - Timeout
    - Number of retries

    It is now possible to select from the following behaviors when unresponsiveness is detected:

    - Do not perform monitoring
    - Notify messages
    - Automatic degradation

  - Disk abnormality monitoring

    Abnormality monitoring tuning can now be configured individually:

    - Interval time
    - Number of retries

  - Tablespace disk abnormality monitoring

    It is now possible to select from the following behaviors when an abnormality is detected:

    - Notify messages
    - Automatic degradation

See

Refer to "Server Configuration File for the Database Servers" in the Cluster Operation Guide (Database Multiplexing) for details.

- Disconnection of the standby server on the primary server

  Supports a detach mode, which enables the standby server to be disconnected from the primary server at any time using the mc_ctl command.

See

Refer to "mc_ctl" in the Reference for details.

- Integration with reference jobs on the standby server

  Supports the features below for improved operability of reference jobs on the standby server.

  - User exit (for the state transition commands)
  - Instance stoppage feature for use during disconnection

See

Refer to "Referencing on the Standby Server" in the Cluster Operation Guide (Database Multiplexing) for details.

- Mirroring Controller monitoring process

  If the Mirroring Controller process that performs abnormality monitoring on the database server is down or unresponsive, abnormality detection of the Mirroring Controller monitoring process enables you to restart the Mirroring Controller process and maintain availability.

See

Refer to "Mirroring Controller Processes" in the Cluster Operation Guide (Database Multiplexing) for details.

- Selection of instance connection settings for the Mirroring Controller process

  Some connection settings can now be changed when the Mirroring Controller process connects to an instance to detect failure of each component.

  - Connection destination database name
    Either of the database names 'postgres' or 'template1' can now be selected. This makes it possible for the SQL statements issued by Mirroring Controller to perform abnormality monitoring to identify target logs from the audit logs or server logs.

  - Connection user name
    The user name of any superuser can be specified. This enables instance administrator users and superusers who operate the Mirroring Controller commands to run database multiplexing mode in different environments.

See

Refer to "Server Configuration File for the Database Servers" in the Cluster Operation Guide (Database Multiplexing) for details.

1.1.1.2 Backup/Recovery Using User Exits

The pgx_dmpall command and the pgx_rcvall command can now perform backup/recovery using user exits. Database clusters and tablespaces can be backed up to any backup destination using a user exit (for the copy command) by any copy method.

See

Refer to "Backup/Recovery Using the Copy Command" in the Operation Guide for details.

1.1.1.3 Improvements to the GUI

The WebAdmin GUI incorporates the following new features and improvements:

- Import instance

  Instances created via the command line using the initdb command can be imported into and subsequently managed by WebAdmin.

  Refer to "Importing Instances" in the Installation and Setup Guide for Server for details.

- Edit instance

  The following items for an instance can now be modified: Instance name, Port number, and Backup storage path.

  Refer to "Editing instance information" in the Installation and Setup Guide for Server for details.

- Anomaly processing

  WebAdmin now detects external changes to the port and backup_destination parameters in postgresql.conf, and provides the ability to synchronize these parameters with the corresponding items in WebAdmin.

WebAdmin also detects external changes to Mirroring Controller configuration of cluster replication added via WebAdmin, and disables Mirroring Controller functionality for the instance for which the anomaly is detected.

Refer to "Anomaly Detection and Resolution" in the Operation Guide for details.

- Interoperability support

  WebAdmin can now be used to manage FUJITSU Enterprise Postgres 9.5 or later instances.

  Refer to "[Server product type]" in "Creating an Instance" in the Installation and Setup Guide for Server for details.

- Optional backup

  Backup and restore functionality can now be disabled for an instance.

  Refer to "[Backup]" in "Creating an Instance" in the Installation and Setup Guide for Server for details.

- Auto-refresh

  The auto-refresh feature automatically refreshes the status of all instances at set intervals.

  Refer to "Using the WebAdmin Auto-Refresh Feature" in the Installation and Setup Guide for Server for details.

- Performance improvements

  Performance has been significantly improved for various operations.

1.1.2 Security

This section explains the new feature related to security.

- Audit logs

1.1.2.1 Audit Logs

Details relating to database access can be retrieved in audit logs. Audit logs can be used to counter security threats such as unauthorized access to the database and misuse of privileges.

See

Refer to "Audit Log Feature" in the Security Operation Guide for details.

1.1.3 Performance

This section explains the new feature added to improve performance:

- High-speed data load

1.1.3.1 High-Speed Data Load

High-speed data load executes COPY FROM commands using multiple parallel workers. Accordingly, data from files can be loaded at high speed into FUJITSU Enterprise Postgres tables.

See

Refer to "High-Speed Data Load" in the Operation Guide for details.

1.1.4 Application Development

This section explains the new features related to application development:

- Support for variable format source code in COBOL programs
- Support for Visual Studio 2015

1.1.4.1 Support for Variable Format Source Code in COBOL Programs

For embedded SQL in COBOL, variable format source code is now supported in COBOL programs. This makes it possible to precompile existing COBOL programs that use variable format source code as is.

 See

Refer to "Embedded SQL in COBOL" in the Application Development Guide for details.

1.1.4.2 Support for Visual Studio 2015

Visual Studio 2015 is supported as a development environment of the FUJITSU Enterprise Postgres client feature for Windows(R).

 See

Refer to "Related Software" in the Installation and Setup Guide for Client for details.

1.1.4.3 Support for Visual Studio 2017

Visual Studio 2017 is supported as a development environment of the FUJITSU Enterprise Postgres client feature for Windows(R).

 See

Refer to "Related Software" in the Installation and Setup Guide for Client for details.

1.1.5 Platform Enhancement

This section explains the new features related to platform enhancement:

- Additional operating system support for client

1.1.5.1 Additional Operating System Support for Client Feature

The following additional operating systems are supported:

- SLES 12 SP2 or later

 See

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

1.1.6 OSS

This section explains the new feature related to OSS:

- PostgreSQL rebase
- Additional supported OSS

1.1.6.1 PostgreSQL Rebase

The PostgreSQL version that FUJITSU Enterprise Postgres is based on is 10.3.

See

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

1.1.6.2 Additional Supported OSS

The OSS below are newly supported:

- oracle_fdw

See

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

Chapter 2 Compatibility Information

This chapter explains incompatible items and actions required when migrating from an earlier version to FUJITSU Enterprise Postgres 10. Check compatibility before migrating and take the appropriate action.

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

In a 64-bit environment, only the 64-bit client can be installed.

Action method

If a 32-bit application is to be used, prepare a 32-bit environment and install the 32-bit client.

2.1.2 Changing the Access Permissions of the Windows Client Installation Directory

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 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 Environment variable (PGXTARGETSERVER)	target_session_attrs 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	-	-

Server selection order	JDBC driver	.NET Data Provider		Other driver	
		Before correction	After correction	Before correction	After correction
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

The method of managing the nchar data type has been enhanced to enable use of embedded SQL applications in C that are compiled with PostgreSQL.

Action method

Use the FUJITSU Enterprise Postgres 10 client to execute embedded SQL applications in C and COBOL that were compiled with FUJITSU Enterprise Postgres 9.6 or earlier, after recompiling them with the FUJITSU Enterprise Postgres 10 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

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.

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- 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

- 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

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.

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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 10, 10.1, 10.2, and 10.3.

See

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

[PostgreSQL 10]

```
https://www.postgresql.org/docs/10/static/release-10.html
```

[PostgreSQL 10.1]

```
https://www.postgresql.org/docs/10/static/release-10-1.html
```

[PostgreSQL 10.2]

```
https://www.postgresql.org/docs/10/static/release-10-2.html
```

[PostgreSQL 10.3]

```
https://www.postgresql.org/docs/10/static/release-10-3.html
```

Furthermore, this version incorporates the following security update that was fixed in PostgreSQL 10.4:

- CVE-2018-1115: Too-permissive access control list on function pg_logfile_rotate()

See

Refer to the URL below for information on PostgreSQL security updates:

PostgreSQL Global Development Group website:

```
https://www.postgresql.org/about/news/1851/
```

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 10

No.	Version and level	P number	Issue
1	10	PH11764	[Issue] The hugepages feature of Linux cannot be used. An error occurs when the instance is started. FATAL: huge pages not supported on this platform [Environment] The following operating system is used: - Linux [Conditions] 1. The huge_pages parameter is set to "on" in postgresql.conf, and 2. An instance is started.
2	10	PH13672	[Issue] If preferSlave is specified for the targetServerType connection string parameter, the connection destination becomes the primary server instead of the standby server.

No.	Version and level	P number	Issue
			[Environment] One of the following operating systems is used: - Linux - Oracle Solaris - Windows [Conditions] 1. The JDBC driver is used, and 2. Multiple hosts are specified for the connection string, and 3. preferSlave is specified for the targetServerType connection string parameter, and 4. When connecting to the database, the status of the connection string host name is in the following order: primary server, standby server
3	10	PH13782	[Issue] Information may be tampered with on the database server using WebAdmin. [Environment] One of the following operating systems is used: - Oracle Solaris - Linux - Windows [Conditions] 1. WebAdmin is used, and 2. A malicious program is used to access the database server port (*1). *1: Port number specified in the WebAdmin setup. For Symfoware Server, the default value is 26515. For FUJITSU Enterprise Postgres, the default value is 27515.
4	10	PH13850	[Issue] If a multibyte string is specified for the rpad function compatible with Oracle databases and the specified output length is such that a fullwidth fill (padding) character cannot be added to the specified string because there is only space available for one halfwidth character, a halfwidth space will be inserted at the beginning of the resultant string. [Environment] One of the following operating systems is used: - Linux - Oracle Solaris - Windows [Conditions] [Condition 1] 1. The rpad function (*1) compatible with Oracle databases is used, and 2. The length (*2) of the specified string is shorter than the specified output length, and 3. The *fill* parameter contains a fullwidth character, and

No.	Version and level	P number	Issue

			4. A fullwidth fill character is added to the specified string, which then exceeds the specified output length, because each fullwidth character is recognized as having a length of 2.
			Example of [Condition 1]
			`oracle.rpad('a b c',11,'Z')`
			`|a b c Z Z_|` becomes
			`|_a b c Z Z|.  (*3)`
			[Condition 2]
			1. The rpad function compatible with Oracle databases is used, and
			2. The *string* parameter contains fullwidth characters, and
			3. The length of the specified string is longer than the specified output length, and padding is added to the specified multibyte string.
			Example of [Condition 2]
			`oracle.rpad('a b c',5,'Z')`
			`| a b_|` becomes
			`|_a b|.  (*3)`
			*1: oracle.rpad(*string*, *length* [, *fill*])
			*2: In the case of halfwidth characters and characters with a width of 1 (such as ±, and ×) as defined in the Unicode definitions, the character width will be counted as 1, and in the case of fullwidth characters, the character width will be counted as 2.
			*3: "_" indicates a halfwidth space

5	10	PH14386	[Issue] An error occurs when connecting from the ODBC driver to the database. Error message: invalid connection option "target_server" [Environment] The following operating system is used: - Windows [Conditions] 1. The ODBC driver connects to the database, and 2. libpq.dll exists in one of the following locations: 2.1 The folder where the application to be executed is stored 2.2 The Windows system folder 2.3 The Windows directory 2.4 The folder that has been set earlier than the product installation folder in the PATH environment variable
6	10	PH14703	[Issue] The WebAdmin start window is not displayed after WebAdmin is set up again. [Environment]

No.	Version and level	P number	Issue
			The following operating system is used: - Linux [Conditions] 1. WebAdmin setup is performed, and then 2. WebAdmin setup is removed, and then 3. WebAdmin setup is performed, and then 4. WebAdmin is started, and then 5. The WebAdmin startup URL is accessed in the browser.
7	10	PH15226	[Issue] This update is to apply the updates for the security issues (*1) incorporated in PostgreSQL10.4 to FUJITSU Enterprise Postgres, so there is no specific symptom. *1: The applicable security issue is as follows: - CVE-2018-1115 [Environment] The following operating system is used: - Linux [Conditions] This update is to apply the updates for the security issues incorporated in PostgreSQL10.4 to this product, so there are no specific conditions. Refer to the URL below for information on security issues fixed in this update: https://www.postgresql.org/docs/10/static/release-10-4.html
8	10	PH15259	[Issue] Even when a search is performed for a table that has a masking policy defined, some of the column data may not be masked. [Environment] The following operating system is used: - Linux [Conditions] 1. The data masking feature is used, and 2. A masking policy has been defined for a table, and 3. Columns targeted for masking are specified in the selection item of the SELECT statement that performs a search 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 for 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.

No.	Version and level	P number	Issue
9	10	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.
10	10	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

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