

# FUJITSU Enterprise Postgres 13 on IBM LinuxONE™



## Release Notes

# Preface

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## 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.

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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
13	OSS	<a href="#">PostgreSQL Rebase</a>
		<a href="#">Update of OSS Provided</a>
	Streaming Replication	<a href="#">WAL Compression for Streaming Replication</a>

## 1.1 Features Added in 13

This section explains new features and improvements in FUJITSU Enterprise Postgres 13.

### 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 13.1.



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 Streaming Replication

This section explains the new feature related to Streaming Replication:

- WAL Compression for Streaming Replication

#### 1.1.2.1 WAL Compression for Streaming Replication

WAL that is transferred by Streaming Replication can be compressed.



See

Refer to "WAL Compression for Streaming Replication" in the Operation Guide for details.

# Chapter 2 Compatibility Information

This chapter explains incompatible items and actions required when migrating from an earlier version to FUJITSU Enterprise Postgres 13. Check compatibility before migrating and take the appropriate action.

## 2.1 Installation/Setup Incompatibility

Item	Pre-migration version		
	11	12	12 SP1
Removing Operating System Support	Y	Y	Y
Changing kernel parameter settings when an instance is created with WebAdmin	Y	Y	Y
Removing Operating System Support	Y	Y	N
Changing the way OSS is set up	Y	N	N
Modifying Pgpool-II Installation Handling	Y	N	N
Changing Core and Log File Paths when Instance is Created with WebAdmin	Y	N	N
Renaming WebAdmin Services	Y	N	N

Y: Incompatibility exists

N: Incompatibility does not exist

### 2.1.1 Removing Operating System Support

#### Incompatibility

In FUJITSU Enterprise Postgres 13 or later, the following operating systems have been removed.

- RHEL7.7 and later minor version
- RHEL8.1

#### Action method

None.

### 2.1.2 Changing kernel parameter settings when an instance is created with WebAdmin

#### Incompatibility

For FUJITSU Enterprise Postgres 13 and later, changes kernel parameter settings for WebAdmin instance creation.

FUJITSU Enterprise Postgres 12 SP1 or earlier

Kernel Parameters	Value	Calculated Value
SHMMAX	If <i>currentValue</i> < <i>calculatedValue</i> , configure the calculated value	$((1800 + 270 * \text{max\_locks\_per\_transaction}) * \text{max\_connections} + (1800 + 270 * \text{max\_locks\_per\_transaction}) * \text{autovacuum\_max\_workers} + (770 + 270 * \text{max\_locks\_per\_transaction}) * \text{max\_prepared\_transactions} +$

Kernel Parameters	Value	Calculated Value
		$(\text{shared\_buffer}) + (16 * 1024 * 1024) + (770 * 1024) * 1.05$
SHMALL	Specify <i>currentValue</i> + <i>calculatedValue</i>	$(\text{SHMMAX} / \text{PAGESIZE}) + 1$  PAGESIZE = 4K
SEMMNI	Specify <i>currentValue</i> + <i>calculatedValue</i>	$\text{ceil}((\text{max\_connections} + \text{autovacuum\_max\_workers} + 4) / 16)$
SEMMNS	Specify <i>currentValue</i> + <i>calculatedValue</i>	$\text{ceil}((\text{max\_connections} + \text{autovacuum\_max\_workers} + 4) / 16) * 17$

#### FUJITSU Enterprise Postgres 13 or later

Kernel Parameters	Value	Calculated Value
SHMMAX	Do not change value	-
SHMALL	Do not change value	-
SEMMNI	Specify <i>currentValue</i> + <i>calculatedValue</i>	- For instances of FUJITSU Enterprise Postgres 11:  $\text{ceil}((\text{max\_connections} + \text{autovacuum\_max\_workers} + \text{max\_worker\_processes} + 5) / 16)$  - For Fujitsu Enterprise Postgres 12 and later instances:  $\text{ceil}((\text{max\_connections} + \text{autovacuum\_max\_workers} + \text{max\_wal\_senders} + \text{max\_worker\_processes} + 5) / 16)$
SEMMNS	Specify <i>currentValue</i> + <i>calculatedValue</i>	- For instances of FUJITSU Enterprise Postgres 11:  $\text{ceil}((\text{max\_connections} + \text{autovacuum\_max\_workers} + \text{max\_worker\_processes} + 5) / 16) * 17$  - For Fujitsu Enterprise Postgres 12 and later instances:  $\text{ceil}((\text{max\_connections} + \text{autovacuum\_max\_workers} + \text{max\_wal\_senders} + \text{max\_worker\_processes} + 5) / 16) * 17$

#### Action method

None.

## 2.1.3 Removing Operating System Support

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#### Incompatibility

In FUJITSU Enterprise Postgres 12 SP1 or later, the following operating systems have been removed.

- SLES 12 SP4

## Action method

None.

## 2.1.4 Changing the Way OSS is Set Up

---

### Incompatibility

FUJITSU Enterprise Postgres 12 or later do not place OSS extension modules in the executable directory. The OSS extension modules must be placed in the executable directory when you set up OSS.

Refer to "Setting Up and Removing OSS" in the Installation and Setup Guide for Server for details.

## Action method

None.

## 2.1.5 Modifying Pgpool-II Installation Handling

---

### Incompatibility

For FUJITSU Enterprise Postgres 12 or later, Pgpool-II is not automatically installed when you install the server. Therefore, if you want to take advantage of Pgpool-II, install it separately from the server installation.

The extension modules required for the database server are shipped with the server program. You should set up Pgpool-II on the database server side, even if Pgpool-II is to be used on a different server than the database server.

Refer to "Setting Up and Removing OSS" in the Installation and Setup Guide for Server for details.

## Action method

None.

## 2.1.6 Changing Core and Log File Paths when Instance is Created with WebAdmin

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### Incompatibility

In FUJITSU Enterprise Postgres 12 or later, change the core and log file paths when creating an instance in WebAdmin.

FUJITSU Enterprise Postgres 11

Log File Path: `/var/tmp/fsep_ version / instanceAdminUser _ instanceNamePortNumber /log`

Core File Path: `/var/tmp/fsep_ version / instanceAdminUser _ instanceNamePortNumber /core`

*version*: product version\_ edition\_ architecture

[Example]

Log File Path: `/var/tmp/fsep_110_AE_64/naomi_myinst27599/log`

Core File Path: `/var/tmp/fsep_110_AE_64/naomi_myinst27599/core`

FUJITSU Enterprise Postgres 12

Log File Path: `/var/tmp/fsep_ version / instanceAdminUser _ instanceNamePortNumber /log`

Core File Path: `/var/tmp/fsep_ version / instanceAdminUser _ instanceNamePortNumber /core`

*version*: product version\_ WA\_ architecture

[Example]

Log File Path: `/var/tmp/fsep_120_WA_64/naomi_myinst27599/core`

Core File Path: `/var/tmp/fsep_120_WA_64/naomi_myinst27599/log`

## Action method

None.

## 2.1.7 Renaming WebAdmin Services

---

### Incompatibility

In FUJITSU Enterprise Postgres 12 or later, change the service name registered when you set up WebAdmin.

FUJITSU Enterprise Postgres 11

fsep\_xSPz\_edition\_64\_WebAdmin\_Port1

fsep\_xSPz\_edition\_64\_WebAdmin\_Port2

FUJITSU Enterprise Postgres 12 or later

fsep\_xSPz\_WA\_64\_WebAdmin\_Port1

fsep\_xSPz\_WA\_64\_WebAdmin\_Port2

### Action method

None.

## 2.2 Application Migration Incompatibility

---

Item	Pre-migration version		
	11	12	12 SP1
Removing Java Support	Y	Y	Y
Changed to Error when Running an Operator or Function that Returns non Data Types for Masking Type	Y	N	N

Y: Incompatibility exists

N: Incompatibility does not exist

### 2.2.1 Removing Java Support

---

#### Incompatibility

In FUJITSU Enterprise Postgres 13 or later, the following Java have been removed.

- Java SE 6

Also, the JDBC driver file 'postgresql-jdbc4.jar' for JDK 6 or JRE 6 isn't installed.

#### Action method

None.

### 2.2.2 Changed to Error when Running an Operator or Function that Returns non Data Types for Masking Type

---

#### Incompatibility

In FUJITSU Enterprise Postgres 12, changed to error when running an operator or function that returns non Data Types for Masking type.

FUJITSU Enterprise Postgres 11

In the following cases, the operator or function in 3) may be executed without masking.



This is an incorrect result because the data containing the masking column is performed without masking.

- 1) Create a Masking policy. and
- 2) Execute a SELECT statement. and
- 3) Execute an operator or function in the SELECT statement of 2). and
- 4) The operator or function argument of 3) includes a subquery. and
- 5) The operator or function argument of 3) contains the column to be protected created in 1). and
- 6) The operator or function of 3) returns a type not listed in "Data Types for Masking" in "Operation Guide".

FUJITSU Enterprise Postgres 12 or later

Operator or function results of 3) in the following error.

```
ERROR: The output data type is incompatible with the confidential policy.
HINT: Data type of the result value(s) produced by expression/function using confidential columns
is not supported by Data masking module. Consider removing confidential columns from such
expressions/functions.
```

This is correct because the operator or function returns a data type not listed in "Data Types for Masking" in "Operation Guide".

### Action method

Do one of the following to ensure that the results are identical to those of FUJITSU Enterprise Postgres 11:

- 1) Modify the Masking policy to prevent masking from being performed for the user executing the SQL.
- 2) Modify SQL to not use operators or functions that return types not listed in "Data Types for Masking" in "Operation Guide".

## 2.3 Operation Migration Incompatibility

Item	Pre-migration version		
	11	12	12 SP1
<a href="#">Changing the Value of the Category Column in the pg_settings view</a>	Y	Y	Y
<a href="#">Changing pgx_stat_lwlock of the Statistics View</a>	Y	Y	Y
<a href="#">Changing the Behavior of pgx_rcvall</a>	Y	Y	Y
<a href="#">Mirroring Controller no longer retries to monitor database processes when they are detected as down</a>	Y	N	N
<a href="#">Changing the Name and Parameter Name of the Mirroring Controller Post-Promote Command</a>	Y	N	N
<a href="#">Changing Mirroring Controller User Command Input Values</a>	Y	N	N

Y: Incompatibility exists

N: Incompatibility does not exist

N: Incompatibility does not exist

### 2.3.1 Changing the Value of the Category Column in the pg\_settings view

#### Incompatibility

For FUJITSU Enterprise Postgres 13, change the value of the category column in the pg\_settings view.

FUJITSU Enterprise Postgres 12 SP1 or earlier

Original value	wrong value
Preset Options	Fujitsu Enterprise Postgres Parameters
Customized Options	Preset Options
Developer Options	Customized Options

This is an incorrect result because it is different from the original value.

FUJITSU Enterprise Postgres 13 or later

The correct value is the category column in the pg\_settings view.

### Action method

Replaces the category column in the pg\_settings view with the values before migration, so that the results are the same as before migration.

## 2.3.2 Changing pgx\_stat\_lwlock of the Statistics View

---

### Incompatibility

In FUJITSU Enterprise Postgres 13, change the wait event name displayed in the lwlock\_name column of the statistics view pgx\_stat\_lwlock.

Wait Event Name

FUJITSU Enterprise Postgres 12 SP1 or earlier	FUJITSU Enterprise Postgres 13
clog (*1)	XactBuffer
commit_timestamp (*1)	CommitTSBuffer
subtrans (*1)	SubtransBuffer
multixact_offset (*1)	MultiXactOffsetBuffer
multixact_member (*1)	MultiXactMemberBuffer
async (*1)	NotifyBuffer
oldserxid (*1)	SerialBuffer
wal_insert (*1)	WALInsert
buffer_content (*1)	BufferContent
buffer_io (*1)	BufferIO
replication_origin (*1)	ReplicationOriginState
replication_slot_io (*1)	ReplicationSlotIO
proc (*1)	LockFastPath
buffer_mapping (*1)	BufferMapping
lock_manager (*1)	LockManager
predicate_lock_manager (*1)	PredicateLockManager
parallel_hash_join (*1)	ParallelHashJoin
parallel_query_dsa (*1)	ParallelQueryDSA
session_dsa (*1)	PerSessionDSA
session_record_table (*1)	PerSessionRecordType
session_typmod_table (*1)	PerSessionRecordTypmod
shared_tuplstore (*1)	SharedTupleStore
tbm (*1)	SharedTidBitmap

FUJITSU Enterprise Postgres 12 SP1 or earlier	FUJITSU Enterprise Postgres 13
parallel_append (*1)	ParallelAppend
serializable_xact (*2)	PerXactPredicateList
shared_mcxt (*2)	SharedMcxt
meta_cache_map (*2)	MetaCacheMap
global_metacache (*2)	GlobalCatcache
cached_buf_tranche_id (*2)	CachedBufTranche

\*1) Events added in FUJITSU Enterprise Postgres 11.

\*2) Events added in FUJITSU Enterprise Postgres 12.

### Action method

None.

## 2.3.3 Changing the Behavior of pgx\_rcvall

---

### Incompatibility

In FUJITSU Enterprise Postgres 13, change the pgx\_rcvall command to fail if the -e option of the pgx\_rcvall command specifies a future time or if the -n option specifies a list appointment that does not exist.

FUJITSU Enterprise Postgres 12 SP1 or earlier

All archived WALs are applied for recovery if the -e option of the pgx\_rcvall command specifies a time in the future, or if the -n option specifies a list appointment that does not exist.

FUJITSU Enterprise Postgres 13 or later

The pgx\_rcvall command fails if the -e option of the pgx\_rcvall command specifies a time in the future, or if the -n option specifies a list appointment that does not exist.

### Action method

Specify recovery objectives correctly, if necessary.

## 2.3.4 Mirroring Controller no Longer Retries to Monitor Database Processes when they are Detected as Down

---

### Incompatibility

For the FUJITSU Enterprise Postgres Mirroring Controller, change the heartbeat monitoring of the database process so that it does not retry monitoring when it detects down.

### Action method

None.

## 2.3.5 Changing the Name and Parameter Name of the Mirroring Controller Post-Promote Command

---

### Incompatibility

In the FUJITSU Enterprise Postgres 12 Mirroring Controller, change the name of the post-promote command, which is the state transition command, and the parameter name in the server configuration file that specifies the post-promote command.

FUJITSU Enterprise Postgres 11

- Command Name  
post-promote command
- The parameter name in the server configuration file that specifies the post-promote command  
post\_promote\_command

FUJITSU Enterprise Postgres 12 or later

- Command Name  
post-switch command
- The parameter name in the server configuration file that specifies the post-promote command  
post\_switch\_command

**Action method**

The post\_promote\_command parameter in the server configuration file continues to be available in FUJITSU Enterprise Postgres 12 or later. If specified in the server configuration file, it acts as a post-switch command. You cannot specify the post\_promote\_command and post\_switch\_command parameters at the same time.

## 2.3.6 Changing Mirroring Controller User Command Input Values

---

**Incompatibility**

Arguments (Fixed value: primarycenter) have been added to the following user commands:

- Fencing command of the database server
- Arbitration command
- Post-switch command
- Pre-detach command
- Post-attach command

**Action method**

If you are checking the number of arguments in a user command, increase the number of arguments by one.

## 2.4 JDBC Drive Incompatibility

---

Item	Pre-migration version		
	11	12	12 SP1
<a href="#">Changing the targetServerType Value</a>	Y	Y	Y

Y: Incompatibility exists

N: Incompatibility does not exist

### 2.4.1 Changing the targetServerType Value

---

**Incompatibility**

In FUJITSU Enterprise Postgres 13, the value of targetServerType specified in the connection string was changed. Therefore, the previously used values are no longer available.

## Action method

If you specified a value for targetServerType, change the value as follows:

Table 2.1 Specified values for the target server

Server Selection Order	FUJITSU Enterprise Postgres 12 SP1 or earlier	FUJITSU Enterprise Postgres 13
Primary Server	master	primary
Standby Server	slave	secondary
Prefer Standby Server	preferSlave	preferSecondary
Any	any	any

## 2.5 oracle\_fdw Incompatibility

---

Item	Pre-migration version		
	11	12	12 SP1
<a href="#">Changing the Oracle Client Version</a>	Y	N	N

Y: Incompatibility exists

N: Incompatibility does not exist

### 2.5.1 Changing the Oracle Client Version

---

#### Incompatibility

FUJITSU Enterprise Postgres 12 change the version of the Oracle client used to build oracle\_fdw to 11.2.

#### Action method

Use Oracle client version 11.2 or later.

Also, if a file named libclntsh.so.11.1 does not exist in OCI library, create a symbolic link named libclntsh.so.11.1.

## 2.6 pgaudit Incompatibility

---

Item	Pre-migration version		
	11	12	12 SP1
<a href="#">Changing to Print Extra NEW and OLD Values in the Audit Log when the Trigger Function Executes</a>	Y	Y	Y

Y: Incompatibility exists

N: Incompatibility does not exist

### 2.6.1 Changing to Print Extra NEW and OLD Values in the Audit Log when the Trigger Function Executes

---

#### Incompatibility

In FUJITSU Enterprise Postgres 13, the trigger function additionally outputs NEW and OLD values to the audit log when the pgaudit.log\_parameter is set to on.

## FUJITSU Enterprise Postgres 12 SP1 or earlier

The following (18) does not output the values of New, OLD.

[Example]

```
AUDIT: SESSION,WRITE,2020-09-03 07:07:39 UTC,
      (1)   (2)   (3)
[local],9775,psql,k5user,postgres,3/536, 1, 2, INSERT, ,
(4)   (5) (6) (7)   (8)   (9)  (10)(11)(12)(13)
TABLE,public.trig_audit, ,
(14) (15)  (16)
"INSERT INTO trig_audit SELECT 'U', now(), user, OLD.*, NEW.*",
(17)
trig_audit AFTER ROW UPDATE 92027 trig_test trig_test public 0 f aaaa
(18)
```

## FUJITSU Enterprise Postgres 13 or later

New, OLD values are printed.

[Example]

```
AUDIT: SESSION,WRITE,2020-09-03 07:07:39 UTC,
[local],9775,psql,k5user,postgres,3/536,1,2,INSERT,,TABLE,public.
trig_audit,,
"INSERT INTO trig_audit SELECT 'U', now(), user, OLD.*, NEW.*",
(bbb) (aaa) trig_audit AFTER ROW UPDATE 92027 trig_test trig_test
public 0 f aaaa
```

## Action method

If you are using an application that works by monitoring the string that the trigger function prints to the audit log, modify the application to work with the NEW and OLD values.

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