

# FUJITSU Enterprise Postgres 9.6



## Reference Guide

Windows/Solaris/Linux

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# Preface

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## Purpose of This Document

This document is a command reference, and explains FUJITSU Enterprise Postgres commands and options with features expanded on from PostgreSQL.

## Intended Readers

This document is aimed at people who manage and operate FUJITSU Enterprise Postgres. Readers of this document are also assumed to have general knowledge of:

- PostgreSQL

- SQL

**S** - Oracle Solaris

**L** - Linux

**W** - Windows

## Structure of This Document

This document is structured as follows:

### [Chapter 1 Command List and Specification Format](#)

Lists commands and describes their specification format.

### [Chapter 2 Client Commands](#)

Explains options not listed in "PostgreSQL Client Applications" in the PostgreSQL Documentation.

### [Chapter 3 Server Commands](#)

Explains commands and options not listed in "PostgreSQL Server Applications" in the PostgreSQL Documentation.

### [Chapter 4 Mirroring Controller Commands](#)

Explains the Mirroring Controller commands

## How to Read This Document

Examples in this document are predominantly for UNIX/Linux.

For Windows, replace values (such as paths in the examples) as appropriate.

## Export Restrictions

If this document is to be exported or provided overseas, confirm legal requirements for the Foreign Exchange and Foreign Trade Act as well as other laws and regulations, including U.S. Export Administration Regulations, and follow the required procedures.

## Issue Date and Version

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|-----------------------------|

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# Chapter 1 Command List and Specification Format

This chapter lists commands and describes their specification format.

## 1.1 Command List

This chapter lists commands and options not explained in "PostgreSQL Client Applications" or in "PostgreSQL Server Applications" in the PostgreSQL Documentation.

### 1.1.1 Client Commands

The commands below have options not explained in "PostgreSQL Client Applications" in the PostgreSQL Documentation.

| Command                    | Functional overview                                      |
|----------------------------|--|
| <a href="#">pg_dumpall</a> | Extract a PostgreSQL database cluster into a script file |

### 1.1.2 Server Commands

The commands below have options not explained in "PostgreSQL Server Applications" in the PostgreSQL Documentation.

| Command                  | Functional overview                                     |
|--------------------------|---|
| <a href="#">pg_ctl</a>   | Initialize, start, stop, or control a PostgreSQL server |
| <a href="#">postgres</a> | PostgreSQL database server                              |

The commands below are not explained in "PostgreSQL Server Applications" in the PostgreSQL Documentation.

| Command                      | Functional overview  |
|------------------------------|--|
| <a href="#">pgx_dmpall</a>   | Backs up the data directory, tablespaces, and configuration files. |
| <a href="#">pgx_keystore</a> | Manages keystore   |
| <a href="#">pgx_rcvall</a>   | Recovers the data directory, tablespaces, and configuration files. |

### 1.1.3 Mirroring Controller Commands

Mirroring Controller has the following commands:

| Command                | Functional overview  |
|------------------------|--|
| <a href="#">mc_ctl</a> | Start and stop Mirroring Controller, switch/disconnect the server, display the server status, build the standby server, or register and unregister from the Windows services |

## 1.2 Command Specification Format

The table below shows the command specification format.

| Item | Explanation  |
|------|--|
| [ ]  | Indicates optional element.                          |
| ...  | Indicates that the item can be specified repeatedly. |

# Chapter 2 Client Commands

This chapter explains options not listed in "PostgreSQL Client Applications" in the PostgreSQL Documentation.

## 2.1 pg\_dumpall

---

### Name

`pg_dumpall` -- Extract a PostgreSQL database cluster into a script file

### Synopsis

```
pg_dumpall [connectionOption...] [option...]
```

### Options

`--no-tablespace-encryption`

Do not output commands to encrypt tablespaces. Running the generated SQL script will restore the originally encrypted data without being encrypted.

### See

Refer to "pg\_dumpall" in the PostgreSQL Documentation for details.

## Chapter 3 Server Commands

This chapter explains commands and options not listed in "PostgreSQL Server Applications" in the PostgreSQL Documentation.

### 3.1 pg\_ctl

---

#### Name

pg\_ctl -- Initialize, start, stop, or control a PostgreSQL server

#### Synopsis

```
pg_ctl start [-w] [-t seconds] [-s] [-D datadir] [-l filename]
           [-o options] [-p path] [-c] [--keystore-passphrase]

pg_ctl restart [-w] [-t seconds] [-s] [-D datadir] [-c]
              [-m s[mart] | f[ast] | i[mmmediate] ] [-o options]
              [--keystore-passphrase]
```

#### Options

--keystore-passphrase

Prompt for the passphrase to open the keystore.

#### See

Refer to "pg\_ctl" in the PostgreSQL Documentation for details.

### 3.2 pgx\_dmpall

---

#### Name

pgx\_dmpall - Backs up the data directory, tablespaces, and configuration files.

#### Synopsis

```
pgx_dmpall [option...]
```

#### Description

The pgx\_dmpall command backs up the data directory, tablespaces, and configuration files. The backup data is stored in the directory specified by backup\_destination parameter of postgresql.conf. The pgx\_dmpall command also deletes archived Write Ahead Logs (WAL) that are no longer necessary for recovery when the backup completes successfully.

#### Options

-c

This option only backs up configuration files. The configuration files are as follows:

- postgresql.conf (postgresql.conf)
- File for host-based authentication (pg\_hba.conf)
- Configuration file for ident authentication (pg\_ident.conf)

If an external reference, such as 'include' in postgresql.conf, is set, the reference destination files are also backed up.

**-C fast|spread**

**--checkpoint=fast|spread**

Sets checkpoint mode to fast or spread (default).

If fast is specified, the checkpoint processing at the start of backup becomes quick, but the impact on performance of running applications gets larger due to intense I/O. In spread mode, the impact on applications is smaller but the backup takes longer, because the checkpoint is performed slowly.

**-D *datadir***

Specify the data directory. If this option is omitted, the value of the environment variable PGDATA is used.

**-f *configFile***

Specify the postgresql.conf configuration file. This option is set if the data directory and the configuration file set in the 'data\_directory' parameter of the postgresql.conf file are running in separate directories.

**-U *username***

**--username=*username***

Specify the user name of the database superuser. This defaults to the name of the effective user running pgx\_dmpall.

**-w**

**--no-password**

Never issue a password prompt. If the server requires password authentication and a password is not available by other means such as a .pgpass file, the connection attempt will fail. This option can be useful in batch jobs and scripts where no user is present to enter a password.

**-W**

**--password**

Force pgx\_dmpall to prompt for a password before connecting to a database.

This option is never essential, since pgx\_dmpall will automatically prompt for a password if the server demands password authentication. However, pgx\_dmpall will waste a connection attempt finding out that the server wants a password. In some cases it is worth typing -W to avoid the extra connection attempt.

**--maintenance-db=*dbname***

Specifies the name of the database to connect to. If not specified, the postgres database will be used; if that does not exist, template1 will be used.

Any database can be specified as long as it can be connected to.

## Environment

PGDATA

Specify the data directory. You can overwrite using the -D option.

## Diagnostics

0: Normal exit

Other than 0: Abnormal exit

## Notes

This command can only be executed when the database server is running.

Execute this command as a PostgreSQL user account.

Do not update or delete files in the backup storage directory. Otherwise, you may not be able to recover the database.

Do not store other files in the backup storage directory.

This command uses one database connection. To establish a connection, this command uses the IPv4 loopback address 127.0.0.1 on Windows, and the UNIX domain socket on other operating systems. Therefore, permit these connections in pg\_hba.conf.

This command cannot be executed on the standby server.

### Example

In the following example, the data directory, tablespaces, and configuration files are backed up. At this time, stored WALs are no longer necessary because the backups are destroyed.

```
$ pgx_dmpall
```

### Related item

`pgx_rcvall`

## 3.3 pgx\_keystore

---

### Name

`pgx_keystore --` Manages keystore

### Synopsis

```
pgx_keystore [option...] keystore_location
```

### Description

`pgx_keystore` enables auto-open of a keystore.

### Options

`-a`

`--enable-auto-open`

Enables auto-open of a keystore. This allows the keystore to open automatically without entering the passphrase when the database server starts.

When auto-open is enabled, an obfuscated copy `keystore.aks` is created in the same directory where the keystore file `keystore.ks` is stored. To disable auto-open, delete `keystore.aks`.

`-P passphrase`

`--passphrase=passphrase`

Specify the passphrase to open the keystore. If this option is omitted, the prompt to enter the passphrase is displayed.

*keystore\_location*

Specify the absolute or relative path of the keystore file.

### Diagnostics

0: Normal exit

Other than 0: Abnormal exit

### Notes

This command can be executed whether the database server is running or stopped. It does not connect to the database server.

### Example

Enables auto-open of a keystore.

```
$ pgx_keystore -a /key/store/location/keystore.ks
```

## 3.4 pgx\_rcvall

---

### Name

pgx\_rcvall - Recovers the data directory, tablespaces, and configuration files.

### Synopsis

```
pgx_rcvall [option...]
```

### Description

The `pgx_rcvall` command recovers the data directory, tablespaces, and configuration files using the data that was backed up with `pgx_dmpall` command and archived Write-Ahead-Log (WAL). If none of the options that indicate the recovery point is specified, all archived WAL are applied and the data will be recovered to the latest point.

### Options

**-B** *backupdir*

Specify the backup storage directory. If the data directory is damaged, this option cannot be omitted.

**-D** *datadir*

Specify the data directory. If this option is omitted, the value of the environment variable PGDATA is used.

**-e** *targetTime*

Specify this option to recover the data as of the specified date and time.

*targetTime*

Specify the time at which the data is recovered. The format is as follows:

```
"YYYY-MM-DD HH:MM:SS"
```

**-l**

This option displays a list of the backup data information in the backup storage directory that was obtained using the `pgx_dmpall` command. This cannot be specified together with `-p`, `-e` or `-n` option.

**-n** *restorePoint*

Specify this option to recover the data to the specified restore point. Restore points are created with SQL function `pg_create_restore_point`. If multiple restore points with the same names were created, the first one after the backup was taken is used for recovery. If the specified restore point does not exist, all archived WAL are applied. This cannot be specified together with `-e` or `-p` option.

**-p**

Specify this option to recover the data as of the time when the last backup completed. This cannot be specified together with `-e` or `-n` option.

**-s** *connectionString*

Construct a standby server from the backup created by `pgx_dmpall`. Specify as an argument a connection string for connecting to the primary server. This is the same as `primary_conninfo` parameter in `recovery.conf`. This option can only be specified together with `-D` and `-B`.

**-x**

Specify this option if you do not want to include transactions committed at the time specified in the `-e` option as part of the recovery.

**--keystore-passphrase**

Prompt for the passphrase to open the keystore.

## Environment

### PGDATA

Specify the data directory. You can overwrite using the `-D` option.

### PGPORT

Specify the port number for connecting to the database.

### PGUSER

Specify the user name of the database superuser. This defaults to the name of the effective user running `pgx_dmpall`.

## Diagnosis

0: Normal exit

Other than 0: Abnormal exit

## Backup data information

### Date

Date the backup data was created using the `pgx_dmpall` command.

### Dir

This is the name of the directory in the backup storage directory that is used to store the backup data.

Directory naming format: Time format (YYYY-MM-DD\_HH-MM-SS)

### Status

This is the status of the `pgx_dmpall` command backup data.

COMPLETE: Complete

INCOMPLETE: Incomplete

## Notes

This command can only be executed when the database server is stopped, except when it is executed with `-l` option.

Execute this command as a PostgreSQL user account.

Use backup data that was taken from the recovery target data directory.

Before executing this command, disconnect all application database connections. Additionally, do not connect to the database during recovery.

Hash indexes cannot be recovered correctly in this command. If you are using the hash index, execute `REINDEX` for the corresponding index after this command finishes.

The configuration files are restored from those files that were taken by the last `pgx_dmpall` (including `-c` option).

This command connects to the database to determine whether the recovery has completed. So ensure that you set the port number with `PGPORT` environment variable in the environment where multiple instances exist.

Match the OS timezone setting when running `pgx_dmpall/pgx_rcvall` to the timezone specified by `timezone` parameter in `postgresql.conf`.

Otherwise, data might be recovered to an unexpected time when `-e` or `-p` is specified.

If you recover to a past point, a new timeline (history of database updates) begins at that point. That recovery point is the latest point in the new timeline when the recovery is completed. If you subsequently recover to the latest point, the database updates in the new timeline will be replayed.

Valid restore points are the ones that were created in the timeline where the backup had been taken. That means that if you recover to a past point, those restore points created thereafter are unavailable. Therefore, take a backup when you have restored the past data desired.

## Example

In the following example, the data directory, tablespaces, and configuration files are recovered.

```
$ pgx_rcvall -B /home/pgsql/Backupdir
```

In the following example, the data directory and tablespaces are recovered at 10:00:00 on 01-05-2015. The configuration files are recovered at the point at which the last of the data is obtained.

```
$ pgx_rcvall -B /home/pgsql/Backupdir -e "2015-05-01 10:00:00"
```

In the following example, the data directory and tablespaces are recovered upto the time of restore point "before\_match\_20150510\_1". The configuration files are restored from the latest backup.

```
$ pgx_rcvall -B /home/pgsql/Backupdir -n before_match_20150510_1
```

In the following example, the obtained backup data information in the backup storage directory is displayed in a list.

```
$ pgx_rcvall -l
```

## Related item

pgx\_dmpall

## 3.5 postgres

---

### Name

postgres -- PostgreSQL database server

### Synopsis

```
postgres [option...]
```

### Options

-K

Prompt for the passphrase to open the keystore. This option works in single-user mode only, so you must also specify the --single option, as shown below:

```
postgres --single -K
```

### See

Refer to "postgres" in the PostgreSQL Documentation for details.

# Chapter 4 Mirroring Controller Commands

This chapter explains the Mirroring Controller commands.

## 4.1 mc\_ctl

### Name

**S** **L**

`mc_ctl` - Start and stop Mirroring Controller, switch/disconnect the server, or display the server status.

**W**

`mc_ctl` - Start and stop Mirroring Controller, switch/disconnect the server, display the server status, or register and unregister from the Windows services.

### Overview

```
mc_ctl start [-M mcdir] [-w] [-f] [--mc-only] [--local-server server_id]
```

```
mc_ctl stop [-M mcdir] [[-a] [--mc-only] | [-e][--local-server server_id]]
```

```
mc_ctl status [-M mcdir] [--local-server server_id]
```

```
mc_ctl switch [-M mcdir] [--local-server server_id]
```

```
mc_ctl enable-failover [-M mcdir] [--local-server server_id]
```

```
mc_ctl disable-failover [-M mcdir] [--local-server server_id]
```

**W**

```
mc_ctl register [-M mcdir] [-w] [-f] [--mc-only] -P password  
[-S a[uto] | d[emand]] [--local-server server_id]
```

```
mc_ctl unregister [-M mcdir] [--local-server server_id]
```

### Description

**S** **L**

`mc_ctl` starts and stops Mirroring Controller, switches/disconnects the server, or displays the server status.

**W**

`mc_ctl` starts and stops Mirroring Controller, switches/disconnects the server, displays the server status, or registers and unregisters from the Windows services.

The start mode starts Mirroring Controller. If the `--mc-only` option is omitted, the command starts a database instance. Specify the `-w` option to get the status of this command.

The stop mode stops Mirroring Controller. If the `--mc-only` option is omitted, the database instance is stopped. If `--mc-only` option is not specified, database instance is also stopped. When executes on standby server without `--mc-only`, standby server will be detached from primary server.

The status mode displays the status of the servers, database instance processes, and disks monitored by Mirroring Controller.

The switch mode switches the primary server. When the server is switched, the database instance on the primary server stops, and the database instance on the standby server is upgraded to primary server and begins degrading operation.

The enable-failover mode enables automatic switching and disconnection.

The disable-failover mode disables automatic switching and disconnection.

**W**

The register mode registers Mirroring Controller in the Windows service. The `-w`, `-f`, `--mc-only`, and `--local-server` options are used when Mirroring Controller is started and stopped from the Windows services. If the `mc_ctl` command is used to start and stop Mirroring Controller, the option specified in the command will be valid.

The unregister mode unregisters Mirroring Controller from the Windows service.



If Mirroring Controller has not been started on the server that executes the command, commands for any mode other than the start mode, and status mode.

Execute this command as an instance administrator.



If Mirroring Controller has not been started on the server that executes the command, commands for any mode other than the start mode, status mode, register mode, and unregister mode terminate with an error.

Execute this command as an instance administrator user with the "Administrator" privilege (operating system user ID that belongs to the Administrator group).

Until you start Mirroring Controller of standby server after starting Mirroring Controller of the primary server, disconnect of the standby server occurs operation to be able to continue with only the primary server. Standby server is incorporated when you start the Mirroring Controller of standby server, and you should be able to operate in the multiplexing configuration.

## Options

-a

Specify this option to stop Mirroring Controller on all servers.

-e

Specify this option to forcibly stop Mirroring Controller on the active server.

-f

Specify this option to enable automatic switching and disconnection of Mirroring Controller immediately after startup.

--local-server *server\_id*

If you run a simulation build of the primary and standby servers in a single server (for system testing, for example), specify this option to identify the server to be operated.

For *server\_id*, specify the server identifier specified in the network.conf file. ASCII characters other than single-byte space can be specified in the server identifier. The operations will be executed as if the user has logged in to *server\_id*.

--mc-only

Specify this option to start and stop only Mirroring Controller processes. At the start mode, this option can be specified only while the database instance is running. If this option is omitted, the database instance is simultaneously started and stopped.

-M *mcdir*

Specify the Mirroring Controller management directory.



ASCII characters other than halfwidth spaces can be specified in the directory path.



ASCII characters can be specified in the directory path.

If this option is omitted, the value of the environment variable MCONTROLDIR is used.

-P *password*



For the register mode, specify the password for the user who executed the command.



-S *a[uto] | d[emand]*

Specify the start type for the Windows service to be registered. You can choose auto or demand as the start type by specifying the entire word or just its first letter. The default is auto.

-w

Waits for operations to finish.

## Environment variable

### MCCONTROLDIR

Specifies the Mirroring Controller management directory.

**S L**

ASCII characters other than halfwidth spaces can be specified in the directory path.

**W**

ASCII characters can be specified in the directory path.

You can specify the -M option to override this value.

## Diagnostics

0: Normal end

Other: Abnormal end

## Notes

The message under execution might be output though the mc\_ctl command is not being executed and, besides, it terminate abnormally when the server is downed while processing execution of this command, an automatic switch, and an automatic separation, and the communication between a primary server and the standby server is cut off. Besides, please reactivate Mirroring Controller to solve this problem after confirming nobody is operating the mc\_ctl command. Afterwards, please execute a necessary operation.

If a time-out error occurs when the mc\_ctl command is in progress, the messages may be different from the processes. Take the actions described in the "Action" section of the message.

Automatic switching and disconnection by the enable-failover mode, the disable-failover mode, and the -f option of the start mode is effective only while Mirroring Controller is running. Therefore, please activate each time you start the Mirroring Controller if you want to enable automatic switching and disconnection.

**W**

Use the start mode and stop mode to start and stop the Windows services. To do this, use the register mode to register Mirroring Controller in the Windows services in advance.

In case of postgresql.conf has any incorrect parameter when this command is executed, this command will be abnormally terminated. If this is the case, please re-execute it again after correct the parameter in postgresql.conf.

**W**

In Windows Server(R) 2008, Windows Server(R) 2008 R2, Windows Server(R) 2012 or Windows Server(R) 2012 R2, the mc\_ctl command must be executed from "Administrator: Command Prompt". Right-click [Command Prompt], and then select [Run as administrator] from the menu to display the [Administrator: Command Prompt] window.

## Example

**S L**

To start Mirroring Controller:

```
$ mc_ctl start -M /mcdire/inst1
```

**W**

To start Mirroring Controller:

```
> mc_ctl start -M D:\mcdire\inst1
```

Display details of mc\_ctl status

```
mirroring status
-----
(1)

server_id  host_role      host           host_status    db_proc_status  disk_status
(2)       (3)           (4)           (5)           (6)             (7)
```

```
(1) Multiplexing status
    switchable      : Switchable
    switching       : Switching
```

```

switched          : Switched (displayed when switching has finished and the degrading
operations status has been enabled)
not-switchable   : Not switchable (displayed when a server is disconnected and
switching is not possible)
unknown          : Unknown (*1)
failover-disabled : Failover is disabled
(2) Server identifier
(3) Server role
primary : Primary
standby : Standby
none(inactivated primary): No role
                        (primary is stopped or being defined as primary)
none(inactivated standby): No role
                        (standby is stopped or being defined as primary)
(4) Host name or IP address
(5) Live/dead state of the server
normal : Normal operation
abnormal : Abnormal
unknown : Unknown (*1)
(6) DBMS process status
normal          : Normal
abnormal (abnormal process name (*2)) : Abnormal
unknown        : Unknown (*1)
(7) Disk status
normal          : Normal
abnormal (abnormal disk type (*3)) : Abnormal
unknown        : Unknown (*1)

```

\*1: Displayed when Mirroring Controller is stop state, the management network is abnormal, or Mirroring Controller has failed or is unresponsive.

\*2: The names of the DBMS processes in which the abnormality was detected are output separated by a comma. The name has the following meaning:

- postmaster: Process (postmaster) that accepts application connections
- wal\_sender or wal\_receiver: Process (WAL sender or WAL receiver) that sends and receives transaction logs

\*3: The types of disks where the abnormality was detected are output separated by a comma. The type has the following meaning:

- data: Data storage disk
- tran\_log: Transaction log storage disk
- tablespace: Tablespace storage disk