

# FUJITSU Enterprise Postgres 9.4



## Reference Guide

Windows/Linux

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# Preface

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## Purpose of This Document

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

## Intended Readers

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

- PostgreSQL
- SQL
- Linux
- Windows

A small blue square icon with a white letter 'L' inside, representing Linux.A small blue square icon with a white letter 'W' inside, representing 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

### [Chapter 5 PL/extJava Commands](#)

Explains the PL/extJava commands.

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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_pclrsc</a>	Register, unregister, or display Enterprise Postgres database cluster with PRIMECLUSTER as resource of PRIMECLUSTER.
<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

### 1.1.4 PL/extJava Commands

PL/extJava has the following commands:

Command	Functional overview
<a href="#">pgx_jadmin</a>	Setup and operation of PL/extJava.

## 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` [*connecti onOpti on...*] [*opti on...*]

### 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[mmediate] ] [-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. 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.

## 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\_pclrsc

---

## Name

`pgx_pclrsc` -- Register, unregister, or display Enterprise Postgres database cluster with PRIMECLUSTER as resource of PRIMECLUSTER.

## Synopsis

```
pgx_pclrsc -a -c name -u osuser -D directory -w directory
           -n nodes [options...]
pgx_pclrsc -d -c name
pgx_pclrsc -p [-c name]
```

## Description

`pgx_pclrsc` is an utility for registering or unregistering Enterprise Postgres database cluster with PRIMECLUSTER, or displaying settings of Enterprise Postgres database cluster registered with PRIMECLUSTER. Execute the command on a member node of the cluster. Only the super user(root) can execute this command.

## Options

`-a`

`--add`

Register the specified database cluster with PRIMECLUSTER. If the specified database cluster has already been registered with PRIMECLUSTER, then terminate abnormally.

`-c name`

`--db-cluster-name=name`

Specify database cluster name. *name* is case-sensitive, and must be within 16 bytes, and an initial letter must be ascii alphabet, and following letters must be ascii alphabet or ascii digit or underscore(\_).

`-d`

`--delete`

Unregister the specified database cluster from PRIMECLUSTER.

`-D directory`

`--pgdata=directory`

Specify an absolute path of data directory.

`--db-user=name`

Specify a database super user. Default is the user specified with '-u'.

`-n nodes`

`--member-nodes=nodes`

Specify names of all member nodes of the cluster. Specify a cluster node name with suffix "RMS" to the name. Separate names with comma(.). (e.g. `-n node1RMS,node2RMS`)

`-p`

`--print`

Print a list of database clusters registered with PRIMECLUSTER. If `-c` option is specified, then print settings of the database cluster.

`--response-timeout=seconds`

Specify timeout of the query for health check. It's used with a count specified with '--timeout-retry-num'. The query is "SELECT 1" to the database "template1". If '0', wait infinitely. (default: '0')

`--timeout-retry-count=count`

Specify a limit count of retrying query when timeout is occurred. If retry counter is over the limit, then PRIMECLUSTER considers status of the database server as FAULT. If a query doesn't timeout once, retry counter is reset. (default: '6')

`--trace-max-file-size=size`

Specify max size(KB) of trace file. (default: '10240')

`-u osuser`

`--os-user=osuser`

Specify an OS user who can start/stop Enterprise Postgres database server.

`-w directory`

`--work-dir=directory`

Specify a directory for temporary data and trace files. It's used for starting, stopping or checking Enterprise Postgres database server. If the directory doesn't exist, then create it. Owner of the directory created by the command is set to the user specified with '-u'. Permission of the directory created by the command is set to 0700.

`--watch-interval=seconds`

Specify an interval. It's used for the amount of time between health checks. (default: '3')

## Diagnostics

0 : On success

otherwise : On error

## Notes

Before unregistering a resource, stop RMS of PRIMECLUSTER.

## Example

The simplest example of registering a resource.

```
# pgx_pclrsc -a -c dbcluster1 -u postgres -D /mnt/swdsk1/pgdata -w /var/tmp/work -n  
node1RMS,node2RMS
```

# 3.5 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`

## 3.6 postgres

---

### Name

`postgres` -- PostgreSQL database server

## Synopsis

`postgres [option...]`

## Options

`-K`

Prompt for the passphrase to open the keystore.

## 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

**L** mc\_ctl - Start and stop Mirroring Controller, switch/disconnect the server, display the server status, or build the standby server

**W** mc\_ctl - 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

### Overview

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

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

```
mc_ctl status [-M mcdi r] [--local-server server_id]
```

```
mc_ctl switch [-M mcdi r] [--local-server server_id]
```

```
mc_ctl enable-failover [-M mcdi r] [--local-server server_id]
```

```
mc_ctl disable-failover [-M mcdi r] [--local-server server_id]
```

```
mc_ctl setup [-M mcdi r] -r standby -U username [-P password]  
-h hostname -p port --standby-name=standby_name  
[-c connstr] [--local-server=server_id]
```

**W**

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

```
mc_ctl unregister [-M mcdi r] [--local-server server_id]
```

### Description

**L** mc\_ctl starts and stops Mirroring Controller, switches/disconnects the server, displays the server status, or builds the standby server.

**W** mc\_ctl starts and stops Mirroring Controller, switches/disconnects the server, displays the server status, builds the standby server, 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. You can use this mode after installing the Mirroring Controller option.

The disable-failover mode disables automatic switching and disconnection. You can use this mode after installing the Mirroring Controller option.

The setup mode creates a new standby server.

**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 the option specified in the command will be valid.

The unregister mode unregisters Mirroring Controller from the Windows service.

**L** 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.

**W** 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.

**-c *connstr***

Specify a connection string to connect to the primary server in keyword/value format.

Refer to "primary\_conninfo" in the "Standby Server Settings" in the PostgreSQL Documentation for information on connection string.

If you specify the following parameter key words in `-c` option, the error will occur. Because there are specified in other options.

```
-host  
-port  
-user  
-password  
-application
```

The equivalence relationship between the parameter key word and the option are follows.

```
-host           : -h option  
-port          : -p option  
-user          : -U option  
-password      : -P option  
-application_name : --standby-name option
```

**-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.

This option is available only if you install the Mirroring Controller options.



**-h *hostname***

Specify the host name or IP address.

**--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.

**L**

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

**W**

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 setup mode, specify the password for the user specified for the user name. If the password is specified in the password file, then this can be omitted.

**W**

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

**-p *port***

Specify the port number of the instance on the primary server.

**-r standby**

Specify this option to create a new standby server.

**W**

**-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.

**--standby-name=*standby\_name***

Specify the name of the standby server. For *standby\_name*, specify the same as synchronous\_standby\_name parameter in the postgresql.conf on the primary server.

**-U *username***

Specify the username with REPLICATION privileges.

**-w**

Waits for operations to finish.

## Environment variable

MCONTROLDIR

Specifies the Mirroring Controller management directory.

**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

**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

```

# Chapter 5 PL/extJava Commands

This chapter explains the PL/extJava commands.

## 5.1 pgx\_jadmin

### Name

pgx\_jadmin -- Setup and operation of PL/extJava

### Synopsis

```
pgx_jadmin init-domain --sharedir directory [--domainport port1, port2, port3]
                    --dbadminuser username
                    [--pgdata directory | -D directory]
                    [--cluster-standbynode]

pgx_jadmin delete-domain [-y] [--force] [--cluster-standbynode]

pgx_jadmin list-domain

pgx_jadmin modify-domain-port --domainport port1, port2, port3
                    [--cluster-standbynode]

pgx_jadmin create-container --dbname database_name [--instanceport port1, port2]
                    [--dbport port] --dbuser username
                    --dbpassword password
                    [--cluster-standbynode]

pgx_jadmin delete-container --dbname database_name [--cluster-standbynode]

pgx_jadmin list-container --dbname database_name

pgx_jadmin add-instance --dbname database_name
                    --instanceport port1, port2 [--cluster-standbynode]

pgx_jadmin delete-instance --dbname database_name [--cluster-standbynode]

pgx_jadmin modify-instance-port --instance name
                    --instanceport port1, port2 [--cluster-standbynode]

pgx_jadmin modify-container-db --dbname database_name [--dbport port]
                    [--dbuser username] [--dbpassword password]

pgx_jadmin list-jvm-options --dbname database_name

pgx_jadmin modify-jvm-options --dbname database_name [--heapsize size]
                    [--permsize size]

pgx_jadmin backup --backupdir directory

pgx_jadmin restore --backupdir directory [--cluster-standbynode]
```

### Description

The pgx\_jadmin unified command is used in Enterprise Postgres Java Application Server, which incorporates the PL/extJava environment into Enterprise Postgres. The pgx\_jadmin command consists of several subcommands. Each subcommand corresponds to an operation in the PL/extJava environment.

In init-domain subcommand, creates a domain for using the PL/extJava environment. This command creates a domain only once after Enterprise Postgres is installed.

In delete-domain subcommand, deletes the domain for using the PL/extJava environment.

In list-domain subcommand, displays domain information.

In modify-domain-port subcommand, modifies the domain management port numbers.

In create-container subcommand, creates a container in a domain. When you create a container, a server instance (JavaVM) is simultaneously created in the container. Create one container per database within an instance. To use Java functions in multiple databases, create a container for each one.

In delete-container subcommand, deletes a container from a domain.

In list-container subcommand, displays container information.

In add-instance subcommand, add a server instance (JavaVM) to a container.

In delete-instance subcommand, deletes a server instance (JavaVM) from a container. If multiple server instances (JavaVM) have been created in a container, this command deletes the one that was added last.

In modify-instance-port subcommand, modifies the server instance management port numbers.

In modify-container-db subcommand, modifies the database connection information of a container.

In list-jvm-options subcommand, displays JavaVM option information of a container.

In modify-jvm-options subcommand, modifies the JavaVM settings of a container.

In backup subcommand, backup the PL/extJava.

In restore subcommand, restore the PL/extJava.

## Options

--backupdir *directory*

Specify a backup storage directory for PL/extJava, using an absolute path.

W

Specify the directory name in up to 64 bytes.

L

Specify the directory name in up to 120 bytes.

You can use the following characters in the directory name:

- Alphanumeric characters
- Spaces
- Underscores "\_"
- Hyphens "-"
- Parentheses "()"

Do not specify the following directories:

- Same directory as the instance data storage directory, the backup storage directory and the domain root directory
- Directory in the instance data storage directory, the backup storage directory and the domain root directory
- Directory that exists under the instance data storage directory, the backup storage directory and the domain root directory is under the backup storage directory for PL/extJava

--cluster-standbynode

Specify this option to execute the command for the standby node in a cluster environment.

-D *directory*

--pgdata *directory*

Specify the absolute path of the data storage destination of the instance.

If you omit this option, the command references the environment variable (PGDATA).

**W****--dbadminuser *username***

Specify the name of the instance administrator.

Specify the user name in up to 20 bytes.

If you are specifying the domain user, use the "domainName\userName" format. Specify the domain name in up to 250 bytes.

After creating a domain, you cannot change the instance administrator set during creation of the domain.

**L****--dbadminuser *username***

Specify the name of the instance administrator. Refer to "User of PL/extJava" in "Setting up and Operating PL/extJava" of the Operation Guide for information on the instance administrator. Specify the user name in up to 8 bytes. After creating a domain, you cannot change the instance administrator set during creation of the domain.

**--dbname *database\_name***

Specify the database name using 1 to 28 bytes of the database corresponding to the container. You can use the following characters in the database name:

- Alphanumeric characters
- Underscores "\_"

You cannot specify an underscore as either the leading or trailing character. You cannot specify a database name already registered, even if you change name capitalization. For example, if the database name "database001" has already been registered, you cannot create a container with the database name "DATABASE001". You cannot specify the following as a database name:

- domain
- default
- server
- resources

The database name to the instance is not revokable. Recreate the container when you change the database name.

**W**

Windows operating system reserved words cannot be specified.

**--dbpassword *password***

Specify the password of the user who will connect to the database.

Ensure that it matches the password of the user registered in the instance.

Specify --dbpassword option or --dbuser option when you modify the database connection information.

**--dbport *port***

Specify the port number of the instance.

If you omit the port number, the default value of 27500 for the instance is used.

**--dbuser *username***

Specify a user name for connecting to the database. You must register the user in the instance in advance.

Specify --dbuser option or --dbpassword option when you modify the database connection information.

**--domainport *port1,port2,port3***

Specify the domain management port numbers separated with a comma. Three port numbers are required. If you omit the port numbers, the default values are used. Refer to "Preparation for portnumber" in "Setting up and Operating PL/extJava" of the Operation Guide for information on port numbers. Specify the portnumber not changed in order of specification for the init-domain subcommand when specifying it for the modify-domain-port subcommand.

**--force**

Specify this option to forcibly delete the domain even if it has containers. If you omit this option, the domain will fail to be deleted if it has containers.

**--heapsize *size***

Specify the size of the heap area in megabytes. Specify a value of 64 or greater for the size of the heap area.

Specify **--heapsize** option or **--permsize** option when you modify the JavaVM settings.

**--instance *name***

Specify the server instance name (JavaVM).

You can check the names of server instances (JavaVM) registered in a container by using the **list-container** subcommand.

**--instanceport *port1, port2***

Specify the server instance management port numbers separated with a comma. Two port numbers are required. If you omit the port numbers, the default values are used. Refer to "Preparation for portnumber" in "Setting up and Operating PL/extJava" of the Operation Guide for information on port numbers.

For the port numbers you are not going to change, you must specify them in the same order for the **create-container** subcommand or **add-instance** subcommand when specifying them for the **modify-instance-port** subcommand.

**--permsize *size***

Specify the size of the Perm area in megabytes. Specify a value of 64 or greater for the size of the Perm area.

Specify **--permsize** option or **--heapsize** option when you modify the JavaVM settings.

**--shareddir *directory***

Specify the absolute path of the directory (domain root) that will store the domain resources.

W

Specify the directory that does not exist in the directory name in up to 64 bytes.

When specifying **--cluster-standbynode**, however, you must specify an existing directory for the directory name.

Specify the directory that there is a writing authority of the user who has the administrator authority in the parent directory of the domain root.

L

Specify the directory that does not exist in the directory name in up to 255 bytes.

Specify the directory that there is a writing authority of the user who has the instance administrator authority in the parent directory of the domain root.

You can use the following characters in the directory name:

- Alphanumeric characters
- Spaces
- Underscores "\_"
- Hyphens "-"
- Parentheses "()"

Do not specify the following directories for the domain root:

- Same directory as the instance data storage directory
- Directory in the instance data storage directory
- Directory for which the instance data storage directory is under the domain

**-y**

Specify this option to skip the message prompting you to confirm deletion of the domain.

If you omit this option, a message prompting you to confirm deletion of the domain will be displayed.

## Environment

PGDATA

Specify the absolute path of the data storage destination of the instance. If the `pgx_jadmin` command with the `-D` option or `--pgdata` is specified, then that will be used.

## Diagnostics

0 : On success

otherwise : On error

## Notes

The Executing of this command cannot be done at the same time.

## Using an escape character

To use any of the following characters as the value of an option or operand in the command, you must escape it with `"\"`. However, do not specify escape character when you specify `--dbuser` and `--dbpassword` excluding the metacharacter for the `modify-container-db` subcommand.

### W

#### Windows

Character type	Description	Characters
Java escape sequence	Character used as an escape character in Java	<code>\</code> etc
Special character of the <code>pgx_jadmin</code> command	Special character used as a delimiter or escape character in subcommands	<code>.-:=</code>

### L

#### Linux

Character type	Description	Characters
Metacharacter	Character used as a metacharacter	<code>;&amp;() &gt;&lt;?*?[]~+-@!"\"`\${}^(*1)</code>
Java escape sequence	Character used as an escape character in Java	<code>\</code>
Special character of the <code>pgx_jadmin</code> command	Special character used as a delimiter or escape character in subcommands	<code>.-:=</code>

\*1: The characters treated as metacharacters vary depending on the type of shell being used.

To set the password of the user who will connect to the instance to `"pass\word!"`:

### W

```
pgx_jadmin create-container --dbname db01 --dbuser user1 --dbpassword pass\\word\!
```

### L

```
pgx_jadmin create-container --dbname db01 --dbuser user1 --dbpassword pass\\\\word\!
```

## Stop of instance

The following subcommand can only be executed when the database server is stopping.

- `init-domain`
- `create-container`
- `add-instance`



- delete-instance
- modify-domain-port
- modify-instance-port
- modify-container-db
- modify-jvm-options
- delete-container
- delete-domain
- backup
- restore

### Start the instance

The following subcommand can only be executed when the instance is being started:

- list-jvm-options

### Command executing user

**W**

The all subcommand execute this command as:

- User with administrator privileges on the operating system

**L**

The init-domain subcommand and the delete-domain subcommand and the backup subcommand and the restore subcommand execute this command as:

- Operating system administrator

The others subcommand execute this command as:

- instance administrator

The list-domain subcommand is the Executing by the above-mentioned user.

**W**

### Create the domain

Register the instance in the Windows services before creating the domain.

### Deletion of domain

Delete of domain before uninstalling Enterprise Postgres. Deleting a domain deletes the domain root directory. Back up the required directories and files before executing this command.

### Backup storage directory of PL/extJava

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

Do not store other files in the backup storage directory of PL/extJava.

## Examples

### Create a domain

The following example omits the domain management port numbers and the instance data storage directory.

**W**

```
pgx_jadmin init-domain --sharedir C:\database\domain --dbadminuser dbadmin1
```

**L**

```
pgx_jadmin init-domain --sharedir /database/domain --dbadminuser dbadmin1
```

The following example specifies the domain management port numbers and the instance data storage directory.

**W**

```
pgx_jadmin init-domain --sharedir C:\database\domain --dbadminuser dbadmin1
--domainport 27530,27521,27522 --pgdata C:\database\inst1
```

**L**

```
pgx_jadmin init-domain --sharedir /database/domain --dbadminuser dbadmin1
--domainport 27530,27521,27522 --pgdata /database/inst1
```

### Delete a domain

The following example shows the command when the domain has no containers.

```
pgx_jadmin delete-domain
```

The following example forcibly deletes the containers in the domain.

```
pgx_jadmin delete-domain --force
```

### Display domain information

To display the domain information:

```
pgx_jadmin list-domain
```

#### Contents of list-domain

```
domain status: (1)
sharedir:      (2)
domainport:    (3)
dbadminuser:   (4)
datadir:       (5)
```

- (1) Domain status
  - running : Start state
  - not running : Stop state
- (2) Directory (domain root) that will store the domain resources
- (3) Domain management port number (x 3)
- (4) Instance (database) administrator
- (5) Instance data storage directory

**W**

### Display example

```
domain status: running
sharedir: C:\database\domain
domainport: 27530,27521,27522
dbadminuser: dbadmin1
datadir: C:\database\inst1
```

**L**

### Display example

```
domain status: running
sharedir: /database/domain
domainport: 27530,27521,27522
dbadminuser: dbadmin1
datadir: /database/inst1
```

### Modify the domain management port numbers

To modify the domain management ports:

```
pgx_jadmin modify-domain-port --domainport 27600,27601,27602
```

### Create a container

The following example omits the port number of the instance and the port number of the server instance.

```
pgx_jadmin create-container --dbname db01 --dbuser user1 --dbpassword password1
```

The following example specifies the port number of the instance and the port number of the server instance.

```
pgx_jadmin create-container --dbname db01 --dbuser user1 --dbpassword password1
--dbport 27011 --instanceport 27531,27532
```

#### Delete a container

To delete a container:

```
pgx_jadmin delete-container --dbname db01
```

#### Display container information

To display container information:

```
pgx_jadmin list-container --dbname db01
```

#### Contents of list-container display

```
container status: (1)
dbname:           (2)
instance:         (3) (4)
dbport:           (5)
dbuser:           (6)
```

- (1) Container status
  - running : Start state (all server instances are started)
  - partially running : Degrading start (some server instances are stopped)
  - not running : Stop state (all server instances are stopped)
- (2) Database name
- (3) Server instance name
- (4) Server instance management port number (x 2)
- (5) Instance port number
- (6) User name for connecting to the instance

#### Display example

```
container status: running
dbname: db01
instance: db01-1 27531,27532
instance: db01-2 27801,27802
dbport: 27011
dbuser: user1
```

#### Add a server instance(JavaVM)

To add a server instance(JavaVM):

```
pgx_jadmin add-instance --dbname db01 --instanceport 27801,27802
```

#### Delete a server instance(JavaVM)

To delete a server instance(JavaVM):

```
pgx_jadmin delete-instance --dbname db01
```

#### Modify the server instance(JavaVM) management port numbers

To modify the server instance(JavaVM) management port numbers:

```
pgx_jadmin modify-instance-port --instance db01-1 --instanceport 27701,27702
```

#### Modify the instance connection information

To modify the user name and password used for connecting to the database:

```
pgx_jadmin modify-container-db --dbname db01 --dbuser user02 --dbpassword passwd2
```

## Display JavaVM option information of a container

To display the JavaVM options of a container:

```
pgx_jadmin list-jvm-options --dbname db01
```

## Modify the JavaVM settings

To modify the JavaVM heap area size and the Perm area size:

```
pgx_jadmin modify-jvm-options --dbname db01 --heapsize 1024 --permsize 384
```

## Backup the PL/extJava

To backup the PL/extJava:

W

```
pgx_jadmin backup --backupdir D:\backup
```

L

```
pgx_jadmin backup --backupdir /backup
```

## Restore the PL/extJava

To restore the PL/extJava:

W

```
pgx_jadmin restore --backupdir D:\backup
```

L

```
pgx_jadmin restore --backupdir /backup
```