

# Fujitsu Enterprise Postgres 16

## Installation and Setup Guide for Client

Windows/Linux

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# Preface

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## Purpose of this document

This document describes how to install, uninstall and set up the "Fujitsu Enterprise Postgres client feature".

## Intended readers

This document is intended for those who install and operate Fujitsu Enterprise Postgres.

Readers of this document are assumed to have general knowledge of:

**W**

- PostgreSQL

- SQL

- Windows

**L**

- PostgreSQL

- SQL

- Linux

## Structure of this document

This document is structured as follows:

### [Chapter 1 Overview of Installation](#)

Describes the features that can be installed, and provides an overview of installation methods

### [Chapter 2 Installation and Uninstallation of the Windows Client](#)

Describes how to install the Fujitsu Enterprise Postgres client feature (Windows client)

### [Chapter 3 Installation and Uninstallation of the Linux Client](#)

Describes how to install the Fujitsu Enterprise Postgres client feature (Linux client)

### [Chapter 4 Setup](#)

Describes the setup procedures to be performed after installation completes

## Export restrictions

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# Chapter 1 Overview of Installation

This chapter provides an overview of Fujitsu Enterprise Postgres installation.

## 1.1 Features that can be Installed

Fujitsu Enterprise Postgres provides features to enable access to the database from a variety of platforms and languages, as the connection environment for the client and the database server.

The Fujitsu Enterprise Postgres client package must be installed on the client system to use these features.

The following table shows the relationship between the platforms and the features provided by client packages.

Platform	JDBC	ODBC	.NET Data Provider	C language (libpq)	Embedded SQL (ECPG) in C language	Embedded SQL (ECOBPG) in COBOL	Connection Manager	High-speed data load	pgAdmin	Pgpool-II	Idap2pg	pgBackRest
Windows	Y	Y	Y	Y	Y	Y	Y	Y	Y			
Linux	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y

Y: Supported

## 1.2 Installation Types

The following installation types are available for Fujitsu Enterprise Postgres:

- New installation
- Reinstallation
- Multi-version installation

### 1.2.1 New Installation

In initial installation, the Fujitsu Enterprise Postgres client feature is installed for the first time.

### 1.2.2 Reinstallation

Perform reinstallation to repair installed program files that have become unusable for any reason.

### 1.2.3 Multi-Version Installation

Perform multi-version installation to install different versions to the installed program files separately.

## 1.3 Installation Procedure

The following installation procedures are available for Fujitsu Enterprise Postgres:

- Installation in interactive mode
- Installation in silent mode

Select the installation procedure that corresponds to your environment.

### **1.3.1 Installation in Interactive Mode**

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Interactive mode enables installation to be performed while the required information is entered interactively.

In interactive mode installation, the Fujitsu Enterprise Postgres installer automatically determines the installation state of Fujitsu Enterprise Postgres. Install Fujitsu Enterprise Postgres using one of the following installation types in accordance with the installation state:

- New installation
- Reinstallation
- Multi-version installation

### **1.3.2 Installation in Silent Mode**

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Silent mode enables installation to be performed without the need to enter any information interactively.

New installations and multi-version installations can be performed in silent mode.

## **1.4 Uninstallation**

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Uninstallation removes the system files of the installed Fujitsu Enterprise Postgres client feature.

# Chapter 2 Installation and Uninstallation of the Windows Client

This chapter explains how to install and uninstall the Windows client.

## 2.1 Operating Environment

This section describes the operating environment required to use the Windows client.

### 2.1.1 Required Operating System

One of the following operating systems is required to use the Windows client:

- Windows(R) 10 Home
- Windows(R) 10 Education
- Windows(R) 10 Pro
- Windows(R) 10 Enterprise
- Windows(R) 11 Home
- Windows(R) 11 Education
- Windows(R) 11 Pro
- Windows(R) 11 Enterprise
- Microsoft Windows Server 2016 Datacenter
- Microsoft Windows Server 2016 Standard
- Microsoft Windows Server 2016 Essentials
- Microsoft Windows Server 2019 Datacenter
- Microsoft Windows Server 2019 Standard
- Microsoft Windows Server 2019 Essentials
- Microsoft Windows Server 2022 Datacenter
- Microsoft Windows Server 2022 Standard
- Microsoft Windows Server 2022 Essentials

**Note:** If Windows is 32 bit, only the Windows client (32 bit) can be installed.



The following components of Windows Server(R) 2016, Windows Server(R) 2019 and Windows Server(R) 2022 are not supported:

- Server Core
- Nano Server
- Windows Server Container

### 2.1.2 Related Software

The following table lists the software compatible (that can operate) with the Windows client.

Before using any of these, confirm that the OS supports the software.

Table 2.1 Related software

No.	Software name	Version
1	Visual Studio	2015 2017 2019 2022
2	.NET	6.0 7.0 8.0
3	.NET Standard	2.0 2.1
4	C compiler (*1)	-
5	JDK or JRE	JDK 8 JRE 8 JDK 11 JRE 11 JDK 17 JRE 17
6	NetCOBOL	(*2)
	NetCOBOL for .NET	(*3)

\*1: Only operations using the C compiler provided with the operating system are guaranteed.

\*2: NetCOBOL is available in the following editions:

- NetCOBOL Base Edition V10.5.0 or later
- NetCOBOL Standard Edition V10.5.0 or later
- NetCOBOL Professional Edition V10.5.0 or later
- NetCOBOL Enterprise Edition V10.5.0 or later

\*3: NetCOBOL for .NET is available in the following editions:

- NetCOBOL Standard Edition for .NET V5.0.0 or later
- NetCOBOL Professional Edition for .NET V5.0.0 or later
- NetCOBOL Enterprise Edition for .NET V5.0.0 or later

 **Note**

The following JDKs or JREs are available:

- JDK or JRE shipped with the Interstage Application Server
- JDK shipped with the Enterprise Application Platform
- Oracle JDK or JRE
- An OpenJDK that has passed the Java TCK (Technology Compatibility Kit)

It is recommended that the JDK or JRE included with Interstage Application Server and Enterprise Application Platform is used.

The following table lists servers that can be connected to the Windows client.



When connecting to a server product with a different version from this client function, only the range of functions provided by the server product version is available.

Table 2.2 Connectable servers

OS	Software name
Windows	- Fujitsu Enterprise Postgres Advanced Edition 9.5 or later , up to 16 - Fujitsu Enterprise Postgres Standard Edition 9.4 or later , up to 16
Linux	- Fujitsu Enterprise Postgres Advanced Edition 9.5 or later , up to 16 - Fujitsu Enterprise Postgres Standard Edition 9.4 or later , up to 16
Solaris	- FUJITSU Software Enterprise Postgres Standard Edition 9.6

### 2.1.3 Excluded Software

---

Fujitsu Enterprise Postgres

The Windows client cannot coexist with the Fujitsu Enterprise Postgres Community Edition (hereafter, "CE") client.

Other products

There are no exclusive products.

### 2.1.4 Required Patches

---

No patches are required.

### 2.1.5 Hardware Environment

---

The following hardware is required to use the Windows client.

Memory

At least 256 MB of memory is required.

Mandatory hardware

None.

### 2.1.6 Disk Space Required for Installation

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The disk space shown below is required for new installation of the Windows client.

At the Windows (32-bit) client installation destination:

200 MB

At the Windows (64-bit) client installation destination:

1760 MB

Windows system drive:

300 MB

### 2.1.7 Supported System Environment

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This section describes the supported system environment.

#### TCP/IP protocol

Fujitsu Enterprise Postgres supports version 4 and 6 (IPv4 and IPv6) of TCP/IP protocols.



Do not use link-local addresses if TCP/IP protocol version 6 addresses are used.

## File system

You can install Fujitsu Enterprise Postgres only if the system folder is an NTFS volume.

## 2.1.8 Versions of Open-Source Software Used as the Base for Fujitsu Enterprise Postgres Drivers

For the version of open-source software that Fujitsu Enterprise Postgres each driver is based on, refer to "OSS Supported by Fujitsu Enterprise Postgres" in the General Description.

## 2.2 Installation

This section explains how to install the Windows client.



When installing the Fujitsu Enterprise Postgres Client (32 bit) in a 64 bit environment, do not specify a destination folder under the environment ProgramFiles variable.

### 2.2.1 Pre-installation Tasks

This section describes the operations to be performed before installing the Windows client.

#### hosts file settings

Using an editor, add the IP address and server name of the connected server to the `\System32\drivers\etc\hosts` file in the folder where Windows is installed.



For Windows(R) 10, or Windows(R) 11, assign write privileges in advance to the user responsible for editing the hosts file.

#### Check the installed product and determine the installation method

In Windows, click [All Programs] or [All apps], then [Fujitsu], and then [Uninstall (middleware)]. In the displayed window, check the installed products.

If the Windows client is already installed, determine the installation method to use:

- Reinstallation
- Multi-version installation

#### Remove applied updates

If you perform reinstallation as the installation method, remove applied updates using the procedure shown below.



If a product is installed without removing applied updates, the following problems will occur:

- Performing reinstallation

If an update with the same update and version number is applied, an error informing you that the update has already been applied is displayed.

---

#### 1. Display the applied updates

Execute the following command to display the applied updates:

```
C:\Program Files (x86)\Fujitsu\UpdateAdvisor\UpdateAdvisorMW>uam showup
```

#### 2. Remove the updates

Execute the command below to remove the updates. If an update with the same update number was applied more than once, the updates are removed in order, starting from the highest version number.

```
C:\Program Files (x86)\Fujitsu\UpdateAdvisor\UpdateAdvisorMW>uam remove -i update-number
```

### Confirm service

The Windows Installer service must be running.

### Confirm Path system environment variable

Ensure that the Path system environment variable includes "%SystemRoot%\system32".

## 2.2.2 Pre-installation Considerations

---

This section describes points that the user must take into account prior to installation.

- The remote desktop service is installed in application server mode, it is necessary to switch to install mode by executing the command shown below before installation. Also, after the installation is completed, execute the command shown below to switch back to execute mode.

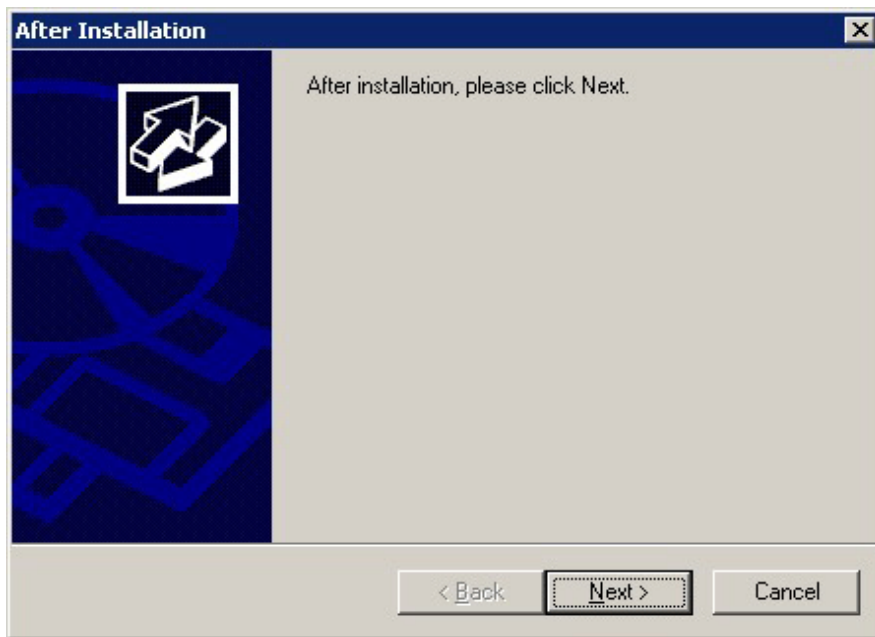
Before installation:

```
CHANGE USER /INSTALL
```

After installation:

```
CHANGE USER /EXECUTE
```

- The following window may be displayed when the installation program is executed.



If the above window is displayed, follow the procedure below:

1. Perform the steps in the installation procedure until the [InstallShield Wizard Complete] window is displayed.
2. Click [Next] in the [InstallShield Wizard Complete] window.
3. The following window is displayed. Click [Finish].



4. Restart the system.

## Information

---

- If the [User Account Control] dialog box is displayed when installation or uninstallation starts, click [Yes] to continue the operation.

If [No] is clicked, the [Error] dialog box will be displayed because continuing is not permitted.

Click [Retry] in the displayed [Error] dialog box to proceed with installation or uninstallation. To end operations, click [Cancel].

- If installation or uninstallation is suspended or processing terminates abnormally, the [Program Compatibility Assistant] dialog box may be displayed.

If this happens, click [This program installed correctly] or [This program uninstalled correctly] and continue operation.

---

## 2.2.3 Installation in Interactive Mode

---

The installation procedure is described below.

### Point

---

For installation in interactive mode, default values are set for the installation information. The following settings can be changed for a new installation or a multi-version installation:

- Installation folder
- 

### 1. Stop applications and programs

If the installation method is the following, all applications and programs that use the product must be stopped:

- Reinstallation

Before starting the installation, stop the following:

- Applications that use the product
- Connection Manager
- pgAdmin

### 2. Insert the DVD

Insert the client program DVD into the DVD drive.

### 3. Run the installation

The installation menu is displayed. Click [Installation].

### 4. Select the product to install

Select the product to install, and then click [Next].

If a selected product can only be reinstalled, refer to "[6. Check the settings](#)".

## Information

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If multi-version installation is possible, the [Select Installation Method] window is displayed for each selected product. Select "Multi-version installation" and click [Next].

---

### 5. Confirm the contents for installation

The [Confirm installation] window will be displayed.

Click [Next] to start the installation.

To modify the settings, select [Modify], and then click [Next]. Follow the on-screen instructions.

## 6. Check the settings

The [Confirm installation] window will be displayed for reinstallation, or if the installation information is modified.

Click [Install] to start the installation.

To modify the settings again, click [Back].

## 7. Completion of installation

The completion window is displayed. Click [Finish].

## 2.2.4 Installation in Silent Mode

---

Installation in silent mode can be performed only when the installation method is one of the following:

- New installation
- Multi-version installation



Refer to the Fujitsu Enterprise Postgres product website for information on installation in silent mode, such as the installation parameters and error messages.

The installation procedure is described below.

### 1. Insert the DVD

Insert the client program DVD into the DVD drive.

The [Install Menu] window is displayed. Click [Finish].

### 2. Create an installation parameters CSV file

Consider the server type or features that will be required for system operations, and then create an installation parameters CSV file that uses the following specification format.

```
sectionName, parameterName, value
sectionName, parameterName, value
:
```



The template for the installation parameters CSV file is "Z:\sample\sample\_windows.csv (Z is the drive into which the DVD is inserted.).

### 3. Start the command prompt

In Windows, right-click [Command Prompt] and then select [Run as administrator].

### 4. Run the installation

Execute the following command:

```
Z:\>silent.bat c:\temp\inspara.csv
```

Z: The drive into which the DVD is inserted.

c:\temp\inspara.csv: The installation parameter CSV file name.

If the silent installer ends in an error, a message is output to the log file and return values are returned.

## 2.3 Uninstallation

---

This section describes the procedure for uninstalling the Windows client.



- Before uninstalling the product, close the product program and all applications that are using it.
- Log in using an account that has administrator privileges and then execute the command, or switch to an account that has administrator privileges and then uninstall the product.

### 2.3.1 Uninstallation in Interactive Mode

---

The uninstallation procedure is described below.



If an error occurs while the product is being uninstalled, refer to "Uninstall (middleware) Messages" in the Fujitsu Enterprise Postgres product website, and take the required action.

#### 1. Stop applications and programs

Before starting the uninstallation, stop the following:

- Applications that use the product
- Connection Manager
- pgAdmin

#### 2. Start the Uninstall (middleware) tool

In Windows, click [All Programs] or [All apps], then [Fujitsu], and then [Uninstall (middleware)].

#### 3. Select the software

Select the product to be uninstalled from [Software Name], and then click [Remove].

#### 4. Start the uninstallation

Click [Uninstall].

#### 5. Finish the uninstallation

The uninstallation completion window is displayed. Click [Finish].

The installation folder may remain after uninstallation. If it is not required, delete it.

#### 6. Stop the Uninstall (middleware) tool

The [Uninstall (middleware)] window is displayed. Click [Close].

### 2.3.2 Uninstallation in Silent Mode

---

The uninstallation procedure is described below.



See

Refer to the Fujitsu Enterprise Postgres product website for information on uninstallation in silent mode, such as the error messages.

### 1. Stop applications and programs

Before starting the uninstallation, stop the following:

- Applications that use the product
- Connection Manager
- pgAdmin

### 2. Start the command prompt

In Windows, right-click [Command Prompt] and then select [Run as administrator].

### 3. Start the uninstaller

Execute the command below.

The installation folder may remain after uninstallation. If it is not required, delete it.

Example

```
X:> installFolder\suninst.bat
```

X: Drive on which the product is installed



# Chapter 3 Installation and Uninstallation of the Linux Client

This chapter explains how to install and uninstall the Linux client.

## 3.1 Operating Environment

This section describes the operating environment required to use the Linux client.

### 3.1.1 Required Operating System

One of the following operating systems is required to use the Linux client:

- RHEL8.2 or later minor version
- RHEL9.2 or later minor version
- SLES 15 SP3 or later minor version



#### Information

- The following packages are required for operations on RHEL8.

Package name	Remarks
bzip2-libs	Required when using pgBackRest.
glibc	-
glibc.i686	-
libnsl2	-
libgcc	-
libmemcached	Required when using Pgpool-II.
libstdc++	-
libtool-ltdl	-
libzstd	-
lz4-libs	Required when using pgBackRest.
ncurses-libs	-
nss-softokn-freebl	-
redhat-lsb	-
rsync	Required when using Pgpool-II.
sudo	-
unixODBC	Required when using ODBC drivers
unzip	-
xz-libs	-
zlib	-

- The following packages are required for operations on RHEL9.

Package name	Remarks
bzip2-libs	Required when using pgBackRest.

Package name	Remarks
glibc	-
glibc.i686	-
libnsl2	-
libgcc	-
libmemcached-awesome	Required if Pgpool-II is used.
libstdc++	-
libtool-ltdl	-
libzstd	-
lz4-libs	Required when using pgBackRest.
ncurses-libs	-
nss-softokn-freebl	-
rsync	Required if Pgpool-II is used.
sudo	-
unixODBC	Required if you are using an ODBC driver.
Unzip	-
xz-libs	-
zlib	-

- The following packages are required for operations on SLES 15.

Package name	Remarks
glibc	-
glibc-32bit	-
JRE 8	Required by installer The following JREs are available: - Oracle JRE Use update 31 or later of the 64-bit version. - OpenJDK Past the Java TCK (Technology Compatibility Kit)
libbz2-1	Required when using pgBackRest.
libfreebl3	-
libgcc	-
libltdl7	-
liblz4-1	Required when using pgBackRest.
liblzma5	-
libmemcached	Required when using Pgpool-II.
libncurses5	-
libstdc++	-
libz1	-
libzstd1	-
rsync	Required when using Pgpool-II.
sudo	-

Package name	Remarks
unixODBC	Required when using ODBC drivers
unzip	-

### 3.1.2 Related Software

The following table lists the software required to use the Linux client.

Table 3.1 Related software

No.	Software name	Version
1	.NET	6.0 7.0 8.0
2	.NET Standard	2.0 2.1
3	C compiler (*1)	-
4	JDK or JRE	JDK 8 JRE 8 JDK 11 JRE 11 JDK 17 JRE 17
5	NetCOBOL	(*2)

\*1: Only operations using the C compiler provided with the operating system are guaranteed.

\*2: NetCOBOL is available in the following editions:

- NetCOBOL Base Edition V12.2.0 or later
- NetCOBOL Standard Edition V12.2.0 or later
- NetCOBOL Enterprise Edition V12.2.0 or later



#### Note

The following JDKs or JREs are available:

- JDK or JRE shipped with the Interstage Application Server
- JDK shipped with the Enterprise Application Platform
- Oracle JDK or JRE
- An OpenJDK that has passed the Java TCK (Technology Compatibility Kit)

It is recommended that the JDK or JRE included with Interstage Application Server and Enterprise Application Platform is used.

The following table lists servers that can be connected to the Linux client.

When connecting to a server product with a different version from this client function, only the range of functions provided by the server product version is available.

Table 3.2 Connectable servers

OS	Software name
Windows	- Fujitsu Enterprise Postgres Advanced Edition 9.5 or later , up to 16 - Fujitsu Enterprise Postgres Standard Edition 9.4 or later , up to 16
Linux	- Fujitsu Enterprise Postgres Advanced Edition 9.5 or later , up to 16 - Fujitsu Enterprise Postgres Standard Edition 9.4 or later , up to 16
Solaris	- FUJITSU Software Enterprise Postgres Standard Edition 9.6

### 3.1.3 Excluded Software

---

#### Fujitsu Enterprise Postgres

The Linux client cannot coexist with the Fujitsu Enterprise Postgres Community Edition (hereafter, "CE") client.

#### Other products

There are no exclusive products.

### 3.1.4 Required Patches

---

There are no required patches.

### 3.1.5 Hardware Environment

---

The following hardware is required to use the Linux client.

#### Memory

At least 160 MB of memory is required.

#### Mandatory hardware

None.

### 3.1.6 Disk Space Required for Installation

---

The following table lists the disk space requirements of the corresponding directories for new installation of the Linux client. If necessary, increase the size of the file system.

#### RHEL

Directory	Required disk space Unit: MB
/etc	1 + 1 (*1)
/var	1 + 2 (*1)
/opt	300 (*1)
Installation destination of the client (64-bit)	180
Installation destination of Pgpool-II	35
Installation destination of ldap2pg	30
Installation destination of pgBackRest	40

\*1: Uninstall (middleware) must be installed.

#### SLES

Directory	Required disk space Unit: MB
/etc	1 + 1 (*1)
/var	1 + 2 (*1)
/opt	300 (*1)
Installation destination of the client (64-bit)	180
Installation destination of Pgpool-II	35
Installation destination of ldap2pg	30
Installation destination of pgBackRest	40

\*1: Uninstall (middleware) must be installed.

### 3.1.7 Supported System Environment

---

This section describes the supported system environment.

#### TCP/IP protocol

Fujitsu Enterprise Postgres supports version 4 and 6 (IPv4 and IPv6) of TCP/IP protocols.



Note

Do not use link-local addresses if TCP/IP protocol version 6 addresses are used.

### 3.1.8 Versions of Open-Source Software Used as the Base for Fujitsu Enterprise Postgres Drivers

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For the version of open-source software that Fujitsu Enterprise Postgres each driver is based on, refer to "OSS Supported by Fujitsu Enterprise Postgres" in the General Description.

## 3.2 Installation

---

This section explains how to install the Linux client.

### 3.2.1 Pre-installation Tasks

---

Check the system environment for the following before the Linux client is installed.

#### Check the disk capacity

Check if sufficient free disk space is available for installing the Linux client.

Refer to "[3.1.6 Disk Space Required for Installation](#)" for information on disk space requirements.

If sufficient free disk space is unavailable, reconfigure disk partitions.

#### Set JAVA\_HOME (SLES only)

Ensure that JRE 8 is installed, and export the JAVA\_HOME environment variable.

```
#export JAVA_HOME="Jre8InstallDir"
```

#### Executable Users

Installation and uninstallation is performed by superuser.

On the system, run the following command to become superuser.

```
$ su -  
Password:*****
```

## Check the installed product and determine the installation method

Using the operation shown below, start Uninstall (middleware), and check the installed products.

Example

```
# /opt/FJSVcir/cimanager.sh -c  
Loading Uninstaller...  
  
Currently installed products  
1. productName  
2. productName  
  
Type [number] to select the software you want to uninstall.  
[number,q]  
=>q  
  
Exiting Uninstaller.
```

If the Linux client is already installed, determine the installation method to use:

- Reinstallation
- Multi-version installation

## Remove applied updates

If you perform reinstallation as the installation method, remove applied updates using the procedure shown below.



If a product is installed without removing applied updates, the following will occur:

- Performing reinstallation

If an update with the same update and version number is applied, an error informing you that the update has already been applied is displayed.

Perform the reinstallation after removing the update.

### 1. Display the applied updates

Execute the following command to display the applied updates:

```
# /opt/FJSVfupde/bin/uam showup
```

### 2. Remove the updates

Execute the command below to remove the updates. If an update with the same update number was applied more than once, the updates are removed in order, starting from the highest version number.

```
# /opt/FJSVfupde/bin/uam remove -i update-number
```



## Note

If the installation directory/lib is set in the environment variable LD\_LIBRARY\_PATH for the running user, remove the installation directory/lib from LD\_LIBRARY\_PATH.

## 3.2.2 Installation in Interactive Mode

---

The installation procedure is described below.



## Note

The following characters can be used as input values:

Alphanumeric characters, hyphens, commas and forward slashes



## Point

For installation in interactive mode, default values are set for the installation information. The following settings can be changed for a new installation or a multi-version installation:

- Installation directory

### 1. Stop applications and programs

If the installation method is the following, all applications and programs that use the product must be stopped:

- Reinstallation

Before starting the installation, stop the following:

- Applications that use the product
- Connection Manager
- pgBadger
- Pgpool-II
- ldap2pg
- pgBackRest

### 2. Mount the DVD drive

Insert the client program DVD into the DVD drive, and then execute the following command:

Example

```
# mount -t iso9660 -r -o loop /dev/dvd /media/dvd
```

Here /dev/dvd is the device name for the DVD drive (which may vary depending on your environment), and /media/dvd is the mount point (which may need to be created before calling the command).



## Note

If the DVD was mounted automatically using the automatic mount daemon (autofs), "noexec" is set as the mount option, so the installer may fail to start. In this case, use the mount command to remount the DVD correctly, and then run the installation. Note that the mount options of a mounted DVD can be checked by executing the mount command without any arguments.

### 3. Run the installation

Execute the following command:

Example

```
# cd /media/dvd
# ./install.sh
```

In the example above, /media/dvd is the DVD mount point.

### 4. Select the product to install

The list of installation target products is displayed.

Type the number for the product to be installed, or "all", and press Enter.



#### Information

If the selected product has already been installed, a window for selecting reinstallation or multi-version installation is displayed for each product. Follow the on-screen instructions to select the installation method.

### 5. Check the settings

The window for checking the installation information is displayed as shown below.

Type "y" and press Enter to start the installation.

To change the settings, type "c" and press Enter, and follow the on-screen instructions. This option is not displayed if there is no information that can be modified.

### 6. Check the changed settings

If the installation information has been modified, the new installation information is displayed.

Type "y" and press Enter to start the installation.

To change the settings again, type "c" and press Enter.

### 7. Finish the installation

When the installation is complete, a message is displayed showing the status.

If installation was successful, the following message is displayed:

```
Installed successfully.
```



#### Note

If an error occurs during the installation, read the error message and remove the cause of the error, and then reexecute the install.sh command.

## 3.2.3 Installation in Silent Mode

Installation in silent mode can be performed only when the installation method is one of the following:

- New installation
- Multi-version installation



#### See

Refer to the Fujitsu Enterprise Postgres product website for information on installation in silent mode, such as the installation parameters and error messages.



The installation procedure is described below.

## 1. Mount the DVD drive

Insert the client program DVD into the DVD drive, and then execute the following command:

Example

```
# mount -t iso9660 -r -o loop /dev/dvd /media/dvd
```

Here /dev/dvd is the device name for the DVD drive (which may vary depending on your environment), and /media/dvd is the mount point (which may need to be created before calling the command).

### Note

If the DVD was mounted automatically using the automatic mount daemon (autofs), "noexec" is set as the mount option, so the installer may fail to start. In this case, use the mount command to remount the DVD correctly, and then run the installation. Note that the mount options of a mounted DVD can be checked by executing the mount command without any arguments.

## 2. Create an installation parameters CSV file

Consider the features that will be required for system operations, and then create an installation parameters CSV file that uses the following specification format.

```
sectionName, parameterName, value  
sectionName, parameterName, value  
:
```

### Information

The templates for the installation parameters CSV file is "*mountPoint/sample/sample\_linux.csv*".

## 3. Run the installation

Execute the following command:

Example

```
# cd /media/dvd  
# ./silent.sh /home/work/inspara.csv
```

In the example above, /media/dvd is the DVD mount point, and /home/work/inspara.csv is the installation parameter CSV.

If the silent installer ends in an error, a message is output to the log file and return values are returned.

## 3.3 Uninstallation

This section describes the procedure for uninstalling the Linux client.

### Note

- Before uninstalling the product, close the product program and all applications that are using it.
- On SLES, before uninstallation, ensure that JRE 8 is installed, and export the JAVA\_HOME environment variable.

```
#export JAVA_HOME="Jre8InstallDir"
```

## 3.3.1 Uninstallation in Interactive Mode

---

The uninstallation procedure is described below.



.....  
If an error occurs while the product is being uninstalled, refer to "Uninstall (middleware) Messages" in the Fujitsu Enterprise Postgres product website, and take the required action.  
.....

### 1. Stop applications and programs

Before starting the uninstallation, stop the following:

- Applications that use the product
- Connection Manager
- pgBadger
- Pgpool-II
- ldap2pg
- pgBackRest

### 2. Start the Uninstall (middleware)

Execute the following command:

```
# /opt/FJSVc/cir/cimanager.sh -c
```

### 3. Select the product

Enter the number for the product to be uninstalled, and press Enter.

### 4. Start the uninstallation

To start the uninstallation, type "y" and press Enter.

To display the list of products again, type "b" and press Enter.

### 5. Finish the uninstallation

If uninstallation is successful, the message below is displayed.

The installation directory may remain after uninstallation. If it is not required, delete it.

```
Uninstalling...

productName is being uninstalled now.
 100% #####

The following products have been uninstalled successfully:
  productName

Uninstallation of "productName" has completed successfully.

Exiting Uninstaller.
```

## 3.3.2 Uninstallation in Silent Mode

---

The uninstallation procedure is described below.



Refer to the Fujitsu Enterprise Postgres product website for information on uninstallation in silent mode, such as the error messages.

### 1. Stop applications and programs

Before starting the uninstallation, stop the following:

- Applications that use the product
- Connection Manager
- pgBadger
- Pgpool-II
- ldap2pg
- pgBackRest

### 2. Run the uninstallation

Execute the following command:

The installation directory may remain after uninstallation. If it is not required, delete it.

Example

```
# /opt/fsepv<x>client64/setup/suninst.sh
```

In the example above, /opt/fsepv<x>client64 is the installation directory, and "<x>" indicates the product version.

```
# /opt/fsepv<x>pgpool-II/setup/suninst.sh
```

In the example above, /opt/fsepv<x>pgpool-II/setup is the name of the installation directory in which the Pgpool-II is installed.

```
# /opt/fsepv<x>ldap2pg/setup/suninst.sh
```

In the example above, /opt/fsepv<x>ldap2pg/setup is the name of the installation directory in which the ldap2pg is installed.

```
# /opt/fsepv<x>pgbackrest/setup/suninst.sh
```

In the example above, /opt/fsepv<x>pgbackrest/setup is the name of the installation directory in which the pgBackRest is installed.

## Chapter 4 Setup

This chapter describes the setup procedures to be performed after installation completes.

### 4.1 Configuring Environment Variables

Configure the following environment variables when using client commands.

W

#### 4.1.1 Windows

PATH environment variable

Add "*installationFolder*\bin".

PGLOCALEDIR environment variable

Add "*installationFolder*\share\locale".

Examples of environment variable configurations are shown below.

Example

This example is specific to 32-bit Windows.

Note that "<x>" indicates the product version.

```
> SET PATH=%ProgramFiles%\Fujitsu\fsepv<x>client32\bin;%PATH%
> SET PGLOCALEDIR=%ProgramFiles%\Fujitsu\fsepv<x>client32\share\locale
```

L

#### 4.1.2 Linux

PATH environment variable

Add "*installationDirectory*/bin".

MANPATH environment variable

Add "*installationDirectory*/share/man".

PGLOCALEDIR environment variable

Add "*installationDirectory*/share/locale".

Examples of environment variable configurations are shown below.

Example

Note that "<x>" indicates the product version.

```
$ PATH=/opt/fsepv<x>client64/bin:$PATH ; export PATH
$ MANPATH=/opt/fsepv<x>client64/share/man:$MANPATH ; export MANPATH
$ PGLOCALEDIR=/opt/fsepv<x>client64/share/locale ; export PGLOCALEDIR
```

L

### 4.2 Setting Up and Removing OSS

This section explains how to set up OSS supported by Fujitsu Enterprise Postgres.

If you want to use OSS supported by Fujitsu Enterprise Postgres, follow the setup procedure.

If you decide not to use the OSS supported by Fujitsu Enterprise Postgres, follow the removing procedure.

## Information

In this section, the applicable database that enables the features of each OSS is described as "postgres".

Refer to "OSS Supported by Fujitsu Enterprise Postgres" in the General Description for information on OSS other than those described below.

## 4.2.1 pgBackRest

### 4.2.1.1 Setting Up pgBackRest

1. Install pgBackRest.

To use the `pgbackrest` command on the same host as the Fujitsu Enterprise Postgres server, install pgBackRest using the server program DVD. If you want to use the `pgbackrest` command on a different host than the Fujitsu Enterprise Postgres server, install pgBackRest using the client program DVD.

2. Set the environment variable `PATH` for pgBackRest.

The pgBackRest material is stored under `/opt/fsepv<x>pgbackrest`. Set the environment variable `PATH` to the storage location/bin of the pgBackRest material to be used.

```
$ export PATH=/opt/fsepv<x>pgbackrest/bin:$PATH
```

3. Perform pgBackRest setup.

Refer to "User Guides" in the pgBackRest website (<https://pgbackrest.org/>) for details.

## Note

- This feature is not available for instances created with WebAdmin. It is available only for operation using server commands.
- The `pg_rman`, `pgx_dmpall`, and `pgx_rcvall` commands cannot be used when using pgBackRest because of conflicting shell commands to set `archive_command`.

### 4.2.1.2 Removing pgBackRest

1. Sets parameters in the `postgresql.conf` file.  
Reverses the information specified during setup
2. Restart Fujitsu Enterprise Postgres.
3. If it was set to perform periodic backups, unset it.

### 4.2.1.3 Servers to which pgBackRest can Connect

The following table lists server that pgBackRest can connected to.

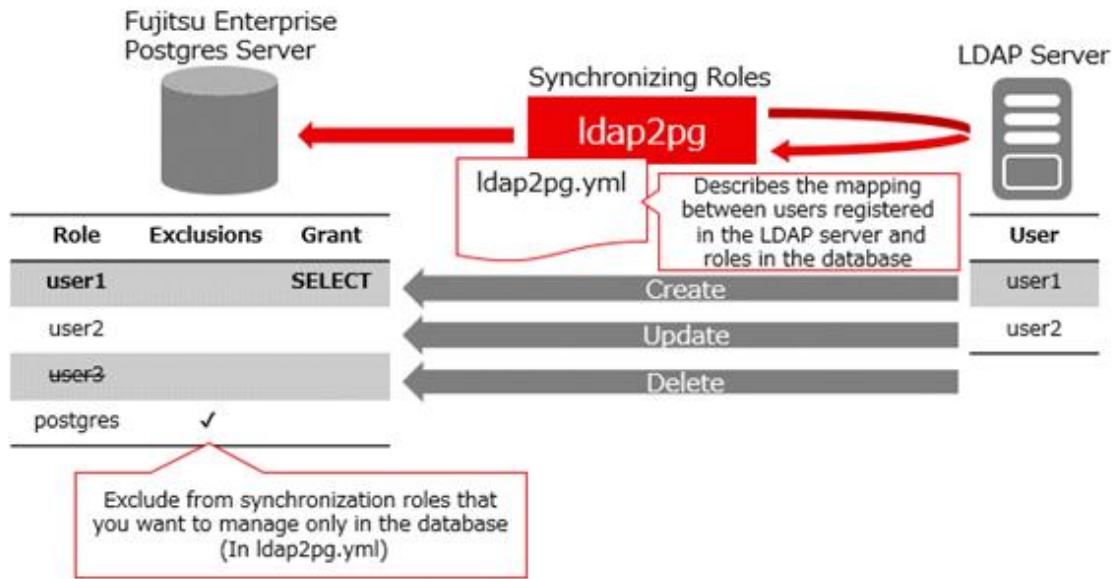
Table 4.1 Connectable server

OS	Product name
Linux	<ul style="list-style-type: none"><li>- Fujitsu Enterprise Postgres Advanced Edition 16</li><li>- Fujitsu Enterprise Postgres Standard Edition 16</li></ul>

## 4.2.2 Idap2pg

PostgreSQL supports LDAP authentication and can be used on both Linux and Windows. You can use an LDAP server to authenticate users, but you must first create a role for the database server.

ldap2pg allows users registered with the LDAP server to be synchronized with Fujitsu Enterprise Postgres roles, so that the above database server roles can be created automatically. This allows you to centrally manage roles on the LDAP server. Note that ldap2pg only supports Linux.



Users registered with the LDAP server and Fujitsu Enterprise Postgres roles are synchronized when the ldap2pg command is executed, based on the ldap2pg.yml that defines these mappings. If a role defined in ldap2pg.yml does not exist in Fujitsu Enterprise Postgres, it is created, and any roles not defined in ldap2pg.yml are removed. Roles that would be difficult to update or delete, such as database administrator roles that do not work with LDAP servers, can be excluded from synchronization by setting them to ldap2pg.yml.

The key points of operation are explained below.

### Timing of Synchronization

Synchronize when the LDAP server user changes so that the database server is always up to date. Therefore, you must synchronize periodically to automatically propagate the LDAP server information, or manually propagate it as the LDAP server changes.

If you synchronize periodically, ensure that the synchronization interval is an acceptable time lag before LDAP server changes are propagated to the database server. This is because, even when fully synchronized, ldap2pg accesses the LDAP server and database to check for changes. For example, run the ldap2pg command periodically every 5 minutes or so.

If you use cron, for example, to run automatically on a regular basis, you should log the standard output and standard error output of ldap2pg using settings or redirects such as cron. You can check the log to see if ldap2pg was interrupted or if an unexpected role was removed.

If you want to synchronize immediately or if you want to control the synchronization timing yourself, synchronize manually.

### Enhanced Security in Combination with Confidentiality Management

ldap2pg can also manage database privileges, but it cannot manage granular units such as tables and rowsets. Combined with the confidentiality management, which allows such configuration and allows auditing of privilege settings, it provides robust security measures.

#### 4.2.2.1 Setting Up ldap2pg

1. Install ldap2pg  
Install ldap2pg using the client program DVD.
2. Set the environment variable PATH for ldap2pg.

```
$ export PATH=/opt/fsepv<x>ldap2pg/bin:$PATH
```

3. Define a database role on the database server that has superuser privileges as the executor of ldap2pg. For more information about defining roles, refer to "CREATE ROLE" in "Reference" in the PostgreSQL Documentation for information on the CREATE ROLE.
4. Perform ldap2pg setup.  
Refer to "Configuration" or "Cookbook" in the ldap2pg document (<https://ldap2pg.readthedocs.io/en/latest/>) for details.
5. Set roles that are defined and used only by the database, such as database administrators not managed by an LDAP server, or roles that exclude synchronization, as defined by Fujitsu Enterprise Postgres.  
Add the settings to roles\_blacklist\_query in the ldap2pg.yml file.

Fujitsu Enterprise Postgres-specific roles to add:

- pgx\_update\_profile\_status, and roles that inherit from pgx\_update\_profile\_status (Role for streaming replication of the Set Operational Policy by Profile feature)
- pgx\_cgroup\_role\_\* (Confidentiality role for the confidentiality management)

### When the Database Server is redundant

In a database redundancy environment, specify "primary" for the target\_session\_attrs parameter. You can also specify "read-write".

#### 4.2.2.2 Removing ldap2pg

1. If you have set ldap2pg to run periodically, unset it.
2. Uninstall ldap2pg. Refer to "3.3 Uninstallation" for more information.
3. If you have defined a role on the database server specifically for running ldap2pg, remove that role.

#### 4.2.2.3 Using ldap2pg to Synchronize Database Roles

Describes how to use ldap2pg to synchronize users of an LDAP server with a database server as database roles.

1. Edit the ldap2pg.yml file, for example if you want to grant access to a role that synchronizes with an LDAP user. For information on ldap2pg.yml, refer to the following document:  
<https://ldap2pg.readthedocs.io/en/latest/config/>
2. Use environment variables to specify information about the connection destination to the LDAP server or database.  
<https://ldap2pg.readthedocs.io/en/latest/cli/#environment-variables>  
The user who connects to the database server must be the user created during the setup procedure. Connections to LDAP servers support LDAP-initiated environment variables and ldaprc files, while database access supports PG-initiated environment variables available in libpq. These environment variables are used to configure the connection.
3. Run ldap2pg with the check option to verify that the role being modified matches the role being modified.
4. Run ldap2pg with the --real option to synchronize roles with the database server.
5. Configure LDAP server users and database roles to synchronize periodically after the initial synchronization.  
Prepare the script that sets the environment variables and the script that synchronizes the roles that you performed in steps 2 and 4, and register the script in the cron job so that the script that synchronizes the roles references the environment variables and synchronizes the roles.

[Configuration Examples for cron]

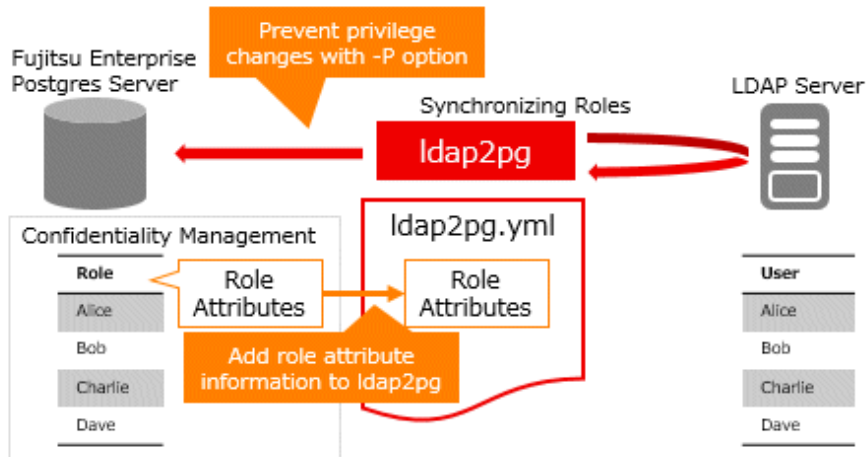
```
SHELL=/bin/bash
*/5 * * * * source /home/postgres/env.sh && . /home/postgres/sample.sh >> /home/postgres/sample.log 2>&1
```

#### 4.2.2.4 Configuration with Confidentiality Management

The combination of ldap2pg and the confidentiality management provides detailed access control. To do this, role attributes and privileges are assigned to the confidentiality management.

Feature	Role Management Assignment
ldap2pg	Add, remove, and managing role membership
Confidentiality Management	Set role attributes, grant and revoke privileges, and audit them

In this case, since ldap2pg overrides the role attributes and parent-child relationships with the information in ldap2pg.yml, it sets the role attributes and privileges set for the confidentiality management so that they are not updated by the execution of ldap2pg.



- Add privilege information for confidentiality management roles to the ldap2pg configuration file (ldap2pg.yml) so that the attributes and privileges of roles set for confidentiality management are not updated by running ldap2pg
- Run ldap2pg with the -P option to prevent privilege changes when ldap2pg is run

The following is the flow for configuring the confidentiality management and ldap2pg.

## Introduction

Configure the necessary settings to run ldap2pg as described in the following procedure.

1. Design user-role mappings on the LDAP server to create a list of roles that should be managed by the confidentiality management.
2. To create an yml file:
  - a. Specify the settings for retrieving and synchronizing the listed objects from the LDAP server.
  - b. Write a confidentiality management role starting with `pgx_cgroup_role_` in `roles_blacklist_query`.
  - c. Ensure that the grant and revoke privileges settings are not listed in the yml file.
3. Stop synchronization if it is already running using ldap2pg.
4. Create a role as described in "4.2.2.3 Using ldap2pg to Synchronize Database Roles".
5. Refer to "Confidentiality Management" in the "Security Operations Guide" and perform all necessary tasks. Register all roles in the list of roles with the confidentiality management.
6. Modify the yml file so that ldap2pg does not interfere with the operation of the confidentiality management. Refer to "Settings When You Change the Attributes or Privileges of a role in a Confidentiality Groups" for a sample script that prints an yml file.
7. If you have already done regular synchronization using ldap2pg, try again.



## Operation

Use the following procedure to manipulate roles according to your situation.

### Adding an ldap2pg Role to a Confidentiality Groups

1. Creates a confidentiality management confidentiality groups.
2. Run ldap2pg with the -P option to create the LDAP server user as a database role.
3. Add the role you added above to the confidentiality groups.
4. Reflect the confidentiality management configuration in ldap2pg.yml, referring to the ["Example of Applying Role Attributes"](#).

### Example of Applying Role Attributes

1. Use the following example to execute SQL and retrieve the settings for each role:

For all roles, this example retrieves the LOGIN attribute, the role attributes of the confidentiality management, and the membership of the confidentiality management role. If you want to change the settings to suit your environment, rewrite the SQL, such as modifying the 'LOGIN' part of the SQL Execution Example, or modify the Example of Run Results directly.

#### [SQL Execution Example]

```
SELECT '- name: ' ||pgxgr.name || chr(10) || ' options: ' || pgxgr.opt ||
chr(10) || ' parent: ' || chr(10) || ' - ' ||
string_agg(pgxgr.cgrorolename, chr(10) || ' - ')
FROM (SELECT pgxg.cgrorolename,
        concat_ws(' ',
        'LOGIN',
        CASE pgxg.cgrosuperuser WHEN true THEN 'SUPERUSER' END,
        CASE pgxg.cgrocreatedb WHEN true THEN 'CREATEDB' END,
        CASE pgxg.cgrocreatorole WHEN true THEN 'CREATEROLE' END,
        CASE pgxg.cgroreplication WHEN true THEN 'REPLICATION' END,
        CASE pgxg.cgrobypassrls WHEN true THEN 'BYPASSRLS' END) AS opt,
        pgxroles.name
FROM pgx_confidential_group pgxg,
      (SELECT pgxr.crolmatid as matid, pgxr.crolgroid as groid, pgxr.crolname
AS name FROM pgx_confidential_role pgxr ) as pgxroles
WHERE pgxg.cgromatid = pgxroles.matid and pgxg.cgroid = pgxroles.groid)
pgxgr
GROUP BY pgxgr.name, pgxgr.opt;
```

#### [Example of Run Results]

```
- name: alice
  options: LOGIN CREATEDB
  parent:
    - pgx_cgroup_role_000000000000000001
- name: bob
  options: LOGIN CREATEDB
  parent:
    -pgx_cgroup_role_000000000000000001
- name: charlie
  options: LOGIN CREATEDB CREATEROLE
  parent:
    - pgx_cgroup_role_000000000000000002
- name: dave
  options: LOGIN CREATEDB CREATEROLE
  parent:
    - pgx_cgroup_role_000000000000000002
```

- Put the setting of roles at the top of the rules in ldap2pg.yml based on the information in the above settings. If it is not at the top, the configuration information that synchronizes with the LDAP server takes effect, and the confidentiality management configuration does not take effect.

### Settings When You Change the Attributes or Privileges of a role in a Confidentiality Groups

- Confidentiality management modifies role attributes and privileges information.
- Create a script to retrieve the confidentiality management configuration information and register it in a cron job so that the changed information is automatically reflected in the yml file.

The following is an example shell script:. Please change the settings to suit your environment.

The shell script shown here consists of two configuration files, ldap2pg\_pre.yml and ldap2pg\_after.yml, and the confidentiality management configuration information (In the sample, it is output to confidential\_roles.yml) that is reflected in yml. Combine these three files to create the ldap2pg.yml file.

ldap2pg\_pre.yml is the information to be placed before the confidentiality management configuration information in ldap2pg.yml, and contains the postgres section and up to "roles:" in the rules section. ldap2pg\_after.yml is information to be placed after the confidentiality management configuration information in ldap2pg.yml, and contains information about roles not managed by the confidentiality management.

#### [Example of Shell Script]

##### **ldap2pg\_pre.yml : Provides information about the postgres section**

```
version: 6

#
#       1.   P O S T G R E S   I N S P E C T I O N
#
# See https://ldap2pg.readthedocs.io/en/latest/postgres/
#
postgres:
# Exclude roles starting with postgres, pg that PostgreSQL uses internally
  roles_blacklist_query: [postgres, pg_*, pgx_update_profile_status,
pgx_cgroup_role* ]
  databases_query: [postgres]
(Omitted)
rules:
- description: "Setup static roles and grants."
  roles:
```

##### **ldap2pg\_after.yml : Provides information about roles that are not part of the confidentiality groups**

```
- names:
  - readers
    options: NOLOGIN
- name: writers
  # Grant reading to writers
  parent: [readers]
  options: NOLOGIN
(Omitted)
```

##### **sample.sh : A script that outputs information about confidentiality groups to confidential\_roles.yml and combines them into a single yml file**

```
#!/bin/bash

psql -h localhost -p 27500 -d postgres -U postgres -A -t <<EOF > /home/postgres/
confidential_roles.yml
SELECT ' - name: ' ||pgxgr.name || chr(10) || '    options: ' || pgxgr.opt ||
chr(10) || '    parent: ' || chr(10) || ' - ' || string_agg(pgxgr.cgrorolename,
chr(10) || ' - ')
```

```

FROM (SELECT pgxg.cgrorolename,
      concat_ws(' ',
        'LOGIN',
        CASE pgxg.cgrosuperuser WHEN true THEN 'SUPERUSER' END,
        CASE pgxg.cgrocreatedb WHEN true THEN 'CREATEDB' END,
        CASE pgxg.cgrocreatorole WHEN true THEN 'CREATEROLE' END,
        CASE pgxg.cgroreplication WHEN true THEN 'REPLICATION' END,
        CASE pgxg.cgrobypassrls WHEN true THEN 'BYPASSRLS' END) AS opt,
      pgxroles.name
FROM pgx_confidential_group pgxg,
      (SELECT pgxr.crolmatid as matid, pgxr.crolgroid as groid, pgxr.crolname AS
name FROM
pgx_confidential_role pgxr ) as pgxroles
      WHERE pgxg.cgromatid = pgxroles.matid and pgxg.cgroid = pgxroles.groid) pgxgr
GROUP BY pgxgr.name, pgxgr.opt;
EOF
cat /home/postgres/ldap2pg_pre.yml /home/postgres/confidential_roles.yml /home/
postgres/ldap2pg_after.yml > /home/postgres/ldap2pg.yml

#Run ldap2pg -P -c ldap2pg.yml to update retrieved role information

```

### Information

If you want to manually apply the attribute or privilege information of a role that has been changed in confidentiality management to ldap2pg.yml, obtain the change information and apply it to ldap2pg.yml, referring to "[Example of Applying Role Attributes](#)".

### Adding Roles Created with ldap2pg to a Confidentiality Groups

1. Create a role to add to the confidentiality groups in ldap2pg.
2. Add the database role you created in step 1 to the existing confidentiality groups.
3. Reflect the newly added role's confidentiality management settings in ldap2pg.yml, as shown in "[Example of Applying Role Attributes](#)".

### Information

If cron automatically reflects changes to the confidentiality groups in ldap2pg.yml, stop cron and add the newly added database role to the confidentiality groups.

### Removing Roles Added in ldap2pg from a Confidentiality Groups

1. Remove the role you want to remove from the confidentiality groups.
2. Reflect changes to confidentiality management in ldap2pg.yml, referring to "[Example of Applying Role Attributes](#)".
3. Execute ldap2pg with the -P option to reflect.

### Point

If you deleted the confidentiality matrix and the confidentiality groups, perform steps 2 and 3 above.



- If you accidentally delete a role managed by confidentiality management using the ldap2pg, refer to "How to Check Confidentiality Objects and Roles" in the Security Operation Guide to recover the role managed by confidentiality management.
- If you accidentally delete the confidentiality role in ldap2pg, refer to "Creating a Confidentiality Management Role" in the Security Operations Guide to recover.

#### 4.2.2.5 Servers to which ldap2pg can Connect

The following table lists server that ldap2pg can connected to.

Table 4.2 Connectable server

OS	Product name
Linux	- Fujitsu Enterprise Postgres Advanced Edition 16 - Fujitsu Enterprise Postgres Standard Edition 16

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---

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