

CH05 Render PostgreSQL 管理

PostgreSQL 簡介

- 一個 PaaS (Platform as a Service) 雲端服務
 - 程式碼部署到 Render 後，不用管 Linux、Firewall、nginx 的設定
- 能部署 Web Services、Static Sites
- 支援主流的語言與框架
- 亦支援 Dockerfile
 - 理論上可以跑任何的 Docker Container

PostgreSQL 簡介 (Cont.)

- 所有服務皆有支援 HTTP/2 協定
- 有 Cloudflare 進階防 DDoS
- 全球 CDN
- 可以直接跟 Github 連接
 - 只要有新的 Commit 會自動 Trigger Deploy

Render PostgreSQL

- 雲端資料庫
- 免費三個月
- 資料庫伺服器一定要與網頁伺服器同個區域

Render PostgreSQL 部署

- 登入 Render
- 新增 PostgreSQL
- 新增資料庫
- 檢視資料庫資訊
- 複製與儲存資料庫連線資訊

登入 Render

- <https://dashboard.render.com/>

Sign In to Render



GitHub



GitLab



Google

or

Email

your@email.com

Password

correct horse battery staple

Sign in

Need an account? [Sign up](#)

Forgot your password? [Reset it](#)

新增 PostgreSQL

[Dashboard](#)[Blueprints](#)[Env Groups](#)[Docs](#)[Community](#)[Help](#)[New +](#)

Overview

SERVICE NAME

STATUS

TYPE



flaskhome



Deployed

Web



PostgreSQL

Render offers fully managed hosted PostgreSQL with internal and external connectivity, multiple storage and memory options, and automated daily backups.

[Learn more.](#)[Static Site](#)[Web Service](#)[Private Service](#)[Background Worker](#)[Cron Job](#)[PostgreSQL](#)[Redis](#)[Blueprint](#)

新增資料庫

New PostgreSQL

[Read the docs](#) 

Name

A unique name for your PostgreSQL instance.

flaskhome

Database Optional

The PostgreSQL `dbname`


smarthome

User Optional

admin

Region

The [region](#) where your PostgreSQL instance runs. Services must be in the same region to communicate privately and you currently have services running in **Singapore**.

Singapore (Southeast Asia) 

PostgreSQL Version

16 

新增資料庫 (Cont.)

Datadog API Key Optional

The API key to use for sending metrics to Datadog. Setting this will enable Datadog monitoring.

Instance Type

For hobby projects

Free
\$0 / month
256 MB (RAM)
0.1 CPU
1 GB (Storage)

⚠ Upgrade to enable more features

Free instances do not support backups. A free database expires 90 days after creation. Only one free PostgreSQL instance can be active for any given Render user or team.

For professional use

Select an instance type for your PostgreSQL instance. Currently, we don't support downgrading PostgreSQL instances. Make sure to pick the instance type that works for you.

Starter
\$7 / month
256 MB (RAM)
0.1 CPU
1 GB (Storage)

Standard
\$20 / month
1 GB (RAM)
1 CPU
16 GB (Storage)

Pro
\$95 / month
4 GB (RAM)
2 CPU
96 GB (Storage)

Pro Plus
\$185 / month
8 GB (RAM)
4 CPU
256 GB (Storage)

Need a [custom instance type](#)? We support up to 512 GB RAM, 64 CPUs, and 5 TB storage.



Access more features like [Point-in-Time Recovery](#) and [High Availability](#) by upgrading to a team plan.

[Create a team](#)

新增資料庫 (Cont.)

Create Database



Feedback



Invite a Friend



Contact Support

檢視資料庫資訊

POSTGRES SQL

 flaskhome Free

[Read the docs](#) 

Connect 

Info

Metrics

Recovery

Logs

 Your database will expire on July 21, 2024. The database will be deleted unless you [upgrade to a paid instance type](#).

General

Name flaskhome 

Created 11 minutes ago

Status  Available

PostgreSQL Version 16

Region Singapore (Southeast Asia)

Read Replica  

檢視資料庫資訊 (Cont.)

Storage

4.81% used out of 1.0 GiB



Datadog API Key

Add Datadog API Key

PostgreSQL Instance

Instance Type

Free • RAM 256 MB CPU 100m Storage 1 GB

Update



A credit card is required to change instance types.

Add payment information

檢視資料庫資訊 (Cont.)

Connections

Hostname ⓘ

dpg-coj831ol6cac739sjuu0-a

Port

5432

Database

smarthome_fv3t

Username

admin

Password



.....

Internal Database URL



.....

External Database URL



.....

PSQL Command



.....

複製資料庫連線資訊

- 複製 Hostname、Database、Username、Password、Internal Database URL、External Database URL 等設定值至純文字檔
- 將純文字檔儲存為 renderdb.txt

下載 pgAdmin

- <https://www.pgadmin.org/download/>

Download

pgAdmin is a free software project released under the [PostgreSQL licence](#). The software is available in source and binary format from the [PostgreSQL mirror network](#). Because compiling from source requires technical knowledge, we recommend installing binary packages whenever possible.

The pages in this section give additional details about each binary package available as well as more direct download links. In addition, you can download source tarballs and pgAgent for your servers to enable additional functionality.

Only recent downloads are kept on the main download site, along with the last release of each major version. Older downloads can be found in the [Download Archive](#). Note that whilst the packages from the APT and YUM repositories are also archived here, the repository metadata is not maintained so it is not possible to configure the archives as working repositories.

pgAdmin 4

pgAdmin 4 is a complete rewrite of pgAdmin, built using Python and Javascript/jQuery. A desktop runtime written in NW.js allows it to run standalone for individual users, or the web application code may be deployed directly on a web server for use by one or more users through their web browser. The software has the look and feels of a desktop application whatever the runtime environment is, and vastly improves on pgAdmin III with updated user interface elements, multi-user/web deployment options, dashboards, and a more modern design.



Container



macOS



Python



APT



RPM



Source Code



Windows

下載 pgAdmin (Cont.)

pgAdmin 4 (Windows)

Download

Maintainer: pgAdmin Development Team

pgAdmin is available for 64 bit Windows™ 7 SP1 (desktop) or 2008R2 (server) and above, up to v4.30.


v5.0 and later are supported on Windows 8 (desktop) or 2012 (server) and above.

v7.0 and later are supported on Windows 10 (desktop) or 2016 (server) and above.


32 bit Windows support is available for versions up to v4.29.

The packages below include both the Desktop Runtime and Web Application:

 [pgAdmin 4 v8.5](#) (released April 4, 2024)

 [pgAdmin 4 v8.4](#) (released March 7, 2024)

 [pgAdmin 4 v8.3](#) (released Feb. 9, 2024)

 [pgAdmin 4 v7.8](#) (released Oct. 19, 2023)

 [pgAdmin 4 v6.21](#) (released March 9, 2023)

下載 pgAdmin (Cont.)

File Browser

Top → pgadmin → pgadmin4 → v8.5 → windows

Directories

 [Parent Directory]

Files

 CURRENT_MAINTAINER	2024-04-04 10:10:40	136 bytes
 pgadmin4-8.5-x64.exe	2024-04-04 10:11:43	183.6 MB

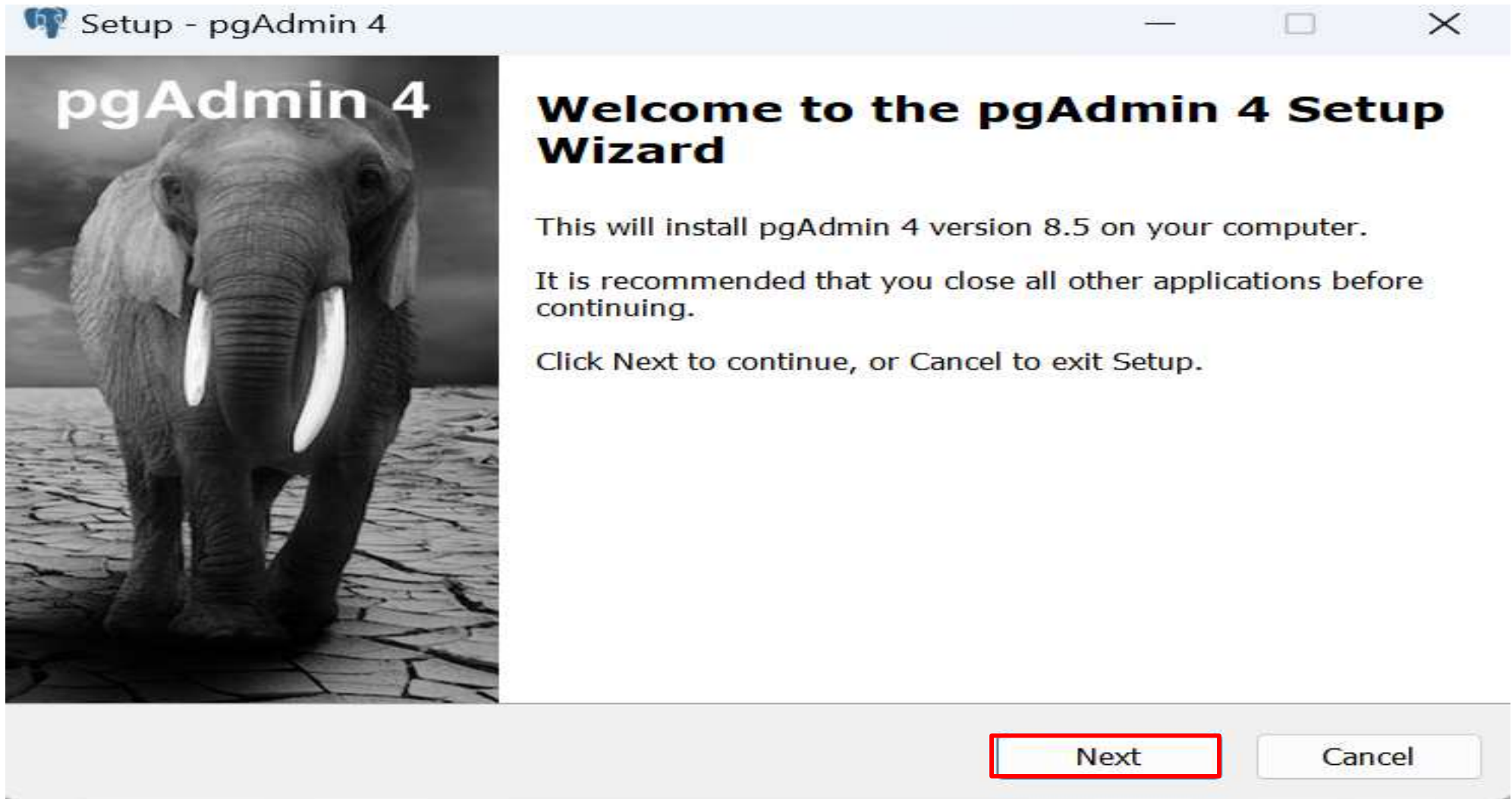
Current Maintainer

Support: pgadmin-support@lists.postgresql.org

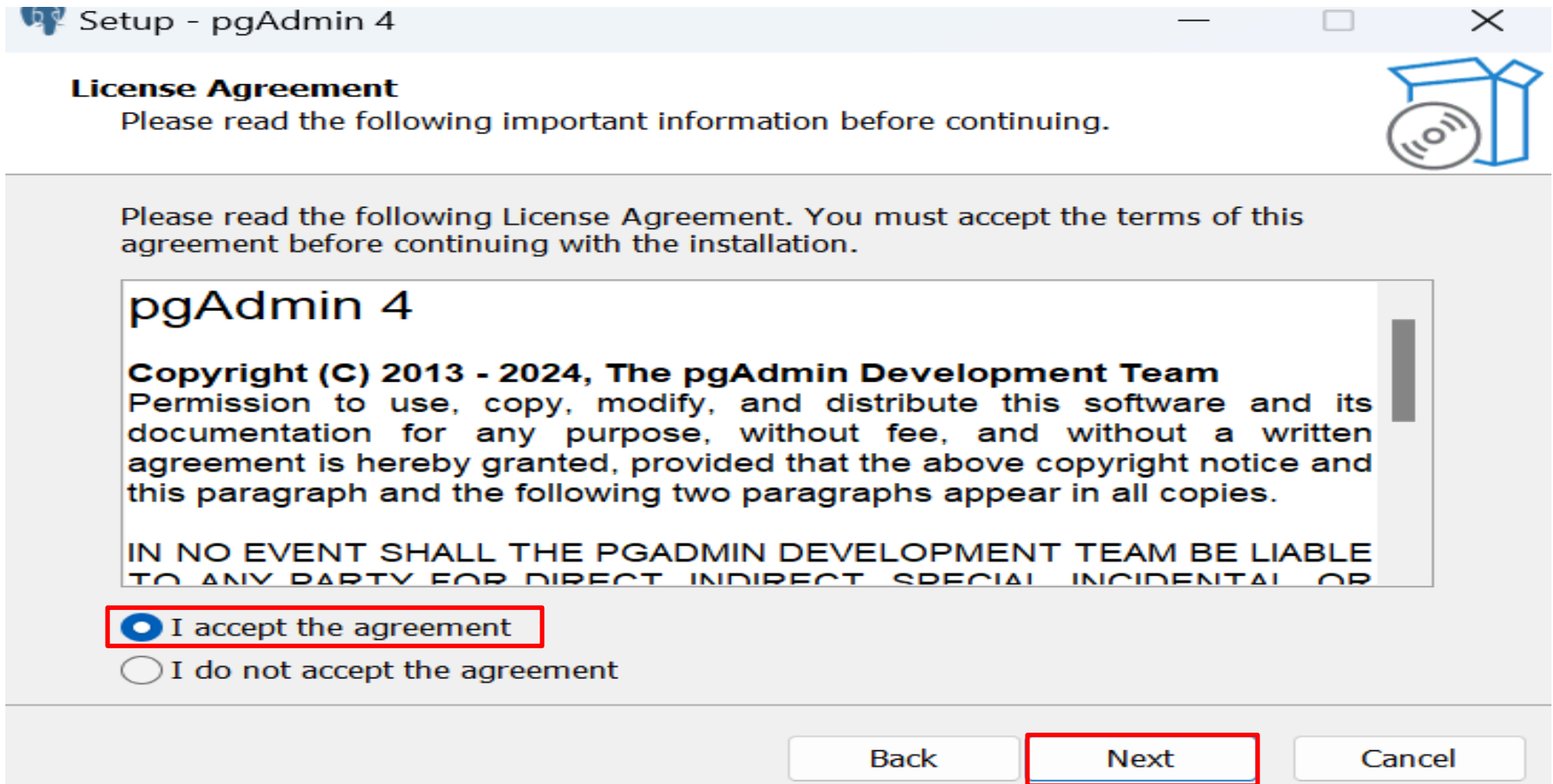
Website: <https://www.pgadmin.org/>

Tracker: <https://github.com/pgadmin-org/pgadmin4/issues>

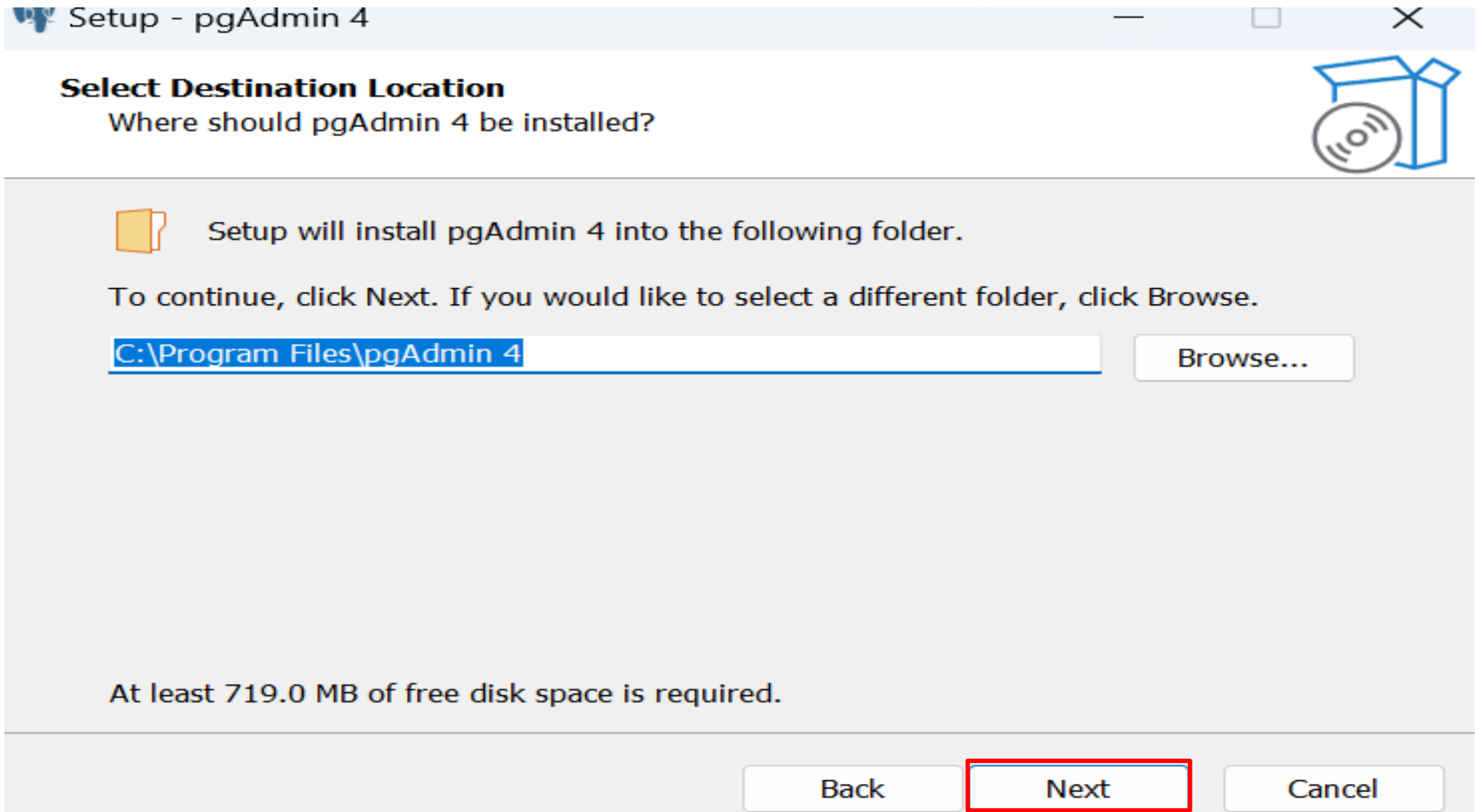
安裝 pgAdmin



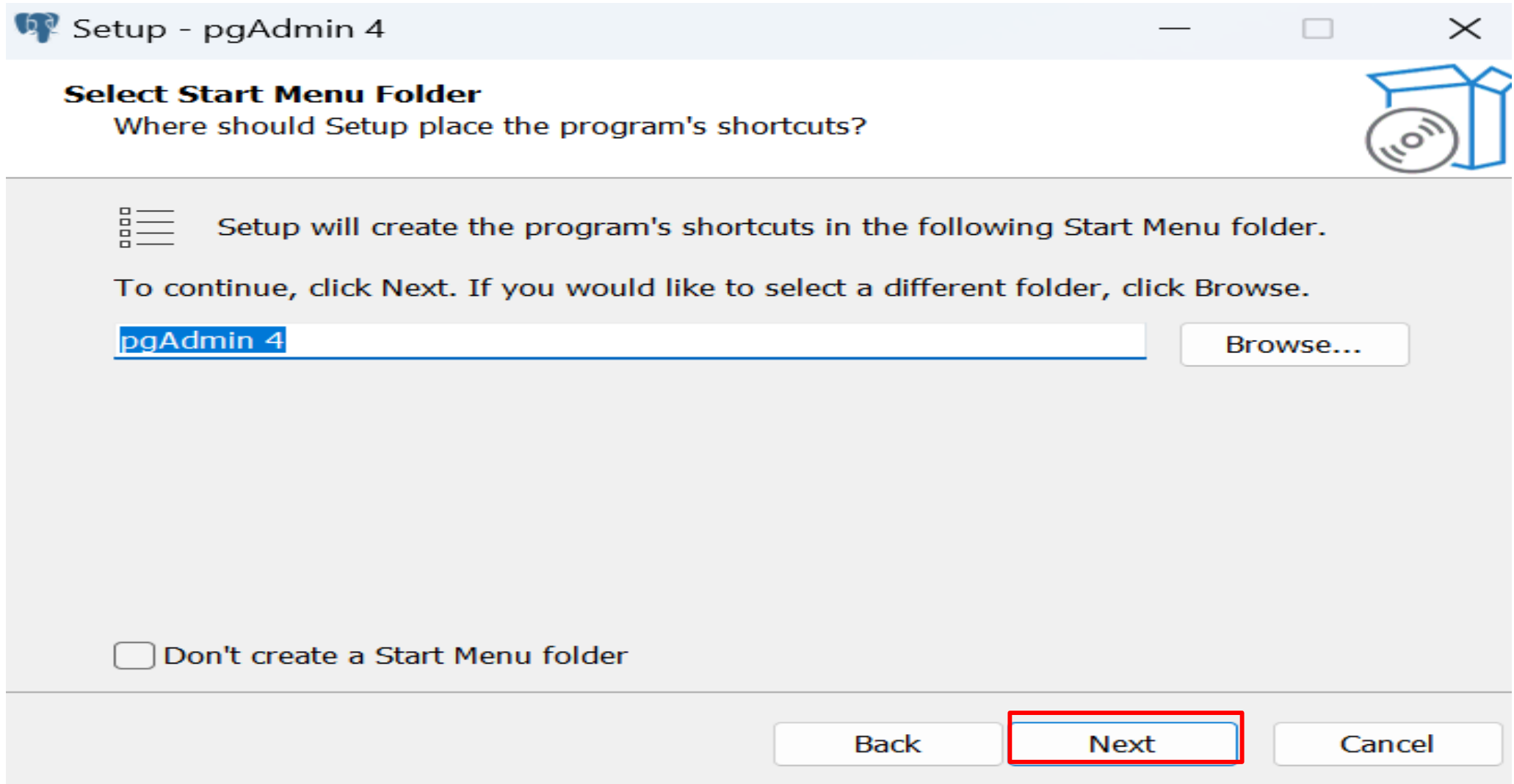
安裝 pgAdmin (Cont.)



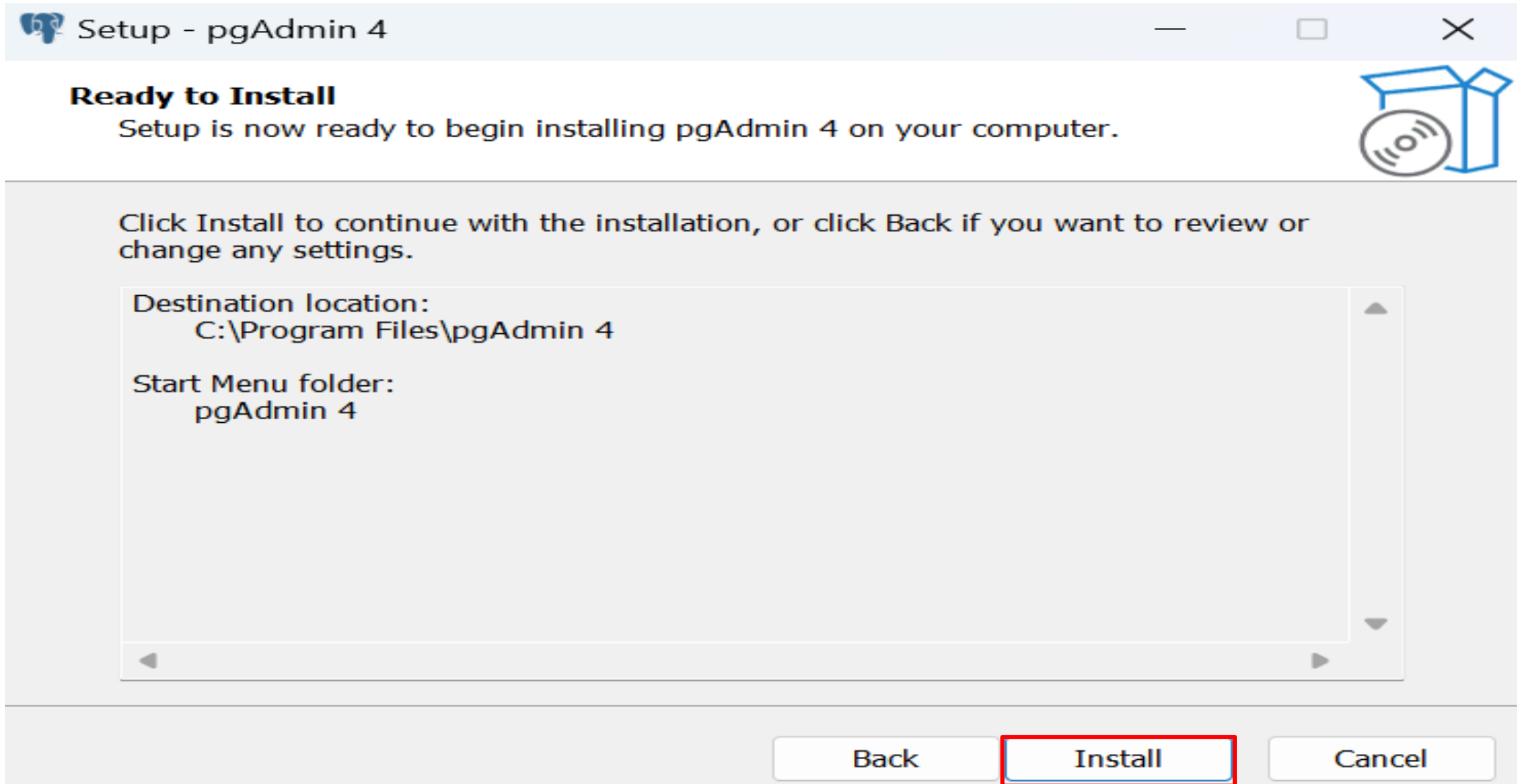
安裝 pgAdmin (Cont.)



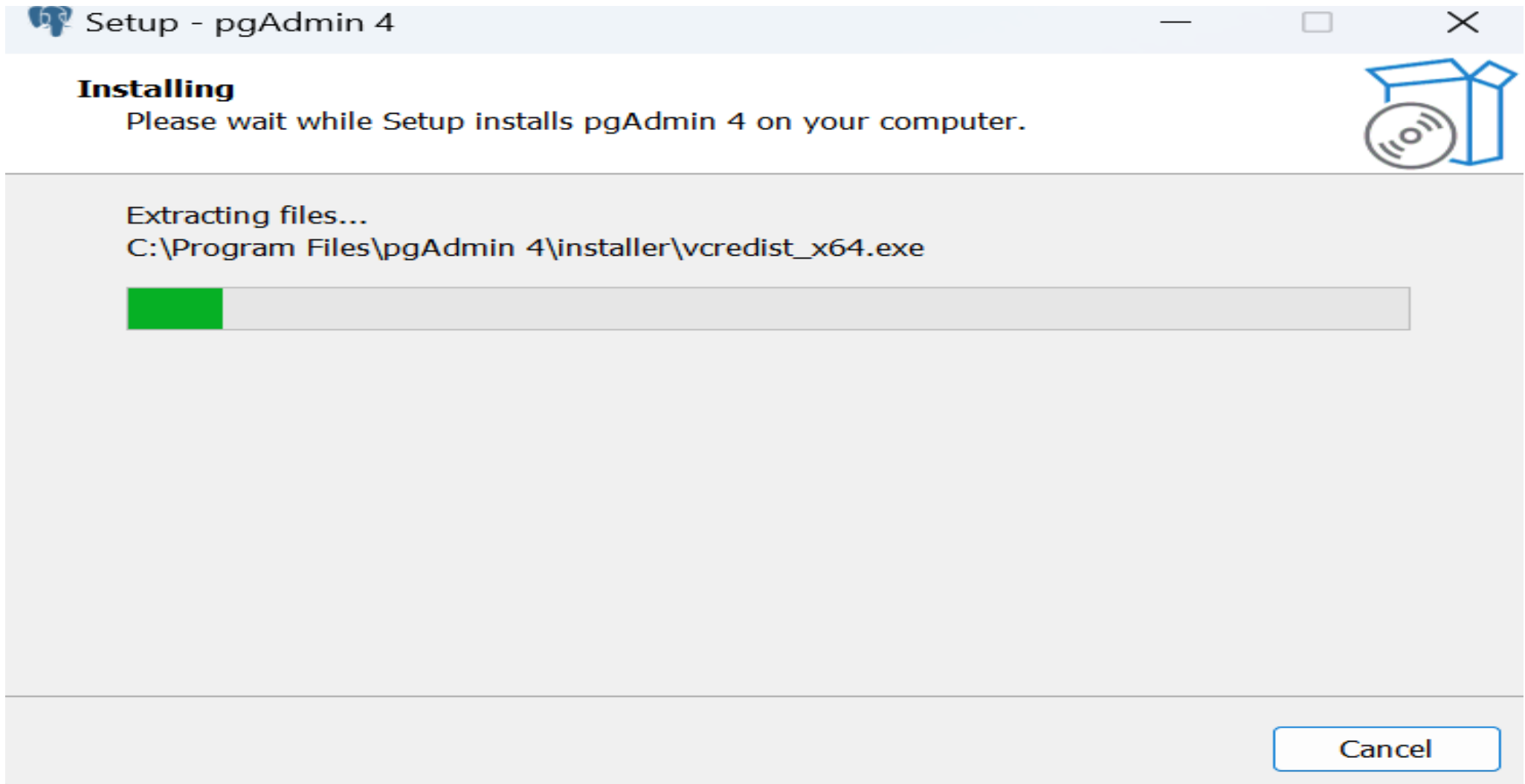
安裝 pgAdmin (Cont.)



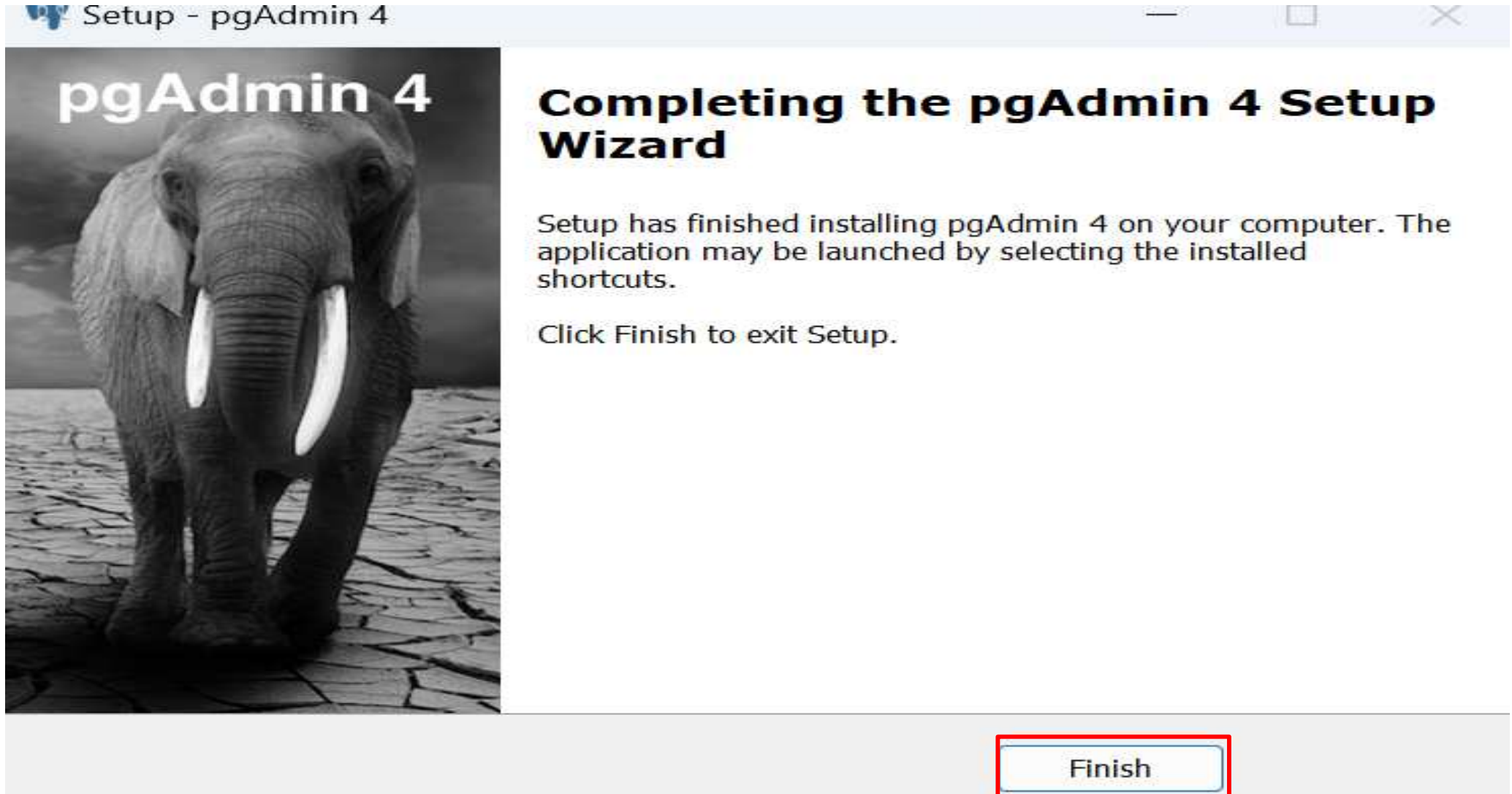
安裝 pgAdmin (Cont.)



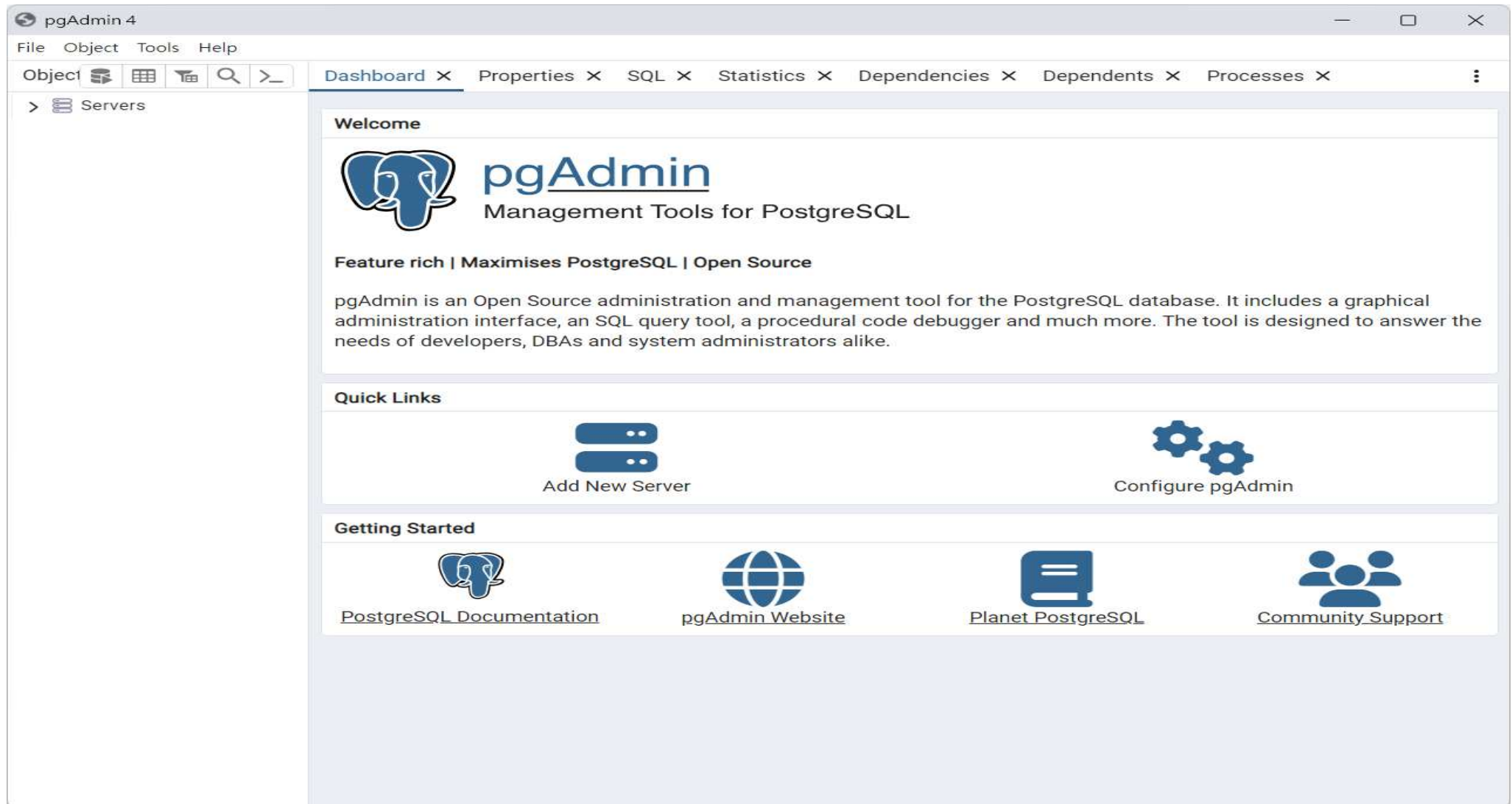
安裝 pgAdmin (Cont.)



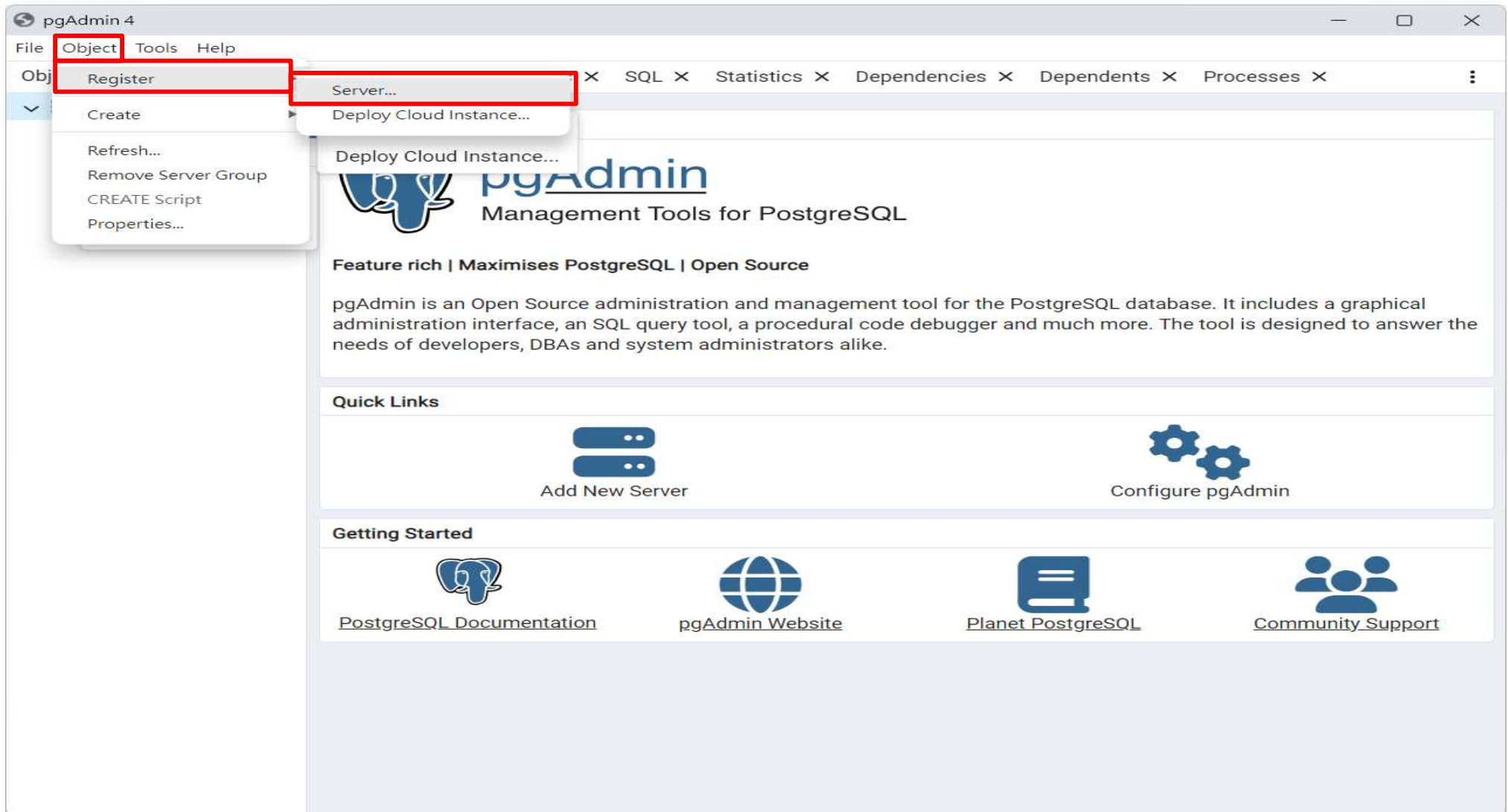
安裝 pgAdmin (Cont.)



檢視 pgAdmin



註冊 DB Server



註冊 DB Server (Cont.)

Register - Server

General

Connection

Parameters

SSH Tunnel

Advanced

Name

render_flaskhome

Server group

Servers

Background

X

Foreground

X

Connect now?

Comments

! Either Host name or Service must be specified.

i

?

X Close

Reset

Save

註冊 DB Server (Cont.)

- 外部網址的組成
 - postgres://[username]:[password]@[hostname].[伺服器位置].render.com/[database]
- 從 @ 的地方開始複製，然後到 .com 的地方結束，貼到 Host name/address 的欄位

註冊 DB Server (Cont.)

Register - Server

General

Connection

Parameters

SSH Tunnel

Advanced

Host name/address

dpg-coj83lol6cac739sjuu0-a.singapore-postgres.render.com

Port

5432

Maintenance database

smarthome_fv3t

Username

admin

Kerberos authentication?

☐

Password

.....

Save password?

☐

Role

Service

i

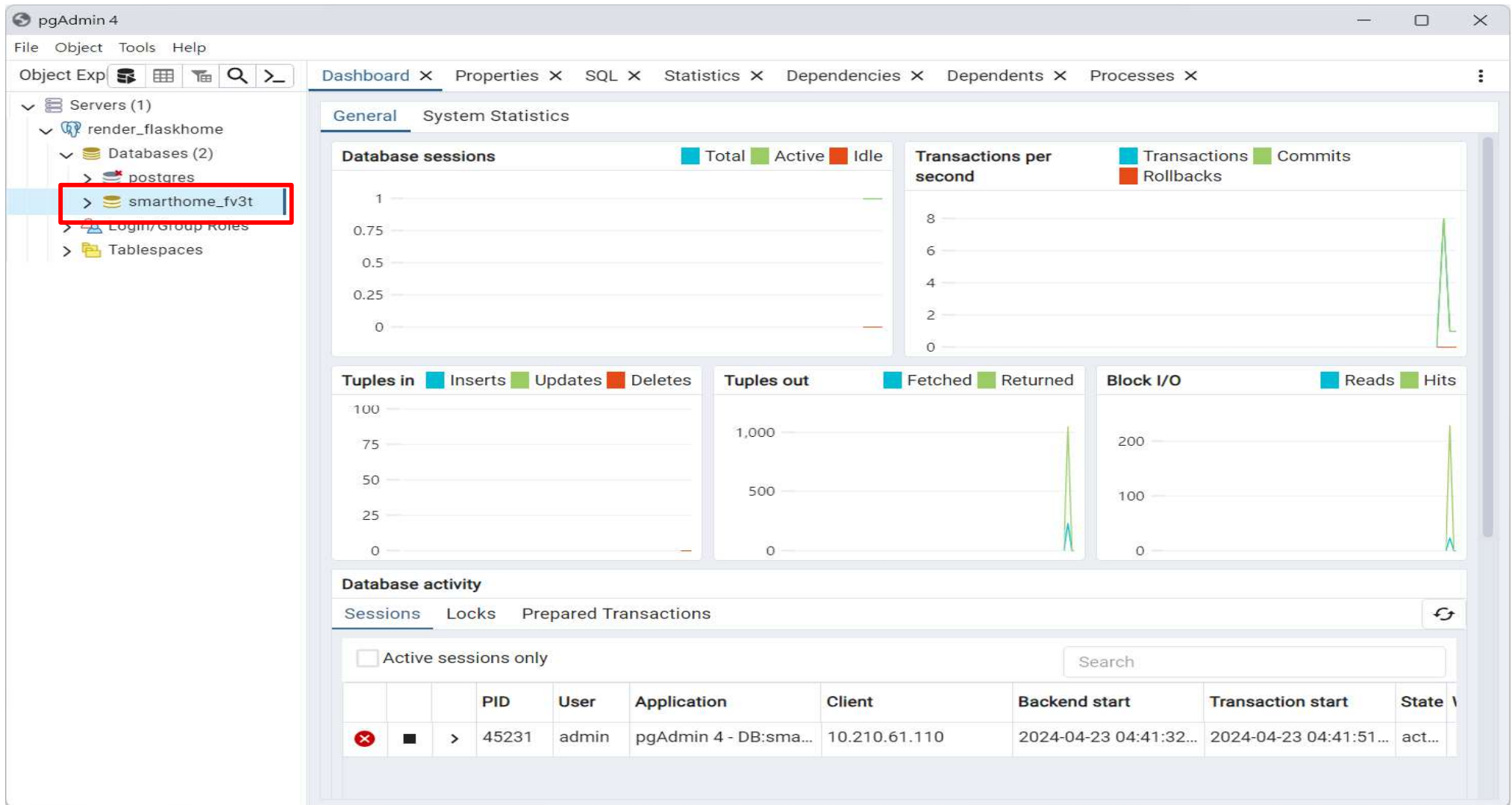
?

Close

Reset

Save

註冊 DB Server (Cont.)



PostgreSQL 欄位資料型態

- 數字型態
- 字串型態
- 貨幣型態
- 位元組型態
- 日期時間型態
- 布林型態
- 列舉型態

PostgreSQL 欄位資料型態 (Cont.)

- 地理資訊型態
- 網路資訊型態
- 位元字串型態
- 全文檢索型態
- UUID 型態
- XML 型態
- JSON 型態

PostgreSQL 欄位資料型態 (Cont.)

- 陣列型態
- 複合型態
- 範圍型態
- Domain 型態
- 物件指標型態
- pg_lsn 型態
- 概念型態

建立資料表

- 會員資料表
- 產品資料表

會員資料表

- 會員資料表規劃
- 會員資料表建立

會員資料表規劃

欄位名稱	資料型態	長度	是否允許 NULL	說明
mid (會員編號)	CHAR	5	<input type="checkbox"/>	
name (姓名)	VARCHAR	8	<input type="checkbox"/>	
birthday (生日)	DATE		<input checked="" type="checkbox"/>	
phone (電話)	VARCHAR	13	<input type="checkbox"/>	
address (地址)	VARCHAR	50	<input checked="" type="checkbox"/>	

會員資料表規劃 (Cont.)

欄位名稱	資料型態	長度	是否允許 NULL	說明
email (電子郵件)	VARCHAR	50	<input type="checkbox"/>	

會員資料表建立

pgAdmin 4

File Object Tools Help

Object Explorer

- Servers (1)
 - render_flaskhome
 - Databases (2)
 - smarthome_fv3t
 - Casts
 - Catalogs
 - Event Triggers
 - Extensions
 - Foreign Data Wrappers
 - Languages
 - Publications
 - Schemas (1)
 - public
 - Aggregates
 - Collations
 - Domains
 - FTS Configurations
 - FTS Dictionaries
 - FTS Parsers
 - FTS Templates
 - Foreign Tables
 - Functions
 - Materialized Views
 - Operators
 - Procedures
 - Sequences
 - Tables
 - Create > Table...
 - Refresh
 - Grant Wizard...
 - Search Objects...
 - PSQL Tool
 - Query Tool
 - Types
 - Views
 - Subscriptions
 - Login/Group Roles
 - Tablespaces

Dashboard x Properties x SQL x Statistics x Dependencies x Dependents x Processes x

General System Statistics

Database sessions

Transactions per second

Tuples in

Tuples out

Block I/O

Database activity

Sessions Locks Prepared Transactions

☐ Active sessions only

			PID	User	Application	Client	Backend start	Transaction start	State	Wait event	Blocking PIDs
✖	■	>	68	admin	pgAdmin 4 - DB:smarth...	10.210.62.112	2024-04-27 08:58:29 U...	2024-04-27 08:58:34 U...	acti...		

會員資料表建立 (Cont.)

Create - Table

General

Columns

Advanced

Constraints

Partitions

Parameters


Security

SQL


Name

member

Owner

 admin

Schema

 public



Tablespace

Select an item...

Partitioned table?

☐

Comment

Close

Reset

Save

會員資料表建立 (Cont.)

Create - Table

General

Columns

Advanced

Constraints

Partitions

Parameters

Security

SQL

Inherited from table(s)

Select to inherit from...

Columns

			Name	Data type	Length/Precision	Scale	Not NULL?	Primary key?	Default
--	--	--	------	-----------	------------------	-------	-----------	--------------	---------

i

?

Close

Reset

Save

會員資料表建立 (Cont.)

Create - Table ×

General **Columns** Advanced Constraints Partitions Parameters Security SQL

Inherited from table(s)

Columns +

			Name	Data type	Length/Precision	Scale	Not NULL?	Primary key?	Default
⋮	✎	🗑	mld	character ▾	5		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="text"/>

i?

× Close ↺ Reset 💾 Save

會員資料表建立 (Cont.)

Create - Table

General

Columns

Advanced

Constraints

Partitions

Parameters

Security

SQL

Inherited from table(s)

Select to inherit from...

Columns

			Name	Data type	Length/Precision	Scale	Not NULL?	Primary key?	Default
⋮	✎	🗑	mId	character ▾	5		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
⋮	✎	🗑	name	character varying ▾	8		<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Close

Reset

Save

會員資料表建立 (Cont.)

Create - Table ×

General **Columns** Advanced Constraints Partitions Parameters Security SQL

Inherited from table(s)

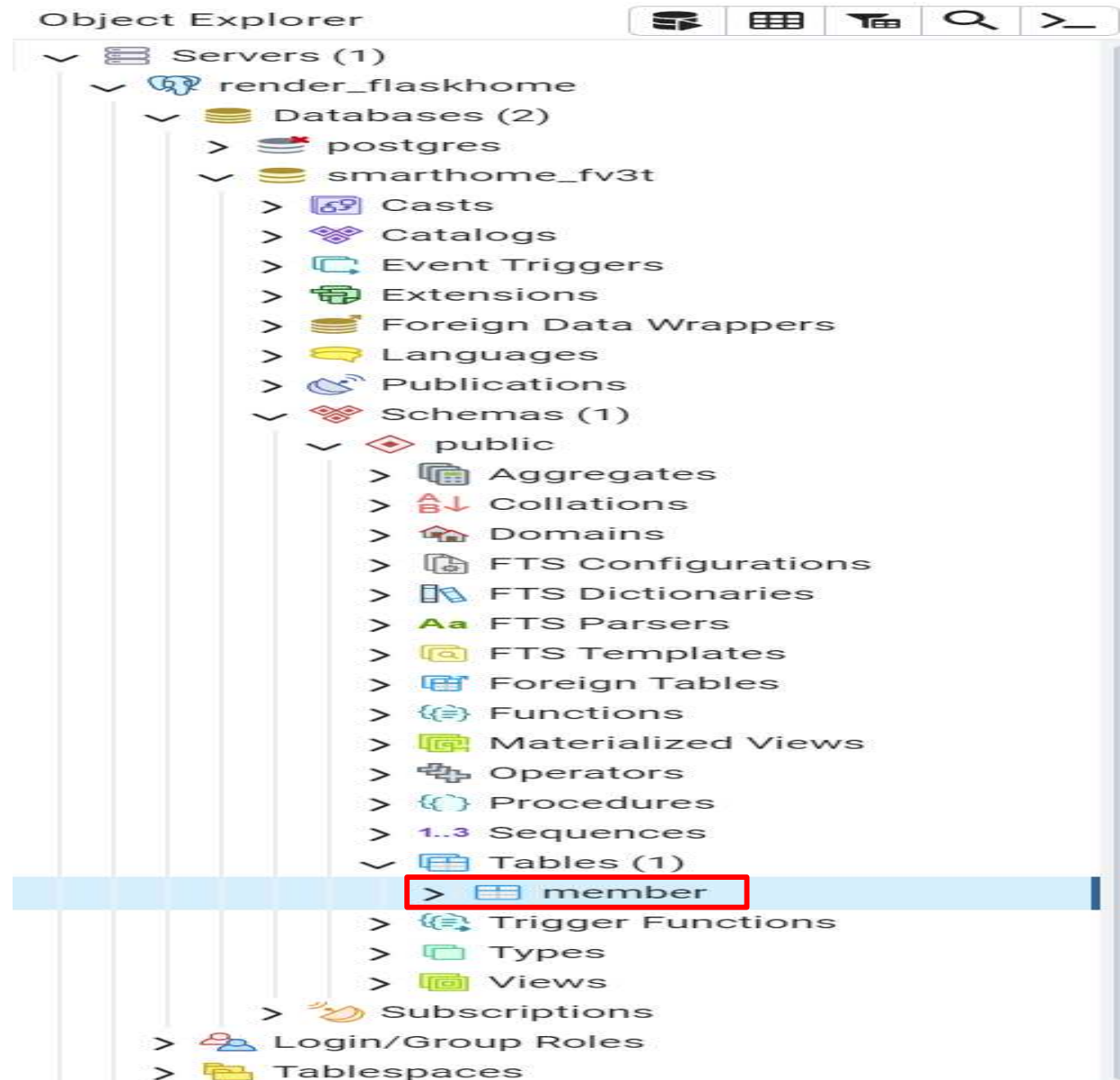
Columns +

			Name	Data type	Length/Precision	Scale	Not NULL?	Primary key?	Default
⋮	✎	🗑	mId	character ▾	5		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
⋮	✎	🗑	name	character varying ▾	8		<input checked="" type="checkbox"/>	<input type="checkbox"/>	
⋮	✎	🗑	birthday	date ▾			<input type="checkbox"/>	<input type="checkbox"/>	
⋮	✎	🗑	phone	character varying ▾	13		<input checked="" type="checkbox"/>	<input type="checkbox"/>	
⋮	✎	🗑	address	character varying ▾	50		<input type="checkbox"/>	<input type="checkbox"/>	
⋮	✎	🗑	email	character varying ▾	50		<input checked="" type="checkbox"/>	<input type="checkbox"/>	

i ?

× Close ↺ Reset 💾 Save

會員資料表建立 (Cont.)



產品資料表

- 產品資料表規劃
- 產品資料表建立

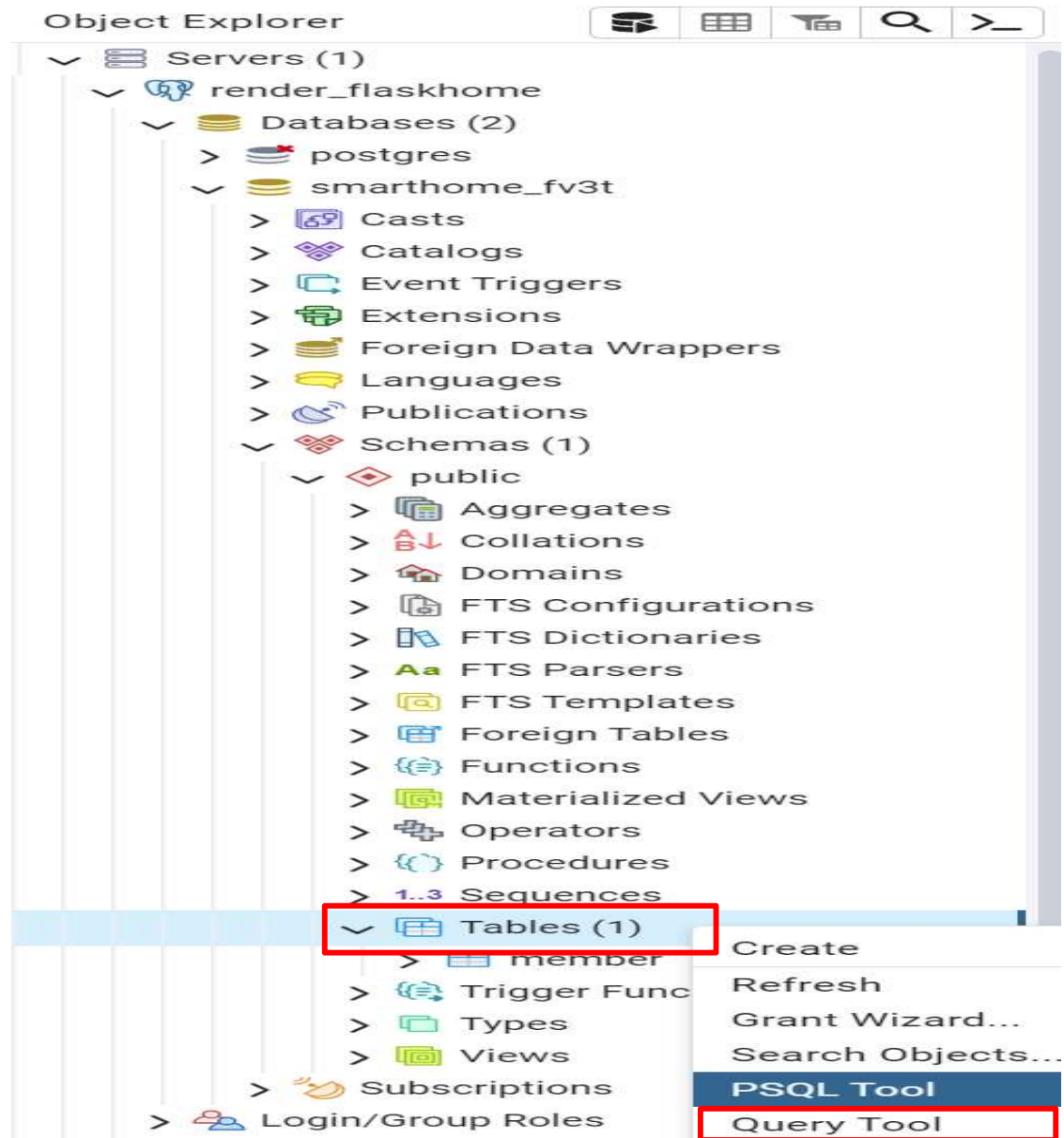
產品資料表規劃

欄位名稱	資料型態	長度	是否允許 NULL	說明
pno (產品編號)	CHAR	6	<input type="checkbox"/>	
pname (產品名稱)	VARCHAR	30	<input type="checkbox"/>	
unitprice (定價)	DECIMAL	(10,2)	<input checked="" type="checkbox"/>	
description (產品描述)	TEXT		<input checked="" type="checkbox"/>	
category (種類)	VARCHAR	20	<input checked="" type="checkbox"/>	

產品資料表建立

- **CREATE TABLE** Product (
 pno CHAR(6) NOT NULL,
 pname VARCHAR(30), NOT NULL,
 unitprice DECIMAL(10,2),
 description TEXT,
 category VARCHAR(20),
 PRIMARY KEY (pno),
 CONSTRAINT UnitPrice_Check
CHECK (unitprice > 1000));

產品資料表建立 (Cont.)



產品資料表建立 (Cont.)

Dashboard X Properties X SQL X Statistics X Dependencies X Dependents X Processes X **smarthome_fv3t/admin@render_flaskhome* X**

smarthome_fv3t/admin@render_flaskhome

Query History Scratch Pad X

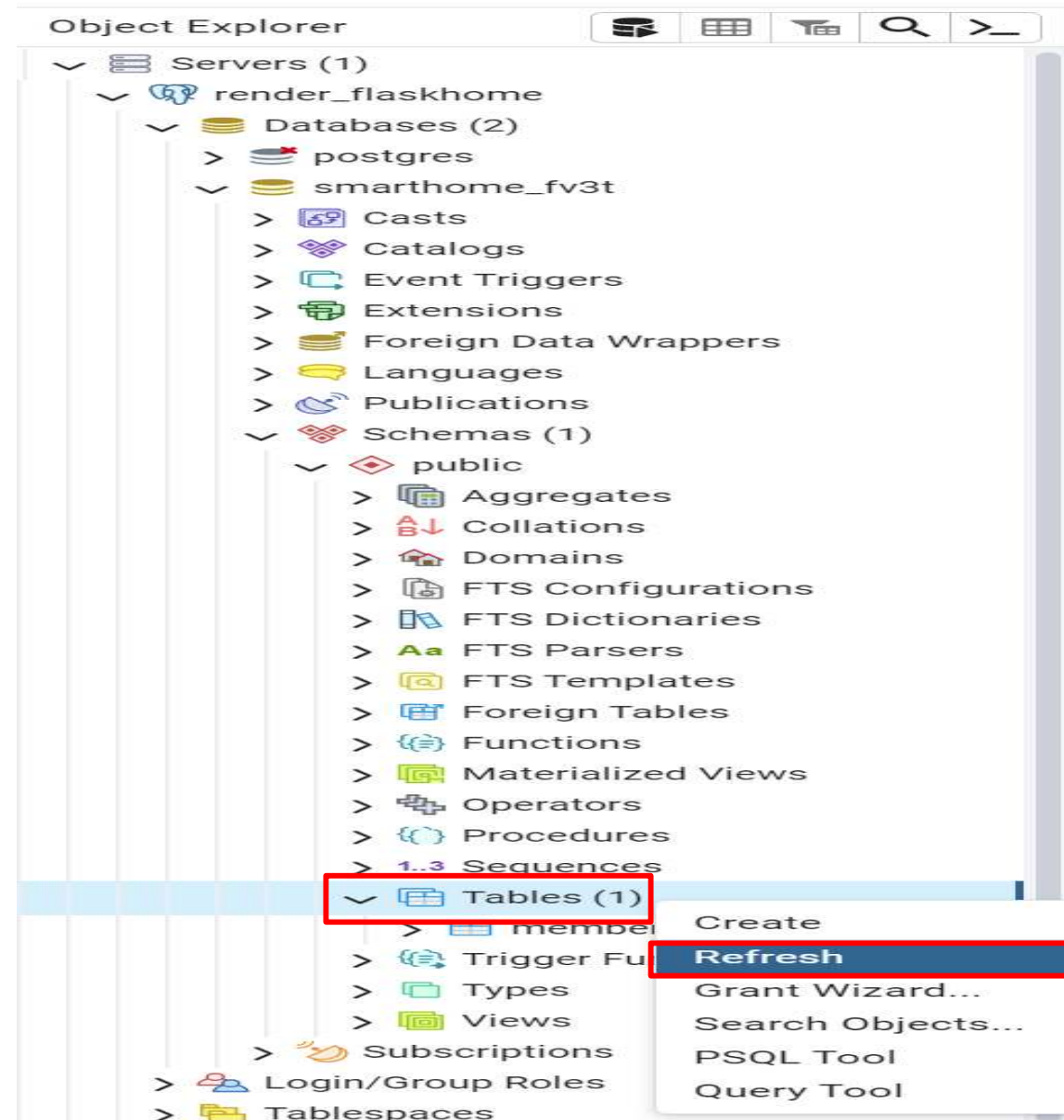
```
1 CREATE TABLE Product (  
2     pNo          CHAR(6)          NOT NULL,  
3     pName        VARCHAR(30)      NOT NULL,  
4     unitPrice    DECIMAL(10,2),  
5     description  TEXT,  
6     category     VARCHAR(20),  
7     PRIMARY KEY (pNo),  
8     CONSTRAINT  UnitPrice_Check  
9     CHECK (unitPrice > 1000)  
10 );
```

Data Output Messages Notifications

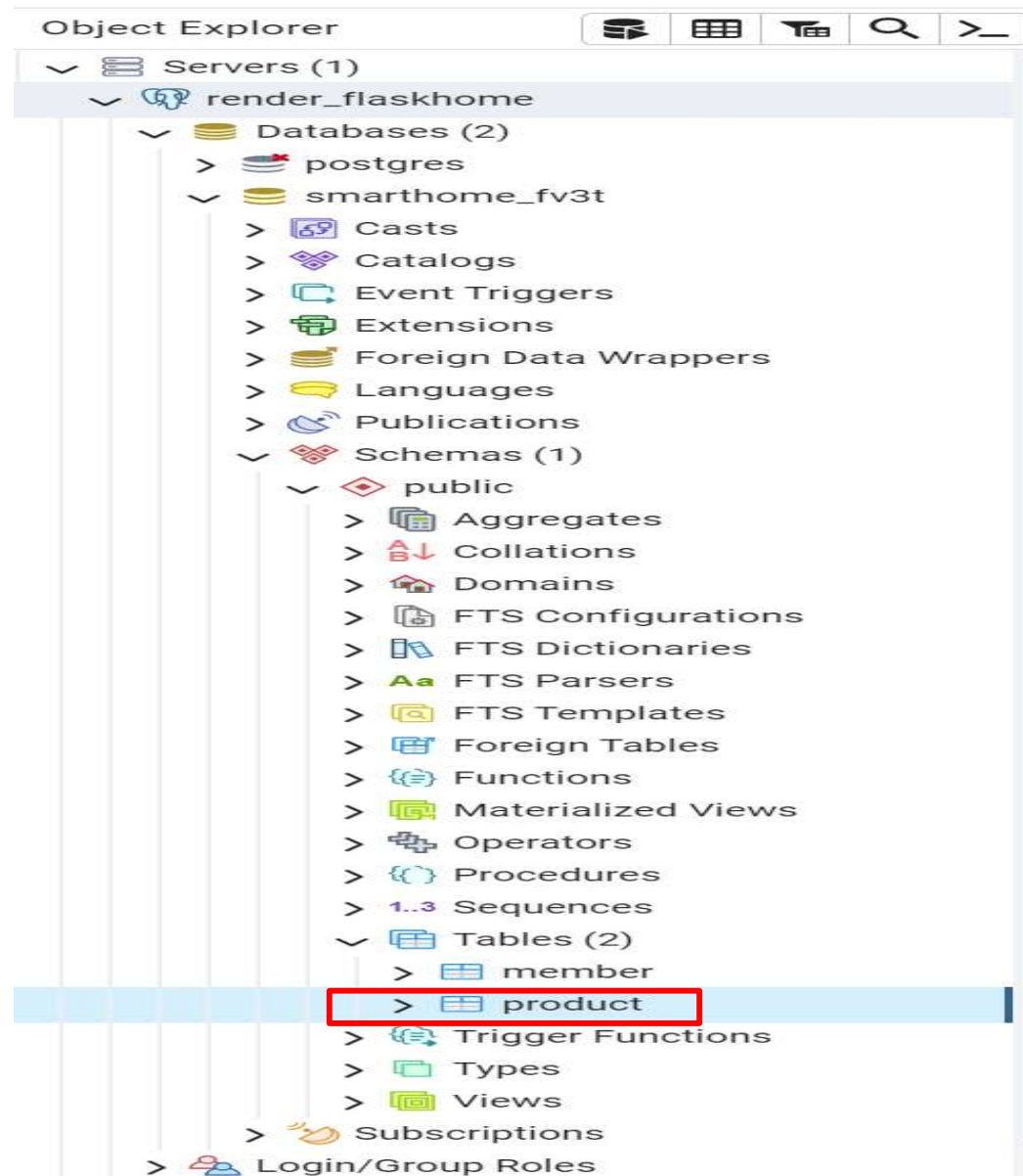
CREATE TABLE

Query returned successfully in 162 msec.

產品資料表建立 (Cont.)



產品資料表建立 (Cont.)



新增資料

- 會員資料表新增資料
- 產品資料表新增資料

會員資料表新增資料

- INSERT INTO member (mid, name, birthday, phone, address, email) VALUES ('m0001', 'Jacky', '1988-03-30', '(04)23920321', '台中市太平區中山路二段', 'jacky@ms8.hinet.net');
- INSERT INTO member (mid, name, birthday, phone, address, email) VALUES ('m0002', 'Jennifer', '1977-03-04', '(07)2221111', '高雄市鹽埕區五福四路', 'jennifer@ms7.hinet.net');

會員資料表新增資料 (Cont.)

- `INSERT INTO member (mid, name, birthday, phone, address, email) VALUES ('m0003', 'Jenny', '1999-01-01', '(06)3312001', '台南市東區裕信路', 'jenny@ms9.hinet.net');`

會員資料表新增資料 (Cont.)

Dashboard X Properties X SQL X Statistics X Dependencies X Dependents X Processes X smarthome_fv3t/admin@render_flaskhome* X

smarthome_fv3t/admin@render_flaskhome

Query History

```
1 INSERT INTO member (mId, name, birthday, phone, address, email)
2   VALUES ('m0001', 'Jacky', '1988-03-30', '(04)23920321', '台中市太平區中山路二段', 'jacky@ms8.hinet.net');
3 INSERT INTO member (mId, name, birthday, phone, address, email)
4   VALUES ('m0002', 'Jennifer', '1977-03-04', '(07)2221111', '高雄市鹽埕區五福四路', 'jennifer@ms7.hinet.net');
5 INSERT INTO member (mId, name, birthday, phone, address, email)
6   VALUES ('m0003', 'Jenny', '1999-01-01', '(06)3312001', '台南市東區裕信路', 'jenny@ms9.hinet.net');
7
```

Data Output Messages Notifications

INSERT 0 1

Query returned successfully in 150 msec.

產品資料表新增資料

- INSERT INTO product (pno, pname, unitprice, description, category) VALUES ('a00001', 'AirFan 智慧節能扇', 2500, '內建Wi-Fi模組-支援OK Google', 'Smart Fan');
- INSERT INTO product (pno, pname, unitprice, description, category) VALUES ('00001', 'AirPlug 智慧插座', 1100, '支援Ok Google', 'Smart Home');

產品資料表新增資料 (Cont.)

- INSERT INTO product (pno, pname, unitprice, description, category) VALUES ('c00001', 'AirCon
一級變頻冷暖分離式冷氣', 50000, '4-6坪-變頻
NF冷暖機-支援 Ok Google', 'Smart Conditioner');

產品資料表新增資料 (Cont.)

The screenshot shows a database management interface with a top navigation bar containing tabs: Dashboard, Properties, SQL, Statistics, Dependencies, Dependents, and Processes. A red box highlights the user session 'smarthome_fv3t/admin@render_flaskhome*'. Below the navigation bar is a toolbar with icons for file operations, filters, and execution. A red box highlights the execution button (a play icon). The main area displays a SQL query with three INSERT statements. Below the query, there are tabs for Data Output, Messages, and Notifications. The Messages tab is active, showing the execution result: 'INSERT 0 1' and 'Query returned successfully in 183 msec.'

Dashboard X Properties X SQL X Statistics X Dependencies X Dependents X Processes X **smarthome_fv3t/admin@render_flaskhome*** X

smarthome_fv3t/admin@render_flaskhome

No limit

Query Query History

```
1 INSERT INTO product (pno, pname, unitprice, description, category)
2   VALUES ('a00001', 'AirFan智慧節能扇', 2500, '內建Wi-Fi模組-支援OK Google', 'Smart Fan');
3 INSERT INTO product (pno, pname, unitprice, description, category)
4   VALUES ('00001', 'AirPlug智慧插座', 1100, '支援Ok Google', 'Smart Home');
5 INSERT INTO product (pno, pname, unitprice, description, category)
6   VALUES ('c00001', 'AirCon一級變頻冷暖分離式冷氣', 50000, '4-6坪-變頻NF冷暖機-支援 Ok Google', 'Smart Conditioner');
7
```

Data Output Messages Notifications

INSERT 0 1

Query returned successfully in 183 msec.

查詢資料

- 查詢會員資料表
- 查詢產品資料表

查詢會員資料表

The screenshot displays a database management interface. On the left, the 'Object Explorer' shows a tree structure with 'member' table selected under 'public' schema. A context menu is open over 'member', with 'View/Edit Data' highlighted, and its sub-menu is also open, showing 'All Rows' as the selected option. The main window shows a SQL query window with the following content:

```
smarthome_fv3t/admin@render_flaskhome
```

Query

```
1 INSERT INTO product (pno, pname, unitprice, description, category)
2   VALUES ('a00001', 'AirFan智慧節能扇', 2500, '內建Wi-Fi模組-支援OK Google', 'Smart Fan');
3 INSERT INTO product (pno, pname, unitprice, description, category)
4   VALUES ('000001', 'AirPlug智慧插座', 1100, '支援Ok Google', 'Smart Home');
INSERT INTO product (pno, pname, unitprice, description, category)
   VALUES ('c00001', 'AirCon一級變頻冷暖分離式冷氣', 50000, '4-6坪-變頻NF冷暖機-支援 Ok Google', 'Smart Conditioner');
```

Output Messages Notifications

RT 0 1

Returned successfully in 183 msec.

Total rows: 0 of 0 Query complete 00:00:00.183

查詢會員資料表 (Cont.)

shboard × Properties × SQL × Statistics × Dependencies × Dependents × Processes × smarthome_fv3t/... × public.member/smarthome_fv3t/admin@render_flaskhome ×

public.member/smarthome_fv3t/admin@render_flaskhome

Query Query History Scratch Pad ×

```
1 SELECT * FROM public.member
2 ORDER BY mid ASC
```

Data Output Messages Notifications

	mid [PK] character	name character varying (8)	birthday date	phone character varying (13)	address character varying (50)	email character varying (50)
1	m0001	Jacky	1988-03-30	(04)23920321	台中市太平區中山路二段	jacky@ms8.hinet.net
2	m0002	Jennifer	1977-03-04	(07)2221111	高雄市鹽埕區五福四路	jennifer@ms7.hinet.net
3	m0003	Jenny	1999-01-01	(06)3312001	台南市東區裕信路	jenny@ms9.hinet.net

查詢產品資料表 (Cont.)

- **SELECT * FROM product;**

The screenshot shows a database management interface with a top navigation bar containing tabs: Dashboard, Properties, SQL, Statistics, Dependencies, Dependents, and Processes. A red box highlights the active tab, which is labeled 'smarthome_fv3t/admin@render_flaskhome*'. Below the navigation bar is a toolbar with various icons for file operations, filters, and execution. The main area is divided into two sections: 'Query' and 'Query History'. The 'Query' section contains the SQL query: `1 SELECT * FROM product;` and `2`. Below the query section is a 'Data Output' section with tabs for 'Data Output', 'Messages', and 'Notifications'. The 'Data Output' tab is active, showing a table of results. A red box highlights the table structure and the first three rows of data.

	pno [PK] character	pname character varying (30)	unitprice numeric (10,2)	description text	category character varying (20)
1	a00001	AirFan智慧節能扇	2500.00	內建Wi-Fi模組-支援OK Google	Smart Fan
2	00001	AirPlug智慧插座	1100.00	支援Ok Google	Smart Home
3	c00001	AirCon一級變頻冷暖分離式冷氣	50000.00	4-6坪-變頻NF冷暖機-支援 Ok Google	Smart Conditioner

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 - <https://docs.render.com/databases>