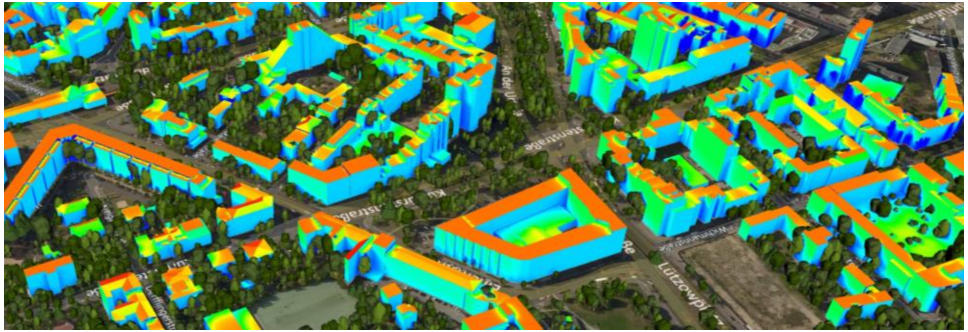
3D City Database 4.x (for PostgreSQL)

Quick installation guide for macOS



Last update: 20 November 2023

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Overview

Install required software

Set up the database

Connect to the database via the Importer/Exporter

Add additional database schemas (Optional)

Install ADE plug-ins (Optional)

Overview

Install required software

Set up the database

Connect to the database via the Importer/Exporter

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Install ADE plug-ins (Optional)

Software required
Software install
Database setup
Imp/Exp connection
Additional schemas
ADE plug-ins
Further resources

Software requirements

- **Java 11 JDK or higher**
  - https://www.oracle.com/java/technologies/javase/jdk11-archive-downloads.html
- **PostgreSQL**
  - See next slide for different download possibilities
- **PostGIS**
  - Often shipped together with most PostgreSQL installation packages
  - https://postgis.net/documentation/getting_started/install_macos
- **pgAdmin**
  - Often shipped together with most PostgreSQL installation packages
  - https://www.pgadmin.org/download/pgadmin-4-macos/
- **CityGML 3D City Database Suite**
  - https://github.com/3dcitydb/3dcitydb-suite/releases
- **Google Earth Pro**
  - Optional, only if you want to export to KML/Collada
  - https://www.google.com/earth/versions/#download-pro
- **NodeJS**
  - Optional, needed only if you want to use the Web-map-client
  - https://nodejs.org/en/download

Software required
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PostgreSQL sources

You can install PostgreSQL on macOS from several different sources:

- **Interactive installer by EnterpriseDB** (EDB)
  - https://www.enterprisedb.com/downloads/postgres-postgresql-downloads
  - https://www.postgresql.org/download/macosx/
- **Postgres.app**
  - https://postgresapp.com/downloads.html
- **Homebrew**
  - https://brew.sh
- **MacPorts** (not covered in these slides)
  - https://www.macports.org
- **Fink** (not covered in these slides)
  - https://www.finkproject.org

TUDelft 3Dgeoinfo

Software required
Software install
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Software installation order

1) **Install Java** (if not yet installed)
   - Required, installation procedure not covered in these slides
   - https://www.java.com/en/download/help/mac_install.html

2) **Install PostgreSQL** (different ways available)
   - Install **PostGIS** (generally installed together with PostgreSQL, see next slides)
   - Install **pgAdmin** (generally installed together with PostgreSQL, see next slides)

3) **Install the 3DCityDB Suite**
   - Execute the Java **.jar file**, it will automatically start the installation process

4) **Install Google Earth**
   - Optional, installation procedure not covered in these slides

5) **Install NodeJS**
   - Optional, installation procedure not covered in these slides

Software required

Software install

- Java
- **PostgreSQL**
- pgAdmin/PostGIS
- 3DCityDB

Database setup

Imp/Exp connection

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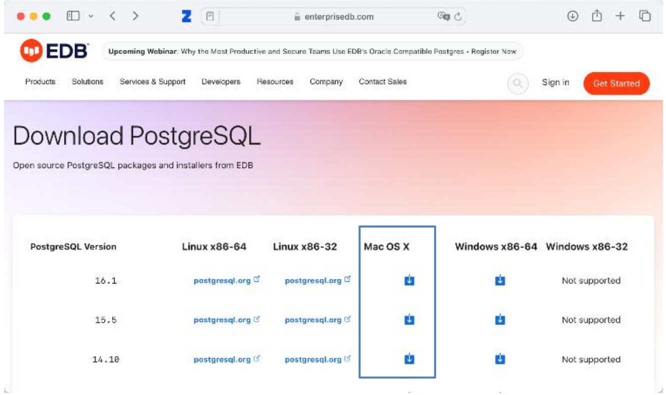
Further resources

PostgreSQL via EDB

- **RECOMMENDED:** Install PostgreSQL using the automatic installer delivered by the Enterprise DB installer



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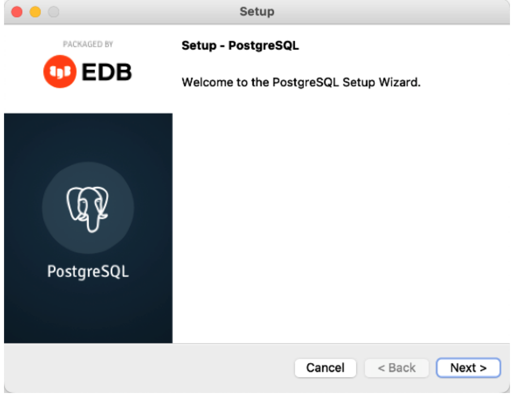
Download PostgreSQL

Open source PostgreSQL packages and installers from EDB

PostgreSQL Version	Linux x86-64	Linux x86-32	Mac OS X	Windows x86-64	Windows x86-32
16.1	postgresql.org	postgresql.org	⬇	⬇	Not supported
15.5	postgresql.org	postgresql.org	⬇	⬇	Not supported
14.10	postgresql.org	postgresql.org	⬇	⬇	Not supported

EDB download website



Setup - PostgreSQL

Welcome to the PostgreSQL Setup Wizard.

EDB Installer first window

- Please take care to:
  - Properly set a **password** for your ***postgres* user**. The *postgres* user is the administrator of the PostgreSQL database cluster. Do not lose the password!
  - You can generally set the default ***port*** of PostgreSQL to **5432**.

Software required

Software install

- Java
- **PostgreSQL**
- pgAdmin/PostGIS
- 3DCityDB

Database setup

Imp/Exp connection

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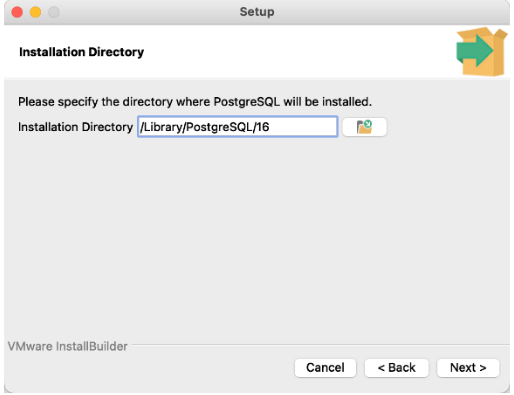
Further resources

PostgreSQL via EDB



Setup

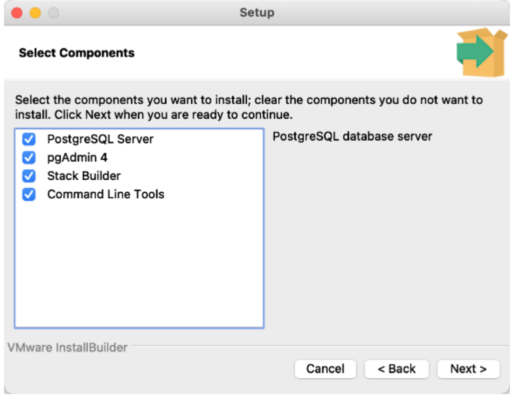
Installation Directory

Please specify the directory where PostgreSQL will be installed.

Installation Directory /Library/PostgreSQL/16

VMware InstallBuilder

Installation directory



Setup

Select Components

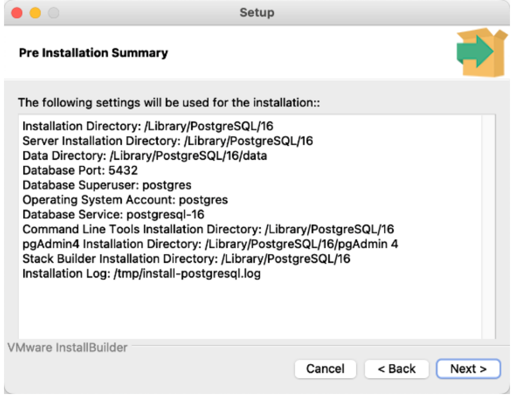
Select the components you want to install; clear the components you do not want to install. Click Next when you are ready to continue.

- ☑ PostgreSQL Server
- ☑ pgAdmin 4
- ☑ Stack Builder
- ☑ Command Line Tools

PostgreSQL database server

VMware InstallBuilder

Select components



Setup

Pre Installation Summary

The following settings will be used for the installation::

```
Installation Directory: /Library/PostgreSQL/16
Server Installation Directory: /Library/PostgreSQL/16
Data Directory: /Library/PostgreSQL/16/data
Database Port: 5432
Database Superuser: postgres
Operating System Account: postgres
Database Service: postgresql-16
Command Line Tools Installation Directory: /Library/PostgreSQL/16
pgAdmin4 Installation Directory: /Library/PostgreSQL/16/pgAdmin 4
Stack Builder Installation Directory: /Library/PostgreSQL/16
Installation Log: /tmp/install-postgresql.log
```

VMware InstallBuilder

Pre-installation summary

Stack Builder allows you to install also PostGIS and pgAdmin 4. Simply check that they are selected!

This is the window with the pre-installation summary details

PostgreSQL via EDB

Software required

Software install

- Java
- PostgreSQL
- **pgAdmin/PostGIS**
- 3DCityDB

Database setup

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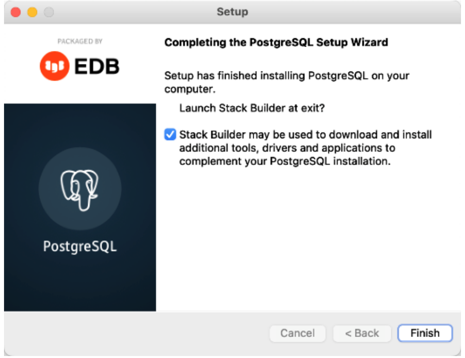
Further resources



Setup

PACKAGED BY EDB

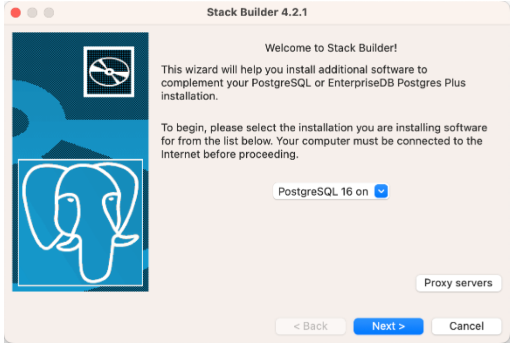
Completing the PostgreSQL Setup Wizard

Setup has finished installing PostgreSQL on your computer.

Launch Stack Builder at exit?

☑ Stack Builder may be used to download and install additional tools, drivers and applications to complement your PostgreSQL installation.

PostgreSQL final setup



Stack Builder 4.2.1

Welcome to Stack Builder!

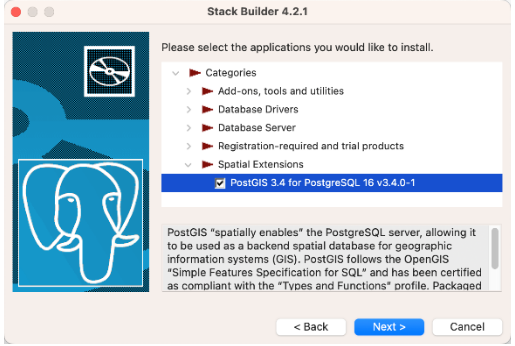
This wizard will help you install additional software to complement your PostgreSQL or EnterpriseDB Postgres Plus installation.

To begin, please select the installation you are installing software for from the list below. Your computer must be connected to the Internet before proceeding.

PostgreSQL 16 on

Stack Builder

This window shows which PostgreSQL version will be used to install the additional components



Stack Builder 4.2.1

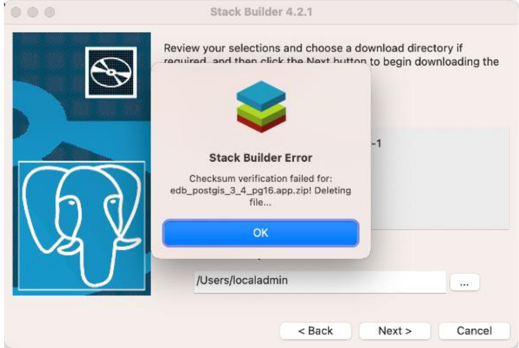
Please select the applications you would like to install.

- Categories
  - Add-ons, tools and utilities
  - Database Drivers
  - Database Server
  - Registration-required and trial products
  - Spatial Extensions
    - ☑ PostGIS 3.4 for PostgreSQL 16 v3.4.0-1

PostGIS "spatially enables" the PostgreSQL server, allowing it to be used as a backend spatial database for geographic information systems (GIS). PostGIS follows the OpenGIS "Simple Features Specification for SQL" and has been certified as compliant with the "Types and Functions" profile. Packaged

PostGIS Selection

In the Spatial Extensions you will find the PostGIS version available for the installed PostgreSQL



Stack Builder 4.2.1

Review your selections and choose a download directory if required, and then click the Next button to begin downloading the

Stack Builder Error

Checksum verification failed for: edb_postgis_3_4_pg16.app.zip! Deleting file...

/Users/localadmin

In some rare circumstances, the PostGIS installation fails. In this case, install it manually (see link to PostGIS in the previous slides).

TUDelft 3Dgeoinfo

PostgreSQL via Postgres.app

Postgres.app is a full-featured PostgreSQL installation packaged as a standard Mac app. It includes everything you need to get started, including the **PostGIS** extension

Software required

Software install

- Java
- **PostgreSQL**
- pgAdmin/**PostGIS**
- 3DCityDB

Database setup

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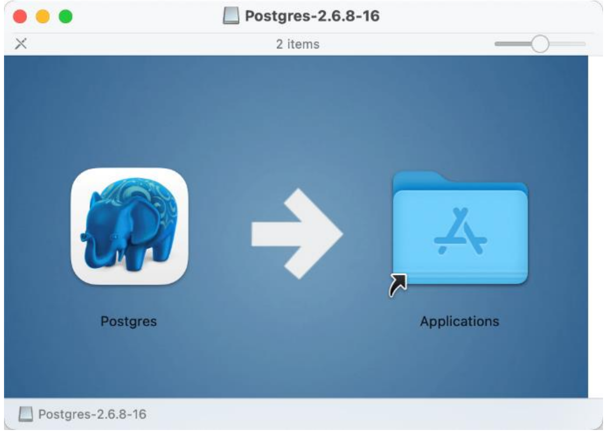
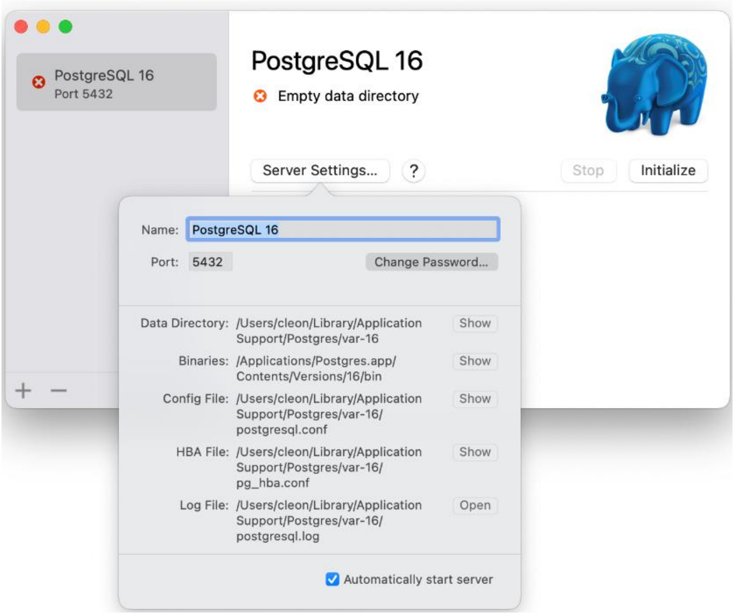
Further resources



Software installation, just drag and drop it to the Applications folder



PostgreSQL 16

Empty data directory

Name: PostgreSQL 16

Port: 5432

Change Password...

Data Directory: /Users/cleon/Library/Application Support/Postgres/var-16 Show

Binaries: /Applications/Postgres.app/Contents/Versions/16/bin Show

Config File: /Users/cleon/Library/Application Support/Postgres/var-16/postgresql.conf Show

HBA File: /Users/cleon/Library/Application Support/Postgres/var-16/pg_hba.conf Show

Log File: /Users/cleon/Library/Application Support/Postgres/var-16/postgresql.log Open

☑ Automatically start server

Once the app is open, you can check the server configuration

PostgreSQL via Postgres.app

Software required

Software install

- Java
- **PostgreSQL**
- pgAdmin/**PostGIS**
- 3DCityDB

Database setup

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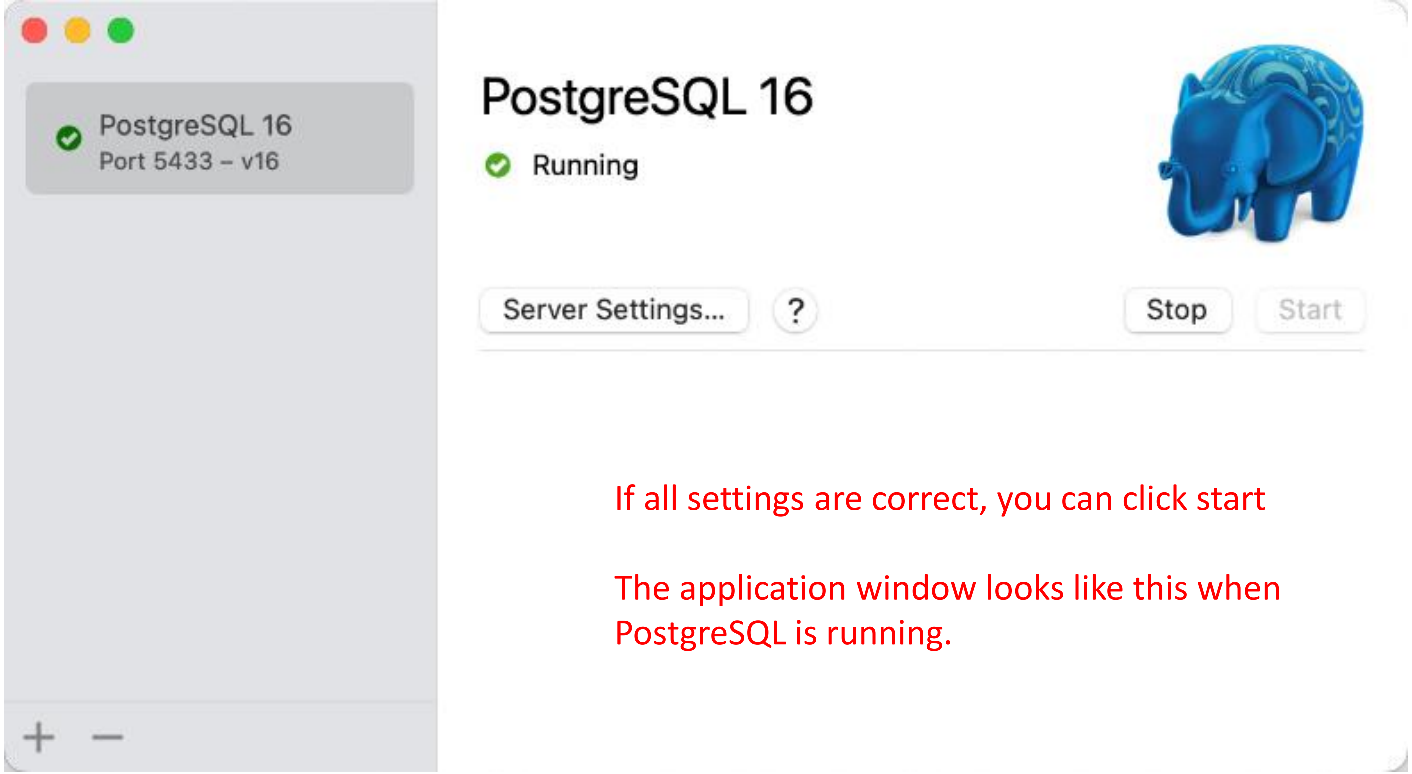
Further resources



If all settings are correct, you can click start

The application window looks like this when PostgreSQL is running.

PostgreSQL via Postgres.app

Software required

Software install

- Java
- **PostgreSQL**
- pgAdmin/**PostGIS**
- 3DCityDB

Database setup

Imp/Exp connection

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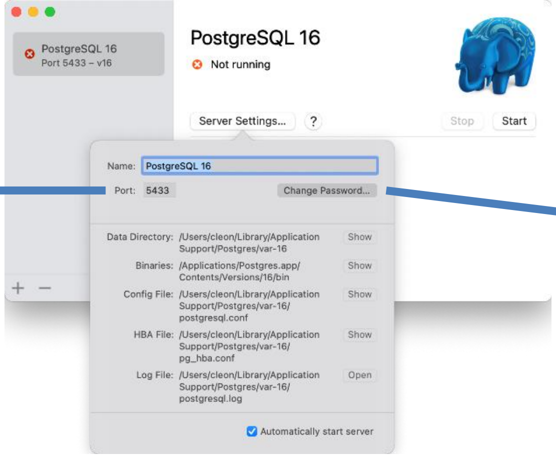
Further resources

When the server is not running, you can open and edit the settings. For example, you can change the port, or change the password of any PostgreSQL user.

If required, change the port



Name: PostgreSQL 16

Port: 5433

Data Directory: /Users/cleon/Library/Application Support/Postgres/var-16

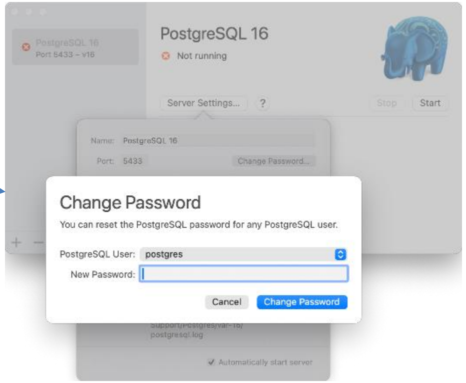
Binaries: /Applications/Postgres.app/Contents/Versions/16/bin

Config File: /Users/cleon/Library/Application Support/Postgres/var-16/postgresql.conf

HBA File: /Users/cleon/Library/Application Support/Postgres/var-16/pg_hba.conf

Log File: /Users/cleon/Library/Application Support/Postgres/var-16/postgresql.log

☑ Automatically start server



Change Password

You can reset the PostgreSQL password for any PostgreSQL user.

PostgreSQL User: postgres

New Password:

Change password for any existing users

BEWARE: As per default installation, **user "postgres"** is the database administrator but has **no password** (!!)

We highly recommend you to change it and set a proper password!

Software required

Software install

- Java
- **PostgreSQL**
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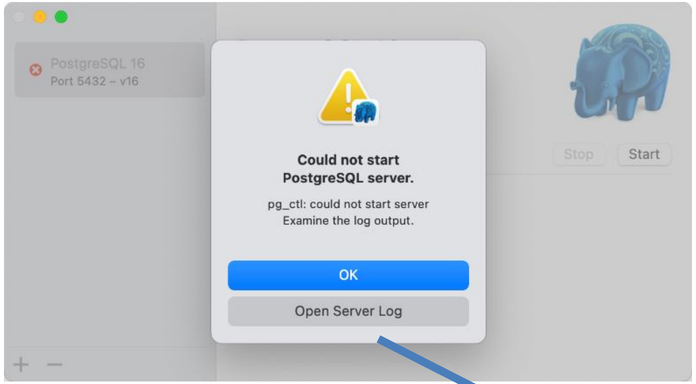
PostgreSQL via Postgres.app

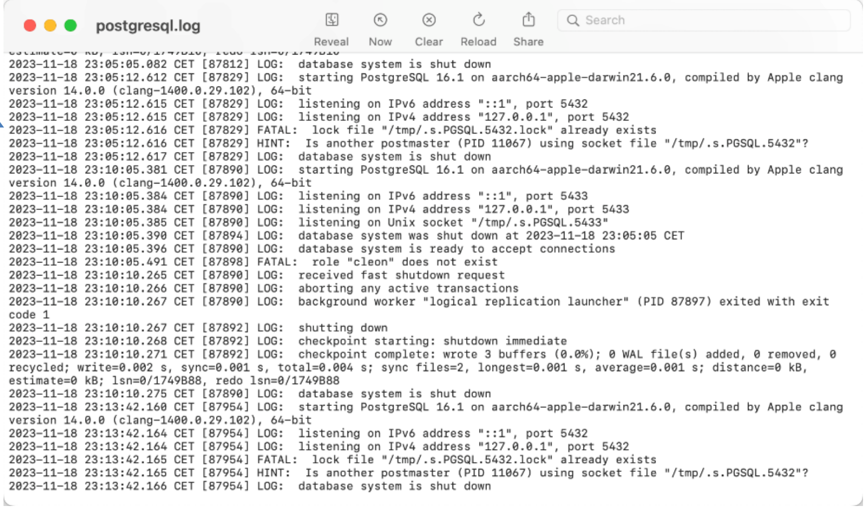


Could not start PostgreSQL server.

pg_ctl: could not start server
Examine the log output.

If something goes wrong when starting PostgreSQL, then an error windows will be opened.

By opening the server log you can find out what the reason of the problem is.



```
2023-11-18 23:05:05.082 CET [87812] LOG:  database system is shut down
2023-11-18 23:05:12.612 CET [87829] LOG:  starting PostgreSQL 16.1 on aarch64-apple-darwin21.6.0, compiled by Apple clang
version 14.0.0 (clang-1400.0.29.102), 64-bit
2023-11-18 23:05:12.615 CET [87829] LOG:  listening on IPv6 address "::1", port 5432
2023-11-18 23:05:12.615 CET [87829] LOG:  listening on IPv4 address "127.0.0.1", port 5432
2023-11-18 23:05:12.616 CET [87829] FATAL:  lock file "/tmp/.s.PGSQL.5432.lock" already exists
2023-11-18 23:05:12.616 CET [87829] HINT:  Is another postmaster (PID 11067) using socket file "/tmp/.s.PGSQL.5432"?
2023-11-18 23:05:12.617 CET [87829] LOG:  database system is shut down
2023-11-18 23:10:05.381 CET [87890] LOG:  starting PostgreSQL 16.1 on aarch64-apple-darwin21.6.0, compiled by Apple clang
version 14.0.0 (clang-1400.0.29.102), 64-bit
2023-11-18 23:10:05.384 CET [87890] LOG:  listening on IPv6 address "::1", port 5433
2023-11-18 23:10:05.384 CET [87890] LOG:  listening on IPv4 address "127.0.0.1", port 5433
2023-11-18 23:10:05.385 CET [87890] LOG:  listening on Unix socket "/tmp/.s.PGSQL.5433"
2023-11-18 23:10:05.390 CET [87894] LOG:  database system was shut down at 2023-11-18 23:05:05 CET
2023-11-18 23:10:05.396 CET [87890] LOG:  database system is ready to accept connections
2023-11-18 23:10:05.491 CET [87898] FATAL:  role "cleon" does not exist
2023-11-18 23:10:10.265 CET [87890] LOG:  received fast shutdown request
2023-11-18 23:10:10.266 CET [87890] LOG:  aborting any active transactions
2023-11-18 23:10:10.267 CET [87890] LOG:  background worker "logical replication launcher" (PID 87897) exited with exit
code 1
2023-11-18 23:10:10.267 CET [87892] LOG:  shutting down
2023-11-18 23:10:10.268 CET [87892] LOG:  checkpoint starting: shutdown immediate
2023-11-18 23:10:10.271 CET [87892] LOG:  checkpoint complete: wrote 3 buffers (0.0%); 0 WAL file(s) added, 0 removed, 0
recycled; write=0.002 s, sync=0.001 s, total=0.004 s; sync files=2, longest=0.001 s, average=0.001 s; distance=0 kB,
estimate=0 kB; lsn=0/1749B88, redo lsn=0/1749B88
2023-11-18 23:10:10.275 CET [87890] LOG:  database system is shut down
2023-11-18 23:13:42.160 CET [87954] LOG:  starting PostgreSQL 16.1 on aarch64-apple-darwin21.6.0, compiled by Apple clang
version 14.0.0 (clang-1400.0.29.102), 64-bit
2023-11-18 23:13:42.164 CET [87954] LOG:  listening on IPv6 address "::1", port 5432
2023-11-18 23:13:42.164 CET [87954] LOG:  listening on IPv4 address "127.0.0.1", port 5432
2023-11-18 23:13:42.165 CET [87954] FATAL:  lock file "/tmp/.s.PGSQL.5432.lock" already exists
2023-11-18 23:13:42.165 CET [87954] HINT:  Is another postmaster (PID 11067) using socket file "/tmp/.s.PGSQL.5432"?
2023-11-18 23:13:42.166 CET [87954] LOG:  database system is shut down
```

For example:
Here, port 5432 is locked, i.e. already used by another application. If this is the case, you can choose another port and set it (see example in previous slide)

Software required

Software install

- Java
- **PostgreSQL**
- pgAdmin/**PostGIS**
- 3DCityDB

Database setup

Imp/Exp connection

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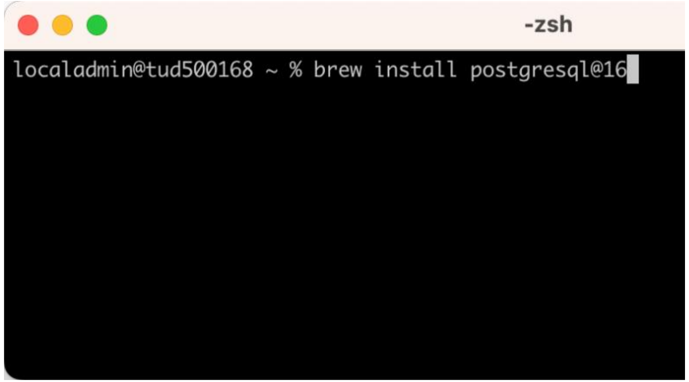
ADE plug-ins

Further resources

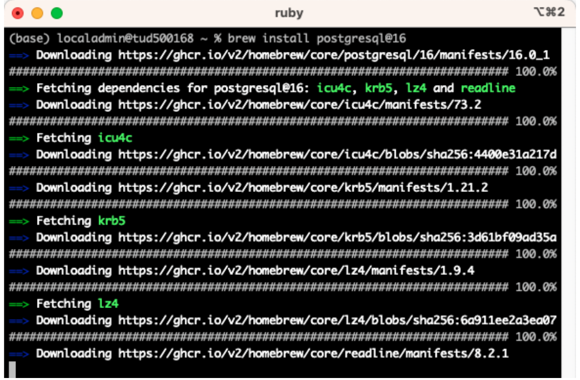
PostgreSQL via Homebrew

- **Homebrew** is a free and open-source software package management system that simplifies the installation of software on macOS
- Before you start, make sure Homebrew is (installed and) up to date:
  - **brew update**
  - **brew doctor**
- Homebrew takes care to install the required packages for their formulae
- Install command:
  - **brew install postgresql@16** → Change **@xx** to the desired version



```
localadmin@tud500168 ~ % brew install postgresql@16
```

Homebrew PostgreSQL install command



```
(base) localadmin@tud500168 ~ % brew install postgresql@16
==> Downloading https://ghcr.io/v2/homebrew/core/postgresql/16/manifests/16.0_1
######################################################################### 100.0%
==> Fetching dependencies for postgresql@16: icu4c, krb5, lz4 and readline
==> Downloading https://ghcr.io/v2/homebrew/core/icu4c/manifests/73.2
######################################################################### 100.0%
==> Fetching icu4c
==> Downloading https://ghcr.io/v2/homebrew/core/icu4c/blobs/sha256:4400e31a217d
######################################################################### 100.0%
==> Downloading https://ghcr.io/v2/homebrew/core/krb5/manifests/1.21.2
######################################################################### 100.0%
==> Fetching krb5
==> Downloading https://ghcr.io/v2/homebrew/core/krb5/blobs/sha256:3d61bf09ad35a
######################################################################### 100.0%
==> Downloading https://ghcr.io/v2/homebrew/core/lz4/manifests/1.9.4
######################################################################### 100.0%
==> Fetching lz4
==> Downloading https://ghcr.io/v2/homebrew/core/lz4/blobs/sha256:6a911ee2a3ea07
######################################################################### 100.0%
==> Downloading https://ghcr.io/v2/homebrew/core/readline/manifests/8.2.1
```

Homebrew PostgreSQL installation process

Software required

Software install

- Java
- **PostgreSQL**
- pgAdmin/PostGIS
- 3DCityDB

Database setup

Imp/Exp connection

Additional schemas

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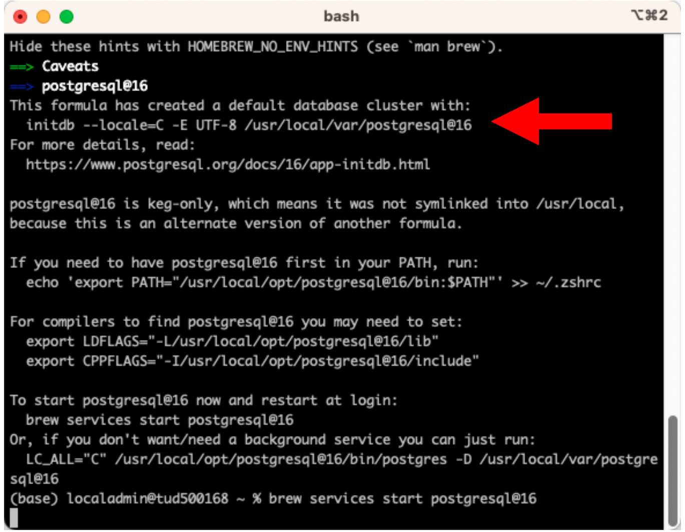
Further resources

PostgreSQL via Homebrew



```
Hide these hints with HOMEBREW_NO_ENV_HINTS (see `man brew`).
==> Caveats
==> postgresql@16
This formula has created a default database cluster with:
  initdb --locale=C -E UTF-8 /usr/local/var/postgresql@16
For more details, read:
  https://www.postgresql.org/docs/16/app-initdb.html

postgresql@16 is keg-only, which means it was not symlinked into /usr/local,
because this is an alternate version of another formula.

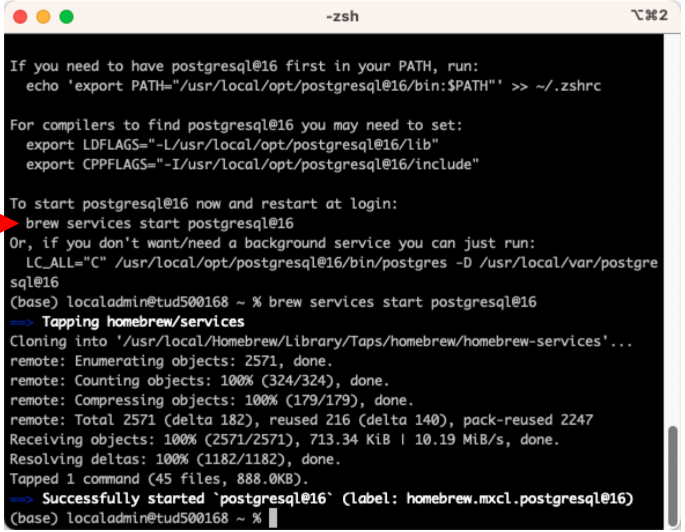
If you need to have postgresql@16 first in your PATH, run:
  echo 'export PATH="/usr/local/opt/postgresql@16/bin:$PATH"' >> ~/.zshrc

For compilers to find postgresql@16 you may need to set:
  export LDFLAGS="-L/usr/local/opt/postgresql@16/lib"
  export CPPFLAGS="-I/usr/local/opt/postgresql@16/include"

To start postgresql@16 now and restart at login:
  brew services start postgresql@16
Or, if you don't want/need a background service you can just run:
  LC_ALL="C" /usr/local/opt/postgresql@16/bin/postgres -D /usr/local/var/postgre
sql@16
(base) localadmin@tud500168 ~ % brew services start postgresql@16
```

PostgreSQL installation complete

Installation shows the database data location



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  LC_ALL="C" /usr/local/opt/postgresql@16/bin/postgres -D /usr/local/var/postgre
sql@16
(base) localadmin@tud500168 ~ % brew services start postgresql@16
==> Tapping homebrew/services
Cloning into '/usr/local/Homebrew/Library/Taps/homebrew/homebrew-services'...
remote: Enumerating objects: 2571, done.
remote: Counting objects: 100% (324/324), done.
remote: Compressing objects: 100% (179/179), done.
remote: Total 2571 (delta 182), reused 216 (delta 140), pack-reused 2247
Receiving objects: 100% (2571/2571), 713.34 KiB | 10.19 MiB/s, done.
Resolving deltas: 100% (1182/1182), done.
Tapped 1 command (45 files, 888.0KB).
==> Successfully started `postgresql@16` (label: homebrew.mxcl.postgresql@16)
(base) localadmin@tud500168 ~ %
```

Post install

To start the PostgreSQL server

brew services start postgresql@16

PostgreSQL via Homebrew

Software required

Software install

- Java
- **PostgreSQL**
- pgAdmin/PostGIS
- 3DCityDB

Database setup

Imp/Exp connection

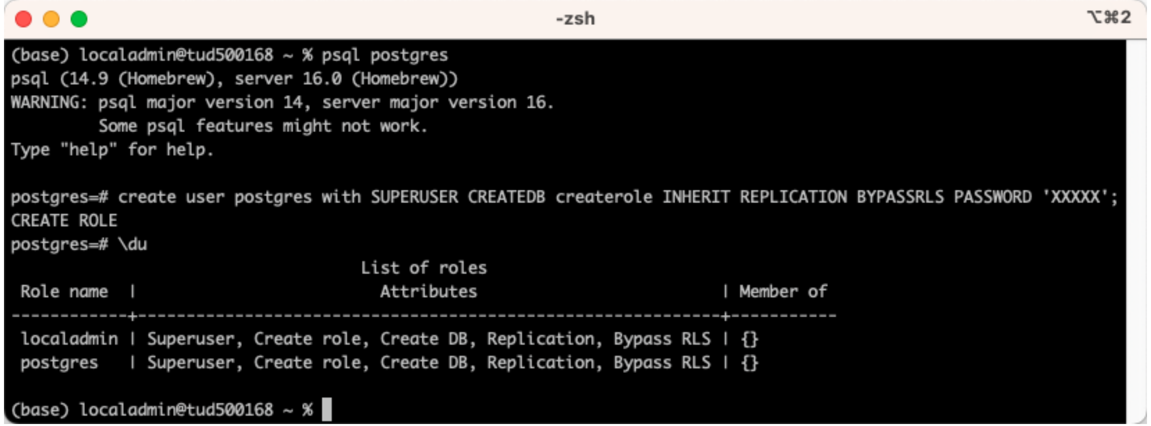
Additional schemas

ADE plug-ins

Further resources

- By default, Homebrew will create only **one** database user, i.e. the same as the **macOS user name** used when running the script
  - This database user has **no password**, and it has administrator privileges
    - In our example we use the user localadmin
- To create a new database user (e.g. postgres):
  - Run **psql postgres** with the same macOS user
  - Create user postgres with this SQL command

    SUPERUSER CREATEDB CREATE ROLE INHERIT REPLICATION BYPASSRLS PASSWORD '***’;
  - Replace *** with the desire password



```
(base) localadmin@tud500168 ~ % psql postgres
psql (14.9 (Homebrew), server 16.0 (Homebrew))
WARNING: psql major version 14, server major version 16.
         Some psql features might not work.
Type "help" for help.

postgres=# create user postgres with SUPERUSER CREATEDB createrole INHERIT REPLICATION BYPASSRLS PASSWORD 'XXXXX';
CREATE ROLE
postgres=# \du
                                   List of roles
 Role name |                         Attributes                         | Member of
-----------+------------------------------------------------------------+-----------
 localadmin | Superuser, Create role, Create DB, Replication, Bypass RLS | {}
 postgres   | Superuser, Create role, Create DB, Replication, Bypass RLS | {}

(base) localadmin@tud500168 ~ %
```

Software required

Software install

- Java
- PostgreSQL
- pgAdmin/**PostGIS**
- 3DCityDB

Database setup

Imp/Exp connection

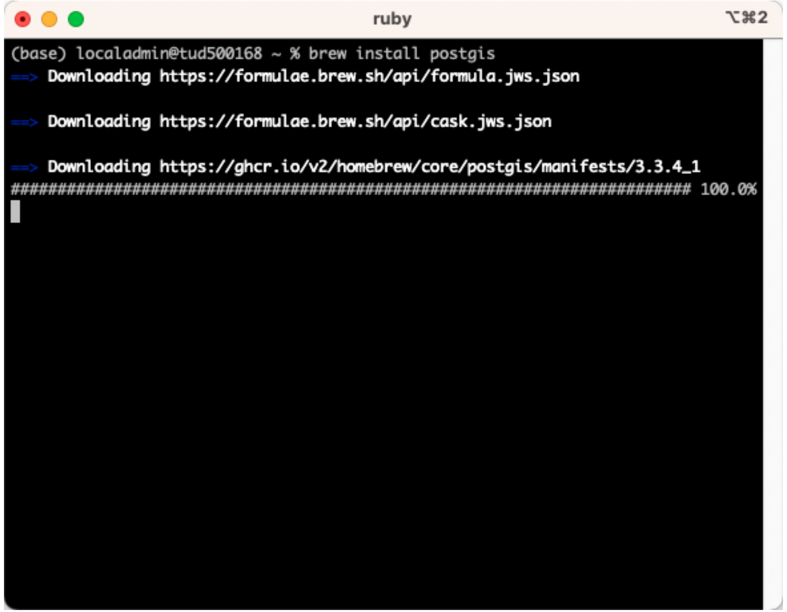
Additional schemas

ADE plug-ins

Further resources

PostGIS via Homebrew

- To install PostGIS via Homebrew, simply run
  - **brew install postgis**

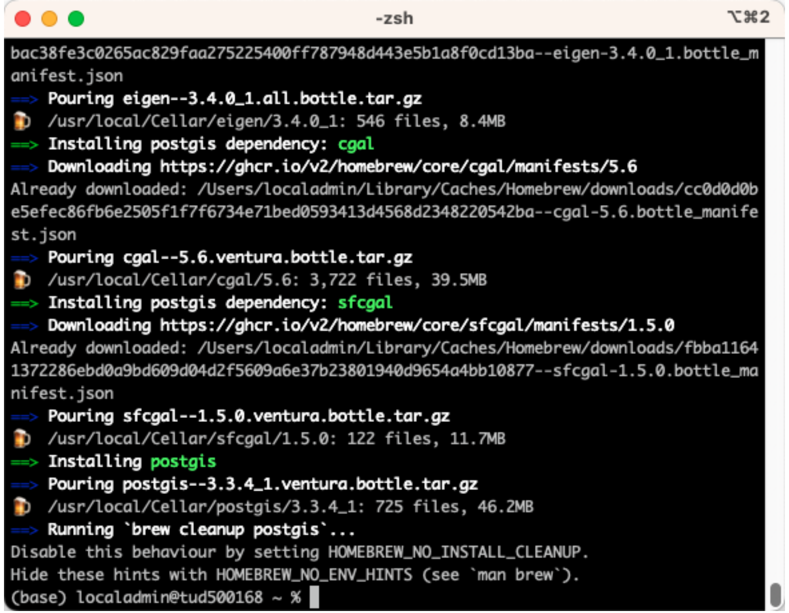


```
(base) localadmin@tud500168 ~ % brew install postgis
==> Downloading https://formulae.brew.sh/api/formula.jws.json

==> Downloading https://formulae.brew.sh/api/cask.jws.json

==> Downloading https://ghcr.io/v2/homebrew/core/postgis/manifests/3.3.4_1
######################################################################## 100.0%
```

Homebrew PostGIS installation started



```
bac38fe3c0265ac829faa275225400ff787948d443e5b1a8f0cd13ba--eigen-3.4.0_1.bottle_m
anifest.json
==> Pouring eigen--3.4.0_1.all.bottle.tar.gz
🍺  /usr/local/Cellar/eigen/3.4.0_1: 546 files, 8.4MB
==> Installing postgis dependency: cgal
==> Downloading https://ghcr.io/v2/homebrew/core/cgal/manifests/5.6
Already downloaded: /Users/localadmin/Library/Caches/Homebrew/downloads/cc0d0d0b
e5efec86fb6e2505f1f7f6734e71bed0593413d4568d2348220542ba--cgal-5.6.bottle_manife
st.json
==> Pouring cgal--5.6.ventura.bottle.tar.gz
🍺  /usr/local/Cellar/cgal/5.6: 3,722 files, 39.5MB
==> Installing postgis dependency: sfcgal
==> Downloading https://ghcr.io/v2/homebrew/core/sfcgal/manifests/1.5.0
Already downloaded: /Users/localadmin/Library/Caches/Homebrew/downloads/fbba1164
1372286ebd0a9bd609d04d2f5609a6e37b23801940d9654a4bb10877--sfcgal-1.5.0.bottle_ma
nifest.json
==> Pouring sfcgal--1.5.0.ventura.bottle.tar.gz
🍺  /usr/local/Cellar/sfcgal/1.5.0: 122 files, 11.7MB
==> Installing postgis
==> Pouring postgis--3.3.4_1.ventura.bottle.tar.gz
🍺  /usr/local/Cellar/postgis/3.3.4_1: 725 files, 46.2MB
==> Running `brew cleanup postgis`...
Disable this behaviour by setting HOMEBREW_NO_INSTALL_CLEANUP.
Hide these hints with HOMEBREW_NO_ENV_HINTS (see `man brew`).
(base) localadmin@tud500168 ~ %
```

Homebrew PostGIS installation completed

pgAdmin via Homebrew

- To install pgAdmin via Homebrew, simply run
  - **brew install --cask pgadmin4**
- The procedure is essentially similar to the one shown before for PostGIS and PostgreSQL
  - More details: https://formulae.brew.sh/cask/pgadmin4#default

Software required

Software install

- Java
- PostgreSQL
- pgAdmin/PostGIS
- **3DCityDB**

Database setup

Imp/Exp connection

Additional schemas

ADE plug-ins

Further resources

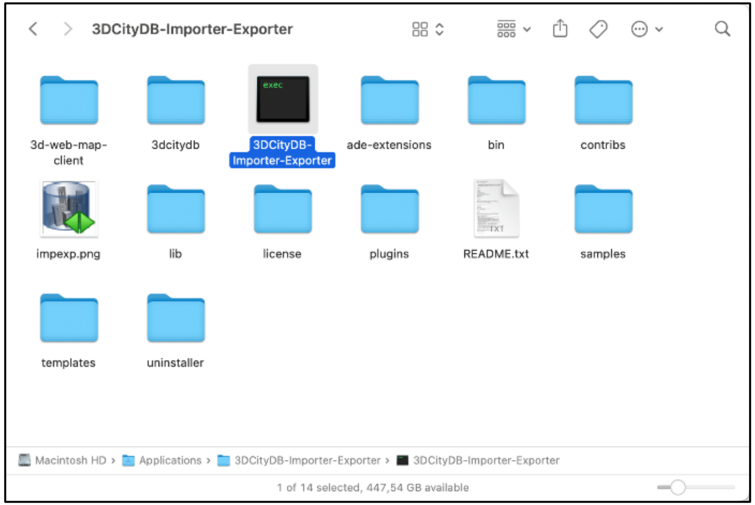
3DCityDB

NOTA BENE: The detailed installation guide can be found here:

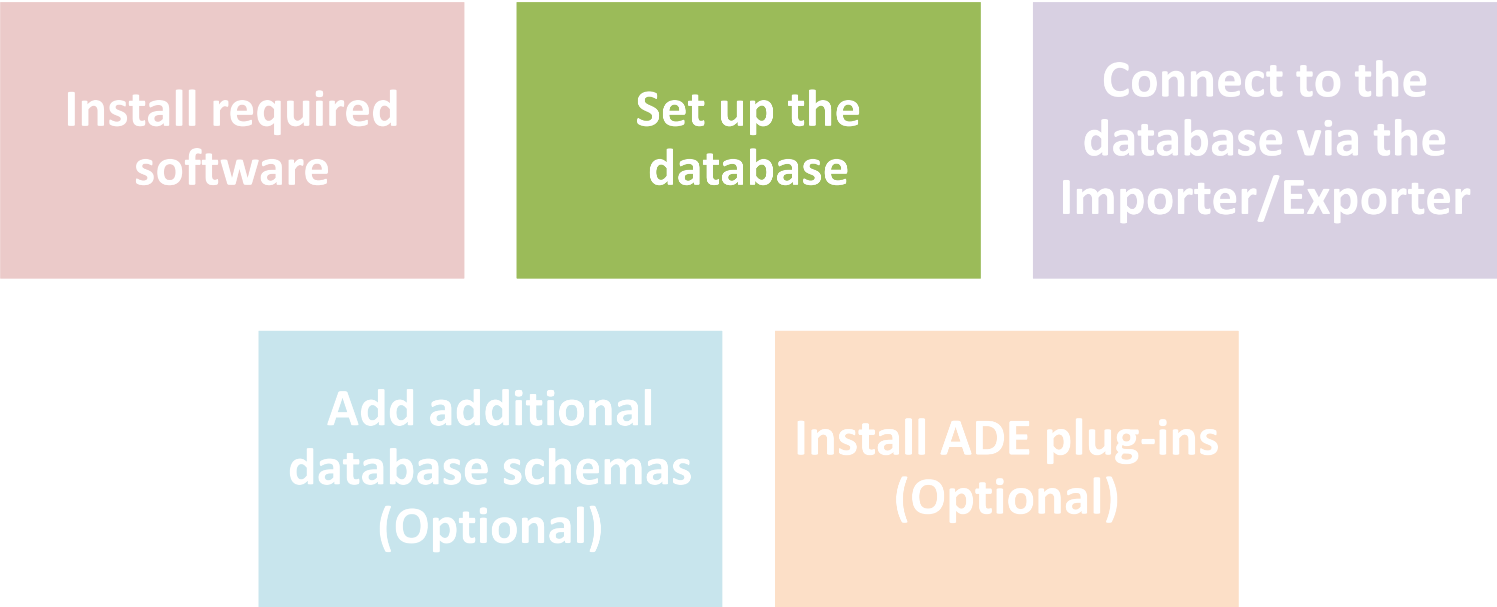
https://3dcitydb-docs.readthedocs.io/en/latest/

In the following slides, only the main points are presented

1) Install the **3D City Database Suite**
   - The default folder is /Applications/3DCityDB-Importer-Exporter
   - Alternatively, you can install the 3DCityDB in any other directory where you have writing privileges
2) Launch the Importer/Exporter just to test whether it starts correctly


3DCityDB-Importer-Exporter
3d-web-map-client
3dcitydb
exec
3DCityDB-Importer-Exporter
ade-extensions
bin
contribs
impexp.png
lib
license
plugins
README.txt
samples
templates
uninstaller
Macintosh HD › Applications › 3DCityDB-Importer-Exporter › 3DCityDB-Importer-Exporter
1 of 14 selected, 447,54 GB available

Overview



Install required software

Set up the database

Connect to the database via the Importer/Exporter

Add additional database schemas (Optional)

Install ADE plug-ins (Optional)

Database setup

Procedure overview

1) In PostgreSQL (e.g. via the pgAdmin GUI)
   - Connect to the PostgreSQL server
   - Create a new empty database that will contain your 3D city model data
   - Add the extensions for PostGIS, PostGIS-raster, etc. to the empty database
   - See the next slides for details

2) From the 3DCityDB installation folder
   - Authorise the execution of the shell files using the following command from the command prompt:
     - **chmod u+x CREATE_DB.sh**
   - Edit the **CONNECTION_DETAILS.sh** file and run the **CREATE_DB.sh** script to create the tables (and other objects) in the empty database you have created in the previous step
   - See the next slides for details

3) Connect to the database (e.g. via pgAdmin) just to check that you created the tables

4) Connect to the database from the 3DCityDB Importer/Exporter

Software required
Software install
Database setup
- **Database connection**
- Database creation
- Create tables etc.
- Check via pgAdmin

Imp/Exp connection
Additional schemas
ADE plug-ins
Further resources

Connecting to the database

- AFTER you have successfully installed PostgreSQL, you can access the database server via pgAdmin

ALTERNATIVELY

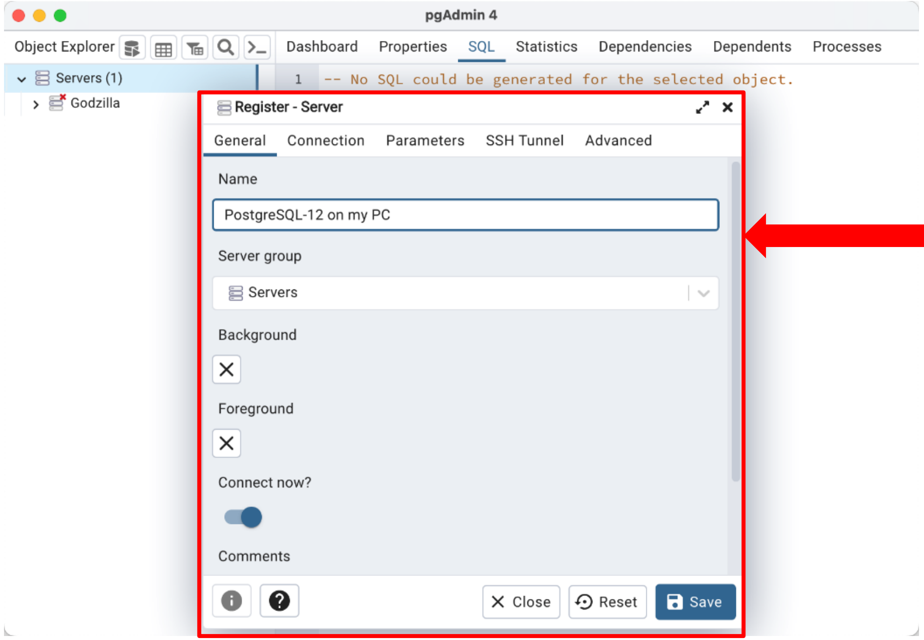
- You do not have PostgreSQL installed on your own computer, but you know the connection parameters to connect to a remote server

- **In both cases**, you will need information about:

– **Server name** or **IP address**	("localhost" if it is on your own computer)
– **Database name**	(generally "postgres" if it is on your own computer)
– **Port**	(generally 5432 if it is on your own computer)
– **Username, Password**	(e.g. the ones created before, see previous slides)

Connecting to the database from pgAdmin

- Create a (link to the) database server
  - You are actually creating a connection to the database server from pgAdmin
  - Click on menu Object\Create\Server **OR** right mouse-click\Create\Server and fill out the fields
  - **Please note**: this step may not be required if you already have a server connection established



```
1  -- No SQL could be generated for the selected object.
```

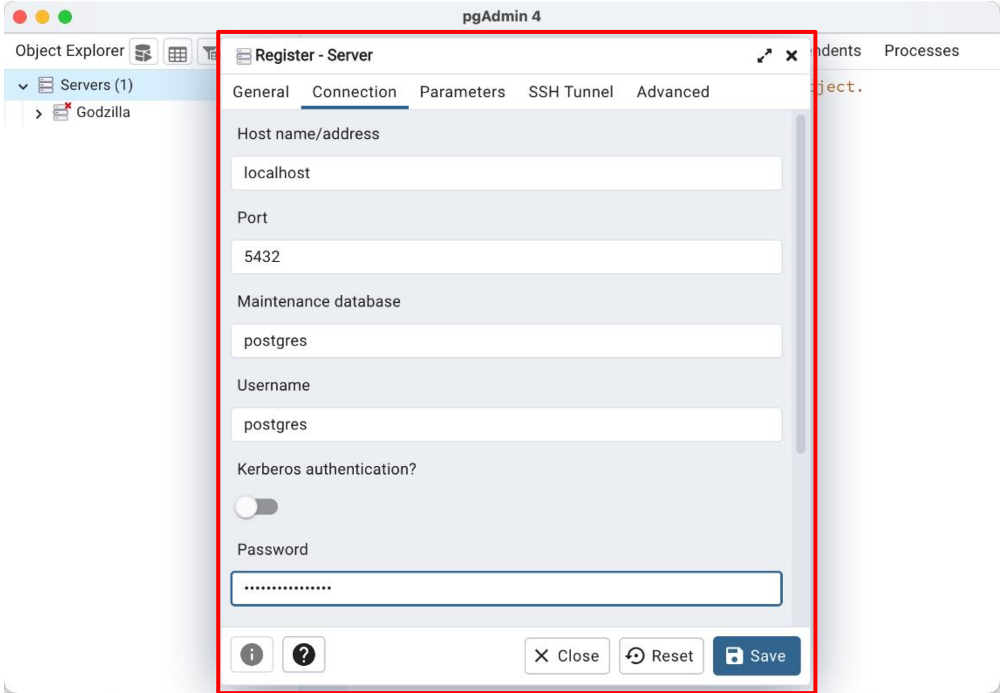
Name: PostgreSQL-12 on my PC

In the "General" tab, you simply add a name to identify your connection

Here, FOR EXAMPLE, the string is "PostgreSQL-12 on my PC"

Connecting to the database from pgAdmin

- Create a (link to the) database server
  - You are actually creating a connection to the database server from pgAdmin
  - Click on menu Object\Create\Server **OR** right mouse-click\Create\Server and fill out the fields
  - **Please note:** this step may not be required if you already have a server connection established



Register - Server

General | Connection | Parameters | SSH Tunnel | Advanced

Host name/address: localhost

Port: 5432

Maintenance database: postgres

Username: postgres

Kerberos authentication? ○

Password: ••••••••••••••••

In the "Connection" tab, you add the connection parameters

- Host name / IP address
- Port
- Database name
- Username
- Password

Software required
Software install
Database setup
- **Database connection**
- Database creation
- Create tables etc.
- Check via pgAdmin

Imp/Exp connection
Additional schemas
ADE plug-ins
Further resources

Software required
Software install
Database setup
- Database connection
- **Database creation**
- Create tables etc.
- Check via pgAdmin

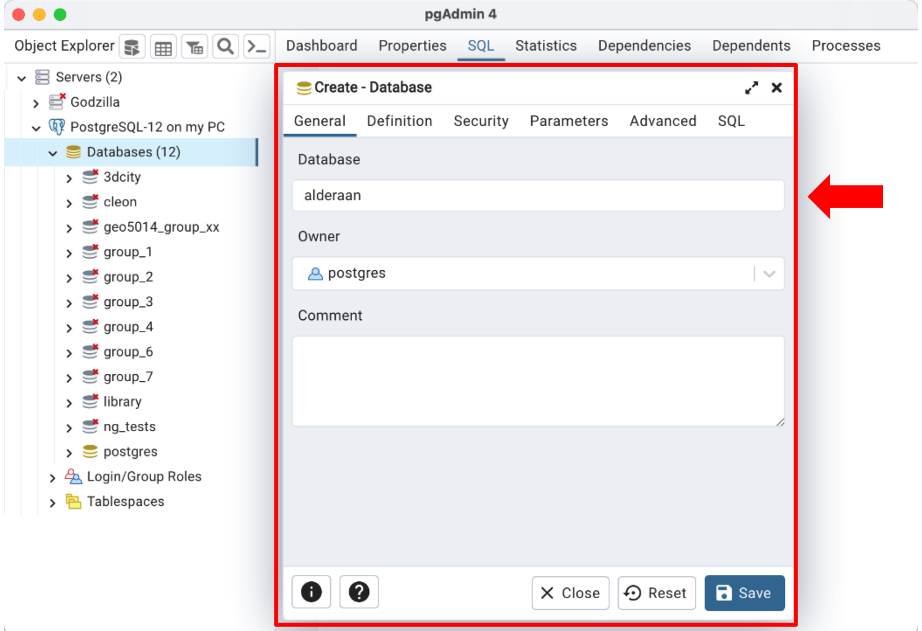
Imp/Exp connection
Additional schemas
ADE plug-ins
Further resources

Database creation

- Once you have created a connection, you must create the database that will contain your city model data
  - Click on menu Object\Create\Database **OR** right mouse-click\Create\Database and fill out the fields
  - Choose the name you want, ideally the name of the city

Here, **for example,** it is "alderaan", but you can choose any name you want

Best if you use only small letters!



Database: alderaan

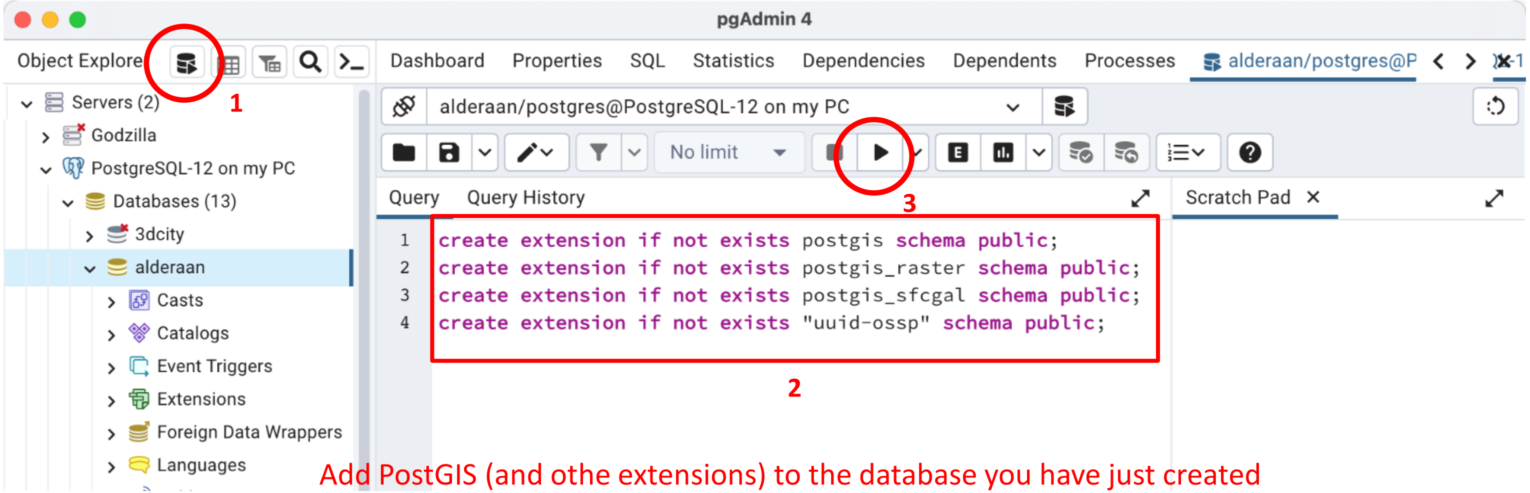
Owner: postgres

Comment:

Database creation

Software required
Software install
Database setup
- Database connection
- **Database creation**
- Create tables etc.
- Check via pgAdmin

Imp/Exp connection
Additional schemas
ADE plug-ins
Further resources



```
create extension if not exists postgis schema public;
create extension if not exists postgis_raster schema public;
create extension if not exists postgis_sfcgal schema public;
create extension if not exists "uuid-ossp" schema public;
```

Add PostGIS (and othe extensions) to the database you have just created

1) Open a SQL query window
2) Copy and paste the text written in the yellow box into the query window
3) Run the query

```
CREATE EXTENSION IF NOT EXISTS postgis SCHEMA public;
CREATE EXTENSION IF NOT EXISTS postgis_raster SCHEMA public;
CREATE EXTENSION IF NOT EXISTS postgis_sfcgal SCHEMA public; -- optional, but good to have
CREATE EXTENSION IF NOT EXISTS "uuid-ossp" SCHEMA public; -- optional, but good to have
```

Database creation

- Check that you have correctly installed the extensions in your database
  - Open "Extensions" item in your database (e.g. "alderaan")
  - Check that the extensions are listed there (the "plpgsql" one is installed by default)

Software required

Software install

Database setup

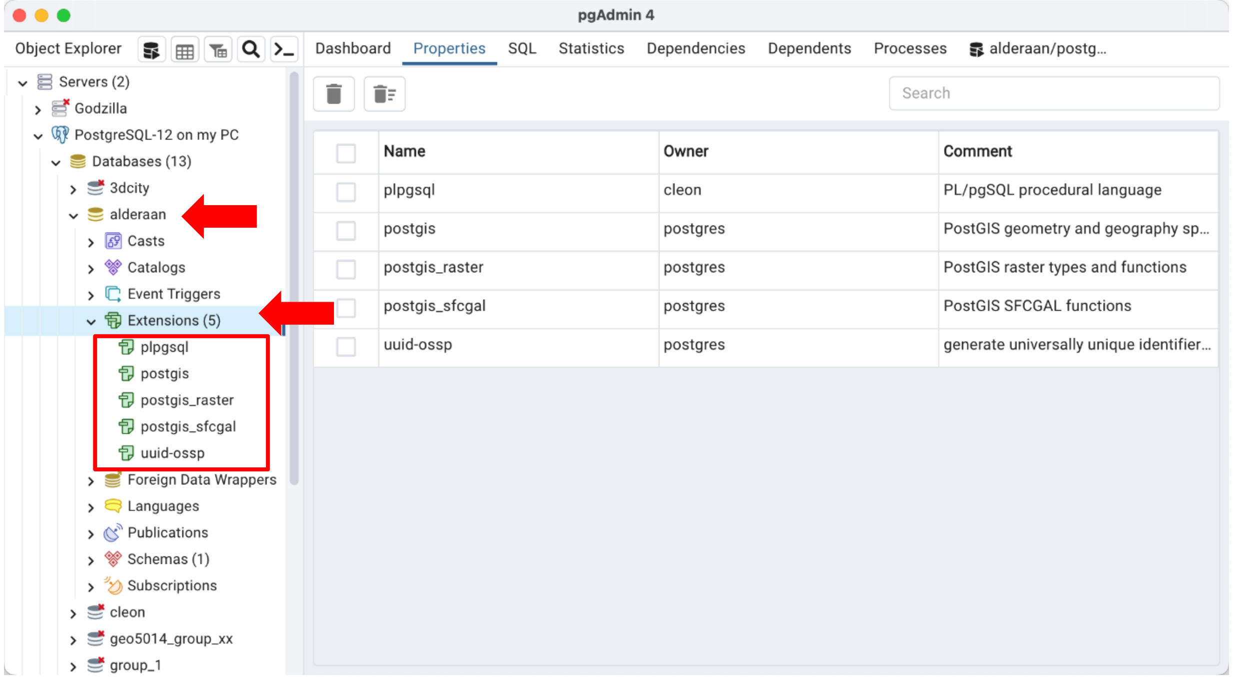
- Database connection
- **Database creation**
- Create tables etc.
- Check via pgAdmin

Imp/Exp connection

Additional schemas

ADE plug-ins

Further resources



	Name	Owner	Comment
□	plpgsql	cleon	PL/pgSQL procedural language
□	postgis	postgres	PostGIS geometry and geography sp...
□	postgis_raster	postgres	PostGIS raster types and functions
□	postgis_sfcgal	postgres	PostGIS SFCGAL functions
□	uuid-ossp	postgres	generate universally unique identifier...

Create tables and other database objects

Software required
Software install
Database setup
- Database connection
- Database creation
- **Create tables etc.**
- Check via pgAdmin

Imp/Exp connection
Additional schemas
ADE plug-ins
Further resources

NOTA BENE: The detailed installation guide can be found here:

https://3dcitydb-docs.readthedocs.io/en/latest/first-steps/index.html

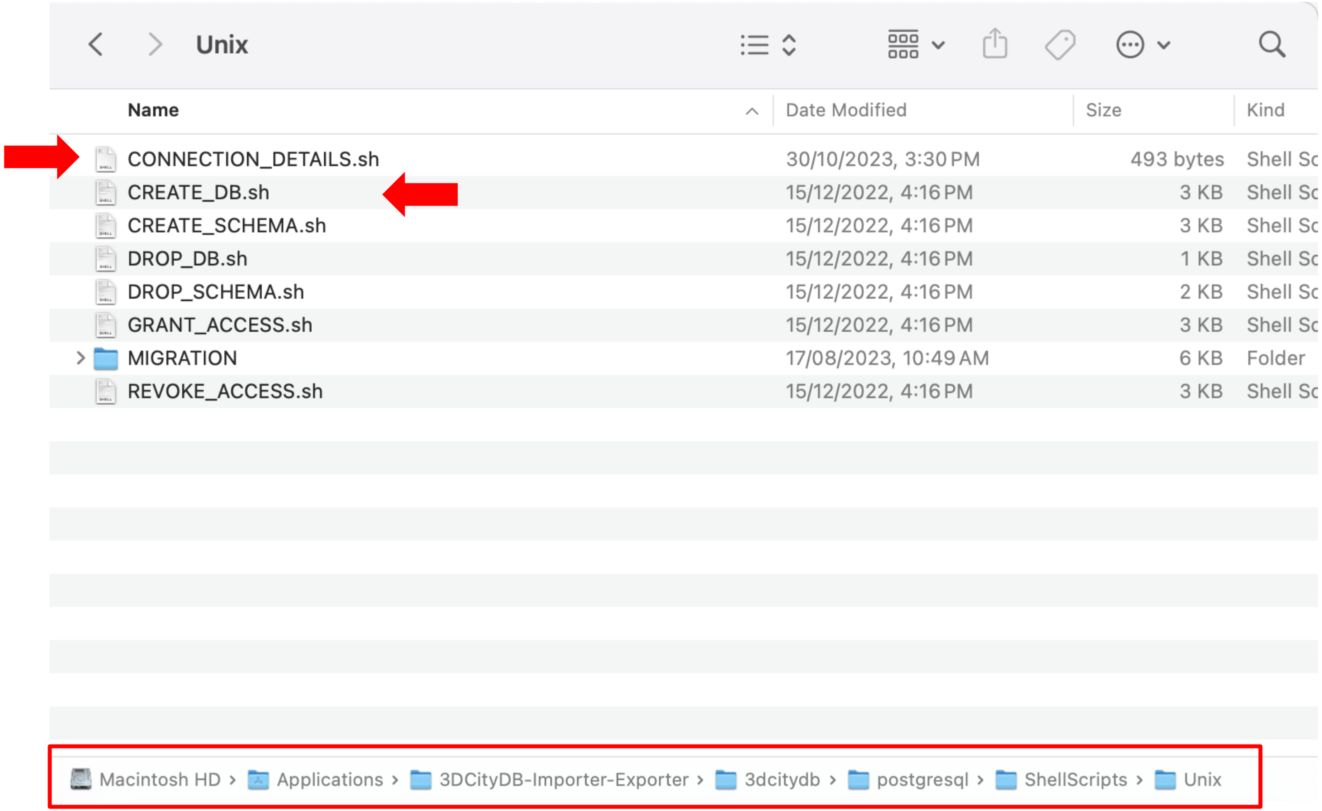
In the following slides, only the main points are presented

- Go to the **3DCityDB installation folder** and look for the 3dcitydb\postgresql\ShellScrips\Unix directory. It should look like in the next slides
  - Remember, if not done previously: **chmod u+x CREATE_DB.sh**
  - Open the **CONNECTION_DETAILS.sh** file in a text editor and insert your PostgreSQL connection details
  - Run the **CREATE_DB.sh** script

Create tables and other database objects

Software required
Software install
Database setup
- Database connection
- Database creation
- **Create tables etc.**
- Check via pgAdmin

Imp/Exp connection
Additional schemas
ADE plug-ins
Further resources



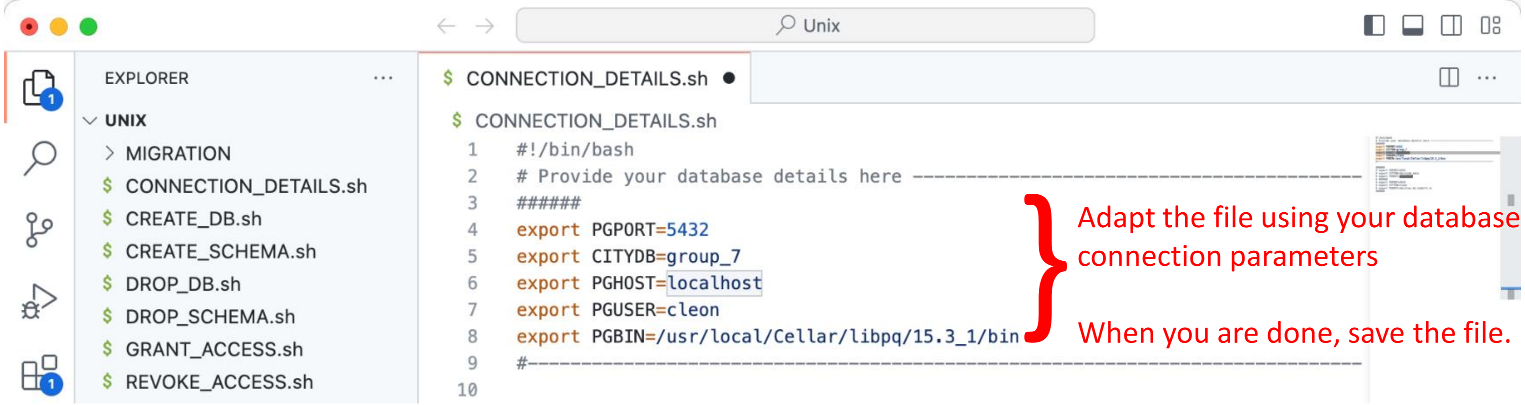
Name	Date Modified	Size	Kind
CONNECTION_DETAILS.sh	30/10/2023, 3:30 PM	493 bytes	Shell Sc
CREATE_DB.sh	15/12/2022, 4:16 PM	3 KB	Shell Sc
CREATE_SCHEMA.sh	15/12/2022, 4:16 PM	3 KB	Shell Sc
DROP_DB.sh	15/12/2022, 4:16 PM	1 KB	Shell Sc
DROP_SCHEMA.sh	15/12/2022, 4:16 PM	2 KB	Shell Sc
GRANT_ACCESS.sh	15/12/2022, 4:16 PM	3 KB	Shell Sc
MIGRATION	17/08/2023, 10:49 AM	6 KB	Folder
REVOKE_ACCESS.sh	15/12/2022, 4:16 PM	3 KB	Shell Sc

Macintosh HD › Applications › 3DCityDB-Importer-Exporter › 3dcitydb › postgresql › ShellScripts › Unix

Create tables and other database objects

Software required
Software install
Database setup
- Database connection
- Database creation
- **Create tables etc.**
- Check via pgAdmin

Imp/Exp connection
Additional schemas
ADE plug-ins
Further resources



```
#!/bin/bash
# Provide your database details here -----------------------------------------------
######
export PGPORT=5432
export CITYDB=group_7
export PGHOST=localhost
export PGUSER=cleon
export PGBIN=/usr/local/Cellar/libpq/15.3_1/bin
#------------------------------------------------------------------------------------

```

Adapt the file using your database connection parameters

When you are done, save the file.

- The **PGBIN** variable contains the path to the psql executable (e.g. psql.exe). Depending on your PostgreSQL installation, it could be in other (but similar) locations.
- **PGHOST** is the IP address of the PostgreSQL server. If you are using the database on your own computer, you can write "localhost", otherwise you have to write the IP address of the server
- **PGPORT** is the port PostgreSQL is listening to. Generally, it is 5432 (this is the default value).
- **CITYDB** contains the name of the database that you have created before and that will contain the 3DCityDB tables, e.g. "alderaan"
- **PGUSER** contains the name of the user to connect to the database. On your local machine, you may use postgres. You will be asked the password during the installation process later

Software required
Software install
Database setup
- Database connection
- Database creation
- **Create tables etc.**
- Check via pgAdmin

Imp/Exp connection
Additional schemas
ADE plug-ins
Further resources

Create tables and other database objects

Find out the EPSG codes that apply to your city or region.
If you do not know them, you can search for them here: https://epsg.org/

Here some examples:

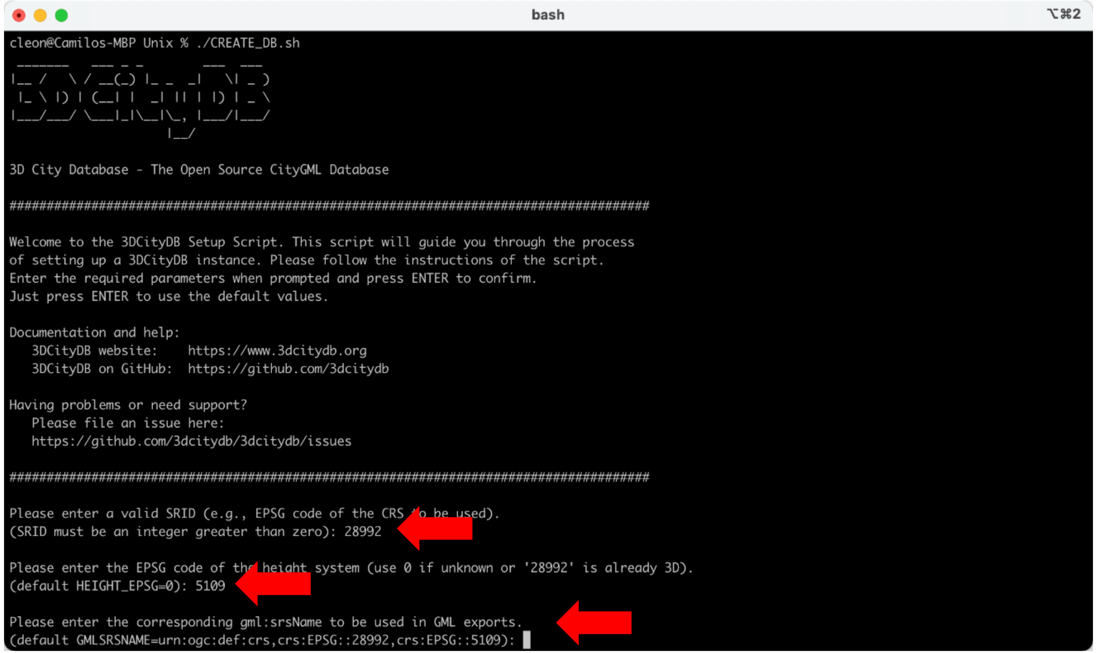
- **Netherlands**
  - **Horizontal datum EPSG: 28992**
  - **Vertical datum EPSG: 5109**
  - (Will automatically create the GMLSrsName: **urn:ogc:def:crs,crs:EPSG::28992,crs:EPSG:5109**)
- **Trento (Italy)**
  - **Horizontal datum EPSG: 25832**
  - **Vertical datum EPSG: 5214**
  - (Will automatically create the GMLSrsName: **urn:ocg:def:crs,crs:EPSG::25832,crs:EPSG::5214**)
- **Vienna (Austria)**
  - **Horizontal datum EPSG: 31256**
  - **Vertical datum EPSG: 1267**
  - (Will automatically create the GMLSrsName: **urn:ocg:def:crs,crs:EPSG::31256,crs:EPSG::1267**)

Software required
Software install
Database setup
- Database connection
- Database creation
- **Create tables etc.**
- Check via pgAdmin

Imp/Exp connection
Additional schemas
ADE plug-ins
Further resources

Create tables and other database objects

- Run the .sh file **CREATE_DB.sh** and set the EPSG codes for horizontal and vertical datum, as shown in the image here



```
cleon@Camilos-MBP Unix % ./CREATE_DB.sh
 _____ ___   ___ _ _        ___  ___
|__ / |   \ / __(_) |_ _  _|   \| _ )
 |_ \ | |) | (__| |  _| || | |) | _ \
|___/ |___/ \___|_|\__|\_, |___/|___/
                       |__/

3D City Database - The Open Source CityGML Database

######################################################################################

Welcome to the 3DCityDB Setup Script. This script will guide you through the process
of setting up a 3DCityDB instance. Please follow the instructions of the script.
Enter the required parameters when prompted and press ENTER to confirm.
Just press ENTER to use the default values.

Documentation and help:
   3DCityDB website:    https://www.3dcitydb.org
   3DCityDB on GitHub:  https://github.com/3dcitydb

Having problems or need support?
   Please file an issue here:
   https://github.com/3dcitydb/3dcitydb/issues

######################################################################################

Please enter a valid SRID (e.g., EPSG code of the CRS to be used).
(SRID must be an integer greater than zero): 28992

Please enter the EPSG code of the height system (use 0 if unknown or '28992' is already 3D).
(default HEIGHT_EPSG=0): 5109

Please enter the corresponding gml:srsName to be used in GML exports.
(default GMLSRSNAME=urn:ogc:def:crs,crs:EPSG::28992,crs:EPSG::5109):
```

- Then press enter, the GMLSRSNAME variable will be automatically generated (accept the proposed value) and the install script will start and install all tables, etc.

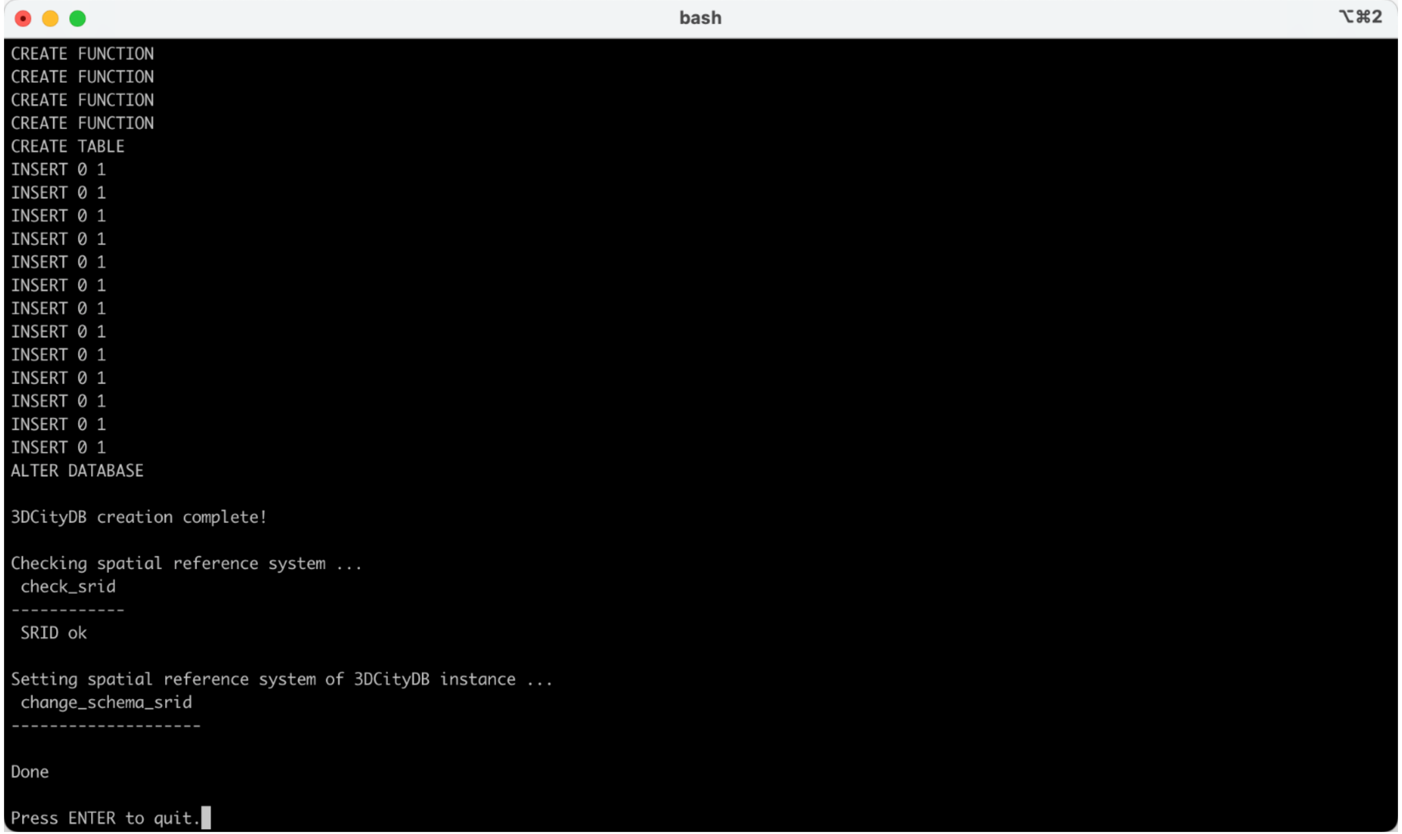
Software required
Software install
Database setup

- Database connection
- Database creation
- **Create tables etc.**
- Check via pgAdmin

Imp/Exp connection
Additional schemas
ADE plug-ins
Further resources

Create tables and other database objects

- Upon successful installation, you should get something like this



```
CREATE FUNCTION
CREATE FUNCTION
CREATE FUNCTION
CREATE FUNCTION
CREATE TABLE
INSERT 0 1
INSERT 0 1
INSERT 0 1
INSERT 0 1
INSERT 0 1
INSERT 0 1
INSERT 0 1
INSERT 0 1
INSERT 0 1
INSERT 0 1
INSERT 0 1
INSERT 0 1
INSERT 0 1
ALTER DATABASE

3DCityDB creation complete!

Checking spatial reference system ...
 check_srid
------------
 SRID ok

Setting spatial reference system of 3DCityDB instance ...
 change_schema_srid
--------------------

Done

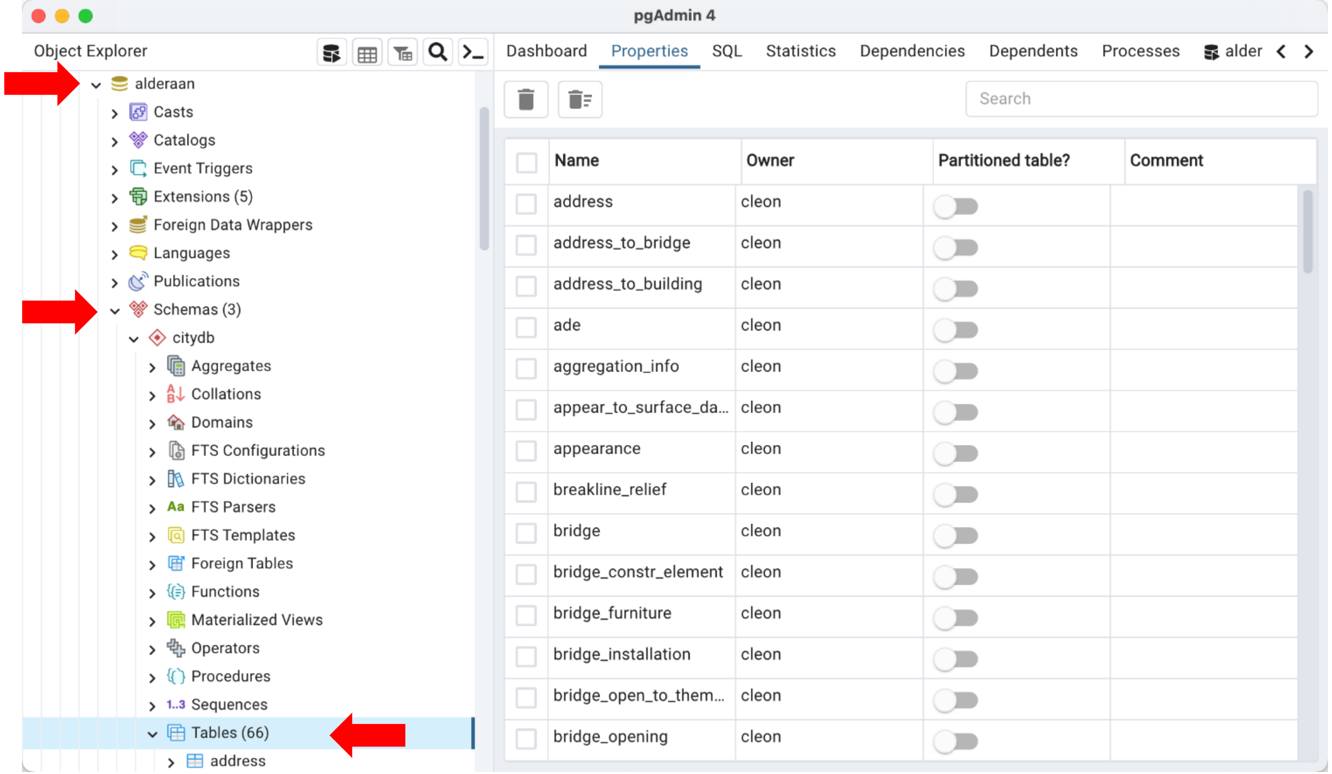
Press ENTER to quit.
```

Software required
Software install
Database setup
- Database connection
- Database creation
- Create tables etc.
- **Check via pgAdmin**

Imp/Exp connection
Additional schemas
ADE plug-ins
Further resources

Check via pgAdmin

- Open pgAdmin and check that the **citydb** and **citydb_pkg** schemas are there. The **citydb** schema should contain 66 tables



□	Name	Owner	Partitioned table?	Comment
□	address	cleon		
□	address_to_bridge	cleon		
□	address_to_building	cleon		
□	ade	cleon		
□	aggregation_info	cleon		
□	appear_to_surface_da...	cleon		
□	appearance	cleon		
□	breakline_relief	cleon		
□	bridge	cleon		
□	bridge_constr_element	cleon		
□	bridge_furniture	cleon		
□	bridge_installation	cleon		
□	bridge_open_to_them...	cleon		
□	bridge_opening	cleon		

Overview

Install required software

Set up the database

Connect to the database via the Importer/Exporter

Add additional database schemas (Optional)

Install ADE plug-ins (Optional)

Software required
Software install
Database setup
Imp/Exp connection
Additional schemas
ADE plug-ins
Further resources

Connecting to the database via Importer/Exporter

- AFTER you have successfully installed PostgreSQL, you can access the database server via pgAdmin

ALTERNATIVELY

- You do not have PostgreSQL installed on your own computer, but you know the connection parameters to connect to a remote server

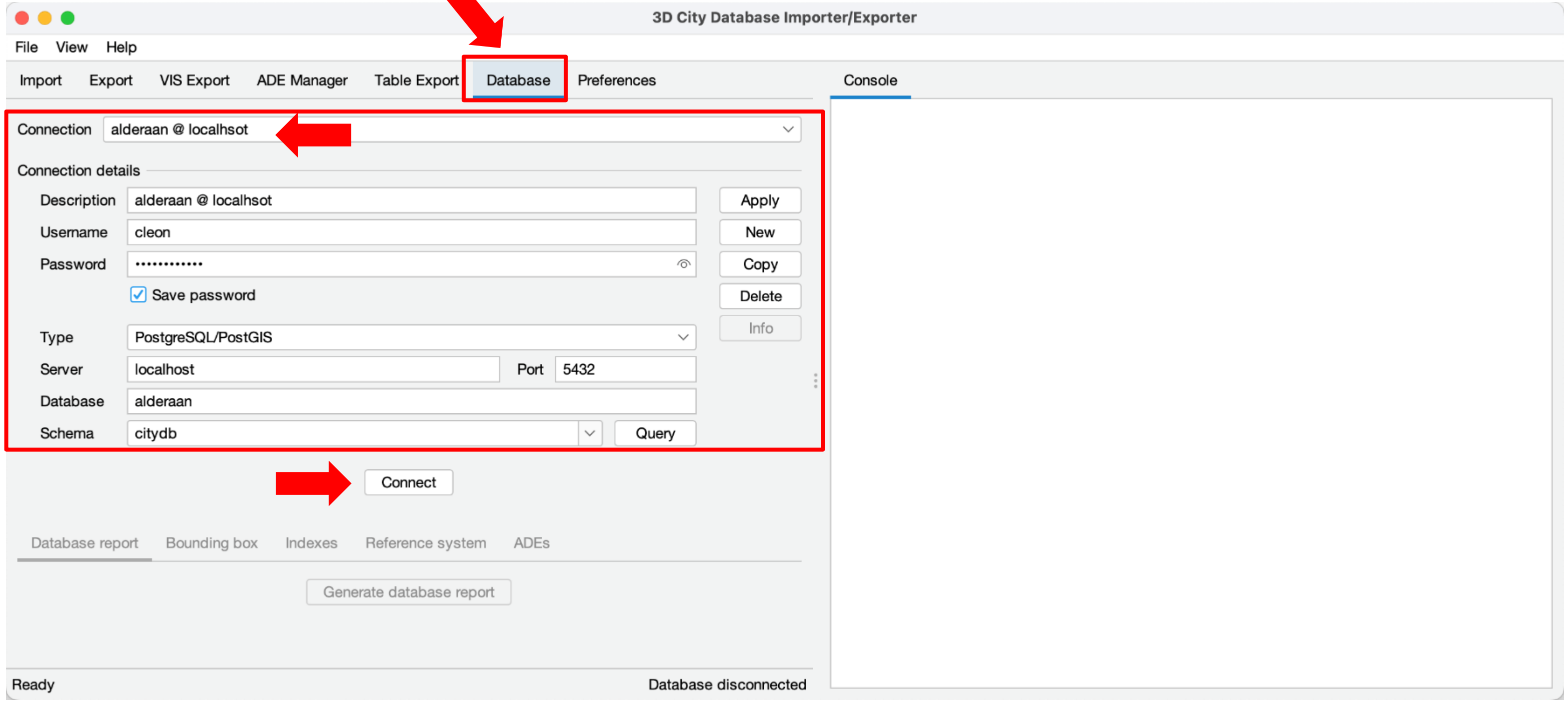
- **In both cases**, you will need information about:
  - **Server name** or **IP address** ("localhost" if it is on your computer)
  - **Database name** (generally "postgres" if it is on your computer)
  - **Port** (generally 5432 if it is on your computer)
  - **Username, Password** (e.g. the ones created before if it is on your computer)

TUDelft
3Dgeoinfo

Software required
Software install
Database setup
Imp/Exp connection
Additional schemas
ADE plug-ins
Further resources

Connecting to the database via Importer/Exporter

- Launch the 3DCityDB Importer/Exporter, select the "Database" tab
  - The Description field contains a simple string to identify the connection
  - Fill out the remaining fields with the connection parameters
  - Click on Connect



3D City Database Importer/Exporter

Connection: alderaan @ localhsot

Connection details

Description: alderaan @ localhsot

Username: cleon

Password: ••••••••••••

☑ Save password

Type: PostgreSQL/PostGIS

Server: localhost

Port: 5432

Database: alderaan

Schema: citydb

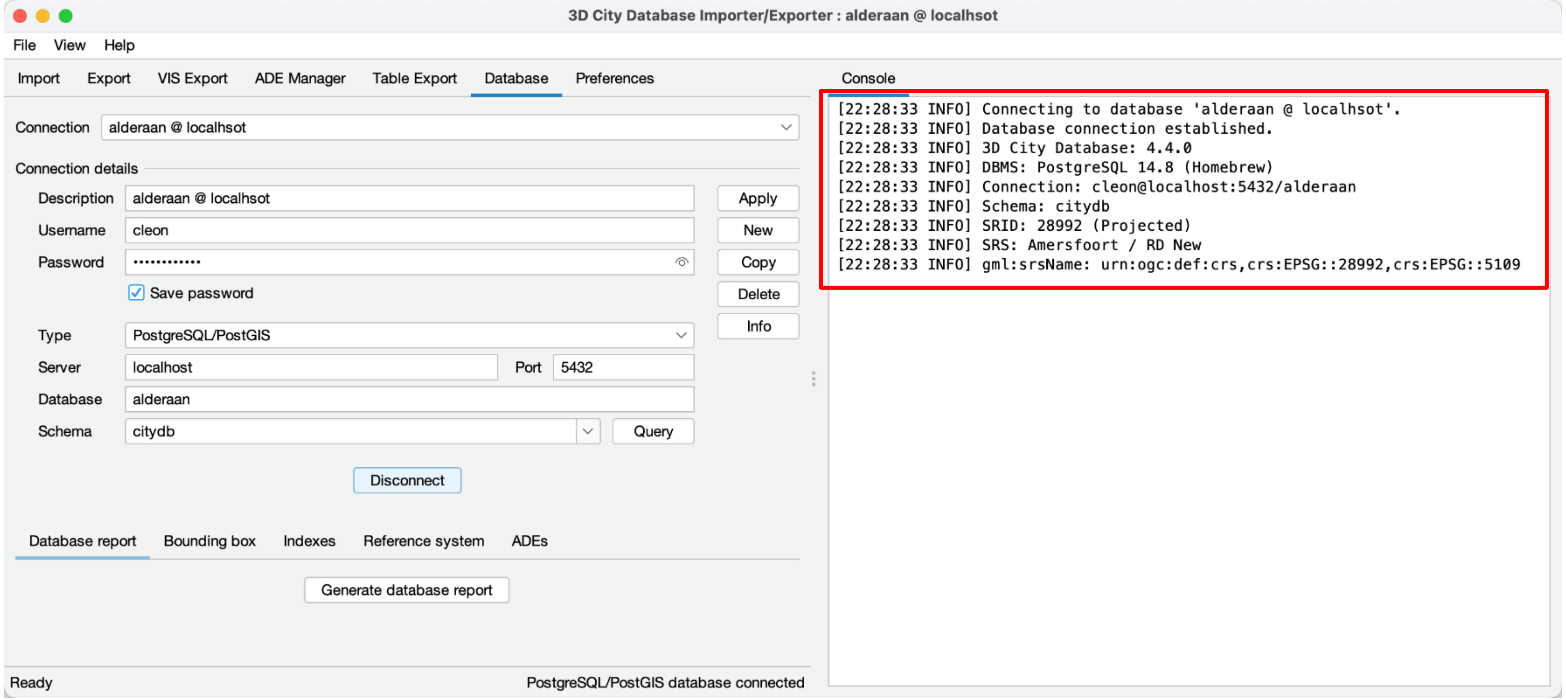
Ready

Database disconnected

Connecting to the database via Importer/Exporter

Software required
Software install
Database setup
Imp/Exp connection
Additional schemas
ADE plug-ins
Further resources

- Launch the 3DCityDB Importer/Exporter, select the "Database" tab
  - Upon successful connection, you will see the notification in the console



Connection: alderaan @ localhsot

Connection details

Description: alderaan @ localhsot
Username: cleon
Password: ••••••••••••
☑ Save password
Type: PostgreSQL/PostGIS
Server: localhost Port: 5432
Database: alderaan
Schema: citydb

```
[22:28:33 INFO] Connecting to database 'alderaan @ localhsot'.
[22:28:33 INFO] Database connection established.
[22:28:33 INFO] 3D City Database: 4.4.0
[22:28:33 INFO] DBMS: PostgreSQL 14.8 (Homebrew)
[22:28:33 INFO] Connection: cleon@localhost:5432/alderaan
[22:28:33 INFO] Schema: citydb
[22:28:33 INFO] SRID: 28992 (Projected)
[22:28:33 INFO] SRS: Amersfoort / RD New
[22:28:33 INFO] gml:srsName: urn:ogc:def:crs,crs:EPSG::28992,crs:EPSG::5109
```

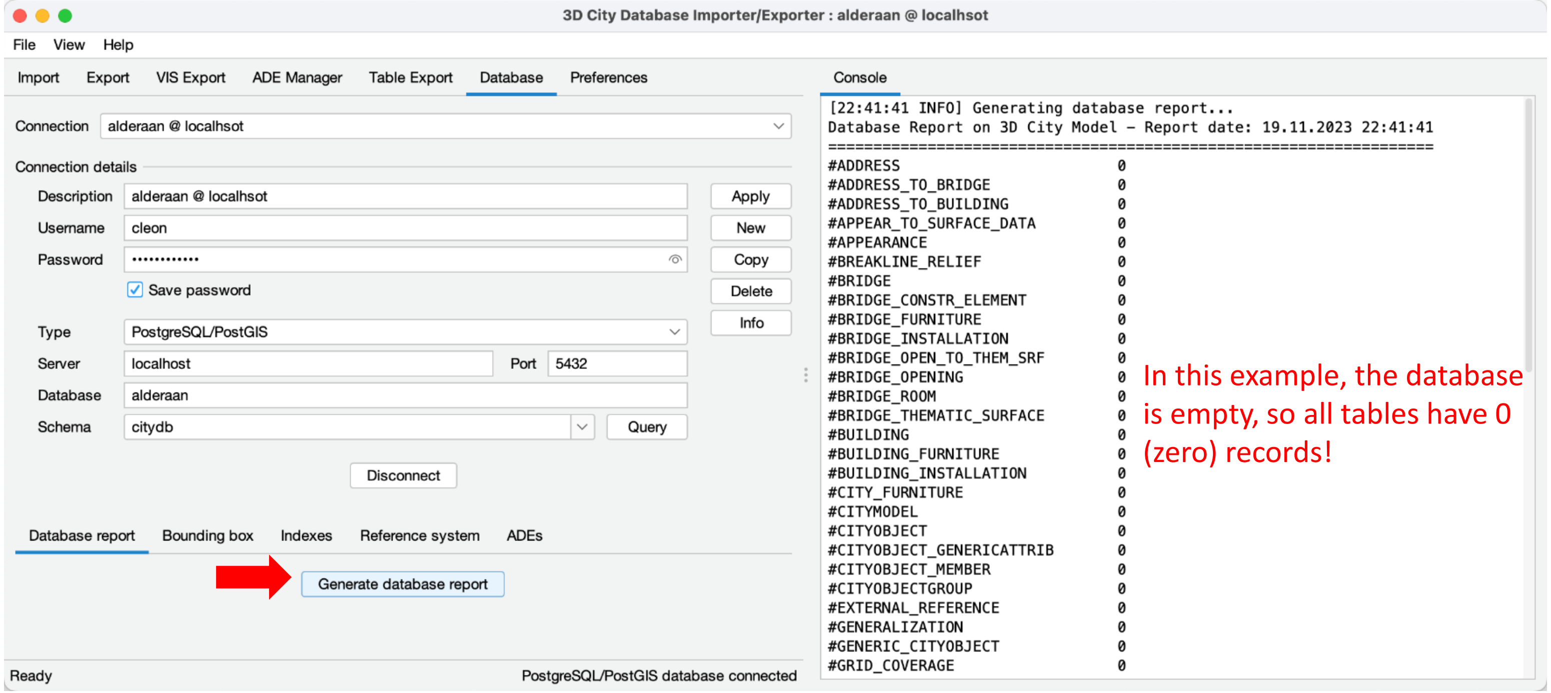
Ready   PostgreSQL/PostGIS database connected

TU Delft 3Dgeoinfo

Software required
Software install
Database setup
Imp/Exp connection
Additional schemas
ADE plug-ins
Further resources

Connecting to the database via Importer/Exporter

- Launch the 3DCityDB Importer/Exporter, select the "Database" tab
  - You can optionally also **Generate a database report**
  - If starting from an empty database, it will simply show that all tables are empty! ☺



Connection: alderaan @ localhsot

Connection details

Description: alderaan @ localhsot
Username: cleon
Password: ••••••••••••
☑ Save password
Type: PostgreSQL/PostGIS
Server: localhost Port: 5432
Database: alderaan
Schema: citydb

Ready
PostgreSQL/PostGIS database connected

```
[22:41:41 INFO] Generating database report...
Database Report on 3D City Model - Report date: 19.11.2023 22:41:41
===================================================================
#ADDRESS                        0
#ADDRESS_TO_BRIDGE              0
#ADDRESS_TO_BUILDING            0
#APPEAR_TO_SURFACE_DATA         0
#APPEARANCE                     0
#BREAKLINE_RELIEF               0
#BRIDGE                         0
#BRIDGE_CONSTR_ELEMENT          0
#BRIDGE_FURNITURE               0
#BRIDGE_INSTALLATION            0
#BRIDGE_OPEN_TO_THEM_SRF        0
#BRIDGE_OPENING                 0
#BRIDGE_ROOM                    0
#BRIDGE_THEMATIC_SURFACE        0
#BUILDING                       0
#BUILDING_FURNITURE             0
#BUILDING_INSTALLATION          0
#CITY_FURNITURE                 0
#CITYMODEL                      0
#CITYOBJECT                     0
#CITYOBJECT_GENERICATTRIB       0
#CITYOBJECT_MEMBER              0
#CITYOBJECTGROUP                0
#EXTERNAL_REFERENCE             0
#GENERALIZATION                 0
#GENERIC_CITYOBJECT             0
#GRID_COVERAGE                  0
```

In this example, the database is empty, so all tables have 0 (zero) records!

Overview

Install required software

Set up the database

Connect to the database via the Importer/Exporter

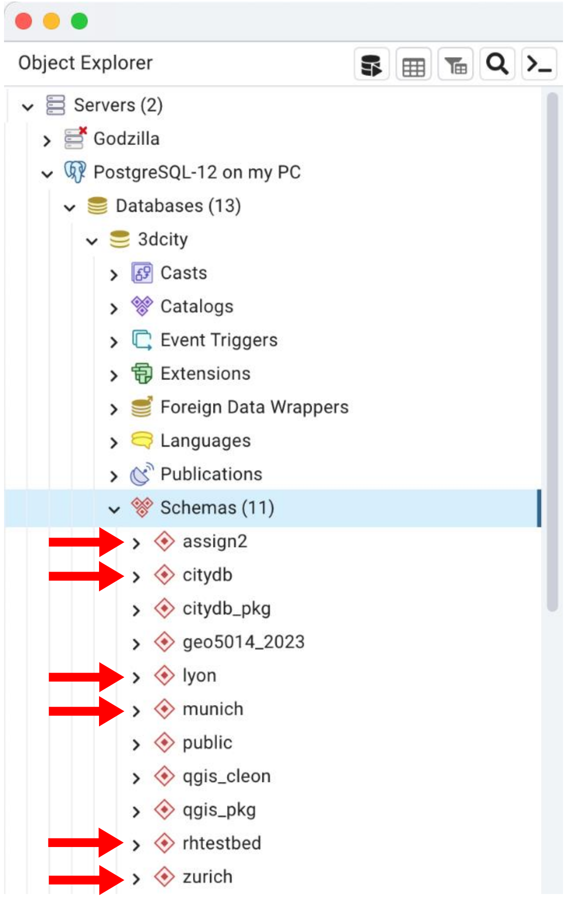
Add additional database schemas (Optional)

Install ADE plug-ins (Optional)

3D City Database: additional schemas

Software required
Software install
Database setup
Imp/Exp connection
Additional schemas
ADE plug-ins
Further resources

- **To add additional schemas** (OPTIONAL, besides the default citydb):
  - Go to the same directory where the citydb installation script are
  - Run **chmod u+x CREATE_SCHEMA.sh** in the command shell
  - Check the connection parameters in file **CONNECTION_DETAILS.sh** (should be the same as before)
  - Run the **CREATE_SCHEMA.sh** script. You will be requested to enter the name of the additional schema (e.g. "citydb_a1", or "scenario_1", etc.)
  - You can choose any name you want, but try to use only small letters
  - The new schema and its contents will be added automatically. The new schema will have the same CRS of the citydb schema
  - You can repeat these steps and add more schemas to the same database. At the end you will have
    - The citydb schema and *n* additional schemas
    - Only one citydb_pkg schema



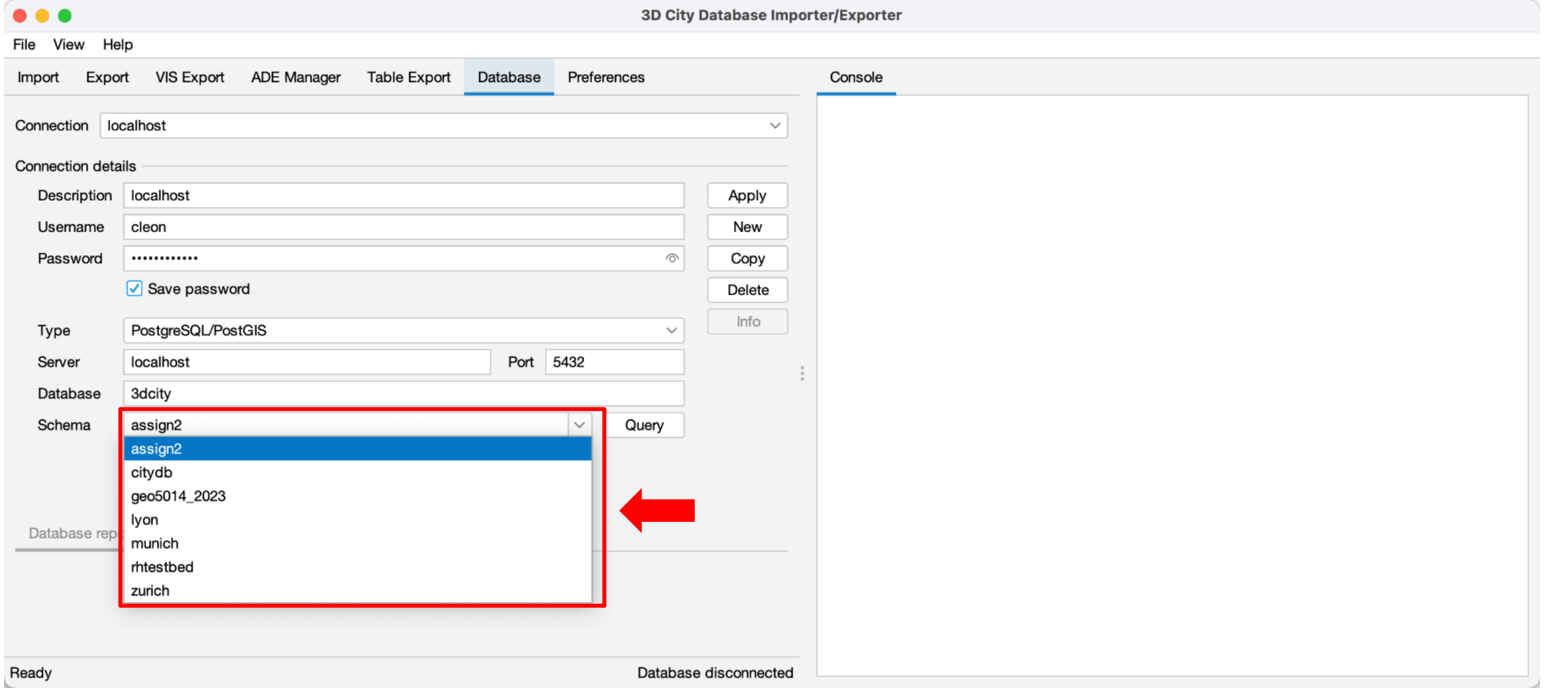
Object Explorer

- Servers (2)
  - Godzilla
  - PostgreSQL-12 on my PC
    - Databases (13)
      - 3dcity
        - Casts
        - Catalogs
        - Event Triggers
        - Extensions
        - Foreign Data Wrappers
        - Languages
        - Publications
        - Schemas (11)
          - assign2
          - citydb
          - citydb_pkg
          - geo5014_2023
          - lyon
          - munich
          - public
          - qgis_cleon
          - qgis_pkg
          - rhtestbed
          - zurich

Software required
Software install
Database setup
Imp/Exp connection
Additional schemas
ADE plug-ins
Further resources

3D City Database: additional schemas

- When using the Importer/Exporter, you can choose which schema to use to import/export data from the GUI.



Connection: localhost

Description: localhost
Username: cleon
Password: ••••••••••••
☑ Save password

Type: PostgreSQL/PostGIS
Server: localhost Port: 5432
Database: 3dcity
Schema: assign2

- assign2
- citydb
- geo5014_2023
- lyon
- munich
- rhtestbed
- zurich

Ready
Database disconnected

Overview

Install required software

Set up the database

Connect to the database via the Importer/Exporter

Add additional database schemas (Optional)

Install ADE plug-ins (Optional)

Software required
Software install
Database setup
Imp/Exp connection
Additional schemas
ADE plug-ins
- **Installation**
- Data import
- Data export

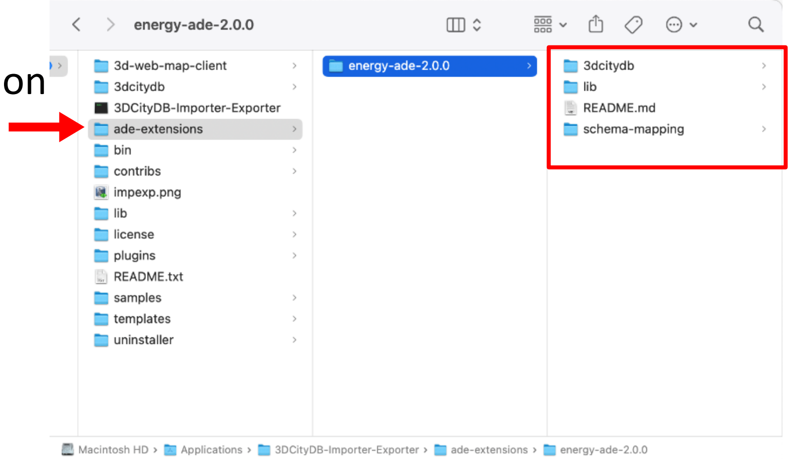
Further resources

ADE plug-in installation

Please note: These slides refer to the Energy ADE plug-in for the 3DCityDB. However, a similar procedure can be followed for other ADEs.

1) Download the **energy-ade-citydb** extension for the Importer/Exporter
   - https://github.com/3dcitydb/energy-ade-citydb/releases/

2) Unzip it in folder ade-extensions of your 3DCityDB install path



energy-ade-2.0.0

3d-web-map-client
3dcitydb
3DCityDB-Importer-Exporter
ade-extensions
bin
contribs
impexp.png
lib
license
plugins
README.txt
samples
templates
uninstaller

energy-ade-2.0.0

3dcitydb
lib
README.md
schema-mapping

Macintosh HD › Applications › 3DCityDB-Importer-Exporter › ade-extensions › energy-ade-2.0.0

Detailed instructions available on-line

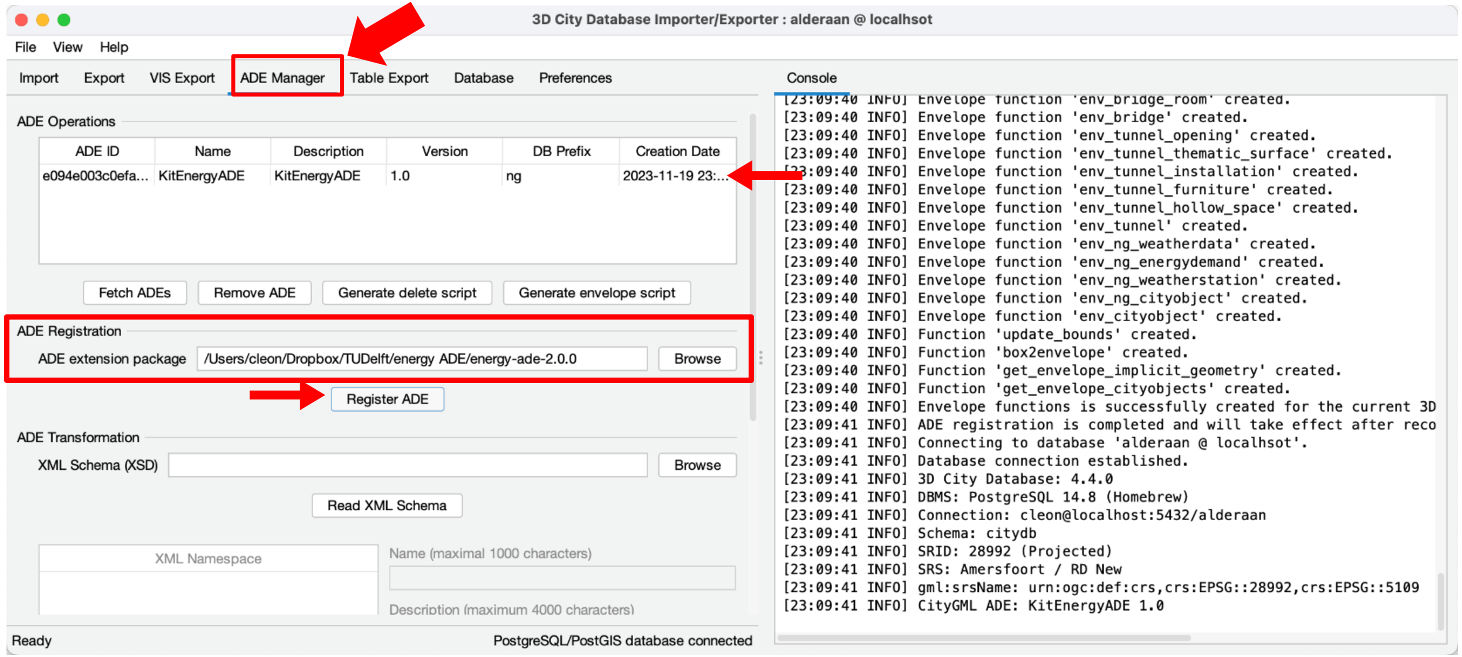
- https://3dcitydb-docs.readthedocs.io/en/latest/plugins/ade-manager/index.html

ADE plugin installation

Software required
Software install
Database setup
Imp/Exp connection
Additional schemas
ADE plug-ins
- **Installation**
- Data import
- Data export

Further resources

- From the Importer/Exporter, connect to an existing 3DCityDB instance
  - In the "ADE extension package" add the path to the plug-in folder unzipped before
  - "Register" the ADE from the ADE Manager tab
  - The ADE will be added to the ADE list (and all tables, etc. will be added to the current schema)



ADE Operations

ADE ID	Name	Description	Version	DB Prefix	Creation Date
e094e003c0efa...	KitEnergyADE	KitEnergyADE	1.0	ng	2023-11-19 23:...

ADE Registration

ADE extension package: /Users/cleon/Dropbox/TUDelft/energy ADE/energy-ade-2.0.0

ADE Transformation

XML Schema (XSD)
Browse
Read XML Schema
XML Namespace
Name (maximal 1000 characters)
Description (maximum 4000 characters)

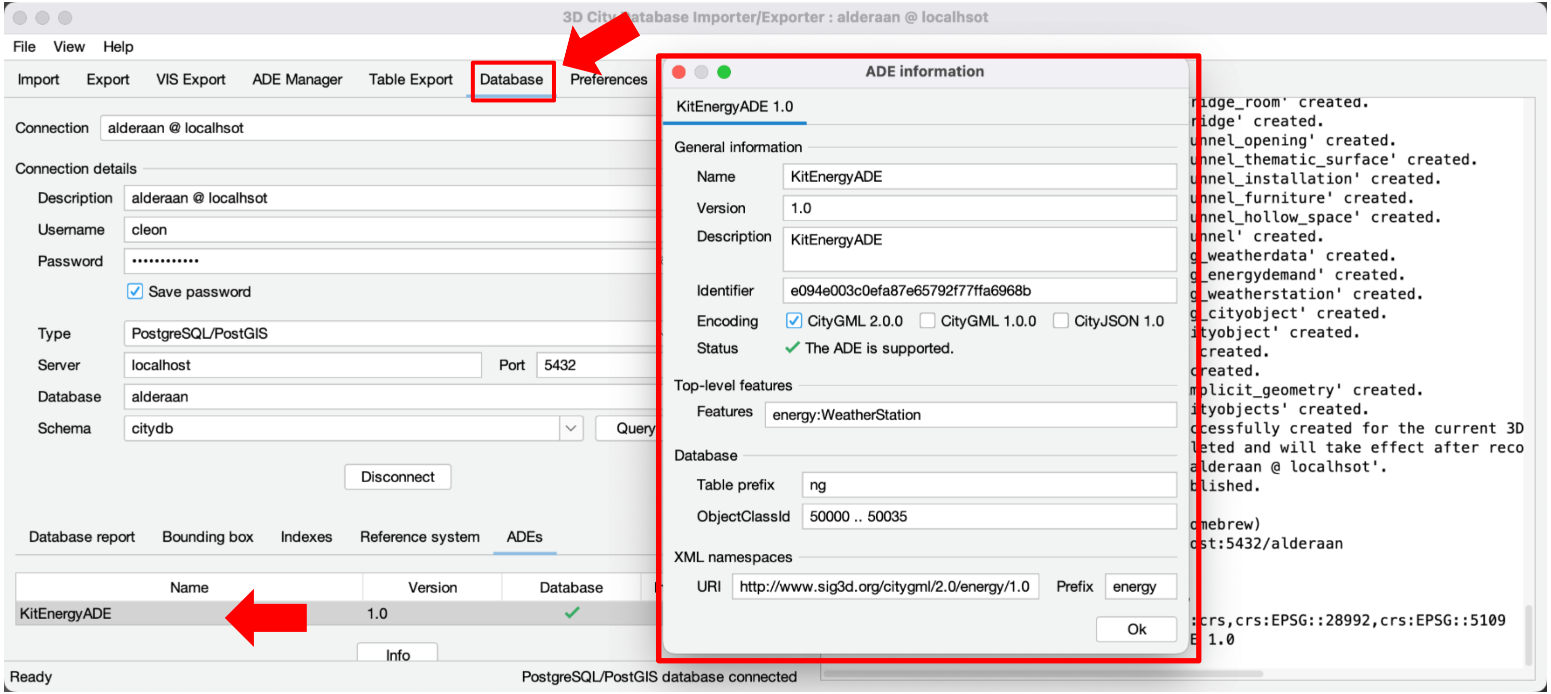
Ready

PostgreSQL/PostGIS database connected

```
[23:09:40 INFO] Envelope function 'env_bridge_room' created.
[23:09:40 INFO] Envelope function 'env_bridge' created.
[23:09:40 INFO] Envelope function 'env_tunnel_opening' created.
[23:09:40 INFO] Envelope function 'env_tunnel_thematic_surface' created.
[23:09:40 INFO] Envelope function 'env_tunnel_installation' created.
[23:09:40 INFO] Envelope function 'env_tunnel_furniture' created.
[23:09:40 INFO] Envelope function 'env_tunnel_hollow_space' created.
[23:09:40 INFO] Envelope function 'env_tunnel' created.
[23:09:40 INFO] Envelope function 'env_ng_weatherdata' created.
[23:09:40 INFO] Envelope function 'env_ng_energydemand' created.
[23:09:40 INFO] Envelope function 'env_ng_weatherstation' created.
[23:09:40 INFO] Envelope function 'env_ng_cityobject' created.
[23:09:40 INFO] Envelope function 'env_cityobject' created.
[23:09:40 INFO] Function 'update_bounds' created.
[23:09:40 INFO] Function 'box2envelope' created.
[23:09:40 INFO] Function 'get_envelope_implicit_geometry' created.
[23:09:40 INFO] Function 'get_envelope_cityobjects' created.
[23:09:40 INFO] Envelope functions is successfully created for the current 3D
[23:09:41 INFO] ADE registration is completed and will take effect after reco
[23:09:41 INFO] Connecting to database 'alderaan @ localhsot'.
[23:09:41 INFO] Database connection established.
[23:09:41 INFO] 3D City Database: 4.4.0
[23:09:41 INFO] DBMS: PostgreSQL 14.8 (Homebrew)
[23:09:41 INFO] Connection: cleon@localhost:5432/alderaan
[23:09:41 INFO] Schema: citydb
[23:09:41 INFO] SRID: 28992 (Projected)
[23:09:41 INFO] SRS: Amersfoort / RD New
[23:09:41 INFO] gml:srsName: urn:ogc:def:crs,crs:EPSG::28992,crs:EPSG::5109
[23:09:41 INFO] CityGML ADE: KitEnergyADE 1.0
```

ADE plugin installation

- Check also in the database tab the ADEs properties



3D City Database Importer/Exporter : alderaan @ localhsot

Connection: alderaan @ localhsot

Connection details

Description: alderaan @ localhsot

Username: cleon

Password: ••••••••••••

☑ Save password

Type: PostgreSQL/PostGIS

Server: localhost

Port: 5432

Database: alderaan

Schema: citydb

Name	Version	Database
KitEnergyADE	1.0	✓

Ready

PostgreSQL/PostGIS database connected

ADE information

KitEnergyADE 1.0

General information

Name: KitEnergyADE

Version: 1.0

Description: KitEnergyADE

Identifier: e094e003c0efa87e65792f77ffa6968b

Encoding: ☑ CityGML 2.0.0 ☐ CityGML 1.0.0 ☐ CityJSON 1.0

Status: ✓ The ADE is supported.

Top-level features

Features: energy:WeatherStation

Database

Table prefix: ng

ObjectClassId: 50000 .. 50035

XML namespaces

URI: http://www.sig3d.org/citygml/2.0/energy/1.0

Prefix: energy

```
ridge_room' created.
ridge' created.
unnel_opening' created.
unnel_thematic_surface' created.
unnel_installation' created.
unnel_furniture' created.
unnel_hollow_space' created.
unnel' created.
g_weatherdata' created.
g_energydemand' created.
g_weatherstation' created.
g_cityobject' created.
ityobject' created.
created.
created.
mplicit_geometry' created.
ityobjects' created.
ccessfully created for the current 3D
leted and will take effect after reco
alderaan @ localhsot'.
blished.

omebrew)
ost:5432/alderaan

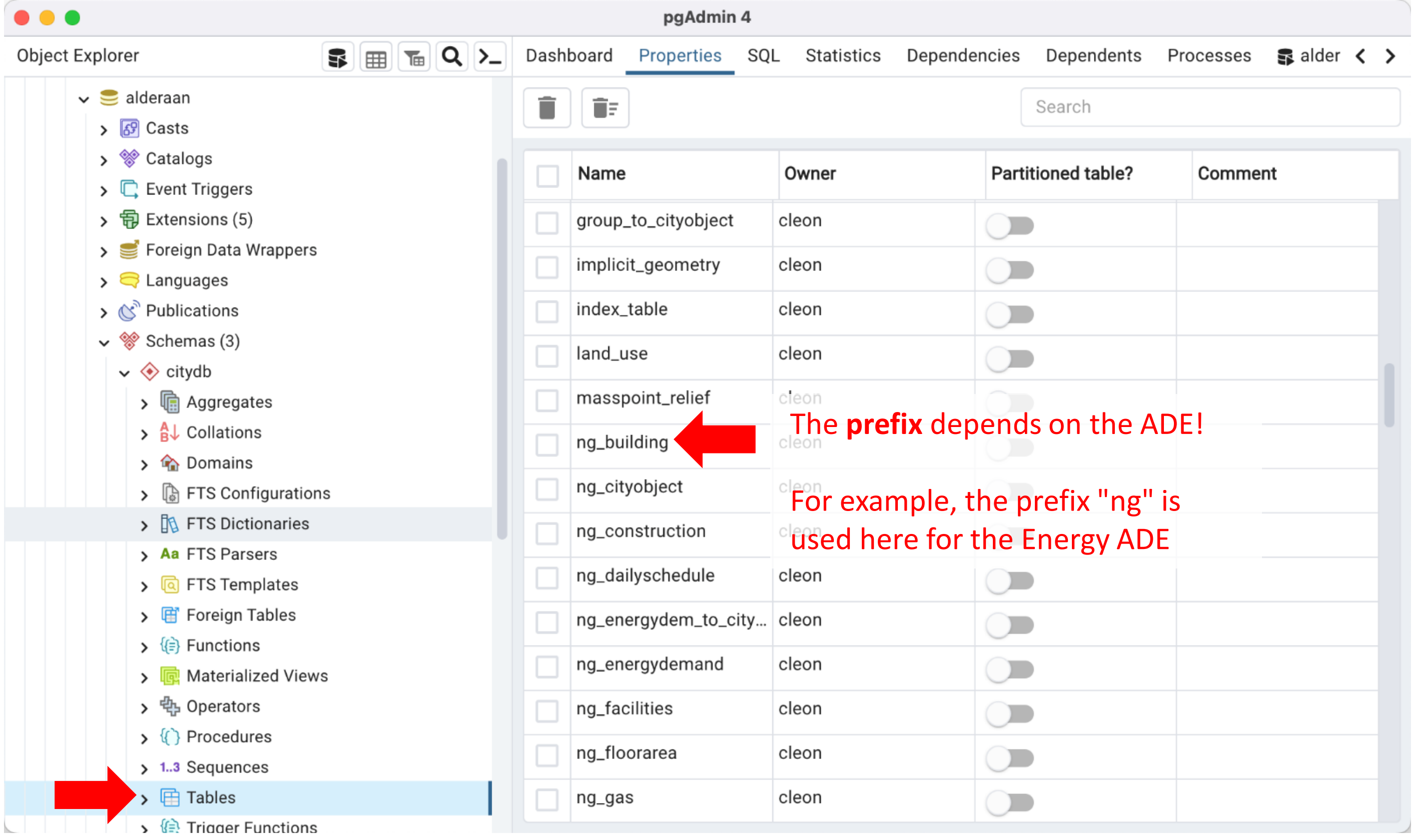
:crs,crs:EPSG::28992,crs:EPSG::5109
E 1.0
```

Software required
Software install
Database setup
Imp/Exp connection
Additional schemas
ADE plug-ins
- **Installation**
- Data import
- Data export

Further resources

ADE plugin installation

- Check in pgAdmin: new tables (and functions) with prefix "ng" have been added



Name	Owner	Partitioned table?	Comment
group_to_cityobject	cleon		
implicit_geometry	cleon		
index_table	cleon		
land_use	cleon		
masspoint_relief	cleon		
ng_building	cleon		
ng_cityobject	cleon		
ng_construction	cleon		
ng_dailyschedule	cleon		
ng_energydem_to_city...	cleon		
ng_energydemand	cleon		
ng_facilities	cleon		
ng_floorarea	cleon		
ng_gas	cleon		

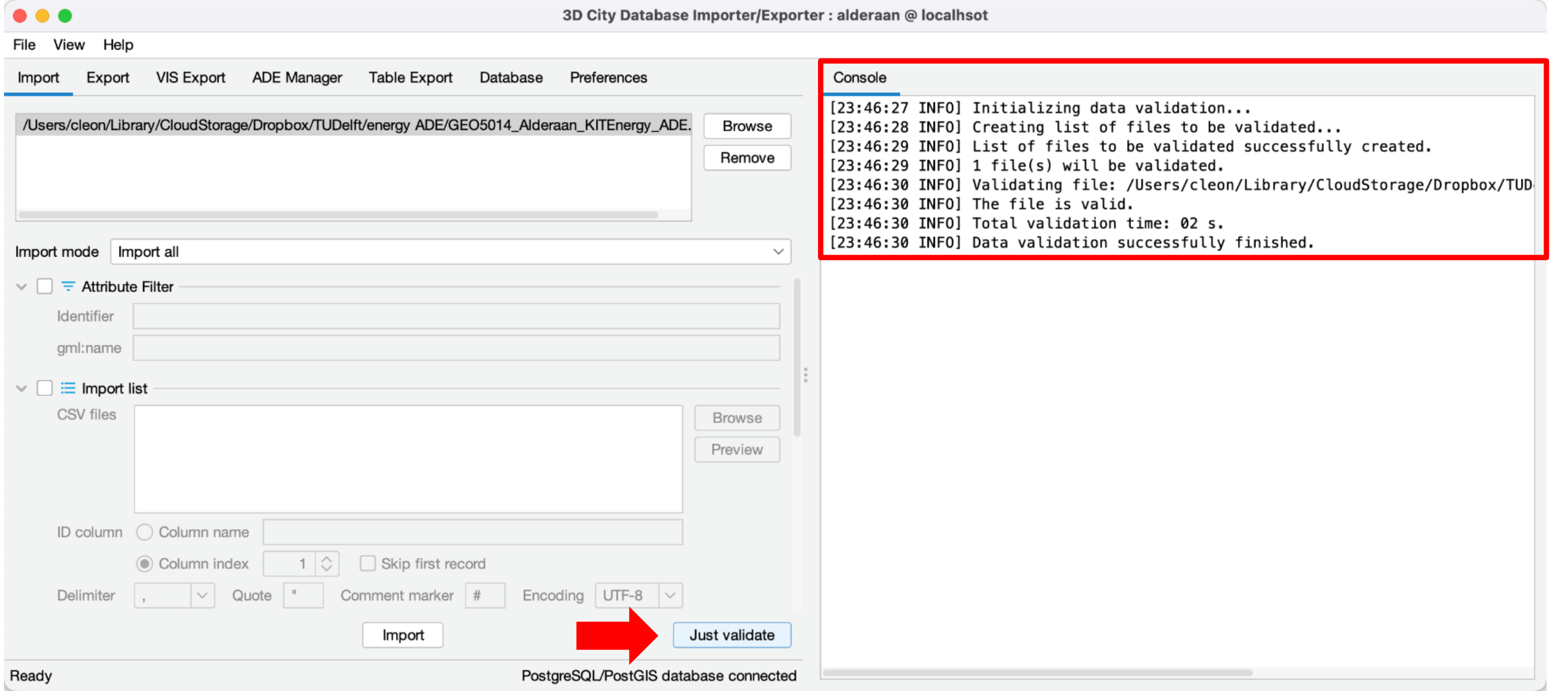
The **prefix** depends on the ADE!

For example, the prefix "ng" is used here for the Energy ADE

TU Delft 3Dgeoinfo

ADE data import

- To import ADE data into the extended 3DCityDB, the procedure is the same as with non-ADE data via the Import tab



3D City Database Importer/Exporter : alderaan @ localhsot

/Users/cleon/Library/CloudStorage/Dropbox/TUDelft/energy ADE/GEO5014_Alderaan_KITEnergy_ADE.

Import mode: Import all

☐ Attribute Filter

Identifier

gml:name

☐ Import list

CSV files

ID column: ○ Column name ● Column index 1 ☐ Skip first record

Delimiter , Quote " Comment marker # Encoding UTF-8

Ready

PostgreSQL/PostGIS database connected

Console

```
[23:46:27 INFO] Initializing data validation...
[23:46:28 INFO] Creating list of files to be validated...
[23:46:29 INFO] List of files to be validated successfully created.
[23:46:29 INFO] 1 file(s) will be validated.
[23:46:30 INFO] Validating file: /Users/cleon/Library/CloudStorage/Dropbox/TUD
[23:46:30 INFO] The file is valid.
[23:46:30 INFO] Total validation time: 02 s.
[23:46:30 INFO] Data validation successfully finished.
```

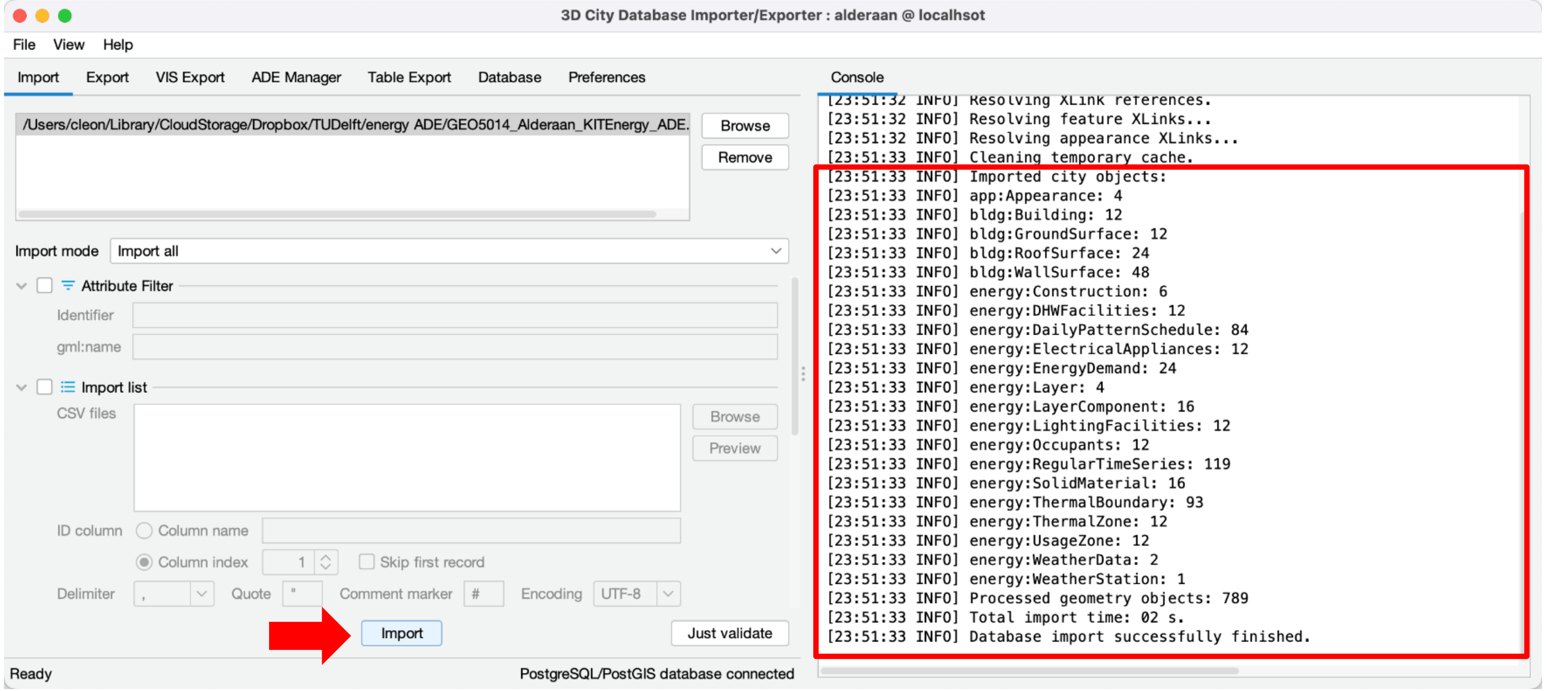
Software required
Software install
Database setup
Imp/Exp connection
Additional schemas
ADE plug-ins
- Installation
- **Data import**
- Data export

Further resources

ADE data import

- To import ADE data into the extended 3DCityDB, the procedure is the same as with non-ADE data via the Import tab

Software required
Software install
Database setup
Imp/Exp connection
Additional schemas
ADE plug-ins
• Installation
• **Data import**
• Data export
Further resources



/Users/cleon/Library/CloudStorage/Dropbox/TUDelft/energy ADE/GEO5014_Alderaan_KITEnergy_ADE.

Import mode: Import all

□ Attribute Filter

□ Import list

ID column: ○ Column name ● Column index 1 □ Skip first record

Delimiter: , Quote: " Comment marker: # Encoding: UTF-8

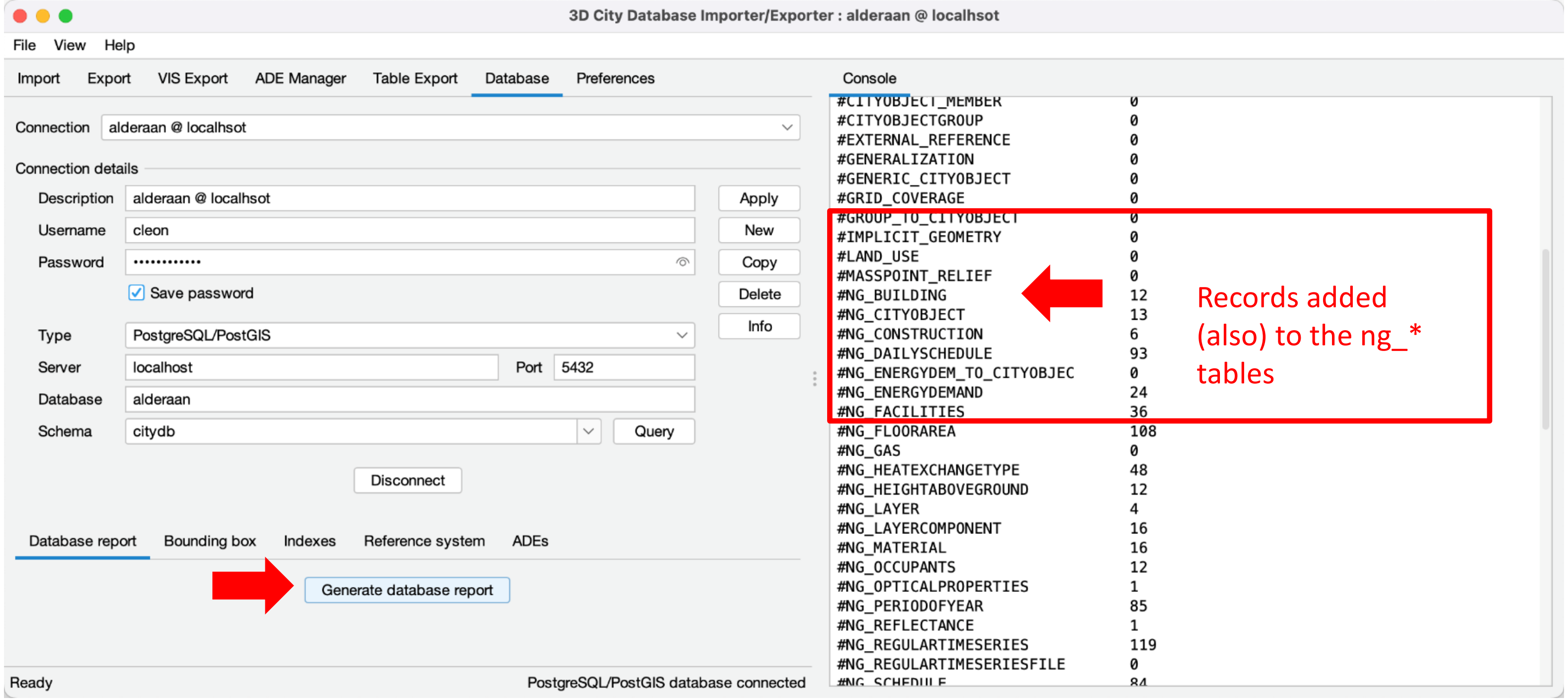
```
[23:51:32 INFO] Resolving XLink references.
[23:51:32 INFO] Resolving feature XLinks...
[23:51:32 INFO] Resolving appearance XLinks...
[23:51:33 INFO] Cleaning temporary cache.
[23:51:33 INFO] Imported city objects:
[23:51:33 INFO] app:Appearance: 4
[23:51:33 INFO] bldg:Building: 12
[23:51:33 INFO] bldg:GroundSurface: 12
[23:51:33 INFO] bldg:RoofSurface: 24
[23:51:33 INFO] bldg:WallSurface: 48
[23:51:33 INFO] energy:Construction: 6
[23:51:33 INFO] energy:DHWFacilities: 12
[23:51:33 INFO] energy:DailyPatternSchedule: 84
[23:51:33 INFO] energy:ElectricalAppliances: 12
[23:51:33 INFO] energy:EnergyDemand: 24
[23:51:33 INFO] energy:Layer: 4
[23:51:33 INFO] energy:LayerComponent: 16
[23:51:33 INFO] energy:LightingFacilities: 12
[23:51:33 INFO] energy:Occupants: 12
[23:51:33 INFO] energy:RegularTimeSeries: 119
[23:51:33 INFO] energy:SolidMaterial: 16
[23:51:33 INFO] energy:ThermalBoundary: 93
[23:51:33 INFO] energy:ThermalZone: 12
[23:51:33 INFO] energy:UsageZone: 12
[23:51:33 INFO] energy:WeatherData: 2
[23:51:33 INFO] energy:WeatherStation: 1
[23:51:33 INFO] Processed geometry objects: 789
[23:51:33 INFO] Total import time: 02 s.
[23:51:33 INFO] Database import successfully finished.
```

Software required
Software install
Database setup
Imp/Exp connection
Additional schemas
ADE plug-ins
- Installation
- **Data import**
- Data export

Further resources

ADE data import

- Check also the database report in the database tab!



3D City Database Importer/Exporter : alderaan @ localhsot

Connection: alderaan @ localhsot

Connection details

Description: alderaan @ localhsot

Username: cleon

Password: ••••••••••••

☑ Save password

Type: PostgreSQL/PostGIS

Server: localhost Port: 5432

Database: alderaan

Schema: citydb

Ready PostgreSQL/PostGIS database connected

```
#CITYOBJECT_MEMBER              0
#CITYOBJECTGROUP                0
#EXTERNAL_REFERENCE             0
#GENERALIZATION                 0
#GENERIC_CITYOBJECT             0
#GRID_COVERAGE                  0
#GROUP_TO_CITYOBJECT            0
#IMPLICIT_GEOMETRY              0
#LAND_USE                       0
#MASSPOINT_RELIEF               0
#NG_BUILDING                    12
#NG_CITYOBJECT                  13
#NG_CONSTRUCTION                6
#NG_DAILYSCHEDULE               93
#NG_ENERGYDEM_TO_CITYOBJEC      0
#NG_ENERGYDEMAND                24
#NG_FACILITIES                  36
#NG_FLOORAREA                   108
#NG_GAS                         0
#NG_HEATEXCHANGETYPE            48
#NG_HEIGHTABOVEGROUND           12
#NG_LAYER                       4
#NG_LAYERCOMPONENT              16
#NG_MATERIAL                    16
#NG_OCCUPANTS                   12
#NG_OPTICALPROPERTIES           1
#NG_PERIODOFYEAR                85
#NG_REFLECTANCE                 1
#NG_REGULARTIMESERIES           119
#NG_REGULARTIMESERIESFILE       0
#NG_SCHEDULE                    84
```

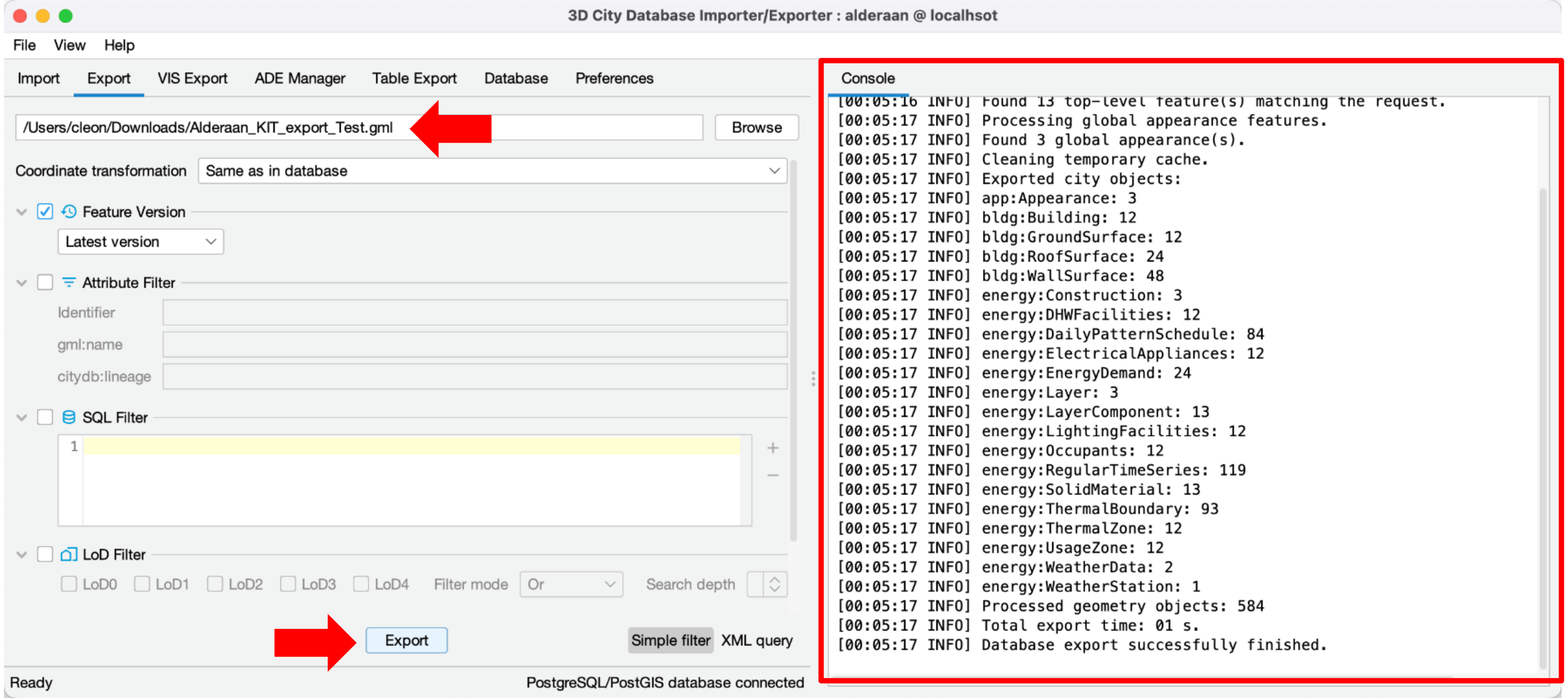
Records added (also) to the ng_* tables

ADE data export

- Conceptually analogous to the procedure without ADE content. Simply choose what to export, and run the exporter!

Software required
Software install
Database setup
Imp/Exp connection
Additional schemas
ADE plug-ins
- Installation
- Data import
- **Data export**

Further resources



/Users/cleon/Downloads/Alderaan_KIT_export_Test.gml

Coordinate transformation: Same as in database

☑ Feature Version: Latest version

□ Attribute Filter

□ SQL Filter

□ LoD Filter — Filter mode: Or

Ready

PostgreSQL/PostGIS database connected

```
[00:05:16 INFO] Found 13 top-level feature(s) matching the request.
[00:05:17 INFO] Processing global appearance features.
[00:05:17 INFO] Found 3 global appearance(s).
[00:05:17 INFO] Cleaning temporary cache.
[00:05:17 INFO] Exported city objects:
[00:05:17 INFO] app:Appearance: 3
[00:05:17 INFO] bldg:Building: 12
[00:05:17 INFO] bldg:GroundSurface: 12
[00:05:17 INFO] bldg:RoofSurface: 24
[00:05:17 INFO] bldg:WallSurface: 48
[00:05:17 INFO] energy:Construction: 3
[00:05:17 INFO] energy:DHWFacilities: 12
[00:05:17 INFO] energy:DailyPatternSchedule: 84
[00:05:17 INFO] energy:ElectricalAppliances: 12
[00:05:17 INFO] energy:EnergyDemand: 24
[00:05:17 INFO] energy:Layer: 3
[00:05:17 INFO] energy:LayerComponent: 13
[00:05:17 INFO] energy:LightingFacilities: 12
[00:05:17 INFO] energy:Occupants: 12
[00:05:17 INFO] energy:RegularTimeSeries: 119
[00:05:17 INFO] energy:SolidMaterial: 13
[00:05:17 INFO] energy:ThermalBoundary: 93
[00:05:17 INFO] energy:ThermalZone: 12
[00:05:17 INFO] energy:UsageZone: 12
[00:05:17 INFO] energy:WeatherData: 2
[00:05:17 INFO] energy:WeatherStation: 1
[00:05:17 INFO] Processed geometry objects: 584
[00:05:17 INFO] Total export time: 01 s.
[00:05:17 INFO] Database export successfully finished.
```

Further resources

- Fur further information, check the official 3DCityDB documentation regarding the installation procedure details

- **Online documentation**
  - https://3dcitydb-docs.readthedocs.io/en/latest/

- **Online tutorial by TU Munich**
  - https://github.com/3dcitydb/tutorials

Thank you for your attention!

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