

OpenLayers + PostGIS Tutorials

Spatial Databases Spring 2017

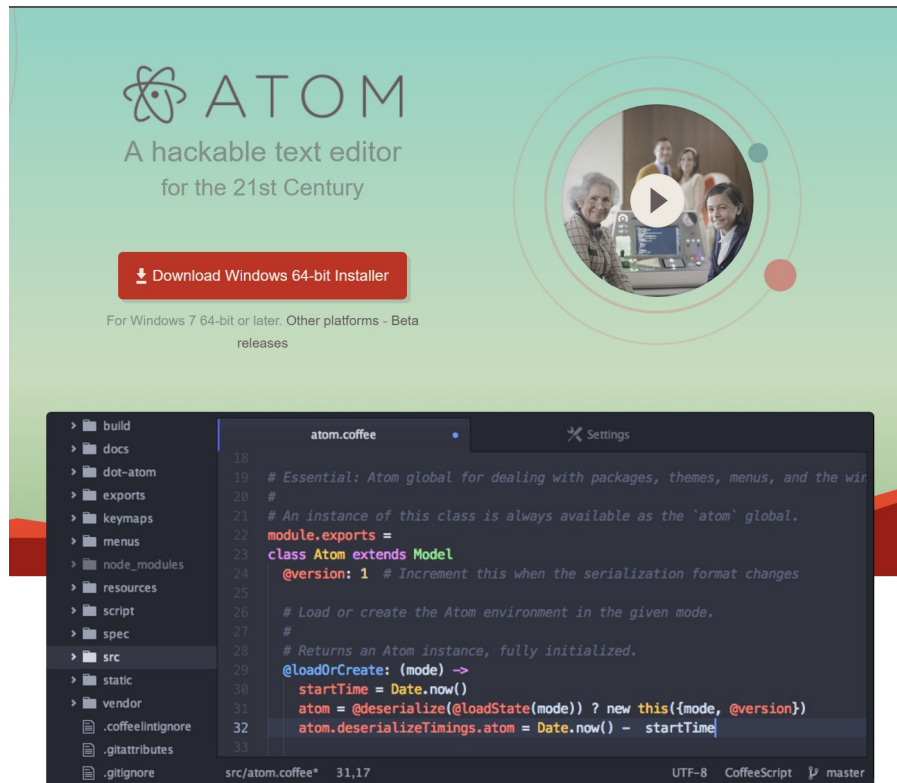
Hyung-Gyu Ryoo

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2017-03-23

Preparing Text Editor

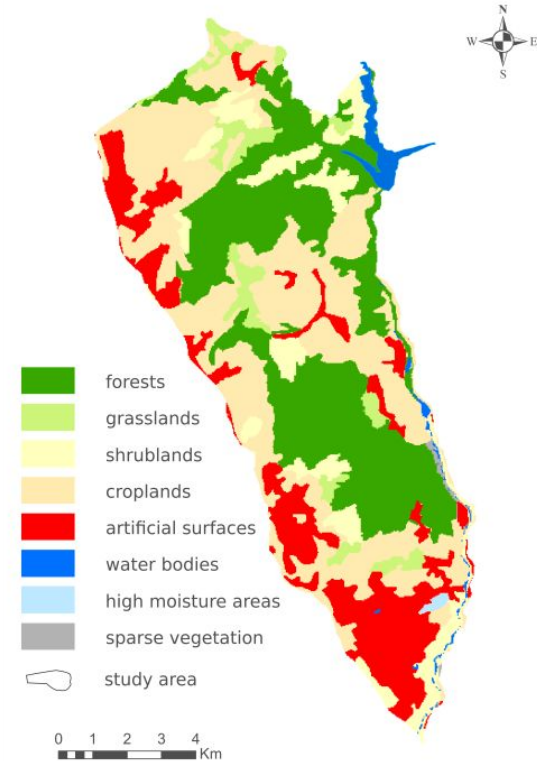
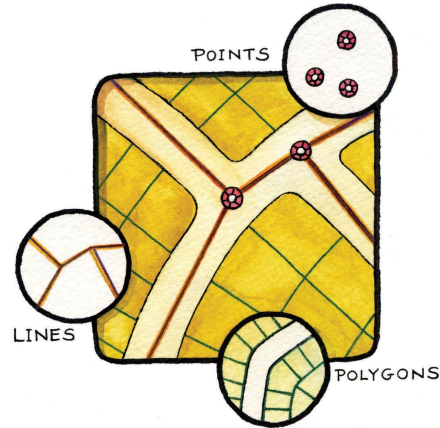
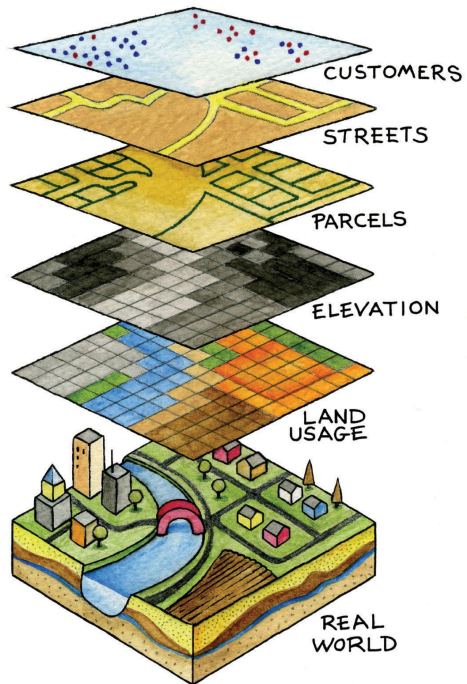
- <https://atom.io/>



The image shows the Atom website header and a screenshot of the Atom code editor. The website header features the Atom logo, the text "ATOM A hackable text editor for the 21st Century", and a red button labeled "Download Windows 64-bit Installer". Below the button, it says "For Windows 7 64-bit or later. Other platforms - Beta releases". To the right is a circular image of a group of people with a play button overlay. The code editor screenshot shows the "atom.coffee" file with the following code:

```
18
19 # Essential: Atom global for dealing with packages, themes, menus, and the wir
20 #
21 # An instance of this class is always available as the 'atom' global.
22 module.exports =
23   class Atom extends Model
24     @version: 1 # Increment this when the serialization format changes
25
26     # Load or create the Atom environment in the given mode.
27     #
28     # Returns an Atom instance, fully initialized.
29     @loadOrCreate: (mode) ->
30       startTime = Date.now()
31       atom = @deserialize(@loadState(mode)) ? new this({mode, @version})
32       atom.deserializeTimings.atom = Date.now() - startTime
33
```

Introduction



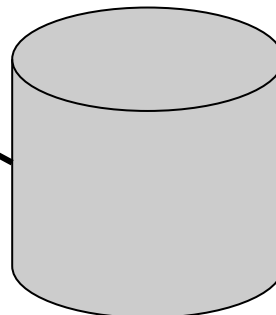
Introduction



GeoJson



Map client

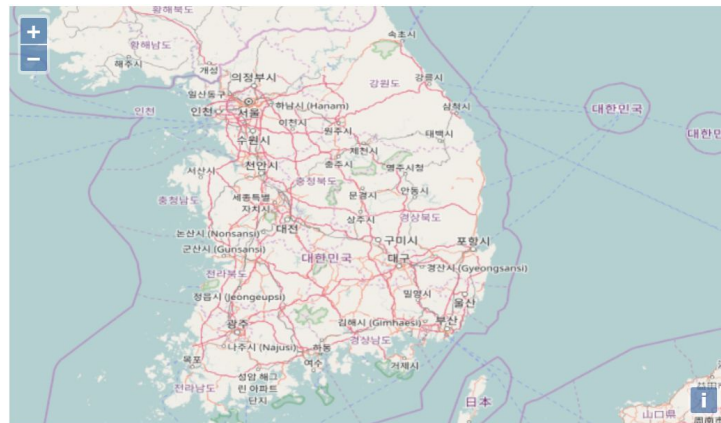


**Spatial
Databases**

OpenLayers?

- An open source client-side Javascript framework for overlaying maps from various map sources
- OpenLayers makes it easy to put a dynamic map in any web page.
- OpenLayers released under the FreeBSD License

A satellite map of East Asia, showing the Korean Peninsula, Japan, and parts of China and Russia. The map is displayed in a web browser interface, with a zoom control in the top left corner (showing a plus sign and a minus sign) and an information icon in the bottom right corner. The map shows the Korean Peninsula, the Sea of Japan, and the surrounding landmasses. The Korean Peninsula is visible in the center, with North Korea in the north and South Korea in the south. The surrounding regions include parts of China to the west and Russia to the north. The map is rendered in a realistic style, showing terrain, vegetation, and urban areas.

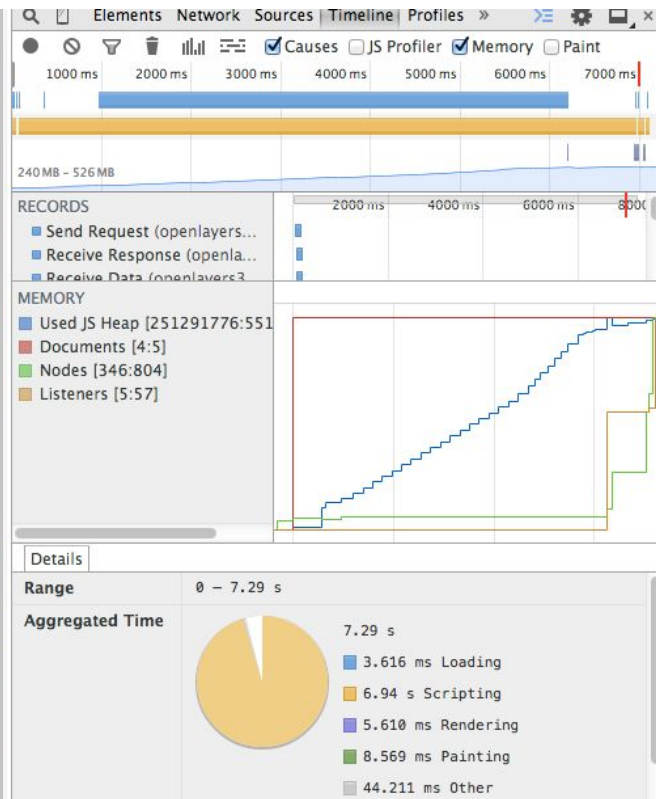
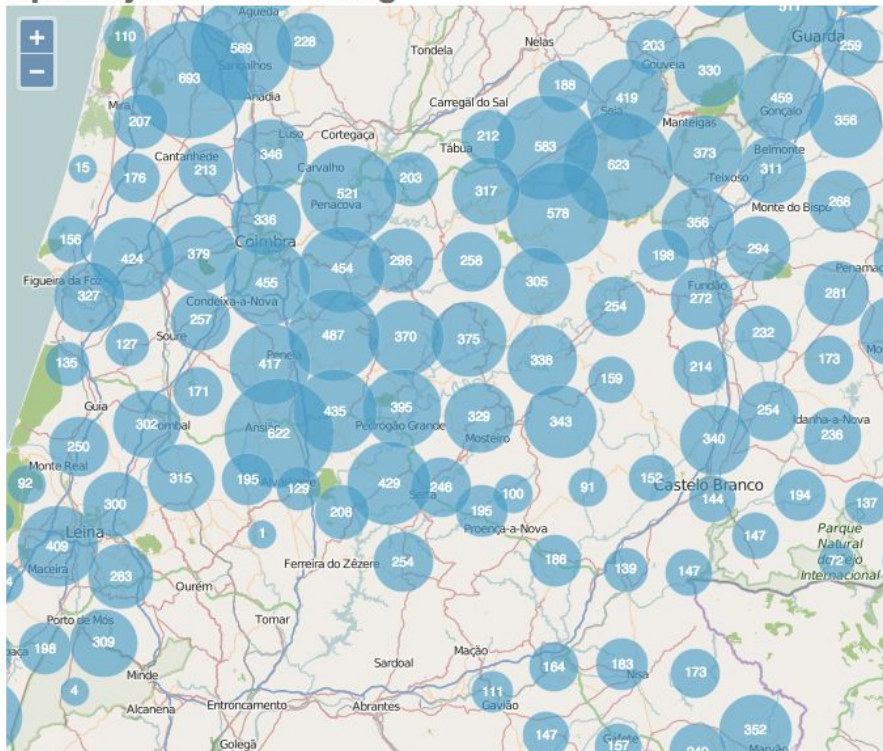


OpenLayers - Vector data on map

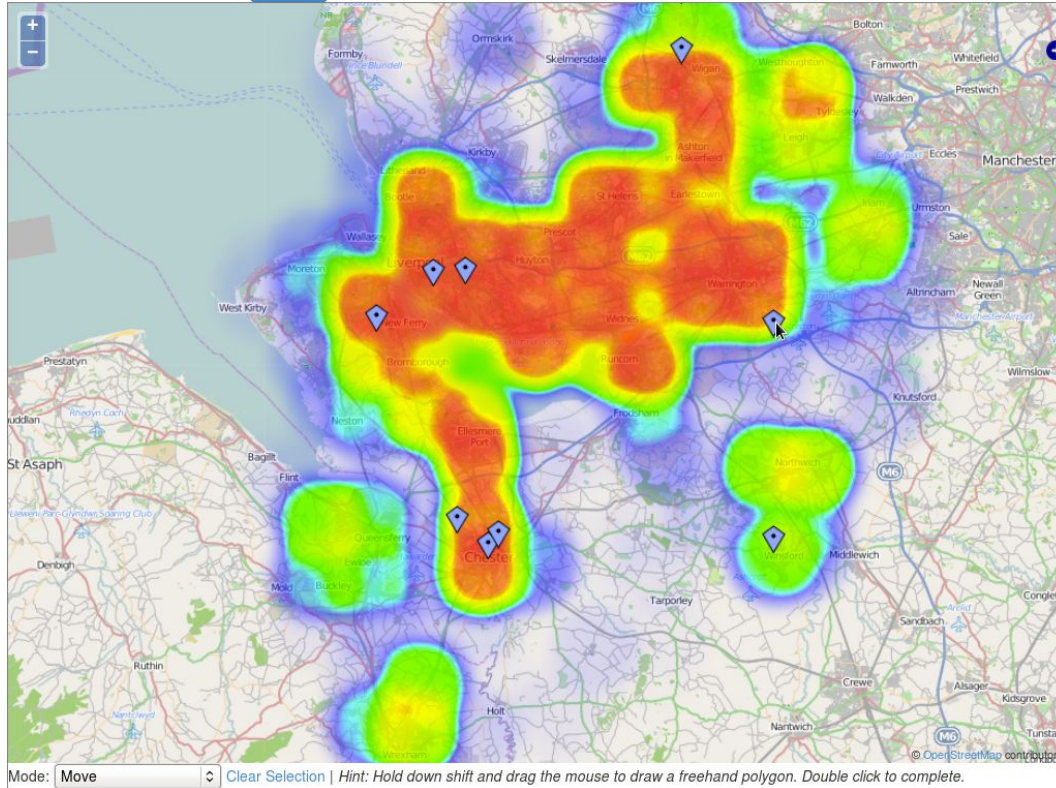


OpenLayers - Visualize clustering result on map

OpenLayers 3 - Clustering



OpenLayers - Heatmap



OpenLayers Tutorial 1 - Quick Start

- Include OpenLayers

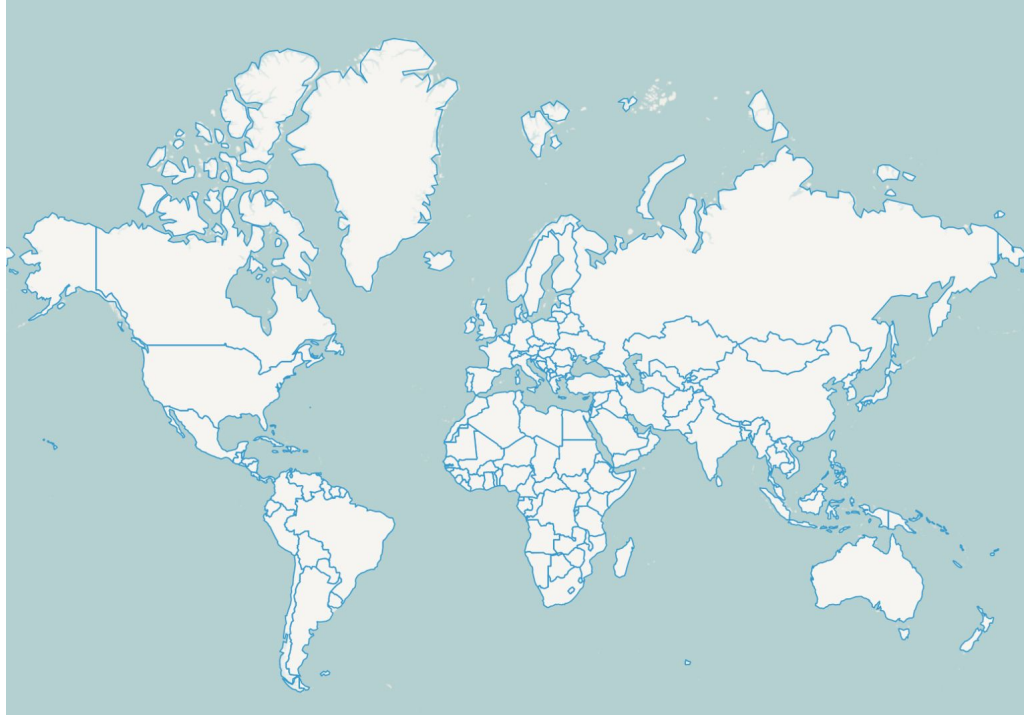
```
<script src="https://openlayers.org/en/v4.0.1/build/ol.js" type="text/javascript"></script>
```

- You can get the code in this url

https://github.com/hgryoo/ol-postgis-tutorial/blob/master/codes/quick_start.html

OpenLayers Tutorial 2

- Draw Vector map from file source

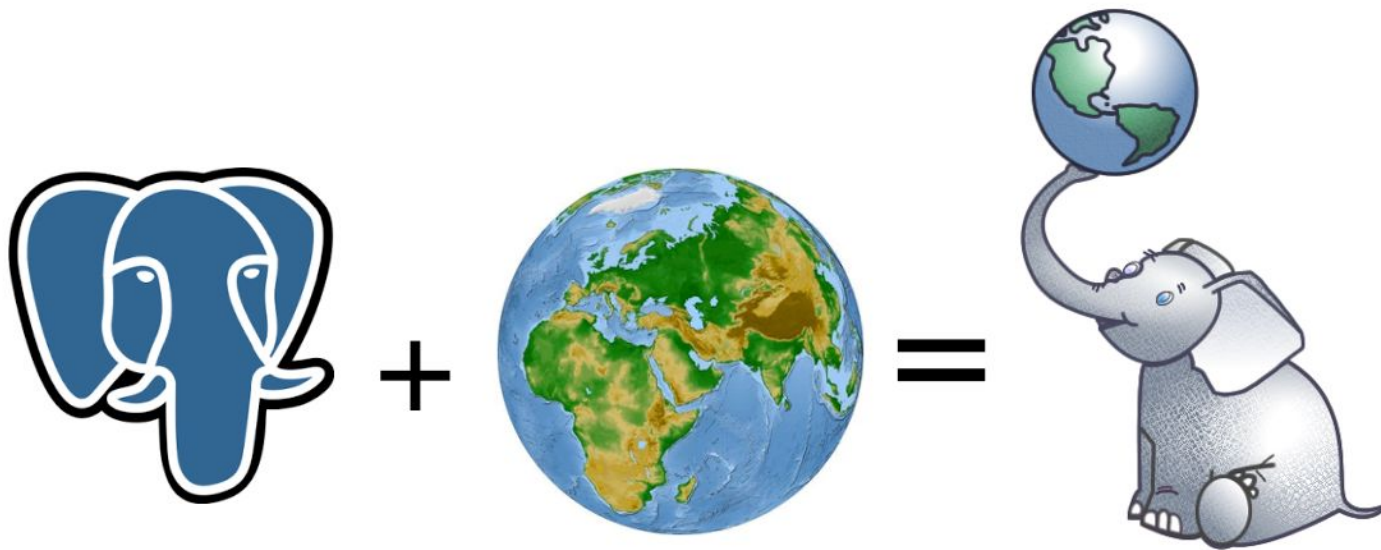


Spatial Databases?

- Spatial databases store and manipulate spatial objects like any other object in the database.



PostGIS?



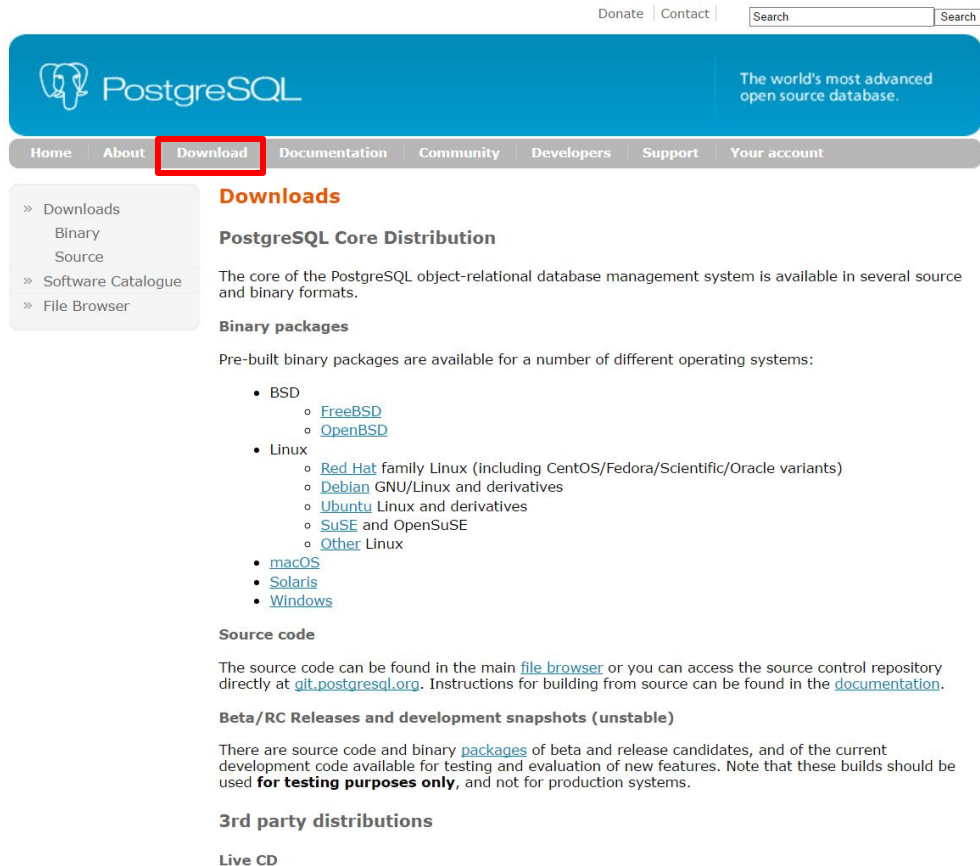
PostGIS?

PostgreSQL is a high-performance object-relational database management system.
PostGIS extends spatial data capabilities to Postgres

- Spatial databases store/manipulate spatial objects
- Spatial data types : point, line, polygon, ...
- Spatial indexing to support efficient processing of spatial operations
- Spatial functions to query of spatial properties and relationships

PostgreSQL Installation (1/8)

- <https://www.postgresql.org/>



The screenshot shows the PostgreSQL website's 'Download' page. The header is blue with the PostgreSQL logo and tagline 'The world's most advanced open source database.' The navigation bar includes links for Home, About, Download (highlighted with a red box), Documentation, Community, Developers, Support, and Your account. A sidebar on the left lists 'Downloads' (with sub-links for Binary and Source), 'Software Catalogue', and 'File Browser'. The main content area is titled 'Downloads' and contains sections for 'PostgreSQL Core Distribution', 'Binary packages' (listing BSD, Linux, macOS, Solaris, and Windows with further sub-links), 'Source code', and 'Beta/RC Releases and development snapshots (unstable)'. The page also mentions '3rd party distributions' and 'Live CD'.

Donate | Contact |

Home | About | **Download** | Documentation | Community | Developers | Support | Your account

» Downloads
 Binary
 Source
» Software Catalogue
» File Browser

Downloads

PostgreSQL Core Distribution

The core of the PostgreSQL object-relational database management system is available in several source and binary formats.

Binary packages

Pre-built binary packages are available for a number of different operating systems:

- BSD
 - [FreeBSD](#)
 - [OpenBSD](#)
- Linux
 - [Red Hat](#) family Linux (including CentOS/Fedora/Scientific/Oracle variants)
 - [Debian](#) GNU/Linux and derivatives
 - [Ubuntu](#) Linux and derivatives
 - [SuSE](#) and OpenSuSE
 - [Other](#) Linux
- [macOS](#)
- [Solaris](#)
- [Windows](#)

Source code

The source code can be found in the main [file browser](#) or you can access the source control repository directly at git.postgresql.org. Instructions for building from source can be found in the [documentation](#).

Beta/RC Releases and development snapshots (unstable)

There are source code and binary [packages](#) of beta and release candidates, and of the current development code available for testing and evaluation of new features. Note that these builds should be used **for testing purposes only**, and not for production systems.

3rd party distributions

Live CD

PostgreSQL Installation (2/8)

Windows installers

Interactive installer by EnterpriseDB

[Download the installer](#) certified by EnterpriseDB for all supported PostgreSQL versions.

This installer includes the PostgreSQL server, pgAdmin; a graphical tool for managing and developing your databases, and StackBuilder; a package manager that can be used to download and install additional PostgreSQL tools and drivers. Stackbuilder includes management, integration, migration, replication, geospatial, connectors and other tools.

This installer can run in graphical or silent install modes.

The installer is designed to be a straightforward, fast way to get up and running with PostgreSQL on Windows.

Advanced users can also download a [zip archive](#) of the binaries, without the installer. This download is intended for users who wish to include PostgreSQL as part of another application installer.

Graphical installer by BigSQL

[Download the graphical installer](#) from BigSQL for all supported versions.

This distribution includes the PostgreSQL server, a graphical component manager, command line and graphical tools for managing databases, plus many open source community components.

Integrated components include web and desktop developer tools, geospatial, provisioning & management, compatibility & migration, backup/restore, integration with external databases (Cassandra, Oracle, SQL Server, Hadoop), and procedural languages (Python, Perl, Java, and TCL).

This distribution is a fast, developer-friendly way to get a complete PostgreSQL environment installed and running. It uses an open source toolchain to build PostgreSQL and extensions, which simplifies cross-platform development of extensions.

Advanced users can also download a [command line](#) version of the distribution, for scriptable installs or embedding with other applications.

PostgreSQL Installation (3/8)



The screenshot shows the EDB PostgreSQL website. At the top, there is a navigation bar with links: DOWNLOADS, BLOG, CONTACT US, LOGIN, MY ACCOUNT, and ENGLISH. Below this is a secondary navigation bar with links: PRODUCTS, USE CASES, CUSTOMERS, PARTNERS, SERVICES AND SUPPORT, TRAINING, and RESOURCES. The EDB POSTGRES logo is on the left. A blue banner at the top contains a cookie consent message with 'OK, I agree' and 'No, give m' buttons. The main heading 'Download PostgreSQL' is centered on a dark background with a cityscape and data visualizations.

EDB
POSTGRES

PRODUCTS USE CASES CUSTOMERS PARTNERS SERVICES AND SUPPORT TRAINING RESOURCES

cookies on this site to enhance your user experience
any link on this page you are giving your consent for us to set cookies.

OK, I agree No, give m

Download PostgreSQL

HOME > DOWNLOAD POSTGRESQL

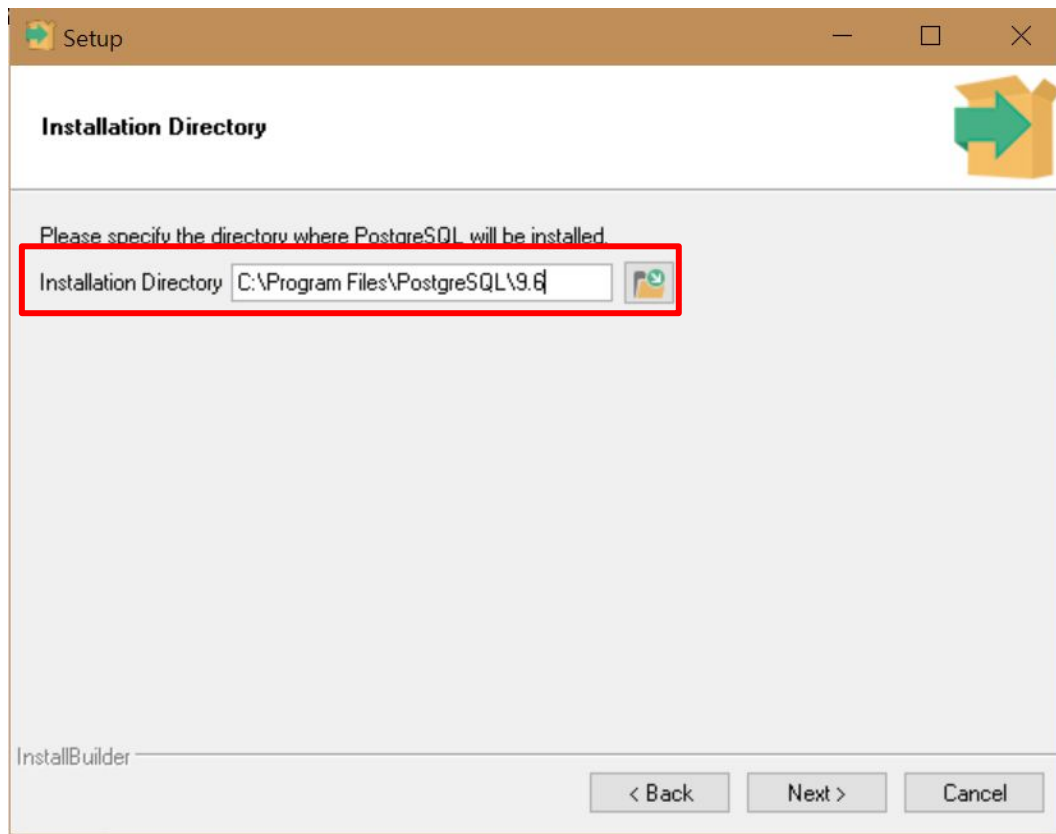
PostgreSQL 9.6.2

Windows x86-64

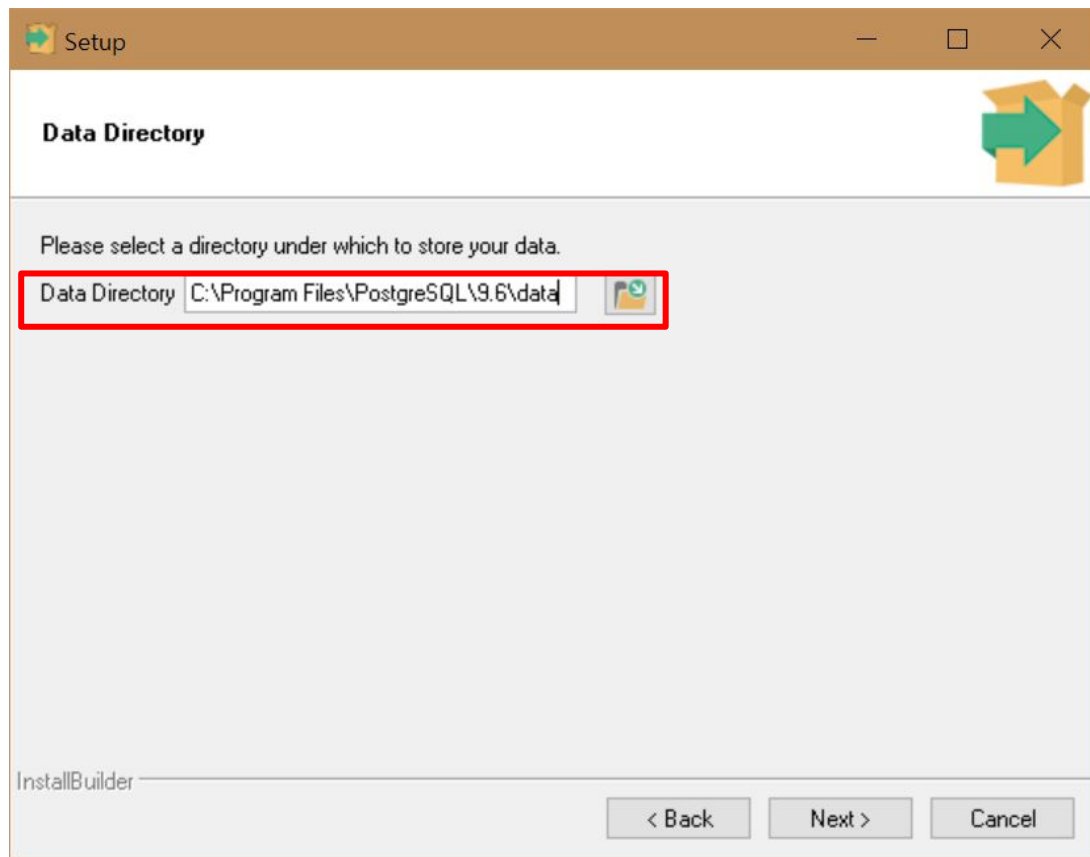
DOWNLOAD NOW

Please note: Cookies should be enabled for the download process to function properly

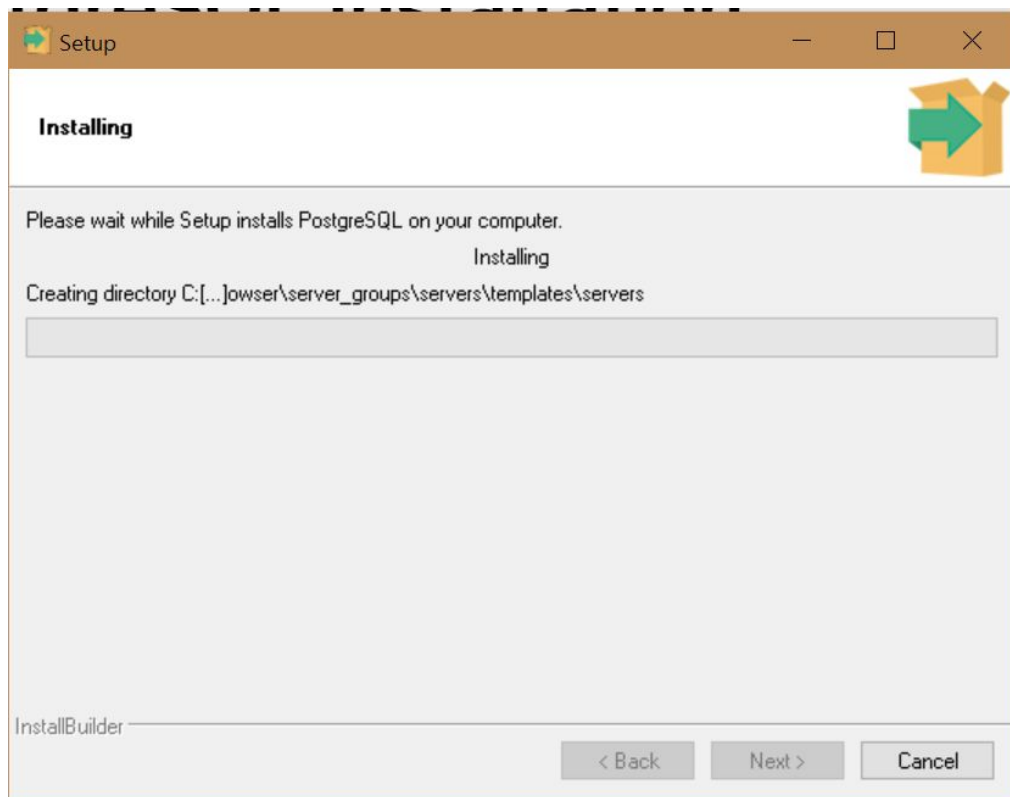
PostgreSQL Installation (4/8)



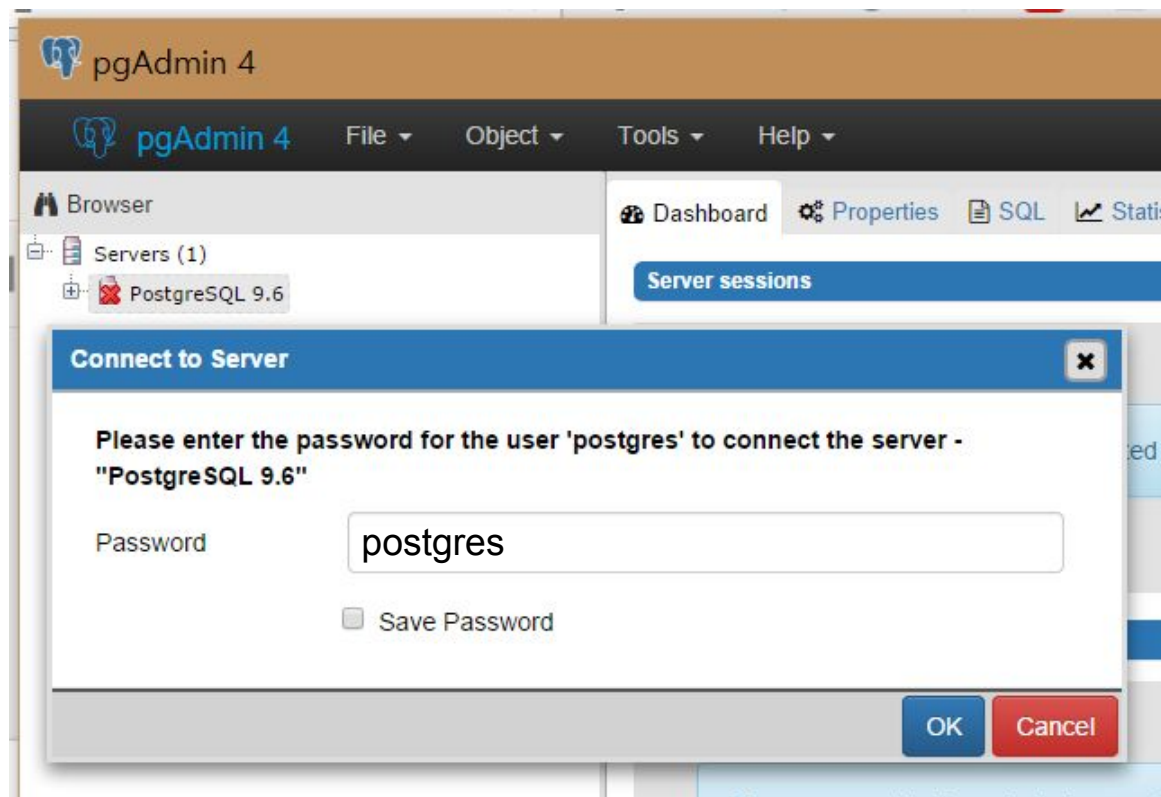
PostgreSQL Installation (5/8)



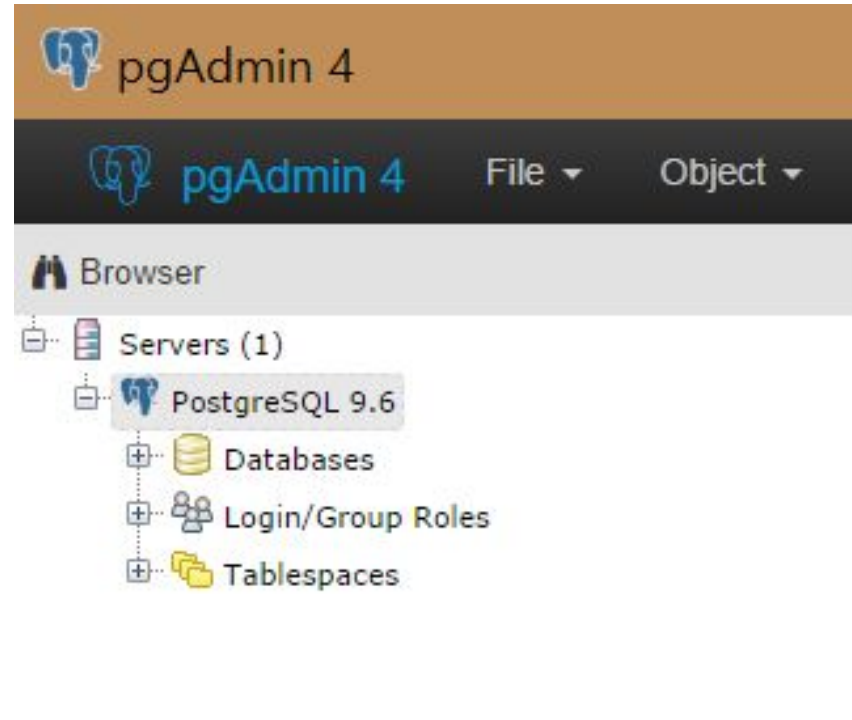
PostgreSQL Installation (6/8)



PostgreSQL Installation (7/8)



PostgreSQL Installation (8/8)



PostGIS Installation(1/4)

- Download at <http://postgis.net/>



The screenshot shows the PostGIS website homepage. At the top is the PostGIS logo, which features a stylized elephant holding a globe. To the right of the logo is the text "Spatial and Geographic objects for PostgreSQL". Below the logo is a navigation bar with links: Home, Download, Documentation, Development, Support, and the OSGeo logo. The main content area is divided into several sections. The "About PostGIS" section contains a paragraph describing PostGIS as a spatial database extender for PostgreSQL, followed by a SQL query snippet. The "License" section states that PostGIS is released under the GNU General Public License. The "News" section includes a link to "What's happening right now" and a link to "Blogs, Tweets and more...". On the right side, there are two boxes for "Upcoming Events" and "Recent past events". The "Upcoming Events" box lists "PGConf US 2017" and "Postgres Vision 2017". The "Recent past events" box lists "PGConf Silicon Valley 2016" and "PostgresOpen 2016". At the bottom right, there is a "Follow @postgis" button.

PostGIS

Spatial and Geographic objects for PostgreSQL

Home Download Documentation Development Support OSGeo

About PostGIS

PostGIS is a spatial database extender for [PostgreSQL](#) object-relational database. It adds support for geographic objects allowing location queries to be run in SQL.

```
SELECT superhero.name
FROM city, superhero
WHERE ST_Contains(city.geom, superhero.geom)
AND city.name = 'Gotham';
```

In addition to basic location awareness, PostGIS offers many features rarely found in other competing spatial databases such as Oracle Locator/Spatial and SQL Server. Refer to [PostGIS Feature List](#) for more details.

License

PostGIS is released under the GNU General Public License ([GPLv2](#) or later). Refer to [License FAQ](#) for more information. PostGIS is developed by a group of contributors led by a Project Steering Committee.

News

What's happening right now

[Blogs, Tweets and more...](#)

[Follow @postgis](#)

Upcoming Events

PGConf US 2017
PGConf US March 28-31st, 2017 in Jersey City, NJ, USA

Postgres Vision 2017
Boston, MA, USA June 26th-28th 2017

FOSS4G BOSTON 2017

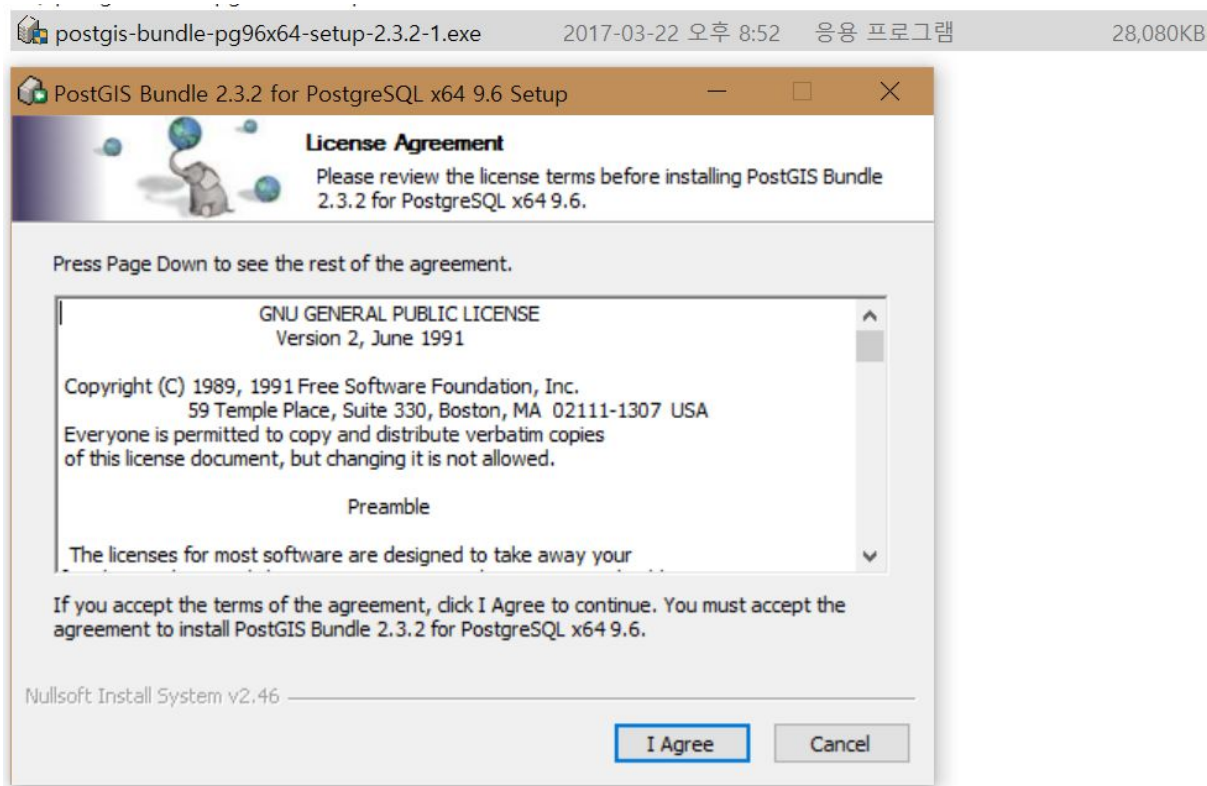
Recent past events

PGConf Silicon Valley 2016

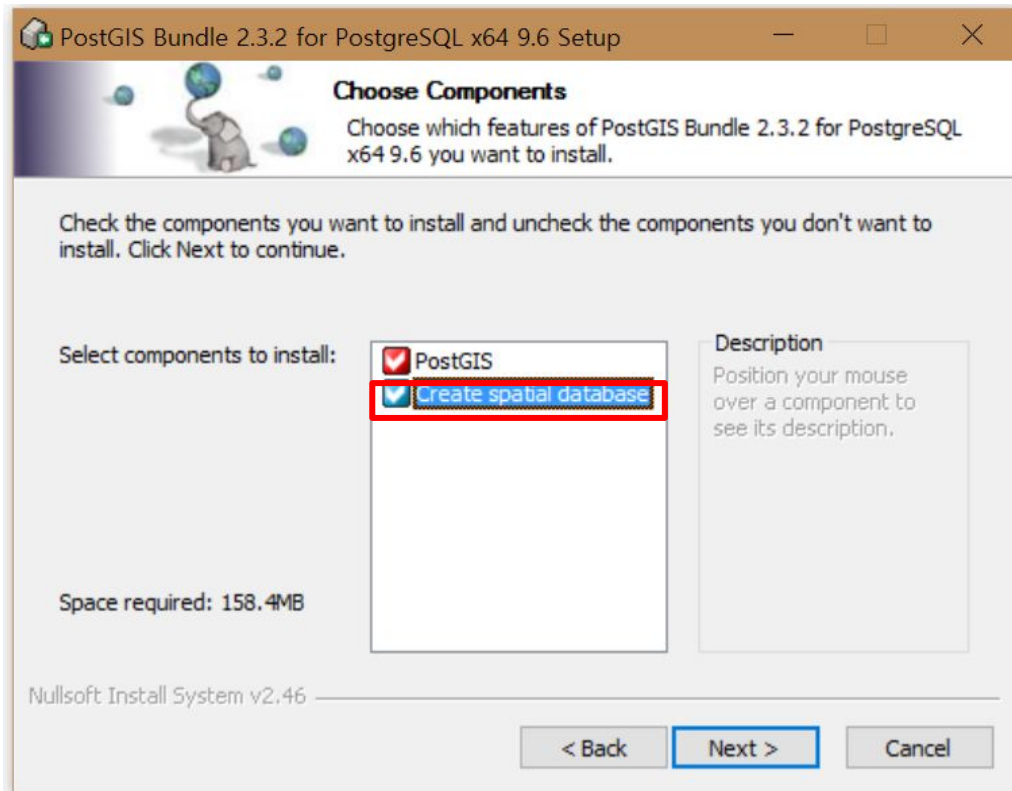
 [PostgreSQL Sessions, 22 Sept 2016, Lyon France](#)

PostgresOpen 2016

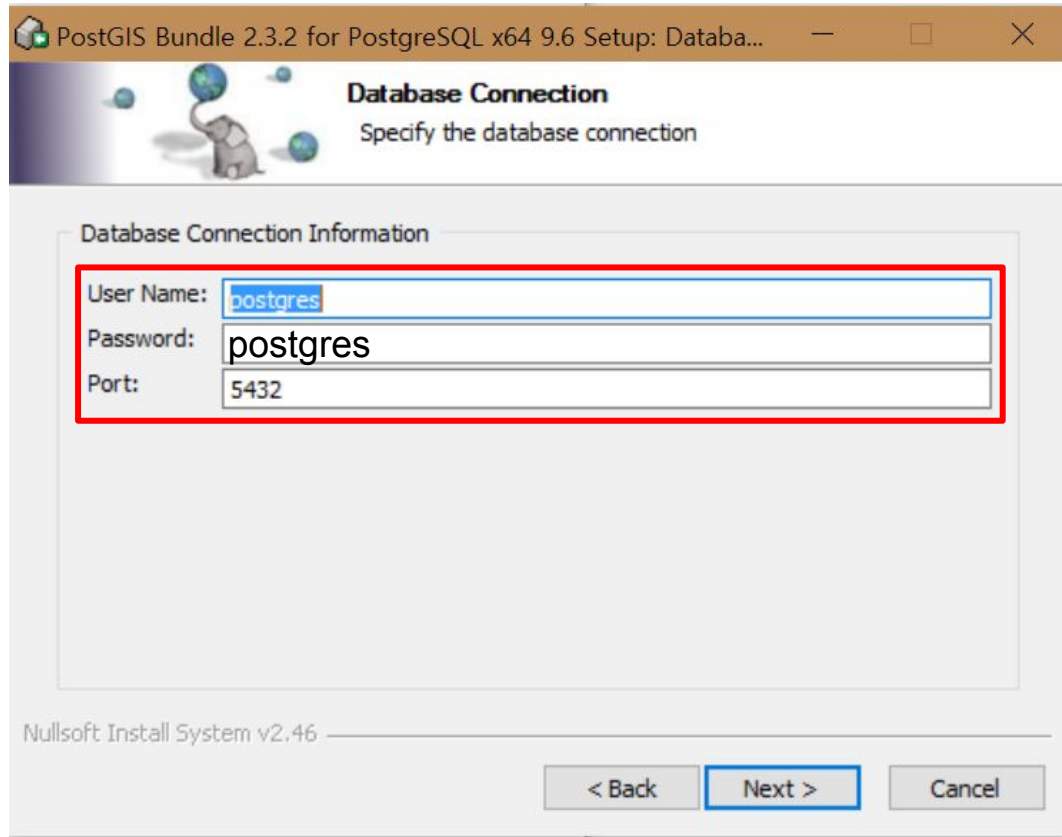
PostGIS Installation (2/4)



PostGIS Installation (3/4)



PostGIS Installation (4/4)



The image shows a Windows installer window titled "PostGIS Bundle 2.3.2 for PostgreSQL x64 9.6 Setup: Database...". The window has a header bar with standard Windows window controls. Below the header, there is a decorative banner with a cartoon elephant and the text "Database Connection" and "Specify the database connection". The main content area is titled "Database Connection Information" and contains three input fields: "User Name:" with the value "postgres", "Password:" with the value "postgres", and "Port:" with the value "5432". These three fields are enclosed in a red rectangular box. At the bottom of the window, there is a status bar that says "Nullsoft Install System v2.46" and three buttons: "< Back", "Next >" (which is highlighted with a blue border), and "Cancel".

PostGIS Bundle 2.3.2 for PostgreSQL x64 9.6 Setup: Databa...

Database Connection
Specify the database connection

Database Connection Information

User Name: postgres

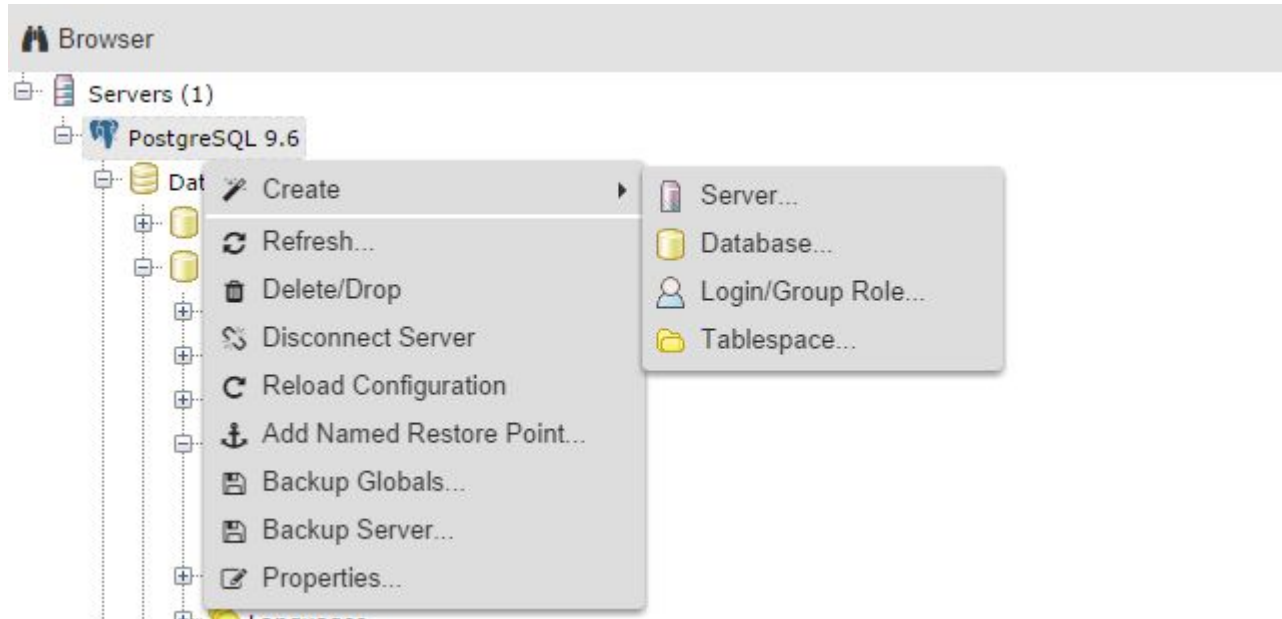
Password: postgres

Port: 5432

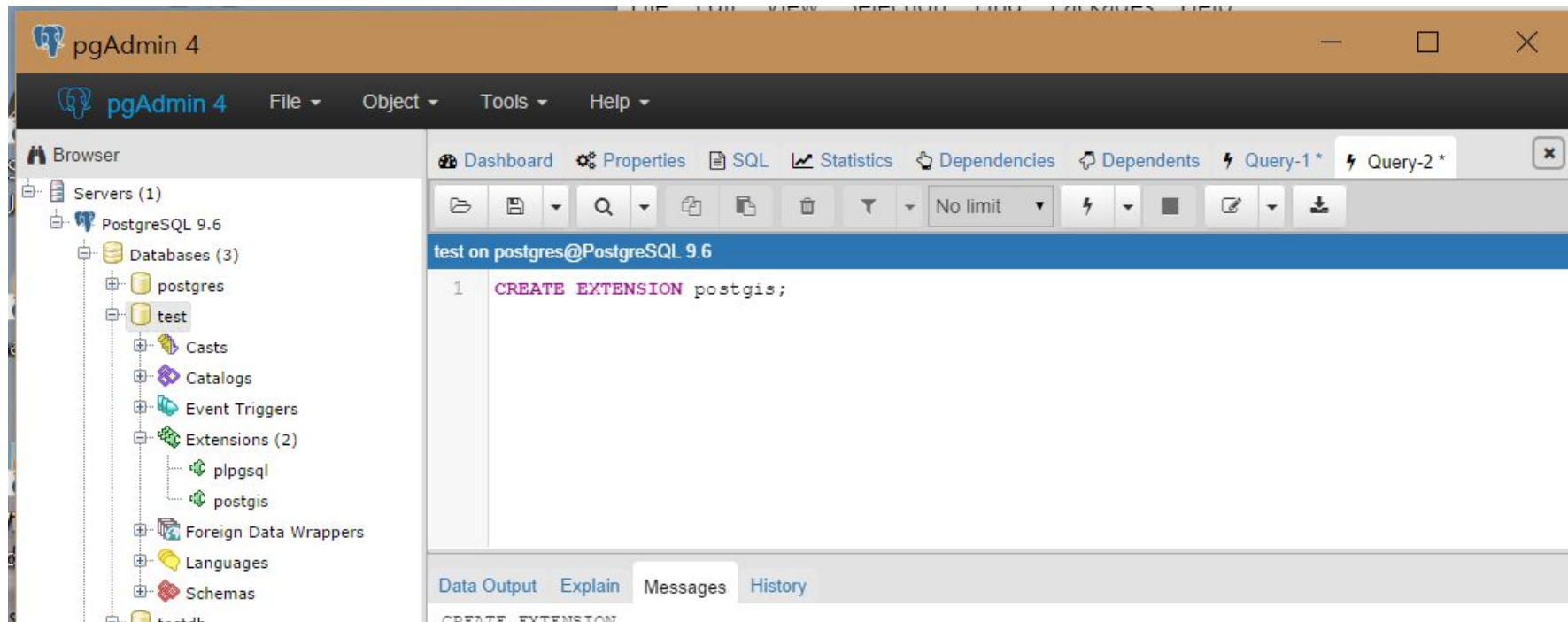
Nullsoft Install System v2.46

< Back Next > Cancel

PostGIS - Create Database



PostGIS - Enable PostGIS Extension



PostGIS - Create Table with Geometry

```
CREATE TABLE world (  
    id SERIAL PRIMARY KEY,  
    name VARCHAR(50),  
    geom GEOMETRY  
);
```


PostGIS - Insert SQL

```
INSERT INTO world (name, geom)
```

```
VALUES ('South Korea',
```

```
ST_GeomFromGeoJSON('{"type":"Polygon","coordinates":[[[128.349716,38.6122  
43],[129.21292,37.432392],[129.46045,36.784189],[129.468304,35.632141],[129.09  
1377,35.082484],[128.18585,34.890377],[127.386519,34.475674],[126.485748,34.3  
90046],[126.37392,34.93456],[126.559231,35.684541],[126.117398,36.725485],[12  
6.860143,36.893924],[126.174759,37.749686],[126.237339,37.840378],[126.68372,  
37.804773],[127.073309,38.256115],[127.780035,38.304536],[128.205746,38.3703  
97],[128.349716,38.612243]]]}'))
```

PostGIS - Select SQL

- SELECT id, name, **ST_ASTEXT(geom)**
FROM world;
- SELECT id, name, ST_ASTEXT(geom), **ST_AREA(geom) AS area**
FROM world;
- SELECT id, name, ST_ASTEXT(geom)
FROM world
WHERE ST_AREA(geom) < 10

Node.js Installation

- Download at <https://nodejs.org/>



Node.js® is a JavaScript runtime built on [Chrome's V8 JavaScript engine](#). Node.js uses an event-driven, non-blocking I/O model that makes it lightweight and efficient. Node.js' package ecosystem, [npm](#), is the largest ecosystem of open source libraries in the world.

Download for Windows (x64)

v6.10.0 LTS

Recommended For Most Users

v7.7.3 Current

Latest Features

[Other Downloads](#) | [Changelog](#) | [API Docs](#)

[Other Downloads](#) | [Changelog](#) | [API Docs](#)

Or have a look at the [LTS schedule](#).

Next Tutorials



GeoServer

