PostGIS

Version 3

Built at 2025-06-09T15:17:00

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1 PostGIS

EDB PostGIS is a PostgreSQL extension that allows you to store geographic information systems (GIS) objects in an EDB Postgres Advanced Server database. It includes functions for analyzing and processing GIS objects and support for GiST-based R-Tree spatial indexes.

The complete documentation for PostGIS is added to your system during the installation and is available online at thePostGIS project site.

2 Release notes

The EDB PostGIS documentation describes the latest version of EDB PostGIS 3, including minor releases and patches. These release notes cover what was new in each release.

Version	Release date
3.5.2	13 Feb 2025
3.4.2	01 Apr 2024
3.2.1	04 Aug 2023
3.2.0	01 Dec 2022
3.1.5	03 Aug 2022
3.1.4	01 Dec 2021
3.1.2	24 Jun 2021

2.1 PostGIS 3.5.2 release notes

Released: 13 Feb 2025

EDB PostGIS is a PostgreSQL extension that allows you to store geographic information systems (GIS) objects in an EDB Postgres Advanced Server database.

New features, enhancements, bug fixes, and other changes in PostGIS 3.5.2 include:

Type	Description
Upstream merges	Merged with community PostGIS 3.5.2. See the community Release Notes for details.

2.2 PostGIS 3.4.2 release notes

Released: 01 Apr 2024

EDB PostGIS is a PostgreSQL extension that allows you to store geographic information systems (GIS) objects in an EDB Postgres Advanced Server database.

New features, enhancements, bug fixes, and other changes in PostGIS 3.4.2 include:

Type	Description
Upstream merges	Merged with community PostGIS 3.4.2. See the community Release Notes for details.

2.3 PostGIS 3.2.1 release notes

Released: 04 Aug 2023

EDB PostGIS is a PostgreSQL extension that allows you to store geographic information systems (GIS) objects in an EDB Postgres Advanced Server database.

New features, enhancements, bug fixes, and other changes in PostGIS 3.2.1 include:

Type	Description
Upstream merges	Merged with community PostGIS 3.2.1. See the community Release Notes for details.

2.4 PostGIS 3.2.0 release notes

Released: 01 Dec 2022

EDB PostGIS is a PostgreSQL extension that allows you to store geographic information systems (GIS) objects in an EDB Postgres Advanced Server database.

New features, enhancements, bug fixes, and other changes in PostGIS 3.2.0 include:

Type	Description
Upstream merges	Merged with community PostGIS 3.2.0. See the community Release Notes for details.

2.5 PostGIS 3.1.5 release notes

Released: 03 Aug 2022

EDB PostGIS is a PostgreSQL extension that allows you to store geographic information systems (GIS) objects in an EDB Postgres Advanced Server database.

New features, enhancements, bug fixes, and other changes in PostGIS 3.1.5 include:

Type	Description
Upstream merges	Merged with community PostGIS 3.1.5. See the community Release Notes for details.

https://postgis.net/docs/manual-3.1/release_notes.html#idm41935

2.6 PostGIS 3.1.4 release notes

Released: 01 Dec 2021

EDB PostGIS is a PostgreSQL extension that allows you to store geographic information systems (GIS) objects in an EDB Postgres Advanced Server database.

New features, enhancements, bug fixes, and other changes in PostGIS 3.1.4 include:

Type	Description
Upstream merges	Merged with community PostGIS 3.1.4. See the community Release Notes for details.

2.7 PostGIS 3.1.2 release notes

Released: 24 Jun 2021

EDB PostGIS is a PostgreSQL extension that allows you to store geographic information systems (GIS) objects in an EDB Posgres Advanced Server database.

New features, enhancements, bug fixes, and other changes in PostGIS 3.1.4 include:

Type	Description
Upstream merges	Merged with community PostGIS 3.1.2. See the community Release Notes for details.

> **Note**
>
> To upgrade from PostGIS version 2.5.4 (or lower) to 3.1.2, you must perform the following actions:
>
> - Since the return type of the raster functions have changed, you must drop and re-create the raster extension as part of the upgrade process.
> - Before upgrading to version 3.1.2, you must upgrade to 3.1.1 first as an intermediate step.
> - When the PostGIS data has a dependency on the raster functions, upgrading to PostGIS 3.1.2 requires dumping and reloading the data.
>
> See the upgrade section for details.

3 Supported platforms

EDB PostGIS is supported on the same platforms as EDB Postgres Advanced Server. To determine the platform support for EDB PostGIS, you can either refer to the platform support for EDB Postgres Advanced Server on the Platform Compatibility page on the EDB website or refer to Installing PostGIS.

Supported database versions

This table lists the latest PostGIS versions and their supported corresponding EDB Postgres Advanced Server (EPAS) versions.

PostGIS	EPAS 16	EPAS 15	EPAS 14	EPAS 13	EPAS 12
3.4	Y	Y	Y	Y	Y
3.3	N	Y	Y	Y	Y
3.2	N	Y	Y	Y	Y
3.1	N	N	Y	Y	Y
3.0	N	N	N	Y	Y
2.5	N	N	N	N	Y
2.4	N	N	N	N	N
2.3	N	N	N	N	N

4 Installing PostGIS

Select a link to access the applicable installation instructions:

Linux x86-64 (amd64)

Red Hat Enterprise Linux (RHEL) and derivatives

- RHEL 9, RHEL 8
- Oracle Linux (OL) 9, Oracle Linux (OL) 8
- Rocky Linux 9, Rocky Linux 8
- AlmaLinux 9, AlmaLinux 8

SUSE Linux Enterprise (SLES)

- SLES 15

Debian and derivatives

- Ubuntu 24.04, Ubuntu 22.04, Ubuntu 20.04
- Debian 12, Debian 11

Linux IBM Power (ppc64le)

Red Hat Enterprise Linux (RHEL) and derivatives

- RHEL 9, RHEL 8

SUSE Linux Enterprise (SLES)

- SLES 15

Linux AArch64 (ARM64)

Red Hat Enterprise Linux (RHEL) and derivatives

- RHEL 9
- Oracle Linux (OL) 9

Debian and derivatives

- Debian 12

Windows

- Windows Server 2019

4.1 Installing PostGIS on Linux x86 (amd64)

Operating system-specific install instructions are described in the corresponding documentation:

Red Hat Enterprise Linux (RHEL) and derivatives

- RHEL 9
- RHEL 8
- Oracle Linux (OL) 9
- Oracle Linux (OL) 8
- Rocky Linux 9
- Rocky Linux 8
- AlmaLinux 9
- AlmaLinux 8

SUSE Linux Enterprise (SLES)

- SLES 15

Debian and derivatives

- Ubuntu 24.04
- Ubuntu 22.04
- Ubuntu 20.04
- Debian 12
- Debian 11

4.1.1 Installing PostGIS on RHEL 9 or OL 9 x86_64

Prerequisites

Before you begin the installation process:

- Install Postgres on the same host. See:
  - Installing EDB Postgres Advanced Server
  - Installing PostgreSQL
- Set up the EDB repository.

  Setting up the repository is a one-time task. If you have already set up your repository, you don't need to perform this step.

  To determine if your repository exists, enter this command:

  ```
  dnf repolist | grep enterprisedb
  ```

  If no output is generated, the repository isn't installed.

  To set up the EDB repository:

  1. Go to EDB repositories.
  2. Select the button that provides access to the EDB repository.
  3. Select the platform and software that you want to download.
  4. Follow the instructions for setting up the EDB repository.
- Install the EPEL repository:

  ```
  sudo dnf -y install https://dl.fedoraproject.org/pub/epel/epel-release-latest-9.noarch.rpm
  ```
- Enable additional repositories to resolve dependencies:

  ```
  ARCH=$( /bin/arch ) subscription-manager repos --enable "codeready-builder-for-rhel-9-${ARCH}-rpms"
  ```

  > **Note**
  >
  > If you are using a public cloud RHEL image, `subscription manager` may not be enabled and enabling it may incur unnecessary charges. Equivalent packages may be available under a different name such as `codeready-builder-for-rhel-8-rhui-rpms`. Consult the documentation for the RHEL image you are using to determine how to install `codeready-builder`.

Install the package

```
# To install PostGIS 3.4:
sudo dnf -y install edb-as<xx>-postgis34

# To install PostGIS 3.1 using EDB Postgres Advanced Server 13-15:
sudo dnf -y install edb-as<xx>-postgis3

# To install PostGIS 3.1 using EDB Postgres Advanced Server 11-12:
sudo dnf -y install edb-as<xx>-postgis
```

Where `<xx>` is the version of EDB Postgres Advanced Server. Replace `<xx>` with the version of EDB Postgres Advanced Server you are using. For example, `edb-as15-postgis34`.

4.1.2 Installing PostGIS on RHEL 8 or OL 8 x86_64

Prerequisites

Before you begin the installation process:

- Install Postgres on the same host. See:
  - Installing EDB Postgres Advanced Server
  - Installing PostgreSQL
- Set up the EDB repository.

  Setting up the repository is a one-time task. If you have already set up your repository, you don't need to perform this step.

  To determine if your repository exists, enter this command:

  ```
  dnf repolist | grep enterprisedb
  ```

  If no output is generated, the repository isn't installed.

  To set up the EDB repository:

  1. Go to EDB repositories.
  2. Select the button that provides access to the EDB repository.
  3. Select the platform and software that you want to download.
  4. Follow the instructions for setting up the EDB repository.
- Install the EPEL repository:

  ```
  sudo dnf -y install https://dl.fedoraproject.org/pub/epel/epel-release-latest-8.noarch.rpm
  ```
- Enable additional repositories to resolve dependencies:

  ```
  ARCH=$( /bin/arch ) subscription-manager repos --enable "codeready-builder-for-rhel-8-${ARCH}-rpms"
  ```

  > **Note**
  >
  > If you are using a public cloud RHEL image, `subscription manager` may not be enabled and enabling it may incur unnecessary charges. Equivalent packages may be available under a different name such as `codeready-builder-for-rhel-8-rhui-rpms`. Consult the documentation for the RHEL image you are using to determine how to install `codeready-builder`.

Install the package

```
# To install PostGIS 3.4:
sudo dnf -y install edb-as<xx>-postgis34

# To install PostGIS 3.1 using EDB Postgres Advanced Server 13-15:
sudo dnf -y install edb-as<xx>-postgis3

# To install PostGIS 3.1 using EDB Postgres Advanced Server 11-12:
sudo dnf -y install edb-as<xx>-postgis
```

Where `<xx>` is the version of EDB Postgres Advanced Server. Replace `<xx>` with the version of EDB Postgres Advanced Server you are using. For example, `edb-as15-postgis34`.

4.1.3 Installing PostGIS on AlmaLinux 9 or Rocky Linux 9 x86_64

Prerequisites

Before you begin the installation process:

- Install Postgres on the same host. See:
  - Installing EDB Postgres Advanced Server
  - Installing PostgreSQL
- Set up the EDB repository.

  Setting up the repository is a one-time task. If you have already set up your repository, you don't need to perform this step.

  To determine if your repository exists, enter this command:

  ```
  dnf repolist | grep enterprisedb
  ```

  If no output is generated, the repository isn't installed.

  To set up the EDB repository:

  1. Go to EDB repositories.
  2. Select the button that provides access to the EDB repository.
  3. Select the platform and software that you want to download.
  4. Follow the instructions for setting up the EDB repository.
- Install the EPEL repository:

  ```
  sudo dnf -y install epel-release
  ```
- Enable additional repositories to resolve dependencies:

  ```
  sudo dnf config-manager --set-enabled crb
  ```

Install the package

```
# To install PostGIS 3.4:
sudo dnf -y install edb-as<xx>-postgis34

# To install PostGIS 3.1 using EDB Postgres Advanced Server 13-15:
sudo dnf -y install edb-as<xx>-postgis3

# To install PostGIS 3.1 using EDB Postgres Advanced Server 11:
sudo dnf -y install edb-as11-postgis
```

Where `<xx>` is the version of EDB Postgres Advanced Server. Replace `<xx>` with the version of EDB Postgres Advanced Server you are using. For example, `edb-as15-postgis34`.

4.1.4 Installing PostGIS on AlmaLinux 8 or Rocky Linux 8 x86_64

Prerequisites

Before you begin the installation process:

- Install Postgres on the same host. See:
  - Installing EDB Postgres Advanced Server
  - Installing PostgreSQL
- Set up the EDB repository.

  Setting up the repository is a one-time task. If you have already set up your repository, you don't need to perform this step.

  To determine if your repository exists, enter this command:

  ```
  dnf repolist | grep enterprisedb
  ```

  If no output is generated, the repository isn't installed.

  To set up the EDB repository:

  1. Go to EDB repositories.
  2. Select the button that provides access to the EDB repository.
  3. Select the platform and software that you want to download.
  4. Follow the instructions for setting up the EDB repository.
- Install the EPEL repository:

  ```
  sudo dnf -y install epel-release
  ```
- Enable additional repositories to resolve dependencies:

  ```
  sudo dnf config-manager --set-enabled powertools
  ```

Install the package

```
# To install PostGIS 3.4:
sudo dnf -y install edb-as<xx>-postgis34

# To install PostGIS 3.1 using EDB Postgres Advanced Server 13-15:
sudo dnf -y install edb-as<xx>-postgis3

# To install PostGIS 3.1 using EDB Postgres Advanced Server 11:
sudo dnf -y install edb-as11-postgis
```

Where `<xx>` is the version of EDB Postgres Advanced Server. Replace `<xx>` with the version of EDB Postgres Advanced Server you are using. For example, `edb-as15-postgis34`.

4.1.5 Installing PostGIS on SLES 15 x86_64

Prerequisites

Before you begin the installation process:

- Install Postgres on the same host. See:
  - Installing EDB Postgres Advanced Server
  - Installing PostgreSQL
- Set up the EDB repository.

  Setting up the repository is a one-time task. If you have already set up your repository, you don't need to perform this step.

  To determine if your repository exists, enter this command:

  ```
  zypper lr -E | grep enterprisedb
  ```

  If no output is generated, the repository isn't installed.

  To set up the EDB repository:

  1. Go to EDB repositories.
  2. Select the button that provides access to the EDB repository.
  3. Select the platform and software that you want to download.
  4. Follow the instructions for setting up the EDB repository.
- Activate the required SUSE module:

  ```
  sudo SUSEConnect -p PackageHub/15.4/x86_64
  ```
- Refresh the metadata:

  ```
  sudo zypper refresh
  ```

Install the package

```
# To install PostGIS 3.4:
sudo zypper -n install edb-as<xx>-postgis34

# To install PostGIS 3.1:
sudo zypper -n install edb-as<xx>-postgis3
```

Where `<xx>` is the version of EDB Postgres Advanced Server. Replace `<xx>` with the version of EDB Postgres Advanced Server you are using. For example, `edb-as15-postgis34`.

4.1.6 Installing PostGIS on Ubuntu 24.04 x86_64

Prerequisites

Before you begin the installation process:

- Install Postgres on the same host. See:
  - Installing EDB Postgres Advanced Server
  - Installing PostgreSQL
- Set up the EDB repository.

  Setting up the repository is a one-time task. If you have already set up your repository, you don't need to perform this step.

  To determine if your repository exists, enter this command:

  ```
  apt-cache search enterprisedb
  ```

  If no output is generated, the repository isn't installed.

  To set up the EDB repository:

  1. Go to EDB repositories.
  2. Select the button that provides access to the EDB repository.
  3. Select the platform and software that you want to download.
  4. Follow the instructions for setting up the EDB repository.

Install the package

```
# To install PostGIS 3.4:
sudo zypper -n install edb-as<xx>-postgis34

# To install PostGIS 3.1:
sudo zypper -n install edb-as<xx>-postgis3
```

Where `<xx>` is the version of EDB Postgres Advanced Server. Replace `<xx>` with the version of EDB Postgres Advanced Server you are using. For example, `edb-as15-postgis34`.

4.1.7 Installing PostGIS on Ubuntu 22.04 x86_64

Prerequisites

Before you begin the installation process:

- Install Postgres on the same host. See:
  - Installing EDB Postgres Advanced Server
  - Installing PostgreSQL
- Set up the EDB repository.

  Setting up the repository is a one-time task. If you have already set up your repository, you don't need to perform this step.

  To determine if your repository exists, enter this command:

  ```
  apt-cache search enterprisedb
  ```

  If no output is generated, the repository isn't installed.

  To set up the EDB repository:

  1. Go to EDB repositories.
  2. Select the button that provides access to the EDB repository.
  3. Select the platform and software that you want to download.
  4. Follow the instructions for setting up the EDB repository.

Install the package

```
# To install PostGIS 3.4:
sudo zypper -n install edb-as<xx>-postgis34

# To install PostGIS 3.1:
sudo zypper -n install edb-as<xx>-postgis3
```

Where `<xx>` is the version of EDB Postgres Advanced Server. Replace `<xx>` with the version of EDB Postgres Advanced Server you are using. For example, `edb-as15-postgis34`.

4.1.8 Installing PostGIS on Ubuntu 20.04 x86_64

Prerequisites

Before you begin the installation process:

- Install Postgres on the same host. See:
  - Installing EDB Postgres Advanced Server
  - Installing PostgreSQL
- Set up the EDB repository.

  Setting up the repository is a one-time task. If you have already set up your repository, you don't need to perform this step.

  To determine if your repository exists, enter this command:

  ```
  apt-cache search enterprisedb
  ```

  If no output is generated, the repository isn't installed.

  To set up the EDB repository:

  1. Go to EDB repositories.
  2. Select the button that provides access to the EDB repository.
  3. Select the platform and software that you want to download.
  4. Follow the instructions for setting up the EDB repository.

Install the package

```
# To install PostGIS 3.4:
sudo apt-get -y install edb-as14-postgis34

# To install PostGIS 3.1:
sudo apt-get -y install edb-as<xx>-postgis3
```

Where `<xx>` is the version of EDB Postgres Advanced Server. Replace `<xx>` with the version of EDB Postgres Advanced Server you are using. For example, `edb-as15-postgis34`.

4.1.9 Installing PostGIS on Debian 12 x86_64

Prerequisites

Before you begin the installation process:

- Install Postgres on the same host. See:
  - Installing EDB Postgres Advanced Server
  - Installing PostgreSQL
- Set up the EDB repository.

  Setting up the repository is a one-time task. If you have already set up your repository, you don't need to perform this step.

  To determine if your repository exists, enter this command:

  ```
  apt-cache search enterprisedb
  ```

  If no output is generated, the repository isn't installed.

  To set up the EDB repository:

  1. Go to EDB repositories.
  2. Select the button that provides access to the EDB repository.
  3. Select the platform and software that you want to download.
  4. Follow the instructions for setting up the EDB repository.

Install the package

```
# To install PostGIS 3.4 using EDB Postgres Advanced Server 12-16:
sudo apt-get -y install edb-as<xx>-postgis34
```

Where `<xx>` is the version of EDB Postgres Advanced Server. Replace `<xx>` with the version of EDB Postgres Advanced Server you are using. For example, `edb-as15-postgis34`.

4.1.10 Installing PostGIS on Debian 11 x86_64

Prerequisites

Before you begin the installation process:

- Install Postgres on the same host. See:
  - Installing EDB Postgres Advanced Server
  - Installing PostgreSQL
- Set up the EDB repository.

  Setting up the repository is a one-time task. If you have already set up your repository, you don't need to perform this step.

  To determine if your repository exists, enter this command:

  ```
  apt-cache search enterprisedb
  ```

  If no output is generated, the repository isn't installed.

  To set up the EDB repository:

  1. Go to EDB repositories.
  2. Select the button that provides access to the EDB repository.
  3. Select the platform and software that you want to download.
  4. Follow the instructions for setting up the EDB repository.

Install the package

```
# To install PostGIS 3.4 using EDB Postgres Advanced Server 12-16:
sudo apt-get -y install edb-as<xx>-postgis34
```

Where `<xx>` is the version of EDB Postgres Advanced Server. Replace `<xx>` with the version of EDB Postgres Advanced Server you are using. For example, `edb-as15-postgis34`.

4.2 Installing PostGIS on Linux AArch64 (ARM64)

Operating system-specific install instructions are described in the corresponding documentation:

Red Hat Enterprise Linux (RHEL) and derivatives

- RHEL 9
- Oracle Linux (OL) 9

Debian and derivatives

- Debian 12

4.2.1 Installing PostGIS on RHEL 9 or OL 9 arm64

Prerequisites

Before you begin the installation process:

- Install Postgres on the same host. See:
  - Installing EDB Postgres Advanced Server
  - Installing PostgreSQL
- Set up the EDB repository.

  Setting up the repository is a one-time task. If you have already set up your repository, you don't need to perform this step.

  To determine if your repository exists, enter this command:

  ```
  dnf repolist | grep enterprisedb
  ```

  If no output is generated, the repository isn't installed.

  To set up the EDB repository:

  1. Go to EDB repositories.
  2. Select the button that provides access to the EDB repository.
  3. Select the platform and software that you want to download.
  4. Follow the instructions for setting up the EDB repository.
- Install the EPEL repository:

  ```
  sudo dnf -y install https://dl.fedoraproject.org/pub/epel/epel-release-latest-9.noarch.rpm
  ```
- Enable additional repositories to resolve dependencies:

  ```
  ARCH=$( /bin/arch ) subscription-manager repos --enable "codeready-builder-for-rhel-9-${ARCH}-rpms"
  ```

  > **Note**
  >
  > If you are using a public cloud RHEL image, `subscription manager` may not be enabled and enabling it may incur unnecessary charges. Equivalent packages may be available under a different name such as `codeready-builder-for-rhel-8-rhui-rpms`. Consult the documentation for the RHEL image you are using to determine how to install `codeready-builder`.

Install the package

```
# To install PostGIS 3.4:
sudo dnf -y install edb-as<xx>-postgis34

# To install PostGIS 3.1 using EDB Postgres Advanced Server 13-15:
sudo dnf -y install edb-as<xx>-postgis3

# To install PostGIS 3.1 using EDB Postgres Advanced Server 11-12:
sudo dnf -y install edb-as<xx>-postgis
```

Where `<xx>` is the version of EDB Postgres Advanced Server. Replace `<xx>` with the version of EDB Postgres Advanced Server you are using. For example, `edb-as15-postgis34`.

4.2.2 Installing PostGIS on Debian 12 arm64

Prerequisites

Before you begin the installation process:

- Install Postgres on the same host. See:
  - Installing EDB Postgres Advanced Server
  - Installing PostgreSQL
- Set up the EDB repository.

  Setting up the repository is a one-time task. If you have already set up your repository, you don't need to perform this step.

  To determine if your repository exists, enter this command:

  ```
  apt-cache search enterprisedb
  ```

  If no output is generated, the repository isn't installed.

  To set up the EDB repository:

  1. Go to EDB repositories.
  2. Select the button that provides access to the EDB repository.
  3. Select the platform and software that you want to download.
  4. Follow the instructions for setting up the EDB repository.

Install the package

```
# To install PostGIS 3.4 using EDB Postgres Advanced Server 12-16:
sudo apt-get -y install edb-as<xx>-postgis34
```

Where `<xx>` is the version of EDB Postgres Advanced Server. Replace `<xx>` with the version of EDB Postgres Advanced Server you are using. For example, `edb-as15-postgis34`.

4.3 Installing PostGIS on Linux IBM Power (ppc64le)

Operating system-specific install instructions are described in the corresponding documentation:

Red Hat Enterprise Linux (RHEL)

- RHEL 9
- RHEL 8

SUSE Linux Enterprise (SLES)

- SLES 15

4.3.1 Installing PostGIS on RHEL 9 ppc64le

Prerequisites

Before you begin the installation process:

- Install Postgres on the same host. See:
  - Installing EDB Postgres Advanced Server
  - Installing PostgreSQL
- Set up the EDB repository.

  Setting up the repository is a one-time task. If you have already set up your repository, you don't need to perform this step.

  To determine if your repository exists, enter this command:

  ```
  dnf repolist | grep enterprisedb
  ```

  If no output is generated, the repository isn't installed.

  To set up the EDB repository:

  1. Go to EDB repositories.
  2. Select the button that provides access to the EDB repository.
  3. Select the platform and software that you want to download.
  4. Follow the instructions for setting up the EDB repository.
- Install the EPEL repository:

  ```
  sudo dnf -y install https://dl.fedoraproject.org/pub/epel/epel-release-latest-9.noarch.rpm
  ```
- Refresh the cache:

  ```
  sudo dnf makecache
  ```
- Enable additional repositories to resolve dependencies:

  ```
  ARCH=$( /bin/arch ) subscription-manager repos --enable "codeready-builder-for-rhel-9-${ARCH}-rpms"
  ```

  > **Note**
  >
  > If you are using a public cloud RHEL image, `subscription manager` may not be enabled and enabling it may incur unnecessary charges. Equivalent packages may be available under a different name such as `codeready-builder-for-rhel-8-rhui-rpms`. Consult the documentation for the RHEL image you are using to determine how to install `codeready-builder`.

Install the package

```
# To install PostGIS 3.4:
sudo dnf -y install edb-as<xx>-postgis34

# To install PostGIS 3.1 using EDB Postgres Advanced Server 13-15:
sudo dnf -y install edb-as<xx>-postgis3

# To install PostGIS 3.1 using EDB Postgres Advanced Server 11-12:
sudo dnf -y install edb-as<xx>-postgis
```

Where `<xx>` is the version of EDB Postgres Advanced Server. Replace `<xx>` with the version of EDB Postgres Advanced Server you are using. For example, `edb-as15-postgis34`.

4.3.2 Installing PostGIS on RHEL 8 ppc64le

Prerequisites

Before you begin the installation process:

- Install Postgres on the same host. See:
  - Installing EDB Postgres Advanced Server
  - Installing PostgreSQL
- Set up the EDB repository.

  Setting up the repository is a one-time task. If you have already set up your repository, you don't need to perform this step.

  To determine if your repository exists, enter this command:

  ```
  dnf repolist | grep enterprisedb
  ```

  If no output is generated, the repository isn't installed.

  To set up the EDB repository:

  1. Go to EDB repositories.
  2. Select the button that provides access to the EDB repository.
  3. Select the platform and software that you want to download.
  4. Follow the instructions for setting up the EDB repository.
- Install the EPEL repository:

  ```
  sudo dnf -y install https://dl.fedoraproject.org/pub/epel/epel-release-latest-8.noarch.rpm
  ```
- Refresh the cache:

  ```
  sudo dnf makecache
  ```
- Enable additional repositories to resolve dependencies:

  ```
  ARCH=$( /bin/arch ) subscription-manager repos --enable "codeready-builder-for-rhel-8-${ARCH}-rpms"
  ```

  > **Note**
  >
  > If you are using a public cloud RHEL image, `subscription manager` may not be enabled and enabling it may incur unnecessary charges. Equivalent packages may be available under a different name such as `codeready-builder-for-rhel-8-rhui-rpms`. Consult the documentation for the RHEL image you are using to determine how to install `codeready-builder`.

Install the package

```
# To install PostGIS 3.4:
sudo dnf -y install edb-as<xx>-postgis34

# To install PostGIS 3.1 using EDB Postgres Advanced Server 13-15:
sudo dnf -y install edb-as<xx>-postgis3

# To install PostGIS 3.1 using EDB Postgres Advanced Server 11-12:
sudo dnf -y install edb-as<xx>-postgis
```

Where `<xx>` is the version of EDB Postgres Advanced Server. Replace `<xx>` with the version of EDB Postgres Advanced Server you are using. For example, `edb-as15-postgis34`.

4.3.3 Installing PostGIS on SLES 15 ppc64le

Prerequisites

Before you begin the installation process:

- Install Postgres on the same host. See:
  - Installing EDB Postgres Advanced Server
  - Installing PostgreSQL
- Set up the EDB repository.

  Setting up the repository is a one-time task. If you have already set up your repository, you don't need to perform this step.

  To determine if your repository exists, enter this command:

  ```
  zypper lr -E | grep enterprisedb
  ```

  If no output is generated, the repository isn't installed.

  To set up the EDB repository:

  1. Go to EDB repositories.
  2. Select the button that provides access to the EDB repository.
  3. Select the platform and software that you want to download.
  4. Follow the instructions for setting up the EDB repository.
- Activate the required SUSE module:

  ```
  sudo SUSEConnect -p PackageHub/15.4/ppc64le
  ```
- Refresh the metadata:

  ```
  sudo zypper refresh
  ```

Install the package

```
# To install PostGIS 3.4:
sudo zypper -n install edb-as<xx>-postgis34

# To install PostGIS 3.1:
sudo zypper -n install edb-as<xx>-postgis3
```

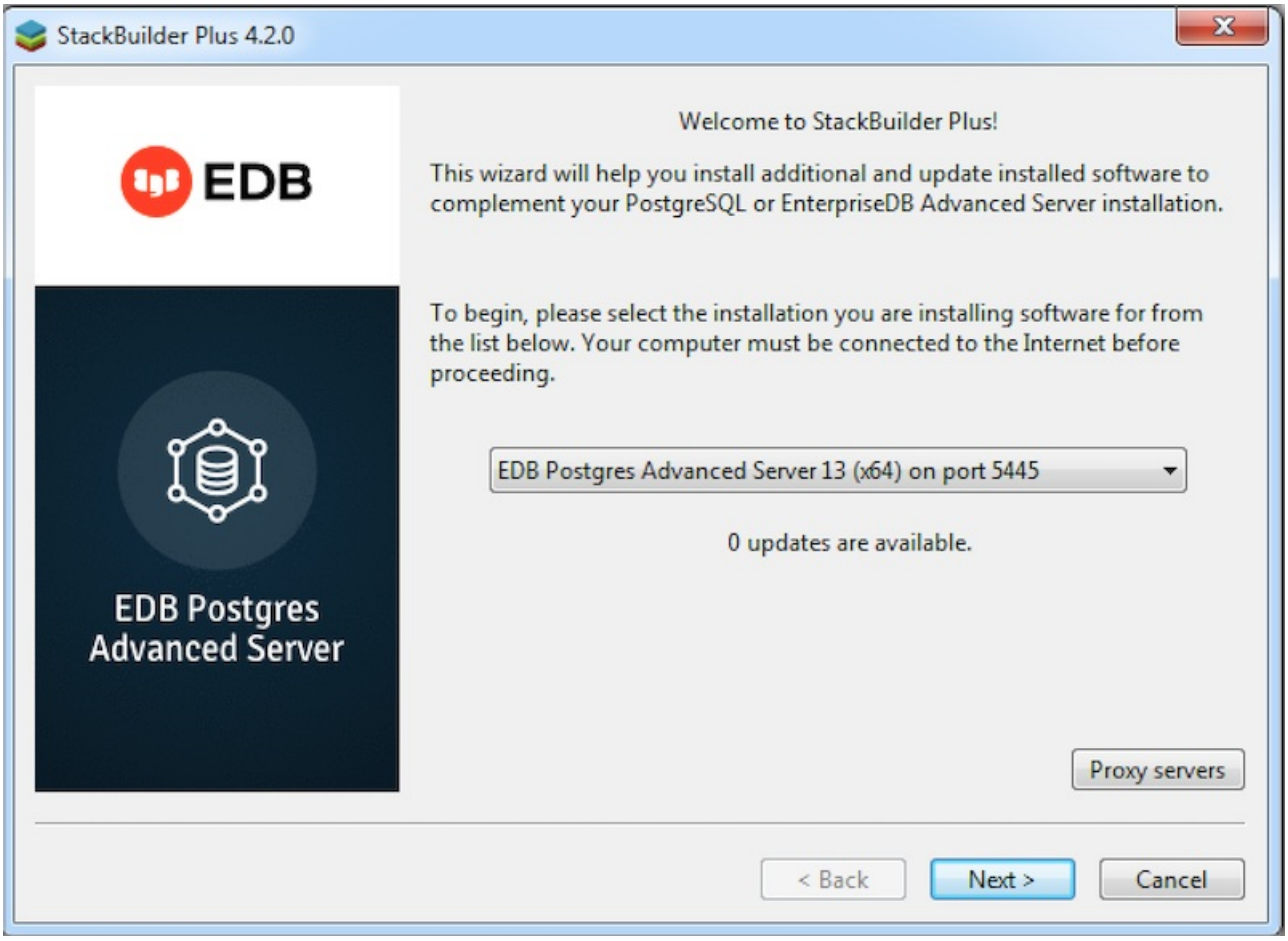
Where `<xx>` is the version of EDB Postgres Advanced Server. Replace `<xx>` with the version of EDB Postgres Advanced Server you are using. For example, `edb-as15-postgis34`.

4.4 Installing PostGIS on Windows

You must install EDB Postgres Advanced Server before installing PostGIS. If you used the graphical wizard to install EDB Postgres Advanced Server, you can use StackBuilder Plus to add PostGIS to your installation. For details about using the graphical installer to install and configure EDB Postgres Advanced Server, see the EDB Postgres Advanced Server documentation.

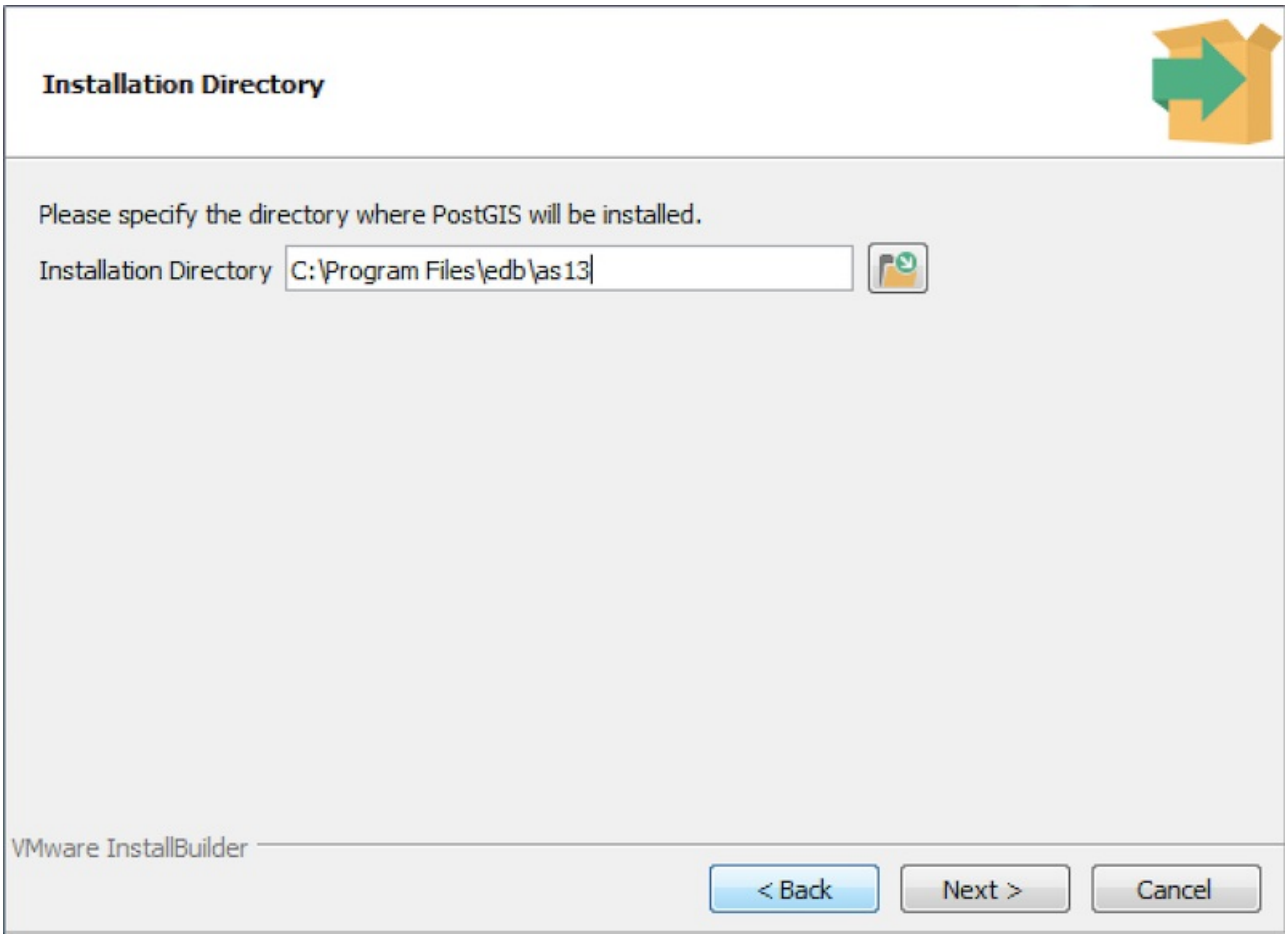
> **Note**
>
> To install PostGIS version 3.1 on EDB Postgres Advanced Server version 10 on Windows, you need to upgrade it to the latest EDB Postgres Advanced Server minor version of 10.16.25 or later, and then proceed with PostGIS 3.1 installation.

1. Open StackBuilder Plus and select your EDB Postgres Advanced Server installation from the list on the Welcome window. Select **Next** to continue to the application selection page.

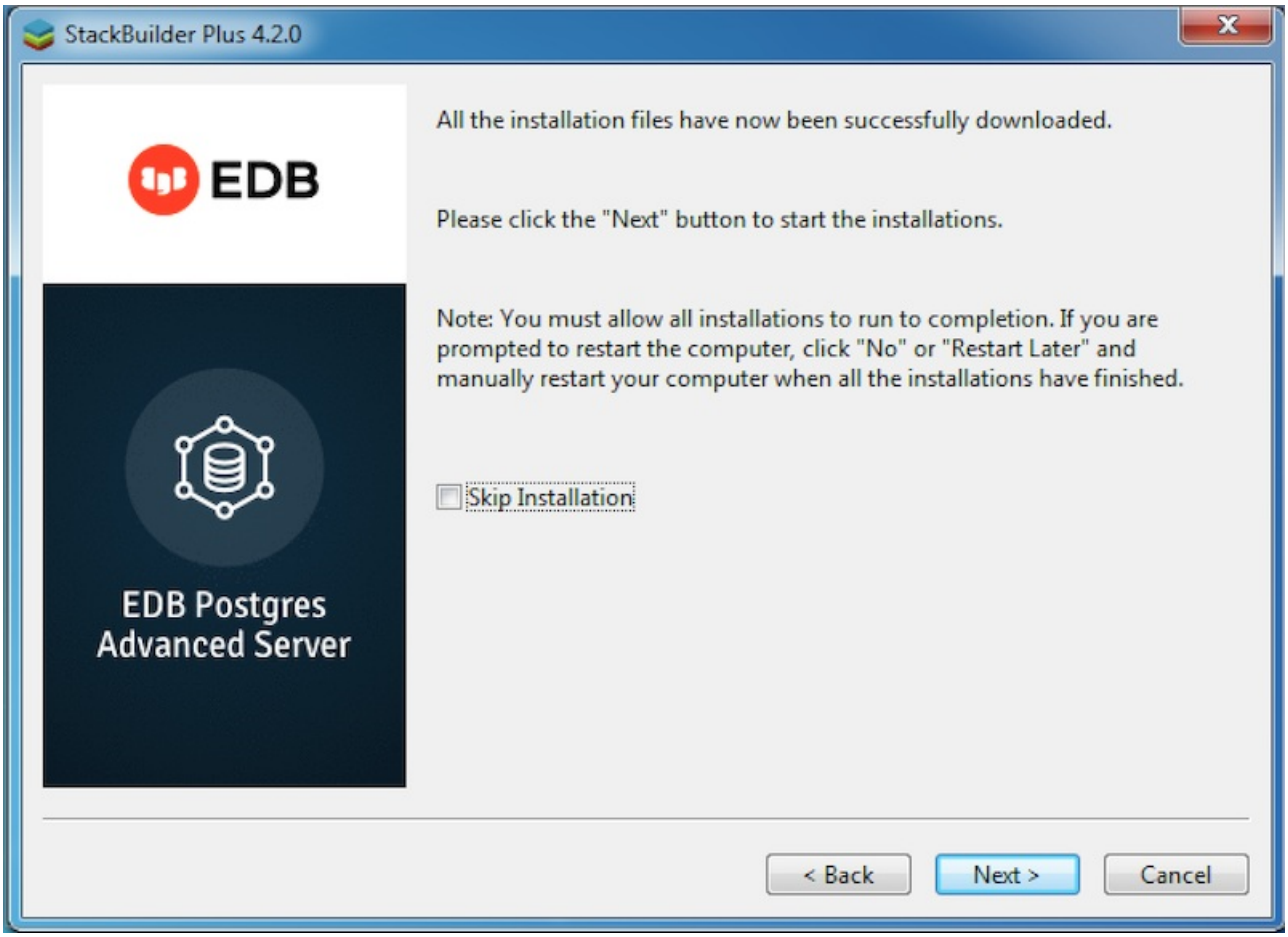


2. Expand the **Spatial Extensions** node, and select the check box next to the PostGIS version. Select **Next**.

3. The selected packages and the default download directory are displayed. If requried, change the locations. Select **Next**.

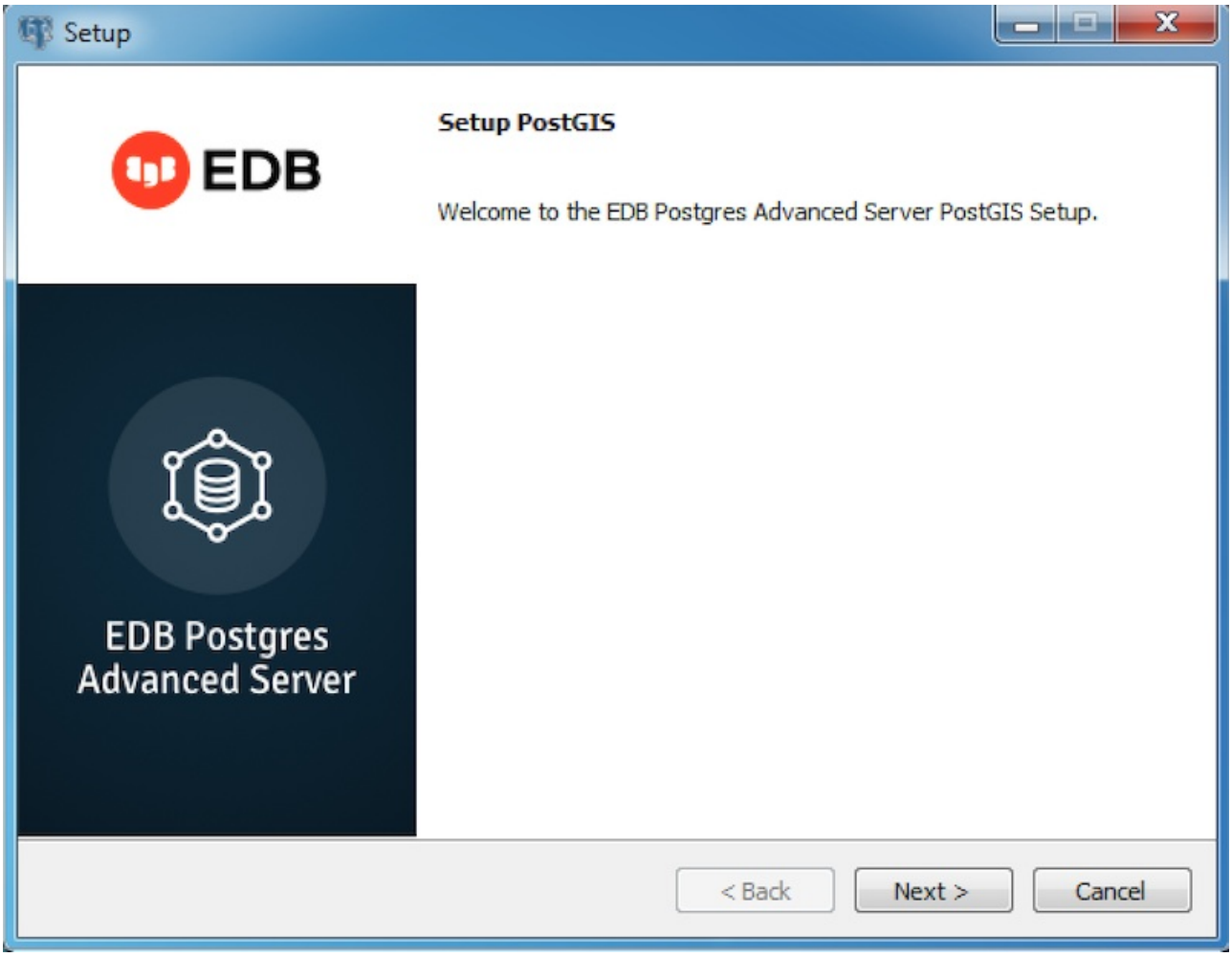


4. After you download the installation files, a confirmation message is displayed. Select **Next** to start the PostGIS installation.



5. Select an installation language and select **OK**.

6. The PostGIS welcome screen is displayed. Select **Next**.

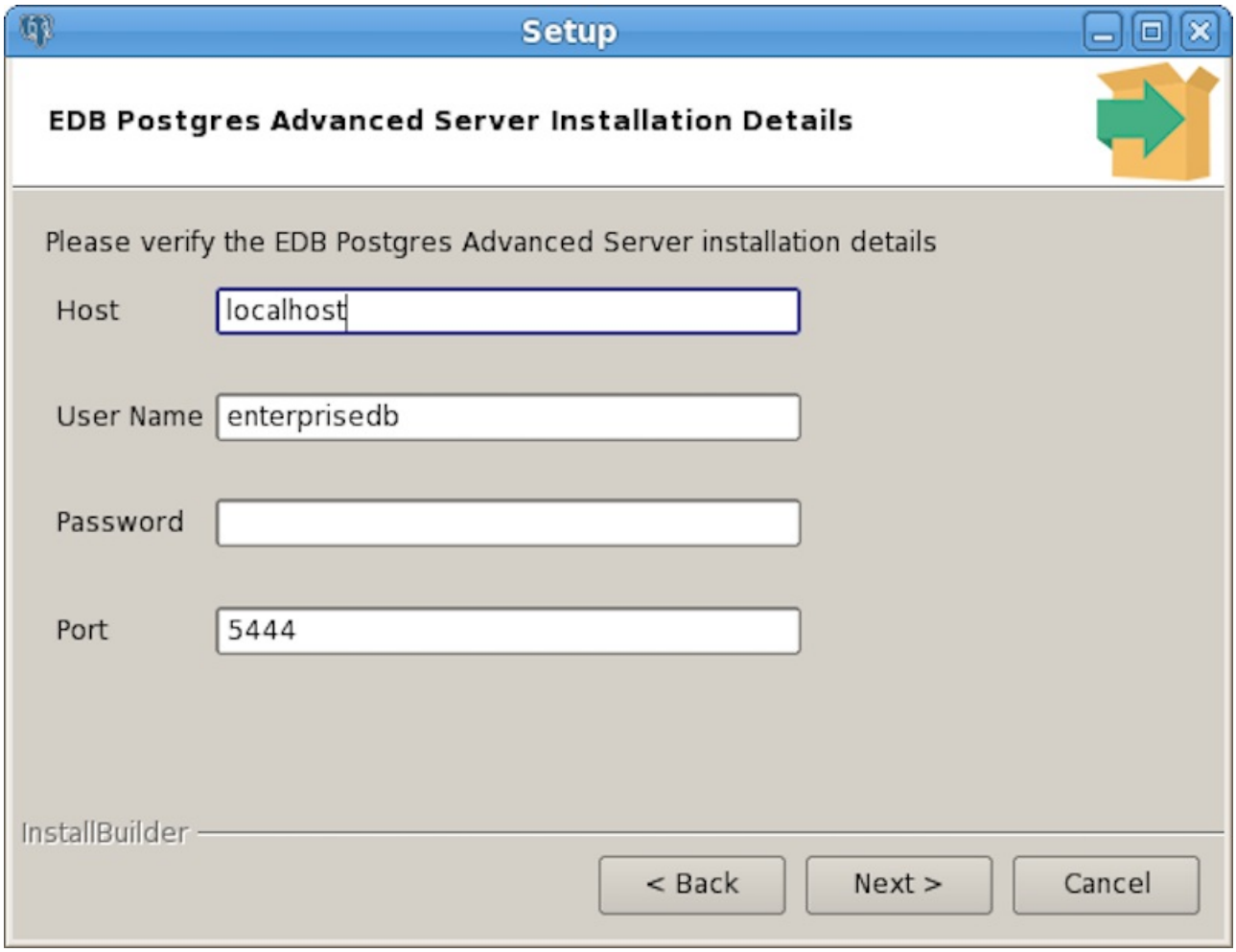


7. Use the **Installation Directory** field to specify the directory where you want to install the PostGIS software. Select **Next**.

8. Use fields on the EDB Postgres Advanced Server Installation Details window to provide connection information for the EDB Postgres Advanced Server host:

    - Use the **Host** field to identify the system on which EDB Postgres Advanced Server resides.
    - In the **User Name** field, provide the name of the role for PostGIS to use for connections to the server.
    - In the **Password** field, provide the password associated with the role.
    - Use the **Port** field to identify the listener port that EDB Postgres Advanced Server monitors for client connections.

    Select **Next**.



9. The Ready to Install window notifies you when the installer has all of the information needed to install PostGIS on your system. Select **Next**.

10. Progress bars inform you as the installation progresses. Select **Finish** to exit the installer when the PostGIS installation completes.

    StackBuilder Plus installs PostGIS and creates the `template_postgis` database and PostGIS functions.

4.5 Upgrading PostGIS

These examples show upgrading for RHEL/CentOS 7 platforms:

- Example 1: Upgrading from PostGIS version 3.3 to 3.4
- Example 2: Upgrading from PostGIS versions 2.5 or later to 3.1.4 on the same EDB Postgres Advanced Server version
- Example 3: Upgrading from PostGIS versions earlier than 2.5 to 3.1.4 on a different EDB Postgres Advanced Server version

Example 1: Upgrading from PostGIS version 3.3 to 3.4

This example upgrades from PostGIS version 3.3 to version 3.4 for EDB Postgres Advanced Server 15.

> **Upgrades from 3.1.4 and later versions**
>
> You can perform upgrades from PostGIS versions 3.1.4 and later (including skip upgrades, e.g. 3.1.4 to 3.4) as described in this example. Ensure you replace the source and target PostGIS versions, as well as the EDB Postgres Advanced Server version in commands accordingly.

To avoid accidental upgrades, PostGIS versions 3.3 and 3.4 use different package names. So, upgrading to version 3.4 requires that you first uninstall version 3.3. After you install version 3.4, you can upgrade the PostGIS extensions.

1. If you haven't already, create the PostGIS extensions in PostGIS version 3.3. For instructions, seeCreating extensions.

2. Uninstall PostGIS version 3.3.

   For EDB Posgres Advanced Server version 15:

   ```
   dnf -y erase edb-as15-postgis33
   ```

   For earlier versions of EDB Postgres Advanced Server:

   ```
   dnf erase edb-as<xx>-postgis33
   ```

   Where `<xx>` is the version of EDB Postgres Advanced Server.

   For more information, see Uninstalling PostGIS.

3. Install PostGIS version 3.4. For instructions, see Installing PostGIS.

4. Upgrade the PostGIS extensions:

> **Note**
>
> If you first upgraded from a PostGIS version earlier than 2.5 to PostGIS version 3.1, then you must `DROP` the `postgis_raster extension` before executing the command.

```
SELECT
postgis_extensions_upgrade();
```

```
                                        output
NOTICE:  Updating extension postgis from 3.3.2 to 3.4.2
NOTICE:  Updating extension postgis_sfcgal from 3.3.2 to 3.4.2
NOTICE:  Updating extension postgis_raster from 3.3.2 to 3.4.2
NOTICE:  Updating extension postgis_topology from 3.3.2 to 3.4.2
NOTICE:  Updating extension postgis_tiger_geocoder from 3.3.2 to 3.4.2
                   postgis_extensions_upgrade
--------------------------------------------------------------------
 Upgrade completed, run SELECT postgis_full_version(); for details
(1 row)
```

Example 2: Upgrading from PostGIS versions 2.5 or later to 3.1.4 on the same EDB Postgres Advanced Server version

This example upgrades from PostGIS version 2.5.5 to PostGIS version 3.1.4 for EDB Postgres Advanced Server version 12.

> **Note**
>
> It's assumed that you already created extensions for PostGIS version 2.5.5 as described in Creating extensions and that the EDB Advanced Server 12 service is running.

1. To upgrade PostGIS version 2.5.5 to PostGIS version 3.1.4 for EDB Postgres Advanced Server 12, assume superuser privileges and invoke:

```
dnf upgrade edb-as12-postgis-3.1.4 -y
```

2. To update extensions, switch to the enterprisedb user, connect to the database where you already created extensions with the psql client application, and invoke:

```
edb=# alter extension postgis update to '3.1.4';
WARNING: unpackaging
raster
WARNING: PostGIS Raster functionality has been
unpackaged
HINT: type `SELECT postgis_extensions_upgrade();` to finish the upgrade. After upgrading, if you
want to drop raster, run: DROP EXTENSION postgis_raster;
ALTER EXTENSION
```

```
edb=# alter extension address_standardizer update to '3.1.4';
ALTER EXTENSION
```

```
edb=# SELECT
postgis_extensions_upgrade();
NOTICE: Updating extension postgis_sfcgal from 2.5.5 to
3.1.4
NOTICE: Packaging extension
postgis_raster
NOTICE: Updating extension postgis_topology from 2.5.5 to
3.1.4
NOTICE: Updating extension postgis_tiger_geocoder from 2.5.5 to 3.1.4
          postgis_extensions_upgrade
--------------------------------------------------------------------
 Upgrade completed, run SELECT postgis_full_version(); for
details
(1 row)
```

Example 3: Upgrading from PostGIS versions earlier than 2.5 to 3.1.4 on a different EDB Postgres Advanced Server version

This example upgrades PostGIS version 2.4.6 for EDB Postgres Advanced Server 10 to PostGIS version 3.1.4 for EDB Postgres Advanced Server version 14:

- Step 1 — Upgrade to PostGIS 3.1.1. This is an intermediate step required to resolve dependency issues.
- Step 2 — Upgrade to PostGIS 3.1.4.
- Step 3 — Upgrade EDB Postgres Advanced Server version 10 to 14.

> **Note**
>
> It's assumed that you already created extensions for the PostGIS version earlier than 2.5.5, as described in Creating extensions, and EDB Advanced Server 10 service is running.
>
> When the PostGIS data has a dependency on the raster functions, upgrading to PostGIS version 3.1.4 requires dumping and reloading the data.

Step 1 — To upgrade PostGIS version 2.4.6 to 3.1.4, you need to upgrade it to 3.1.1 first:

1. Navigate to the bin directory of EDB Advanced Server 10:

```
cd /usr/edb/as10/bin/
```

2. Assume superuser privileges and upgrade to PostGIS version 3.1.1:

```
dnf upgrade edb-as10-postgis-3.1.1 -y
```

> **Note**
>
> See the Installing PostGIS on a Debian/Ubuntu Host section for information about Debian platform commands.

3. To update extensions, switch to the enterprisedb user, connect to the database where you already created extensions with the psql client application, and execute the following commands:

```
edb=# alter extension postgis update to '3.1.1';
WARNING: unpackaging
raster
WARNING: PostGIS Raster functionality has been
unpackaged
HINT: type `SELECT postgis_extensions_upgrade();` to finish the upgrade. After upgrading, if you
want to drop raster, run: DROP EXTENSION postgis_raster;
ALTER EXTENSION
```

```
edb=# alter extension address_standardizer update to '3.1.1';
ALTER EXTENSION
```

```
edb=# SELECT
postgis_extensions_upgrade();
```

output

```
NOTICE: Updating extension postgis_sfcgal from 2.4.6 to 3.1.1
NOTICE: Packaging extension postgis_raster
NOTICE: Updating extension postgis_topology from 2.4.6 to 3.1.1
NOTICE: Updating extension postgis_tiger_geocoder from 2.4.6 to 3.1.1
          postgis_extensions_upgrade
--------------------------------------------------------------------
 Upgrade completed, run SELECT postgis_full_version(); for details
(1 row)
```

Step 2 — Upgrade to PostGIS version 3.1.4:

1. To upgrade PostGIS version 3.1.1 to 3.1.4, invoke the following command for EDB Postgres Advanced Server 10:

```
dnf upgrade edb-as10-postgis-3.1.4 -y
```

2. To update extensions, switch to the enterprisedb user and invoke:

```
edb=# alter extension postgis update to '3.1.4';
WARNING: unpackaging
raster
WARNING: PostGIS Raster functionality has been
unpackaged
HINT: type `SELECT postgis_extensions_upgrade();` to finish the upgrade. After upgrading, if you
want to drop raster, run: DROP EXTENSION postgis_raster;
ALTER EXTENSION
```

With PostGIS version 3.1.4, the return type of the raster functions has changed, which requires dropping and creating the raster extension as part of the upgrade process.

```
edb=# drop extension postgis_raster;
DROP EXTENSION
```

```
edb=# SELECT
postgis_extensions_upgrade();
NOTICE: Updating extension postgis_sfcgal from 3.1.1 to
3.1.4
NOTICE: Updating extension postgis_topology from 3.1.1 to
3.1.4
NOTICE: Updating extension postgis_tiger_geocoder from 3.1.1 to 3.1.4
          postgis_extensions_upgrade
------------------------------------------------------------------------
 Upgrade completed, run SELECT postgis_full_version(); for
details
(1 row)
```

```
edb=# alter extension address_standardizer update to '3.1.4';
ALTER EXTENSION
```

Quit and reopen the psql client session:

```
edb=# \q
./psql -d edb -p
5444
```

```
edb=# create extension postgis_raster;
CREATE EXTENSION
```

Step 3 — Upgrade EDB Postgres Advanced Server version 10 to 14:

1. Assume superuser privileges and stop the EDB Postgres Advanced Server 10 service:

```
systemctl stop edb-as-10
```

2. Install the EDB Postgres Advanced Server version 14:

```
dnf install edb-as14-server -y
```

3. Navigate to the `/bin` directory of EDB Advanced Server 14 and initialize the cluster:

```
cd /usr/edb/as14/bin/

./edb-as-14-setup initdb
```

4. Install PostGIS version 3.1.4 for EDB Postgres Advanced Server version 14.0:

```
dnf install edb-as14-postgis3-3.1.4 -y
```

5. Assume superuser privileges and stop the EDB Postgres Advanced Server 14.0 service:

```
systemctl stop edb-as-14
```

6. Switch to the enterprisedb user and create a `temp` folder:

```
su enterprisedb
cd $(mktemp -d)
```

7. Check cluster compatibility and consistency and perform the upgrade:

```
bash-4.2$ /usr/edb/as14/bin/pg_upgrade -d /var/lib/edb/as10/data/ -D /var/lib/edb/as14/data/ -U
enterprisedb -b /usr/edb/as10/bin/ -B /usr/edb/as14/bin/ -p 5444 -P 5445 -c

Performing Consistency Checks
-----------------------------
Checking cluster versions ok
Checking database user is the install user ok
Checking database connection settings ok
Checking for prepared transactions ok
Checking for reg* data types in user tables ok
Checking for contrib/isn with bigint-passing mismatch ok
Checking for tables WITH OIDS ok
Checking for invalid "sql_identifier" user columns ok
Checking for invalid "unknown" user columns ok
Checking for hash indexes ok
Checking for presence of required libraries ok
Checking database user is the install user ok
Checking for prepared transactions ok
Checking for new cluster tablespace directories ok

Clusters are compatible
```

```
bash-4.2$ /usr/edb/as14/bin/pg_upgrade -d /var/lib/edb/as10/data/ -D /var/lib/edb/as14/data/ -U
enterprisedb -b /usr/edb/as10/bin/ -B /usr/edb/as14/bin/ -p 5444 -P 5445 --link

Performing Consistency Checks
-----------------------------
Checking cluster versions ok
Checking database user is the install user ok
Checking database connection settings ok
Checking for prepared transactions ok
Checking for reg* data types in user tables ok
Checking for contrib/isn with bigint-passing mismatch ok
Checking for tables WITH OIDS ok
```

```
Checking for invalid "sql_identifier" user columns ok
Checking for invalid "unknown" user columns ok
Creating dump of global objects ok
Creating dump of database schemas
ok
Checking for presence of required libraries ok
Checking database user is the install user ok
Checking for prepared transactions ok
Checking for new cluster tablespace directories ok

If pg_upgrade fails after this point, you must re-initdb the
new cluster before continuing.

Performing Upgrade
Analyzing all rows in the new cluster ok
Freezing all rows in the new cluster ok
Deleting files from new pg_xact ok
Copying old pg_clog to new server ok
Setting next transaction ID and epoch for new cluster ok
Deleting files from new pg_multixact/offsets ok
Copying old pg_multixact/offsets to new server ok
Deleting files from new pg_multixact/members ok
Copying old pg_multixact/members to new server ok
Setting next multixact ID and offset for new cluster ok
Resetting WAL archives ok
Setting frozenxid and minmxid counters in new cluster ok
Restoring global objects in the new cluster ok
Restoring database schemas in the new cluster
ok
Adding ".old" suffix to old global/pg_control ok

If you want to start the old cluster, you will need to remove
the ".old" suffix from /var/lib/edb/as9.6/data/global/pg_control.old.
Because "link" mode was used, the old cluster cannot be safely
started once the new cluster has been started.

Linking user relation files
ok
Setting next OID for new cluster ok
Sync data directory to disk ok
Creating script to analyze new cluster ok
Creating script to delete old cluster ok
Checking for hash indexes ok

Upgrade Complete
Optimizer statistics are not transferred by pg_upgrade so,
once you start the new server, consider running:
./analyze_new_cluster.sh

Running this script will delete the old cluster's data files:
./delete_old_cluster.sh
```

8. Assume superuser privileges, navigate to the `bin` directory of EDB Postgres Advanced Server 14, and start the service:

```
cd /usr/edb/as14/bin/

systemctl start edb-as-14
```

9. To update extensions, switch to the enterprisedb user, connect to the database where you already created extensions with the psql client application, and execute the following commands:

```
su enterprisedb
./psql -d edb -p
5444
edb=# SELECT
PostGIS_Extensions_Upgrade();
```

output

```
NOTICE: Updating extension postgis 3.1.4
      postgis_extensions_upgrade
--------------------------------------------------------------------------
Upgrade completed, run SELECT postgis_full_version(); for details
(1 row)
```

4.6 Uninstalling PostGIS

Uninstalling PostGIS on a CentOS/RHEL/Rocky Linux/AlmaLinux host

To uninstall PostGIS on a CentOS/RHEL host, assume the identity of the root user and invoke the appropriate command.

On CentOS/RHEL 7 for EDB Posgres Advanced Server version 13:

```
yum -y erase edb-as13-postgis3*
```

On CentOS/RHEL 7 for earlier versions of EDB Posgres Advanced Server:

```
yum erase edb-as<xx>-postgis-*<y.y.y>
```

Where `<xx>` is the EDB Postgres Advanced Server version and `<y.y.y>` is the PostGIS version you want to uninstall.

On Rocky Linux/AlmaLinux/RHEL 8 for EDB Posgres Advanced Server version 13:

```
dnf -y erase edb-as13-postgis3*
```

On Rocky Linux/AlmaLinux/RHEL 8 for earlier versions of EDB Posgres Advanced Server:

```
dnf erase edb-as<xx>-postgis-*<y.y.y>
```

Uninstalling PostGIS on a Debian/Ubuntu host

To uninstall PostGIS on a Debian or Ubuntu host:

```
apt-get remove edb-as<xx>-postgis-<y.y>*
```

Where `<xx>` is the EDB Postgres Advanced Server version and `<y.y>` is the PostGIS version you want to uninstall

Uninstalling PostGIS on a SLES host

To uninstall PostGIS on a SLES host, assume the identity of the root user and invoke:

```
zypper remove edb-as12-postgis*
```

Uninstalling PostGIS on a Windows host

The PostGIS graphical installer creates an uninstaller that you can use to remove PostGIS. The uninstaller is created in the installation directory that you specified while installing PostGIS. The default is `C:\Program Files\edb\as13`.

1. Navigate into the directory that contains the uninstaller and assume superuser privileges.

2. To begin uninstalling PostGIS, open the uninstaller and select **Yes**.

   The uninstallation process begins.

3. When the uninstallation completes, select **OK**.

5 Creating extensions

After installing PostGIS, create a PostGIS database and the extensions in each database where you want to use PostGIS extensions. Don't create the extensions in the postgres or edb database.

1. Before creating the postgis database, we recommend creating a superuser to administer the database. To create the user, navigate to the bin directory under your EDB Postgres Advanced Server installation and connect to the server with the psql client:

```
./psql -d edb -U enterprisedb -h
127.0.0.1
```

2. Invoke the following command to create a privileged role:

```
CREATE ROLE gisadmin LOGIN PASSWORD 'password'
SUPERUSER;
```

3. Log out of psql and connect as gisadmin:

```
edb=# \q
./psql -d edb -U gisadmin -h
127.0.0.1
```

4. Invoke the following command to create the postgis database owned by gisadmin:

```
CREATE DATABASE
postgis;
```

5. Use the `\c` command to switch to the postgis database, and use the `CREATE EXTENSION` command to create the PostGIS extensions:

```
\c postgis
CREATE EXTENSION
postgis;
CREATE EXTENSION postgis_topology;
CREATE EXTENSION
fuzzystrmatch;
CREATE EXTENSION
address_standardizer;
CREATE EXTENSION
address_standardizer_data_us;
CREATE EXTENSION postgis_tiger_geocoder;
CREATE EXTENSION postgis_sfcgal;
CREATE EXTENSION postgis_raster;
```

> **Note**
>
> - The postgis-sfcgal extension isn't available on Ubuntu 18, Ubuntu 20, SLES 12, RHEL/CentOS 7 - ppc64le, and Windows platforms.
> - The postgis_raster extension isn't supported on SLES 15 x86 and SLES 15 PPCLE. On SLES 15 x86 and SLES 15 PPCLE, libOpenCL1 is required by GDAL and comes from the SUSE Linux Enterprise Workstation Extension 15 SP4 x86_64 repository.

When connected with pgAdmin, you can see PostGIS extensions, functions, tables, and trigger functions beneath the postgis database public schema. The postgis database is now geospatially enabled. You can use it as a template to create geospatial databases.

6 Using PostGIS

The following examples use PostGIS functions to create and query spatial objects. For more information about the PostGIS functions, see theofficial PostGIS documentation.

The following command creates a table named `roads` that holds GIS data and a geometry column.

```
CREATE  TABLE roads ( ID int4, NAME varchar(128)
);
```

Use the PostGIS `AddGeometryColumn` function to add a column to the table:

```
SELECT AddGeometryColumn( 'roads', 'geom', -1, 'GEOMETRY', 2 );
```

Use the following SQL commands to insert data into the table `roads`. This data consists of the geometry of the type of `Linestring` (a line between two points):

```
INSERT INTO ROADS (ID,GEOM,NAME ) VALUES (1,ST_GeomFromText('LINESTRING(0 10,0 0)',-1),'Beacon
Road');
INSERT INTO ROADS (ID,GEOM,NAME ) VALUES (2,ST_GeomFromText('LINESTRING(0 0,0 10)',-1),'Violet
Road');
INSERT INTO ROADS (ID,GEOM,NAME ) VALUES (3,ST_GeomFromText('LINESTRING(0 0,10 0)',-1),'Skelton
Street');
INSERT INTO ROADS (ID,GEOM,NAME ) VALUES (4,ST_GeomFromText('LINESTRING(0 0,10 10)',-1),'Fifth
Avenue');
INSERT INTO ROADS (ID,GEOM,NAME ) VALUES (5,ST_GeomFromText('LINESTRING(0 10,0 0)',-1),'Main
Street');
INSERT INTO ROADS (ID,GEOM,NAME ) VALUES (6,ST_GeomFromText('LINESTRING(10 0,0 0)',-1),'Lipton
Street');
```

You can use the `GIST` function to create an index on the geometry column:

```
CREATE INDEX roads_index ON roads using GIST
(geom);
```

`AsText(geometry)` is a PostGIS function that returns a text representation of the geometry:

```
SELECT id, ST_AsText(geom) AS geom, name FROM ROADS order by id;
```

output

```
 id |         geom          |      name
----+-----------------------+----------------
  1 | LINESTRING(0 10,0 0)  | Bacon Road
  2 | LINESTRING(0 0,0 10)  | Violet Road
  3 | LINESTRING(0 0,10 0)  | Skelton Street
  4 | LINESTRING(0 0,10 10) | Fifth Avenue
  5 | LINESTRING(0 10,0 0)  | Main Street
  6 | LINESTRING(10 0,0 0)  | Lipton Street
(6 rows)
```

After an index is created, you can use the `&&` operator in a query:

```
SELECT NAME, ST_AsText(GEOM) FROM ROADS WHERE GEOM && SetSRID('BOX3D(10 10,10
10)'::box3d,-1);
```

output

```
     name     |        astext
--------------+----------------------
 Fifth Avenue | LINESTRING(0 0,10 10)
(1 row)
```

Use the `BOX3D` function to specify a bounding box. The `&&` operator uses the index to quickly reduce the result set down to only those geometries with bounding boxes that overlap the specified area.

You can use the `~=` operator to check if two geometries are geometrically identical:

```
SELECT ID, NAME FROM roads WHERE GEOM ~= ST_GeomFromText('LINESTRING(0 10,0 0)',-1) order by
id;
```

output

```
 id |    name
----+-------------
  1 | Bacon Road
  5 | Main Street
(2 rows)
```