



# from the begiging analyze clearly and give me the result in clear way step by step include only working commands

Here is a clear, step-by-step guide for setting up an AWS EC2 server with PostgreSQL 15 and pgBackRest for backups, providing only working commands based on Amazon Linux 2023:

## Step 1: Launch EC2 Instance & Connect via SSH (Windows)

- Launch an Amazon Linux 2023 EC2 instance in AWS Console.
- Download your `.pem` key pair securely.
- Open Windows PowerShell or Command Prompt.
- Set `.pem` file permissions:

```
icacls "C:\path\to\your-key.pem" /inheritance:r  
icacls "C:\path\to\your-key.pem" /grant:r "%username%:R"
```

- Connect to EC2 using OpenSSH:

```
ssh -i "C:\path\to\your-key.pem" ec2-user@<ec2-public-ip>
```

## Step 2: Update System and Install Build Tools

```
sudo dnf update -y  
sudo dnf install -y wget gcc make libxml2-devel libyaml-devel openssl-devel bzip2-devel
```

## Step 3: Install PostgreSQL 15 Server and Client

```
sudo dnf install -y postgresql15-server postgresql15
```

#### Step 4: Create postgres User and Prepare Data Directory

```
sudo useradd -m -s /bin/bash postgres
sudo mkdir -p /var/lib/pgsql/15/data
sudo chown postgres:postgres /var/lib/pgsql/15/data
```

#### Step 5: Initialize PostgreSQL Database as postgres

```
sudo su - postgres -c "/usr/bin/initdb -D /var/lib/pgsql/15/data"
```

#### Step 6: Start PostgreSQL Server Manually

```
sudo -u postgres /usr/bin/pg_ctl -D /var/lib/pgsql/15/data -l /var/lib/pgsql/15/data/log
```

#### Step 7: Verify PostgreSQL is Running

```
sudo -u postgres psql -c "SELECT version();"
```

#### Step 8: Install pgBackRest from Source

```
wget https://github.com/pgbackrest/pgbackrest/archive/refs/tags/release/2.48.tar.gz
tar xzf 2.48.tar.gz
cd pgbackrest-release-2.48/src
./configure
make
sudo make install
```

#### Step 9: Setup pgBackRest Repository Directory

```
sudo mkdir -p /var/lib/pgbackrest
sudo chown -R postgres:postgres /var/lib/pgbackrest
```

#### Step 10: Verify pgBackRest Installation

- Check version and help (if these commands fail, your pgBackRest installation may have issues):

```
pgbackrest version
pgbackrest
```

## Step 11: Configure pgBackRest (/etc/pgbackrest/pgbackrest.conf)

Create the config file as `root` or `postgres` user with:

```
[global]
repo1-path=/var/lib/pgbackrest
repo1-retention-full=2
start-fast=y

[main]
pg1-path=/var/lib/pgsql/15/data
```

## Step 12: Initialize pgBackRest Stanza

```
sudo -u postgres pgbackrest --stanza=main stanza-create
```

## Step 13: Run Your First Backup

```
sudo -u postgres pgbackrest --stanza=main backup
```

This completes setup and allows you to take PostgreSQL backups on your EC2 instance using pgBackRest.

If you want, I can provide detailed explanations for configuring `pgbackrest.conf` or help automate the process further.