# xCAT 2 Setup PostgreSQL

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# 1.0  Switching to  PostgreSQL Database on Management Node

One reason to migrate from the default SQLite database to PostgreSQL with xCAT is for xCAT hierarchy using Service Nodes. PostgreSQL provides the ability for remote access to the xCAT database on the Management node which is required by Service Nodes. PostgreSQL also support IPV6.

To set up the postgresql database on the Management Node follow these steps.

This example assumes:
- 11.16.0.1:  IP of management node (cluster-facing NIC)
- xcatdb:  database name
- xcatadm:  database role (aka user)
- cluster:  database password
- 11.16.1.230 & 11.16.2.230:  service nodes (mgmt node facing NIC)

Substitute your addresses and desired userid , password and database name as appropriate.

## 1.1  Install PostgreSQL

### 1.1.1  Install Postgresql on Linux

The postgreSQL rpms are part of the base Linux OS.   You should find for example the following rpms installed.

     postgresql-libs-*
     postgresql-server-*
     postgresql-*

In addition you need to install the Perl-DBD code from the OS.

Perl-DBD-Pg*


### 1.1.2  Install PostgreSQL on  AIX  MN ( under construction ,  supported xCAT 2.5 release)

Before you install make sure you have enough space,  PostgreSQL will be installed in /var/lib/pgsql
and needs about 90 mgbytes for the code + the size needed for the xCAT database.

**As root:**


1. Down load  PostgreSQL rpms from the following location:https://sourceforge.net/projects/xcat/files/
2. Unzip and untar in the location of your choice.

   gunzip  xcat-postgresql-2*.gz
   tar -xvf xcat-postgresql-2*.tar
   ./instpostgresql
3. Create  the postgres id that will administer the PostgreSQL server
   mkgroup postgres
   mkuser pgrp=postgres home=/var/lib/pgsql postgres
   passwd postgres  ( assign a password this is optional)
4. Create the xcatadm id that will own the xcatdb in PostgreSQL
   mkuser xcatadm
   passwd  xcatadm ( assign temp password with root)
   su – xcatadm
   passwd  ( assign permanent password that will be used in the /etc/xcat/cfgloc file)
5. Create the directory for the databases and make postgres the owner
   as root:
   mkdir /var/lib/pgsql/data
   chown postgres /var/lib/pgsql/data
   chgrp postgres /var/lib/pgsql/data

## 1.2  Setup PostgreSQL  on AIX and Linux

**As postgres:**

1. Switch to the postgres userid  for further setup of PostgreSQL
   su – postgres
   pwd ( are you in /var/lib/pgsql)
   Setup .profile
   Add paths needing to run DB commands
   MANPATH=/usr/local/pgsql/man:$MANPATH
   export MANPATH

PATH=/usr/local/pgsql/bin:$PATH
export PATH
2. Create a database installation on AIX as postgres :

```
/var/lib/pgsql/bin/initdb -D /var/lib/pgsql/data
```

You should get the following message "Success. You can now start the database..."

3. Setup the PostgreSQL configuration

**vi /var/lib/pgsql/data/pg_hba.conf**

Lines should look like this (with your IP addresses substituted).   Add all nodes that need to access the database.

```
local all all ident sameuser
# IPv4 local connections:
host all all 127.0.0.1/32 md5
host all all 11.16.0.1/32 md5
host all all 11.16.1.230/32 md5
host all all 11.16.2.230/32 md5
```

For example, where 11.16.0.1 is the MN and 11.16.1.230 and 11.16.2.230 are service nodes.

**vi /var/lib/pgsql/data/postgresql.conf**

set listen_addresses = '*'   # This allows remote access from all ips

Note: be sure and uncomment the line.

The following logging setup is the default on Linux, but should be set on AIX also.

```
logging_collector = on
log_directory = 'pg_log'
log_filename = 'postgresql-%a.log'
log_truncate_on_rotation = on
log_rotation_age = 1d
log_rotation_size = 0
log_min_messages = notice
```

 If you are working on large systems,  you may need to set the max_connections attribute in the file.  This is the number of connections that can be make to the database at one time.   If you are using service nodes,  it is recommended that you
 set max_connections = 1000

4. Start/Stop the server

**On AIX:**
**su – postgres**
start the server:

/var/lib/pgsql/bin/pg_ctl -D /var/lib/pgsql/data  start
If you need to stop the server
/var/lib/pgsql/bin/pg_ctl -D /var/lib/pgsql/data  stop

**On Linux:**

Create a database installation:
service postgresql initdb to initialize the database
service postgresql start

To stop/stop postgresql:

service postgresql start
service postgresql stop

**On AIX and Linux:**
su – postgres:

Create the xcatadm userid in the database and set to own xcatdb

```
/var/lib/pgsql/bin/createuser -SDRP xcatadm
```

( Will prompt for a password, use the same one that you input for the AIX xcatadm id.  Note: this xcatadm  unix id does not have to exist on Linux, only in the database.).

Create the xcatdb database owned by xcatadm

```
/var/lib/pgsql/bin/createdb -O xcatadm xcatdb

exit  ( back to root)
```

## 1.3  Migrate your database to PostgreSQL

1. Backup  your database to migrate to the new database.  (This is required even if you have not added anything to your xCAT database yet.  Required default entries were created when the xCAT RPMs were installed on the management node which, and they must be migrated to the new postgresql database.)

```
mkdir -p ~/xcat-dbback
dumpxCATdb -p ~/xcat-dbback
```

2. /etc/xcat/cfgloc file should contain the following line, substituting your specific info. This points the xCAT database access code to the new database.

```
Pg:dbname=xcatdb;host=11.16.0.1|xcatadm|cluster
```

change to allow only root access:
```
chmod 0600 /etc/xcat/cfgloc
```

3. Restore your database to postgresql (bypass mode runs the command without xcatd):
```
XCATBYPASS=1 restorexCATdb -p ~/xcat-dbback
```

4. Start the xcatd daemon using the postgresql database
```
service xcatd restart
```

## 1.4  Using Postgreql  ( psql command line interface)

If you want to access the database through the Postgresql (psql) command, to check the database, enter the following:
su – postgres:

psql -h <hostname> -U xcatadm -d xcatdb   ( note hostname must be from the pg_hba.conf file) and you will be prompted for the password ( cluster).

You can then run sql commands on the database.

Run   \h for a list of commands
Run  \g so SQL commands can end in ;
Then
select * from nodelist;     to see table entries
\dt  list all tables;
\q  to quit