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 (xCAT 2.5 release or later)

Space Required for database install:

- PostgreSQL will be installed in /var/lib/pgsql and needs about 24 mgbytes for the code and add the size needed for the xCAT database. You may also need to increate /etc and /usr.

As root:

- Down load PostgreSQL rpms package from the following location:http://sourceforge.net/projects/xcat/files/xcat-dep/2.x_AIX

- Unzip and untar in the location of your choice.

  gunzip xcat-postgresql*.gz
  tar -xvf xcat-postgresql*.tar
  Read the README file for installation instructions, and install the two rpms on the AIX Management Node that are appropriate for your OS level.

1.2 Setup PostgreSQL on AIX and Linux

1.2.1 Using the pgsqlsetup script (xCAT 2.5 or later)

You may use the pgsqlsetup script to setup xCAT on PostgreSQL instead of following the manual steps in the Manually setup PostgreSQL.

See man pgsqlsetup for information on running the script. The script will complete all actions in the Manually setup PostgreSQL section , including the Management Nodes ip address in the pg_hba.conf file.

1.2.2 Setting up the Service Nodes (Hierarchy)

After the automatic setup is complete, to support Service Nodes you need to

- add additional ip addresses to the pg_hba.conf file for each Service Node.
- add set listen_addresses = '*' to the postgresql.conf file.
- Stop and start postgreSQL, if you edit those files.
  Look in the Setup the PostgreSQL configuration files section for changing the pg_hba.conf and postgresql.conf files.
- When the Service Node is installed by xCAT, it will transfer the correct /etc/xcat/cfgloc file and the necessary credentials for the xCAT daemon on the Service Node to access the database on the Management Node.
- The postgresql database and perl-DBD must be installed on the Service Node. For Linux, this is part of the OS. For AIX, you must installed the one provided by xCAT. See Install PostgreSQL on AIX MN (xCAT 2.5 release or later) for the location of the rpms. These should be added to the AIX install_bundle resource for the Service Node.
- On AIX, you will need to increase the default install sizes of the filesystems to accommodate installing the PostgreSQL rpms on the Service Nodes when installing.
  - /var - 131072 bytes
  - / - 2818048 bytes
  - /opt – 52428 bytes

1.2.3 Manually setup PostgreSQL

Note: you can use pgsqlsetup to do all this work, if you are running 2.5 or later release. See Using the pgsqlsetup script (xCAT 2.5 or later).

As root: Stop the xcatd daemon during the database migration:

AIX:

```
stopsrc -s xcatd
```

Linux:

```
service xcatd stop
```

On AIX create the needed postgreSQL ids:

- 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)
- 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)
- 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

- 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

On AIX as postgres Create a database installation by running the following:

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

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

On Linux as root run the following to create the Database installation:

service postgresql initdb to initialize the database

Setup the PostgreSQL configuration files

On AIX or Linux as root:

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

- Start/Stop the PostgreSQL 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

Note: you can get the message "$ LOG: could not bind IPv6 socket: Address already in use HINT: Is another postmaster already running on port 5432? If not, wait a few seconds and retry after setting listen_addresses = '*' , it can be ignored.

On Linux as root:

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

Note: the pgsqlsetup script will do this for you also, if you choose to use it.

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
XCATBYPASS=1 dumpxCATdb -p ~/xcat-dbback
```

1. /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
   ```

2. Restore your database to postgresql (bypass mode runs the command without xcatd):

   ```
   XCATBYPASS=1 restorexCATdb -p ~/xcat-dbback
   ```

3. Start the xcatd daemon using the postgresql database

   AIX:

   ```
   startsrc -s xcatd
   ```

   Linux:

   ```
   service xcatd start
   ```

1.4 Using Postgresql (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 match ip in 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