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
   chpasswd -c postgres (assign a password)
4. Create the xcatadm id that will own the xcatdb in PostgreSQL
   mkuser xcatadmin
   chpasswd -c xcatadm (assign a password e.g. cluster)
5. Create the directory for the databases and make postgres the owner
   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

/var/lib/pgsql/bin/initdb -D /var/lib/pgsql/data
You should get the following message Success. You can now start the database...

3. Make the directory for the PostgreSQL log.
   mkdir /tmp/postgres
4. Start/Stop the server

   On AIX:

   /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:

   service postgresql initdb to initialize the database

   To stop/stop postgresql:

   service postgresql start
   service postgresql stop

5. Create the xcatadm userid in the database and set to own xcatdb
   /var/lib/pgsql/bin/createuser -SDRP xcatadm
   (will prompt for password, remember the password.
6. Create the xcatdb database
   /var/lib/pgsql/bin/createdb -O xcatadm xcatdb
7. exit (back to root)
8. cd /var/lib/pgsql/data
9. vi pg_hba.conf

   Lines should look like this (with your IP addresses substituted). This allows the service nodes to access the DB.

```
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
```

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

10. vi postgresql.conf
    set listen_addresses = '*' # This allows remote access.

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

```
logging_collector = on
log_filename = 'postgresql-%a.log'
log_truncate_on_rotation = on
```

```
log_rotation_age = 1d
log_rotation_size = 0
```

Note: Be sure to uncomment the line

If you are working on large systems, you may need to increase 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

On Linux:

- `service postgresql restart`
- `chkconfig postgresql on`

On AIX:

- `/var/lib/pgsql/bin/pg_ctl -D /var/lib/pgsql/data stop`
- `/var/lib/pgsql/bin/pg_ctl -D /var/lib/pgsql/data start`

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

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