

Installing the GPL Version of OpenQM on Ubuntu

Version: 1.30

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General

This is a guide for installing the GPL version of OpenQM onto the Ubuntu distribution of Linux. It is aimed at novice users of linux – of which I am one. Accordingly, I've tried to detail most things I've done to get things working. Hopefully, this will help others get things going.

Note that these instructions deal mostly with the installation of OpenQM. However, this revision (1.30) contains some new notes on Linux permissions. In general, you should aim to sort out you Linux networking before you commence installation of OpenQM.

As Ubuntu is based on Debian, the instructions here should be useful for anyone trying to install on Debian. A link to install notes for Fedora or Red Hat is given at the end of this document.

Environment

Dell XPS M1210 notebook with T7200 (2 GHz) chip and 2 GB of RAM, running Windows Vista Business edition.

Ubuntu 8.04

Ubuntu 8.04.1 installed inside Sun VirtualBox 2.124 This was a server installation plus the Xubuntu desktop, and the VirtualBox Guest Additons. Ubuntu was set up with 384 MB of RAM and host interface networking. Other VirtualBox settings were left at default (but note that PAE/NX must be enabled within VirtualBox for Ubuntu to boot correctly).

Linux Editors

There are many text editors available for Linux, and each distribution comes with its own default editor. The full Ubuntu desktop uses **gedit**, the xdesktop uses **mousepad**, other distributions may use **nano**, **vi**, **vim**, **pico** ... This document shows the use of **mousepad**. Use your own editor wherever this document shows **mousepad**.

Ubuntu Setup

In general, Ubuntu must have development libraries and networking libraries installed. These can be installed either via the 'Synaptic Package Manager' or via the command-line:

Synaptic

Synaptic is started from the menu: 'System | Administration | Synaptic Package Manager' under Gnome, or 'Applications | System | Synaptic Package Manager' under the xdesktop.

Under the 'Development' packages, make sure that 'gcc' is installed.

Under the 'Libraries' packages, make sure that 'libc6-i686' is installed.



Under ‘Networking’, make sure that ‘Samba’ is installed.

Under ‘Networking (Universe)’, make sure that ‘telnetd’ is installed.

If any of the above are not installed, mark them for installation, and click on ‘Apply’. Click on ‘Apply’ again at the ‘Summary’ screen, and Ubuntu will download and apply the packages. Click on ‘Close’ once all packages have been installed, and close the package manager.

Command-Line

The above packages can be installed from the command-line using the following command:

```
sudo apt-get install gcc libc6-i686 samba telnetd
```

Other

Some other packages were also required to install the VirtualBox Guest Additions:

```
sudo apt-get install build-essential linux-headers-`uname -r`
```

Note this command needs to be typed exactly as shown – including the back-ticks.

You may also want to consider installing telnetd-ssl rather than telnetd.

Networking and User/Group Setup

From an external computer, make sure that you can log onto the Ubuntu computer using telnet (using the standard telnet port: 23). If you can’t log in, then you won’t be able to communicate with OpenQM unless you physically do all your work on the server.

The setup described later assumes that a user group named ‘qmusers’ is set up. This should be done now:

Open the ‘Users and Groups’ manager (‘System | Administration | Users and Groups’ or ‘Applications | System | Users and Groups’). Unlock the manager, then click on the ‘Manage Groups’ button, then ‘Add Group’. Enter a group name of ‘qmusers’, and select the names of the users to go into that group. Click on ‘OK’, then close the ‘Users and groups’ manager.

The command-line equivalent of this is:

```
sudo addgroup qmusers  
sudo adduser username qmusers
```

Any users that will use qm should be made a member of the qmusers group.

Make sure that you add **root** to the **qmusers** group!

There is more information on users and groups here:

http://www.techotopia.com/index.php/Managing_Ubuntu_Linux_Users_and_Groups

User and Group Permissions

If only person uses the OpenQM installation, then you will probably not have any problems with user or group permissions. However, getting permissions right for multiple users can take some time. One approach is outlined below:



Edit the default profile for all users and set the **umask** property to a value of 002 (or 0002):

```
cd /etc
sudo mousepad profile
```

Add the following line to the end of the profile (or change the existing line):

```
umask 0002
```

If you already have users set up, check their logon profiles to see if they have different **umask** values set. Note that **umask** may be set in a number of different login configuration files:

```
cd /home/username
sudo mousepad .profile
sudo mousepad .bashrc
```

If no **umask** value is set, then leave the profiles alone as they will get the **umask** value from the default profile.

This **umask** value will create new folders and files with the following permissions:

Folders	775	drwxrwxr-x
Files	664	-rw-rw-r--

The problem with **umask** is that it sets permissions on a broad basis – all group permissions set by each user will be set as 6 (files) or 7 (folders), rather than each group (or each combination of user and groups) having their own specific default file permissions. This can mean that either:

- users give excessive default permissions to all members of their groups to allow full permissions for only some groups; or
- default permissions are set at a more restrictive level (a **umask** of 0022 will give default permissions of 755 and 644 for folders and files respectively) leading to continual manual adjustment of permissions for selected groups.

Setting **umask** as described above is probably an adequate solution for a small group of users, or for a server which only holds the OpenQM database. However, a multi-purpose server serving a large number of users will probably require a finer-grained security solution. Access control lists are one means of providing finer-grained security – google **setfacl** and **getfacl** for more information.

OpenQM

Download the latest GPL version of OpenQM. This was version 2.6-6, and had a filename of `qmsrc_2-6-6.tgz`. Save this to a folder on the Ubuntu machine. In this case it was saved to `/home/brian/temp`.

Double-click on the zipped file from within the file manager, and it will be opened by the Archive Manager. Click on the ‘Extract’ button, then make sure the ‘Re-create folders’ and ‘Overwrite existing files’ options are selected, then click on ‘Extract’.

Close the Archive Manager. You should see a new folder named ‘`gpl.qmsys`’.

Open the folder named ‘`gpl.qmsys`’ and find the file named ‘`buildgpl`’. Double-click on this file, and choose ‘Display’ from the options presented. The file will be opened in the editor.

Find the line starting with:

```
QM_GCC_OPTIONS=
```



Make a copy of this line immediately below the original. Comment the original out with a '#', then remove the '-Werror' string from the active line. The two lines should look like:

```
#QM_GCC_OPTIONS="-Wall -Werror -DLINUX -D_FILE_OFFSET_BITS=64 -DGPL -g"
QM_GCC_OPTIONS="-Wall -DLINUX -D_FILE_OFFSET_BITS=64 -DGPL -g"
```

Save the file, open a terminal session, and execute the file:

```
cd /home/brian/temp/gpl.qmsys          Change the path name as necessary
./buildgpl
```

The build process should go through 9 stages. Some warnings will probably be displayed during Stage 1. (Had we left the '-Werror' option in the compilation settings, these warnings would have terminated the build process).

Now we need to move this folder structure to its proper place:

```
cd /home/brian/temp          Change the path name as necessary
sudo mv gpl.qmsys /usr/qmsys
```

Note that this has changed the name of the folder to 'qmsys' during the move. Use the file manager to check that the folder is in place. Now, go to the /usr folder in terminal and change the group ownership:

```
cd /usr
ls -l                               This will display current ownership
sudo chgrp -R qmusers qmsys
sudo chmod -R 775 qmsys
ls -l                               Check group ownership and permissions
```

Now, create a configuration file:

```
cd /etc
sudo mousepad qmconfig              Change the editor name as necessary
[qm]
QMSYS=/usr/qmsys
NUMUSERS=8                          Change this as necessary
SORTMEM=4096                         Enlarge the default sort memory
```

Save the configuration file. Now start OpenQM:

```
cd /usr/qmsys
./bin/qm -start
      QM has been started
./bin/qm
```

You should see the following message:

```
[ OpenQM Rev 2.6-6   Copyright Ladybridge Systems, 2007 ]
```

```
This program is free software and is supplied with ABSOLUTELY NO WARRANTY.
You are welcome to modify or redistribute this software subject to certain
conditions. For details type CONFIG GPL.
```

This confirms that OpenQM is running. Log off by typing **OFF** at the command prompt.

Now, test that you can log in from an external machine:

```
telnet vub002                       Change machine name as necessary
Ubuntu 8.04.2
vub002 login: brian                 Change user name as necessary
Password: xxxxxx
      Login messages appear here
```

```
cd /usr/qmsys
./bin/qm
```



Once again, this should leave you at the colon prompt. Check that some basic commands work, and create a **MASTER.LOGIN** item.

```
LISTU
LISTFL
PTERM DISPLAY
ED VOC MASTER.LOGIN
I                               Put the editor into insert mode
PA
DATE.FORMAT ON                 Change as necessary
PTERM CASE NOINVERT
<enter>                         Exit from insert mode
FI                               File the MASTER.LOGIN item

QUIT
exit
```

Configuration

Automatic Startup

Create a script in the `/etc/init.d` folder as follows:

```
cd /etc/init.d
sudo cp skeleton qm           Copy the skeleton script to 'qm'
sudo mousepad qm             Edit new qm script

#!/bin/sh
### BEGIN INIT INFO
# Provides:                  OpenQM
# Required-Start:
# Required-Stop:
# Default-Start:            2 3 4 5
# Default-Stop:             S 0 1 6
# Short-Description:        Initscript for OpenQM
# Description:              Starts and stops OpenQM at startup/shutdown
#
### END INIT INFO

# Author: Brian Speirs
#
# Adapted from skeleton script file
#

PATH=/usr/sbin:/usr/bin:/sbin:/bin:/usr/qmsys/bin
DESC="OpenQM database"
NAME=qm
DAEMON=/usr/qmsys/bin/qmlnxd
PIDFILE=/var/run/$NAME.pid
SCRIPTNAME=/etc/init.d/$NAME

# Exit if the package is not installed
[ -x "$DAEMON" ] || exit 0

case "$1" in
  start)
    echo "Starting OpenQM database." >&2
    qm -start -quiet
    ;;
  stop)
    echo "Stopping OpenQM database." >&2
    qm -stop -quiet
    ;;
  restart|force-reload)

```



```

        echo "Restarting OpenQM database." >&2
        qm -restart -quiet
        ;;
    *)
        #echo "Usage: $SCRIPTNAME {start|stop|restart|reload|force-reload}" >&2
        echo "Usage: $SCRIPTNAME {start|stop|restart|force-reload}" >&2
        exit 3
        ;;
esac

:

```

Save the modified script.

```

sudo chmod +x qm
sudo update-rc.d qm start 75 2 3 4 5 . stop 25 0 1 6 .

```

These first of the two steps above makes the script executable, while the second creates symbolic links in the startup folders so that OpenQM will be started and shut down automatically. Make sure you include the two periods in this second command (after the 5 and the 6). The startup priority is set at 75 (relatively late), while shutdown priority is 25 (relatively early). You may change these priorities as you see fit, or simply use the default priorities (20 and 80):

```

sudo update-rc.d qm defaults

```

Make available to users

Now, put the qmsys/bin folder into the \$PATH variable for all users:

```

cd /etc
sudo mousepad profile

```

Add the following line to the end of the profile:

```

PATH=$PATH:/usr/qmsys/bin

```

Make sure that **umask** is also set as previously described in ‘User and Group Permissions’.

Create a “home” directory

This is based on the assumption that you want to keep the OpenQM data files under the home directory, but separate from other users.

Open a terminal session, and create a folder under the /home folder named ‘qm’:

```

cd /home
sudo mkdir qm
sudo chgrp -R qmusers qm    Make qmusers the group associated with the qm folder
sudo chmod -R 775 qm        Give owner and group read/write/execute permissions
sudo chmod -R g+s qm        Ensure the group retains permissions for new files

```

This sequence should leave you as the owner of the folder, but with the group set to ‘qmusers’. Further, any new file or folder created within the ‘qm’ folder should belong to the ‘qmusers’ group.

Restart Linux

Restart Linux and check that preceding changes are working correctly. After restarting:

```

ps -ef | grep qm

```



This should display two lines – one showing the qm daemon (qmlnxd), and the other showing the grep command. If the qm daemon is not running, go back to the automatic startup script and try to figure out why not.

Now check the qmsys/bin folder is in your path:

```
echo $PATH
```

You should see /usr/qmsys/bin in the list of folders reported back.

Log in with AccuTerm

This assumes that you will use AccuTerm (on a Windows PC) as the terminal emulator to log into OpenQM.

Start Accuterm, then click on the ‘Create a new session’ icon (or choose ‘File | New’ from the menu). Click on the ‘Connection Wizard’ button.

Select ‘Telnet’ as the connection type, then click ‘Next’.

Enter the name of your Linux machine in the ‘Host name’ box, select ‘QM’ from the drop-down list for type of host, and enter port 23 in the ‘Port’ edit box. Click on ‘Next’.

Choose a terminal type on the next screen (VTxxx terminals work well in Linux), then click ‘Finish’. A Ubuntu login message should appear. Log in.

Change to the qmsys folder, and check that you can access OpenQM:

```
cd /usr/qmsys
qm
```

Now create a new account for the ACCUTERM host programs:

```
:CREATE.ACCOUNT ACCUTERM /home/qm/accuterm
Create new directory for account (Y/N)? y
Creating VOC...
Creating $HOLD...
Creating $SAVEDLISTS...
Creating private catalogue directory...
Adding to register of accounts...
:LOGTO ACCUTERM
:WHO
2 ACCUTERM from QMSYS
:!pwd
/home/qm/accuterm
:
```

Now, it is up to you!

Services

At this stage, you need to log onto the Linux server to use OpenQM. However, the normal procedure is simply to log onto an OpenQM service (without actually logging into Linux), so we need to create those services. This requires xinetd.

```
sudo apt-get install xinetd
```

On Ubuntu, this will probably uninstall the inetd server (named openbsd-inetd), but this does not appear to cause any problems. The install process will automatically start the xinetd service.



Now, place the following service definitions in the /etc/xinetd.d folder:

```

cd /etc/xinetd.d
sudo mousepad qmsrvr

# Description: Service allowing connections to the OpenQM
#              database server from telnet clients.
#
service qmsrvr
{
    protocol          = tcp
    flags             = REUSE
    socket_type       = stream
    wait              = no
    groups            = yes
    user              = root
    group             = qmusers
    umask             = 002
    server            = /usr/qmsys/bin/qm
    server_args       = -n
    log_on_failure    += USERID
    disable           = no
}

sudo mousepad qmclient

# Description: Service allowing QMClient connections to
#              the OpenQM database server.
#
service qmclient
{
    protocol          = tcp
    flags             = REUSE
    socket_type       = stream
    wait              = no
    groups            = yes
    user              = root
    group             = qmusers
    umask             = 002
    server            = /usr/qmsys/bin/qm
    server_args       = -n -q
    log_on_failure    += USERID
    disable           = no
}

```

Note these service definitions define the user, group, and umask settings for the services. These affect file permissions of any files created, and it is important to get these right. Similarly, because root is the 'user' of these services, it is important that root is a member of qmusers (see: Networking and User/Group Setup).

Now we need to tell xinetd about these services. Add the following two lines to the services file:

```

cd /etc
sudo mousepad services

qmsrvr          4242/tcp          # QMSrvr
qmclient        4243/tcp          # QMClient

```

Restart xinetd to put these changes into effect:

```
sudo /etc/init.d/xinetd restart
```

You should now be able to log onto OpenQM from an external machine using telnet on port 4242 without logging onto the Linux server.



File Ownership and Permissions

You may well strike problems with file ownership and permissions. These take time to get right.

Error numbers 3018 (file is read-only) or 3035 (permissions error) are the most likely. Error 3018 will occur if you try to write or delete an item, whereas 3035 probably means you don't have permission to read the file.

Troubleshooting steps:

- Check who owns the file, and what group is associated with that file.
- Check who you are (type **!whoami** from the OpenQM prompt, or **whoami** from the Linux prompt), then check which group you are in (use the 'Users and Groups' manager).
- Check your umask settings (type **!umask** from the OpenQM prompt, or **umask** from the Linux prompt).
- Try creating a file and checking what permissions are given to that file.
- Try logging in as a different user, and see if that user has file permission problems.

For further information on Linux file and folder sharing, look here:

<http://www.udel.edu/topics/os/unix/general/groupsharing.html>

Concluding Remarks

At this stage, OpenQM should be installed on the Linux server, and set to start and shutdown as the server changes run levels. You should be able to telnet into OpenQM from an external machine, and the file permissions should be set correctly to allow OpenQM to operate (provided users are in the 'qmusers' group).

What you do now is up to you.

Other OpenQM Resources

OpenQM home page:	http://www.openqm.com
OpenQM Google groups:	http://groups.google.co.uk/group/OpenQM?hl=en&lnk= http://groups.google.co.uk/group/openqm-opensource http://gpl.openqm.com/wiki/Main_Page
Getting started in OpenQM:	http://www.rushflat.co.nz
AccuSoft Enterprises:	http://www.asent.com
Anji Development environment:	http://billabong-services.co.uk/ANJI/
Install notes for Red Hat	www.geneb.org/qm/fedora_notes.txt

Other Multi-value Resources

Multi-value databases newsgroup	comp.databases.pick (nntp)
Pick Wiki:	http://www.pickwiki.com/cgi-bin/wiki.pl

