

X11 and NEXTSTEP

By Hanul Sieger, Essen

1. Introduction

This article should provide a quick and dirty HowTo about setting up X, and related services like XDMCP between a NeXTSTEP box and other UNIX/Linux boxes.

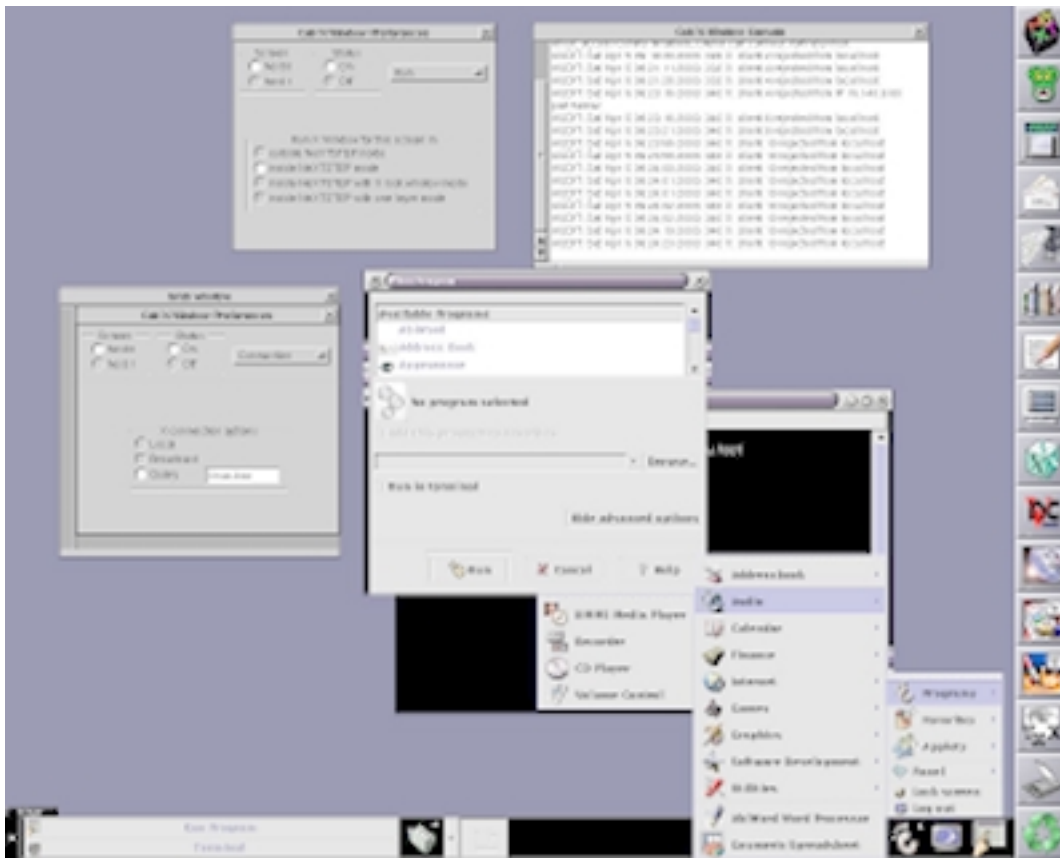
2. Overview

XDMCP stands for "X Display Manager Control Protocol" and is a network protocol. It provides a way of running the X-Terminal to run on your PC, Mac or NeXT and it uses the X Server to provide a client/server interface between display hardware (the mouse, keyboard, and video displays) and the desktop environment while also providing both the windowing infrastructure and a standardized application interface. The X-Terminal can be displayed with an individual window or multiple windows, based on your X window system's software capabilities and setup.

The X server is usually started from the X Display Manager. Almost all the UNIX/Linux flavors include the xdm, kdm and gdm to you as your choices. (This document will use gdm and kdm as an example). The Display Manager provides a nice and consistent interfaces for general users (X-based login, starting up a window manager, clock, etc.). X Display Manager manages a collection of X displays, which may be on the local host or remote servers. It is worth noting that the Xsession file is what runs the desktop environment.

When xdm runs, it offers display management in two different ways. It can manage X Server running on the local machine and specified in "Xservers", and/or it can manage remote X Servers (typically Xterminals) using XDMCP as specified in the "Xaccess" file (refer to the xdm man page).

For kdm (which comes with the KDE desktop), it is a replacement of xdm and configures the same way, except its files are in /etc/X11/kdm in Caldera, /etc/kde/kdm in Red Hat and /usr/share/config/kdm in Mandrake.



The gdm (Gnome Display Manager) is a re-implementation of the well known xdm. gdm has similar functions to xdm and kdm, gdm is the Gnome Display Manager, and its configuration files are found in `/etc/X11/gdm/gdm.conf`. The `gdm.conf` file contains sets of variables and many options for gdm, and the `Sessions` directory contains a script for each session option; each script calls `/etc/X11/xdm/Xsession` with the appropriate option. gdm has similar functions to xdm and kdm, but was written from scratch and does not contain any original XDM/X Consortium code.

2. Setup

Install your UNIX/Linux OS. In my case, I installed Red Hat 8 (Custom Installation). You may encounter problem, if you do not add firewall rules or temporary disable it in setting up XDMCP. I will not cover the firewall rules here in details, since this is not the focus of this document.

Setup your Networking. To test it out, ping, ftp and telnet are good commands to use to determine if your network works. RH 8 and up do not have telnet daemon turn on by default (for security reason). Remember to enable it, if you prefer to use it for your test. You can always turn it off when you are done (Using `ntsysv` with root privilege). One other thing is to remember firewall rules are there. Add your own rules or temporary disable it (as mentioned above) to make these commands work. This can be done with graphical tools you can find in the "Start Here" folder on the desktop.

Setup X. Do not setup with a resolution higher than what the remote users are able to use for their display. Test the X Server by typing either `startx` or `telinit 5`. Make sure X is running properly.

Creates the necessary user accounts (and associated groups) for user who will access via the Xterminal.

These are steps I used to setup the X Server for accepting XDMCP requests:

In Linux X environment, you need to provide font using either X font server (xfs) or hard coded font path in XF86Config and XF86Config-4 configuration files. If you plan to use xfs font server (check here to see the xfs advantages), modify /etc/rc.d/init.d/xfs and make the following changes.

Change all (this is where the Font Server port):

```
daemon xfs -droppriv -daemon -port -1
```

to:

```
daemon xfs -droppriv -daemon -port 7100
```

In Mandrake 7.2, the port is already set to 7100. Also, in RH 8, it is by default, for security enhancement, not listening to TCP port any longer! If you like to setup X font server, do the following steps:

Change this line in /etc/rc.d/init.d/xfs:

```
daemon xfs -droppriv -daemon
```

to:

```
daemon xfs -droppriv -daemon -port 7100
```

Then, in /etc/X11/fs/config, comment out this line:

```
# don't listen to TCP ports by default for security reasons  
#no-listen = tcp
```

If you change or add the port, use this command to restart your X font server (requires root): `service xfs restart`

You do not have to use port 7100. You can set a different port, as long as you carefully plan it first to make sure no conflicts in using the port number and change it accordingly. It is better to consult your Linux admin before doing so, so that he/she knows the port has been taken! Different Linux distribution may put the xfs in different folder under /etc/rc.d. You may search for it if that's the case.

Modify /etc/X11/xdm/xdm-config and make the following change. Be default (in most Linux distributions), this line is set, so that it is not listening to XDMCP connection. This is for security reason. For Caldera using kdm, this file is at /etc/X11/kdm. Find this line:

```
DisplayManager.requestPort: 0
```

and comment it out as:

```
! DisplayManager.requestPort: 0
```

Remember, this does not affect gdm. For gdm setup, it is in the following section.

In `/etc/X11/xdm/Xaccess`, change this. (this allow all hosts to connect). For Caldera using kdm, this file is at `/etc/X11/kdm`. Set the security to 644 (`chmod 644`):

```
##* # any host can get a login window
```

to:

```
* # any host can get a login window
```

The above setup is in a Broadcast mode, which will list all the X Server that are listening and willing to manage your X connection. If you only want to allow certain connections, use the CHOOSER section in this same file. An example can be found in the Resources.

I use the gdm as default and use gdm login window to switch between KDE and GNOME. For gdm, edit `/etc/X11/gdm/gdm.conf`. This activates XDMCP, causing it to listen to the request. For kdm (if you pick KDE as your DM in your installation), edit `/usr/share/config/kdm/kdmrc` for Mandrake and `/etc/kde/kdm/kdmrc` for Red Hat or `/opt/kde2/share/config/kdm/kdmrc` for Slackware version (KDE2). Change this line:

```
[xdmcp]  
Enable=false (may shown as 0 in some distributions)
```

to:

```
Enable=true (or 1 in some distributions)
```

Make sure "Port=177" is at the end of this block.

Now edit `/etc/inittab` and change the following line:

```
id:3:initdefault:
```

to:

```
id:5:initdefault:
```

In Slackware, the X11 mode is number "4", not "5".

This is switching from Text Mode login to Graphical Mode using Display Manager. Before changing this line, you can use the `telinit` command to test prior to modifying the line. Use either `telinit 3` to set

to level 3, or telinit 5 to set to level 5, graphics mode (you can issue this command on the second machine that telnets into this server).

Make sure the proper security of the file /etc/X11/xdm/Xservers is set to 444 (chmod 444).

Locate /etc/X11/xdm/Xsetup_0 and chmod 755 this file.

Edit the XF86Config file (if you are using XFree86 4.x, the file is XF86Config-4) at /etc/X11 and change the line:

```
FontPath "unix:-1"
```

to:

```
FontPath "unix/:7100"
```

If you decide to use the port number other than the usual 7100, be sure to change both in "/etc/rc.d/init.d/xf86" file and here!

To save your time and energy, I recommend you to add the FontPath in the XF86Config and XF86-Config-4 configuration files. If you are not sure what fonts are available to you, you can use this command to check it out (requires root):

```
chkfontpath --list
```

The following are some of the example fonts for your reference. Make sure you have these fonts before editing these path.

```
FontPath "/usr/X11R6/lib/X11/fonts/75dpi/"
FontPath "/usr/X11R6/lib/X11/fonts/misc/"
FontPath "/usr/X11R6/lib/X11/fonts/CID/"
FontPath "/usr/X11R6/lib/X11/fonts/Speedo/"
FontPath "/usr/X11R6/lib/X11/fonts/100dpi/"
FontPath "/usr/X11R6/lib/X11/fonts/Type1/"
```

(You do not have to make this change. You can keep the default setting, but this is what I prefer. If you are not sure, leave this alone.) Change this line to the end of /etc/inittab:

```
x:5:respawn:/usr/bin/gdm
```

If you decided not to change this line, it is fine! This is not a required step, but of a personal preference!

You are now ready to run a test.

One other thing to know (that some users have asked) is how to display with Willing to manage message with load info. As I know this is available in xdm by adding the following to the `/etc/X11/xdm/xdm-config`. `DisplayManager.willing: su nobody -c /etc/X11/xdm/Xwilling`

and the `XWilling` script must exist. For `gdm`, add this line to the `/etc/X11/gdm/gdm.conf` in `[security]` section: `Willing=/etc/X11/gdm/Xwilling`

A sample of `Xwilling` script is here for your reference. Adding this script or not is your preference. It is not required step here

3. Testing

To test if your XDMCP with X Server is ready to accept connection(s), do these steps. I find it easier using the X Server and another machine to test it:

(Re-)Start your X (which is in runlevel 5). If you are not sure how to do this, simply reboot your system (but this is really not necessary, if you know how to restart it using command line. That's the beauty of Linux, when comparing it to my Windows).

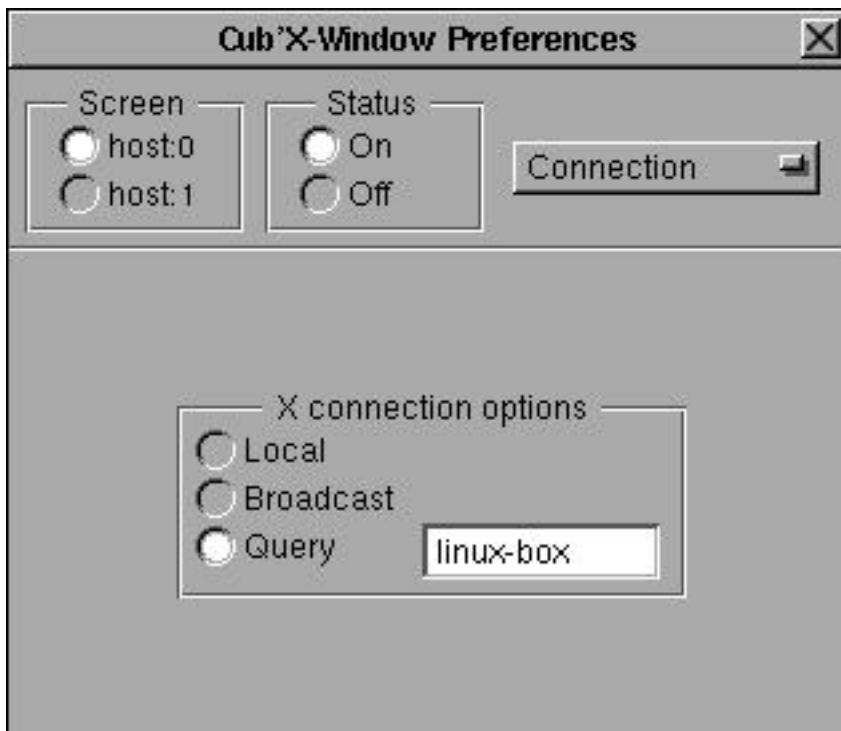
If you have not modify your firewall rules, you need to temporary disable it by using `iptables -F` (or `ipchains -F`).

Make sure the Graphical login page comes up. Make sure the display resolution and mouse work. Log in from the console to see if the local access is OK. If OK, do not log off.

4. On the NeXT side

Install `Cub'XWindow`, don't waste your time trying any other X11 software. This is the best available for NeXTSTEP.

You can do basic choices in the Preferences. I prefer to run X "outside NeXTSTEP" mode, but my advice is to fiddle a bit with the settings just to get a feeling about what's possible. Outside NeXTSTEP gives you another screen or desktop to the right of the NeXTSTEP desktop. If you slide the mouse cursor on the right side it switches to the X desktop. To go back slide the cursor on the left side.



In Preferences (Run, Visuals, Mouse, Sound, Host Access, Connection) set the screen to host:0 and status on, define color depth, mouse, and sound. Allow host access to everyone and set the connection to local or query a specific host ("Broadcast" will broadcast the network for a XDMCP host and the one which answers first shows up). Then choose 'Run X' in the Cub'XWindow menu.

If you chose outside NeXTSTEP mode, X should come up on another screen, your NeXTSTEP screen disappears. If X is local, then a single xterm window is there. If you query for a XDMCP session, the graphical login screen of your Linux/Unix box comes up.

There are two ways to get an X window or the complete environment via XDMCP: command line and the Cub'XWindow GUI. Sometimes it may be necessary to get to the command line, because you cannot establish a connection with the GUI. Type

```
/LocalApps/CubXWindow.app/X11R6/bin/X -query <host>
```

Cub'XWindow shouldn't be running, otherwise you will get an error message.

So have fun re-directing the newest Mozilla to your NeXTSTEP box and enjoy the net :-).