Installation for Multi-seat Display Manager (MDM) and Preparing for Configuration

Bret Charboneau
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Abstract:

Computers are used for a variety of things, one being to access information. Because of the internet, computers were taken to the next level by creating a huge database full of information that can be viewed by anyone. I am of course talking about the internet. Unfortunately some are not as fortunate as others and cannot access this information. In order for multiple people to access the internet at a cheap cost to the producer, multi-terminal systems were invented.   Multi-terminal systems allow multiple users to access a computer while only running one PC. This greatly reduces the cost and helps out many people. Installing this type of system is not as easy as you would think which is why I will be explaining how to install and prepare for the configuration of the system.

Introduction:

Multi-terminal computers are used in many places including cafe's, information booths, classrooms, and library's. They allow users to run multiple computer sessions all off of one computer. This is useful because it cuts down the overall cost of running multiple computers as well as lowering power consumption. We are using this multiseat system in a town who's school is not connected to a power grid. The computer system has such low power consumption that it enable us use solar power in order to run it. If there were several computers connected, say six, then the power output would be six times greater and much harder to get from a solar panel. There are several different ways to install a multi-user system, however we have decided to use Multiseat Display Manager or MDM. MDM has proven to be quite difficult to install, and even harder to configure. This is due to the fact that most systems are completely different from one another which causes several different configurations. An example would be whether or not you are using an Nvidia graphics cards or a different brand. My objective is to describe how to setup and install MDM to the point where you can configure the files.

Installing Ubuntu and MDM:

In order to install Multiseat Display Manager (MDM) we will need to use the Linux driven operating system Ubuntu. The main reasons we are using Ubuntu is because it is free, it has a user friendly interface, and all of the installation files for MDM were created specifically

for Ubuntu. The installation and setup for Ubuntu is quite trivial and very similar to that of Windows.

First we need to decide which version of Ubuntu to use. Currently (2010) there are four different versions of Ubuntu that you can download, 9.1 64bit or 32 bit, and 8.04 LTS 64bit or 32bit. Ubuntu 10.04 LTS will be available in May of 2010 which will replace version 8.04 LTS. LTS stand for Lang Term Support which means that it will be supported three years after its release date. Version 8.04 LTS was used with the previous teams on this project because of its overall long term support which is why we chose it as well. This version is supported until October 2011 which means we will continue to have updates for another year in a half. Eventually the system will have to be updated to 10.04 LTS because 8.04 LTS will no longer be supported. When this occurs, MDM may change slightly and there may be extra steps in the installation process in order to get a multiseat display computer system.

You can install Ubuntu several different ways, however, the easiest would be to download the correct version from www.Ubuntu.com and then burn the image to a cd. Once the cd has been created, you can then restart the computer with the disk in, and the installation will begin. If you already have an operating system installed, it will ask if you would like to partition the hard drive. This would allow you to run either the first operating system or Ubuntu at startup.

After Ubuntu is installed we then have to install all the necessary updates.

1. Install updates

You can find the update manager in the menu at the top of the screen. Once all of the updates are installed you then have to enable the Nvidia driver (assuming you are using Nvidia video cards).

2. Enable Nvidia driver

If you navigate to administration at the top you can find the update drivers program. Once the Nvidia drivers are installed, we can then install Nvidia-settings which will enable us to use multiple screens.

3. Install Nvidia-settings in synaptic package manager

Once again if you navigate to administration towards the top, you can find synaptic package manager. Once in synaptic package manager you can then search for Nvidia-settings and then mark it for install. Next we have to configure our screens to set up multiple monitors. In Nvidia-settings you should now see six screens. If there are not six screens then follow steps four through six, otherwise continue to step 7. If all six screens do not show up it is because there is not enough memory allocated to the video cards. In order to fix this we have to go into the kernal and change the settings.

4. Locate the folder /boot/grub/menu.lst
5. add the line: vmalloc=256M after the splash in the file

6. re-boot and all six screens should show in Nvidia-settings

Next we need to change the permissions to our files so we can edit the configuration file. When we change the permissions from 755 to 777 we are giving everyone access to change the files. Later we need to make sure we change these permissions back to 755 so no one can sabotage our computer. Changing these permissions is very simple and has to be done in the terminal.

7. Open the terminal and type:
    a. chmod 777 /etc/X11
    b. chmod 777 /etc/X11/xorg.conf
8. Enable X-server for each screen in Nvidia-settings

Now that we have permissions to access the configuration files, we have to enable all of the screens as separate X-servers. This is done by clicking the configure button in Nvidia-settings and choosing X-server for all of the six screens. Make sure you click apply and then "Save to X configuration file". When you click on Save to X configuration file it will ask if you want to merge the files, make sure you do not. You then have to restart the computer for the settings to take place

9. Restart the computer

We can now start the installation of MDM. The steps following are the steps to take to install MDM, without configuration. The apt-get command is used to download many different install files that we will be needing. Also the git-clone command will be used in order to download all of the MDM installation files from the c3sl website. Follow these commands exactly with no variation.

10. open the terminal and type:

   a. cd ../../ (until you are at the root folder)

   b. apt-get install git-core build-essential libcairo2-dev libcairo2 fakeroot curl discover gettext xserver-xephyr rccconf

   c. git-clone http://git.c3sl.ufpr.br/pub/scm/multiseat/mdm.git

   d. cd mdm

   e. cd mdm

   f. make

   g. make install

   h. cd ..

   i. cd extra-modes/xephyr-gdm

   j. make

   k. make DESTDIR=/ install

   l. cd ../../ (should now be in the mdm folder)

   m. cd dependencies

   n. apt-get build-dep libx11-6

At this point we have installed all of the MDM files that we will need to edit. It is important to know that at this point we do not want to restart the computer until we have finished customizing our files. There are several files that we need to change in order to make MDM work, and the configuration is done much easier while running X. Several of these files are located through the main folder and then in the etc folder. The most important files include the xorg.conf, discover-devices, mdm-bin, and mdm.conf. All of these files change how the setup process for MDM works. We now have to change the permissions to these files, and folders, so we can edit them to make them correct. Again, once we are done editing these files it is important to change the permissions back to 755.

11. open terminal and make sure you are in the root folder, type:
    a. chmod 777 /etc
    b. chmod 777 /etc/gdm
    c. chmod 777 /etc/gdm/gdm.conf
    d. chmod 777 /etc/gdm/gdm.conf-custon
    e. chmod 777 /mdm
    f. chmod 777 /mdm/mdm.conf
    g. chmod 777 /usr/sbin
    h. chmod 777 /usr/sbin/discover-devices
    i. chmod 777 /usr/sbin/mdm-bin
    j. chmod 777 /usr/sbin/mdm-start-monoseat

k. chmod 777 /usr/sbin/mdm-start-seat

l. chmod 777 /usr/sbin/mdm-common

m. chmod 777 /local/bin

n. chmod 777 /usr/local/bin

o. chmod 777 /usr/share/mdm/modes/xephry-gdm

p. chmod 777 /usr/share/mdm/modes

Now that we have permissions to change these files we can go and edit them. Before we edit these files we must back them up. Backing up these files is very important because if something goes wrong it allows us to reverse the process and recover the original file.

12. create a backup folder in etc/ and backup the following files:

a. discover-devices, gdm.conf, gdm.conf-custom, mdm.conf, mdm-bin, mdm-common, mdm-start-monoseat, mdm-start-seat, xephyr-gdm, xorg.conf

Once you have finished backing up all of the above files, you can then begin to configure them for your setup.

Results and Recommendations:

We first encountered problems when we were trying to enable multiple screens. It turns out that, because we are using an Nvidia graphics card, we have to use Nvidia-settings. Nvidia-settings basically allows us to change our xorg.conf file. This file tells us how the screens

are enabled and where the screens are located. Later we found an easier way to configure this file by putting in the MDM live cd, with all of the monitors connected, and then copying the xorg.conf.mdm file that it created to our setup. It is crucial that this file is correct because if it is not, then our monitors will not be correctly displayed.

One other problem we came across was copying files over from Windows to Ubuntu. We had saved our working files on a flash drive and then copied them to Windows. Later we wanted to use those files, so we copied them from Windows and put them in Ubuntu. We were getting errors that we did not have an mdm-bin file, even though we do. It turns out that if you copy a file from Windows to Ubuntu, you change the file type. For some reason the only file that it affects is the mdm-bin file. In order to fix this you have to manually edit the original mdm-bin file that is installed during the installation process.

Conclusion:

In order to install MDM correctly, it took many trial and error methods. We mainly followed c3sl, who was the creator of MDM. However, in order to configure it correctly we used previous teams knowledge as well as the creators from the c3sl website. It is obvious that this installation is not as easy as 1, 2, 3, but it can be done with the right amount of effort. Because every computer is different, each process may differ. It is very important that you understand the inner-workings of Ubuntu before you try and change any of the files needed for MDM. Unfortunately, the only way of knowing which files are the most important, and how to configure these files, is by manually working with them. It is this, and this alone, that will ensure a correct installation of the Multiseat Display Manager.