Linux Terminal Server Project

From Installation to LTSP Server

LTSP v4.2

Paul VanGundy
pvangundy@gmail.com
Copyright © 2006 Paul VanGundy
Version 1.1 – April 2006

INTRODUCTION:

Welcome to the awesome world of Linux Terminal Server Project. If you are reading this then you are probably wanting to install a Linux Terminal Server on the distribution of your choice. There are Linux distributions out there that currently do have LTSP built into them like K12LTSP and Edubuntu. However, if you are like me and you want to run the distribution of your choice with LTSP on it than this is the guide for you. This guide does use the distribution Ubuntu but with some minor changes this tutorial can be used to install LTSP onto your favorite Linux distribution. I hope that you find this tutorial helpful and easy to use. I always welcome questions, comments, suggestions and complaints so feel free to contact me at the email address listed on the cover page of this tutorial at anytime.

Installing LTSP Services:

The very first thing that I recommend users that are setting up LTSP do is install the services needed by LTSP first. These services are:

- DHCP
- TFTP
- NFS
- XDMCP

These have been outlined in Jim McQuillan's Official LTSP guide. XDMCP by default is installed onto almost all Linux distros and enabled. However, just in case it isn't I will show you how to enable XDMCP.

So what are the list of packages you will want to install? I have listed them below and you can easily apt-get each one:

- dhcp3-server
- dhcp3-common <--- This package is generally already installed
- dhcp3-dev
- tftpd-hpa
- nfs-kernel-server
- xinetd
- libwww-perl <--- Needed in order to install ltsp-utils

NOTE: You will see DHCP fail when it initially tries to start after install. That is normal as we still need to configure DHCP later.

Installing LTSP:

Here is the part where we install the LTSP packages that will allow us to run LTSP from our server. What you want to do is go to www.ltsp.org and download the latest LTSP-UTILS utility. You will see packages for Debian, Ubuntu, Red Hat/Fedora and others. Since we are installing LTSP onto our Ubuntu distro, then we need to get the one for Ubuntu. If you are installing LTSP onto another Linux distro, get the ltsp-utils that is relevant to your distro. You can also wget ltsp-util by opening your terminal and typing the following:

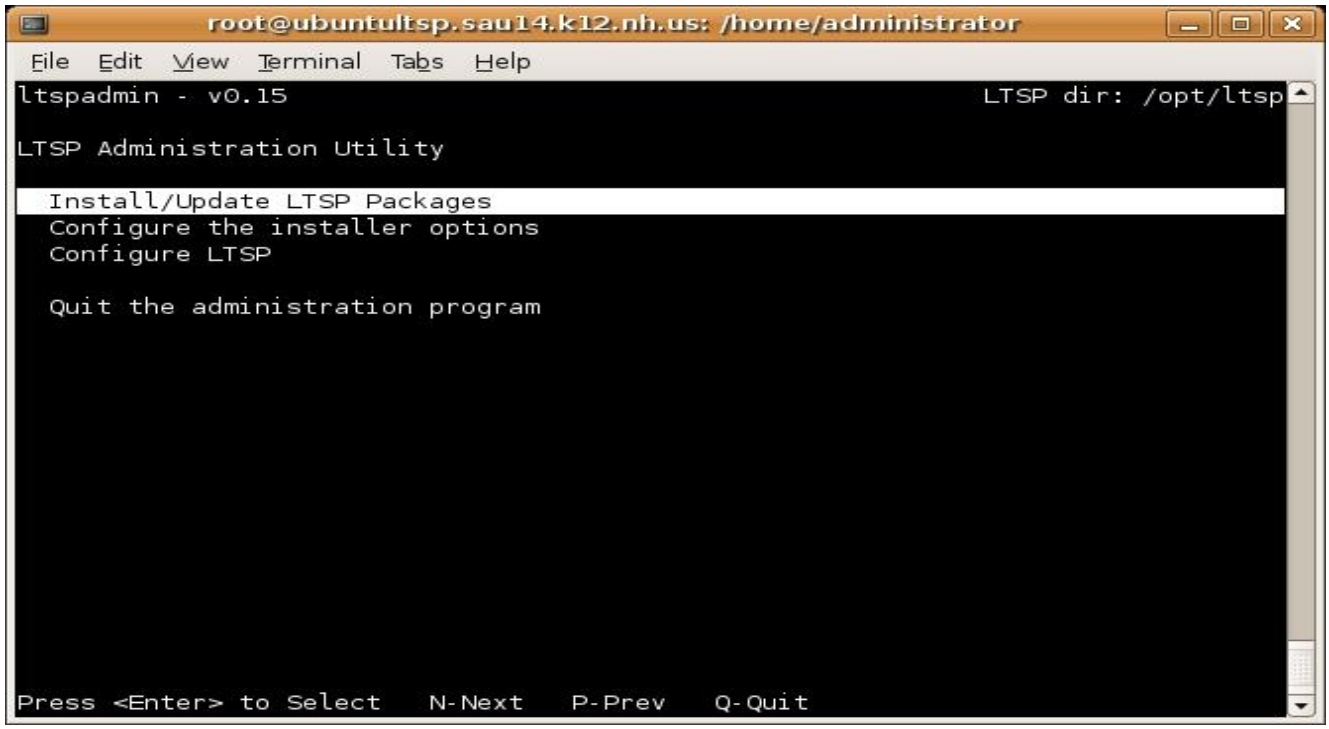
wget http://ltsp.mirrors.tds.net/pub/ltsp/utils/<latest_ltsp-utils_package>

Once you have downloaded the ltsp-utils utility we now need to install it. Open a terminal and navigate to the location where you downloaded ltsp-utils and type the following:

dpkg – i <latest_ltsp-utils_package.deb>

NOTE: You will need to have root privileges to install ltsp-utils. Use **sudo su** to do so.

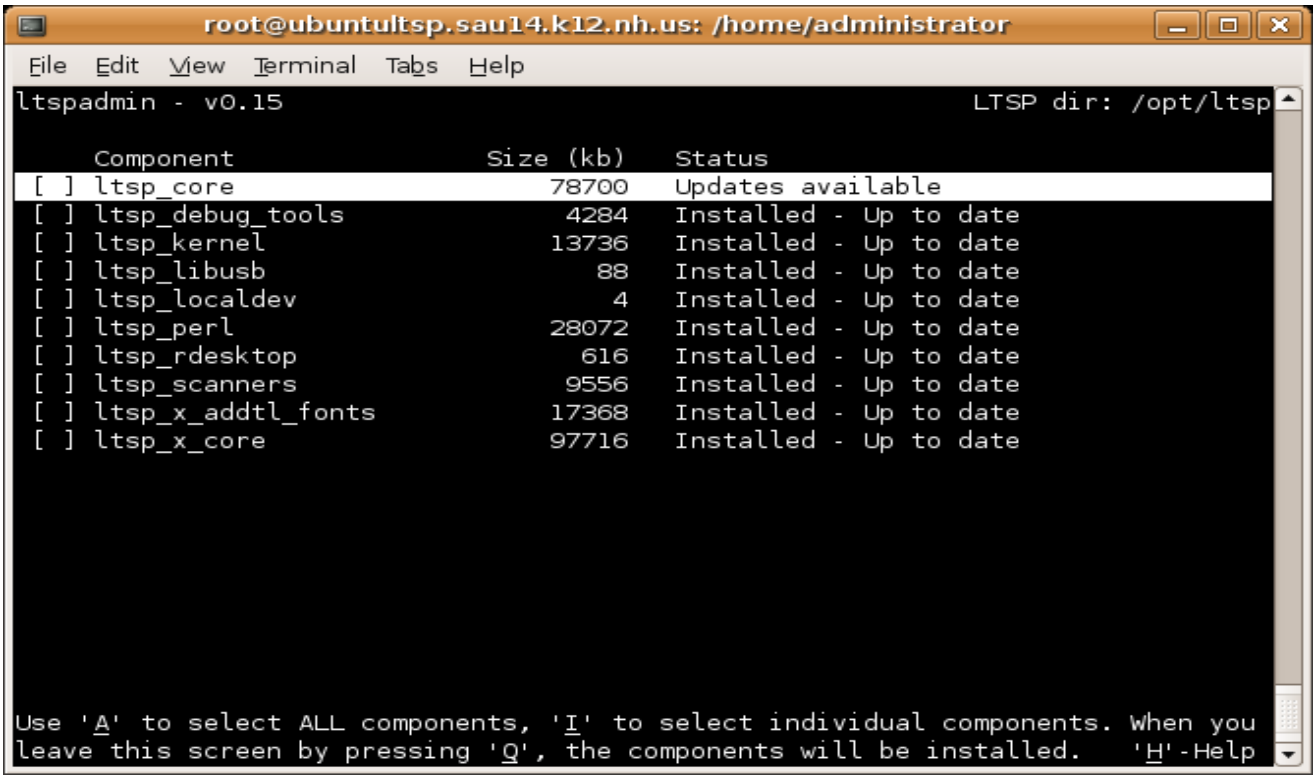
The ltsp-utils package is now installed. Now it's time to start installing the LTSP packages. In the same terminal you just installed ltsp-utils type **ltspadmin**. You will see the following screen come up:



For a new installation of LTSP the default installer options are fine. If you are upgrading then you will need to change these options. Since we are doing a new installation, we will leave the installer options as they are.

NOTE: If you have a proxy server you will need to enter that information in “Configure the installer options”.

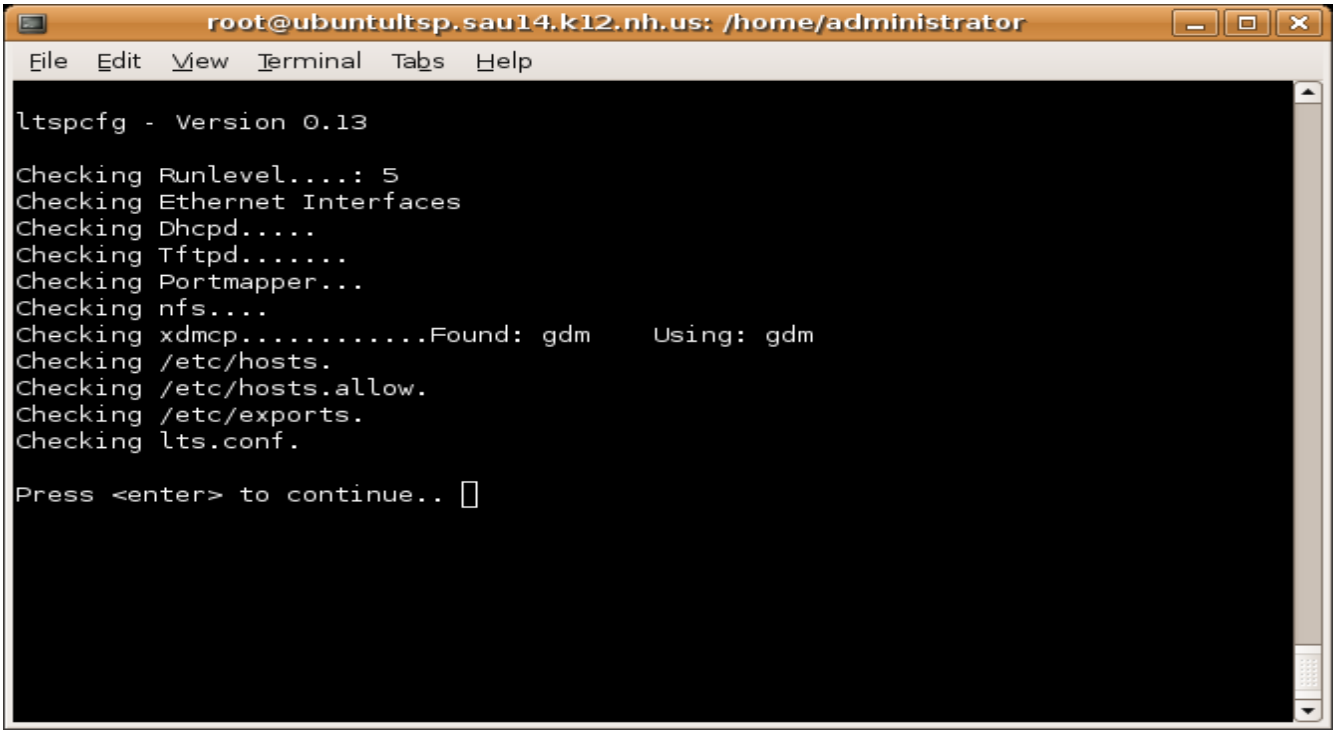
“Install/Update LTSP Packages” by default is already selected. Hit “Enter” on your keyboard to go the next screen which looks like the one on the next page:



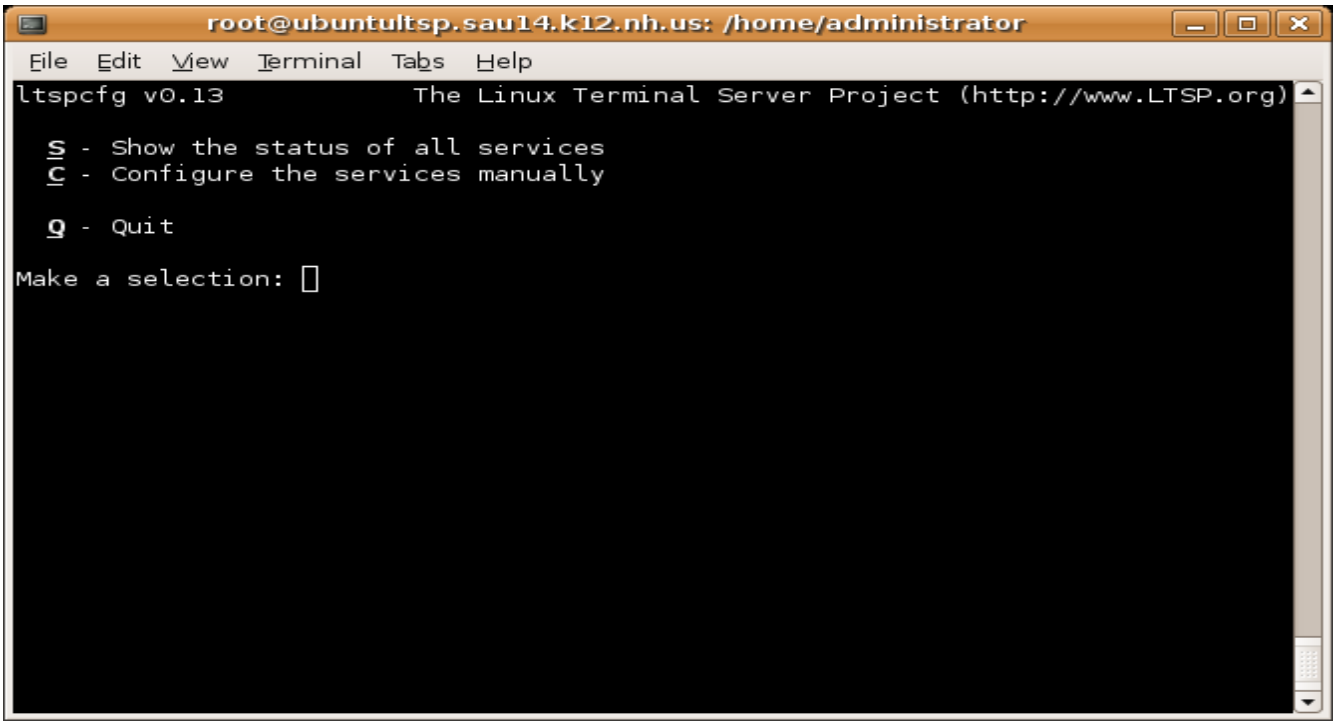
As you can see, this brings up a list of LTSP components available. In my screen, you see that they are already installed and I have one component that can be updated. Since this is a new install you will want to select ALL components for install. To do that press the A key. You will now see asterisks next to each component. You are ready to install! Press the Q key to continue. You will now be prompted if you want to install now, say yes (y). The ltspadmin utility will commence to download the LTSP components.

After installation of the LTSP components is complete, you will be asked to press “Enter” to continue. After pressing “Enter” you will be brought back to the LTSP Administration Utility “homepage” if you will. Now you want to go to “Configure LTSP”. On the next page you will see the screens you will see:

Configuring LTSP and Services:

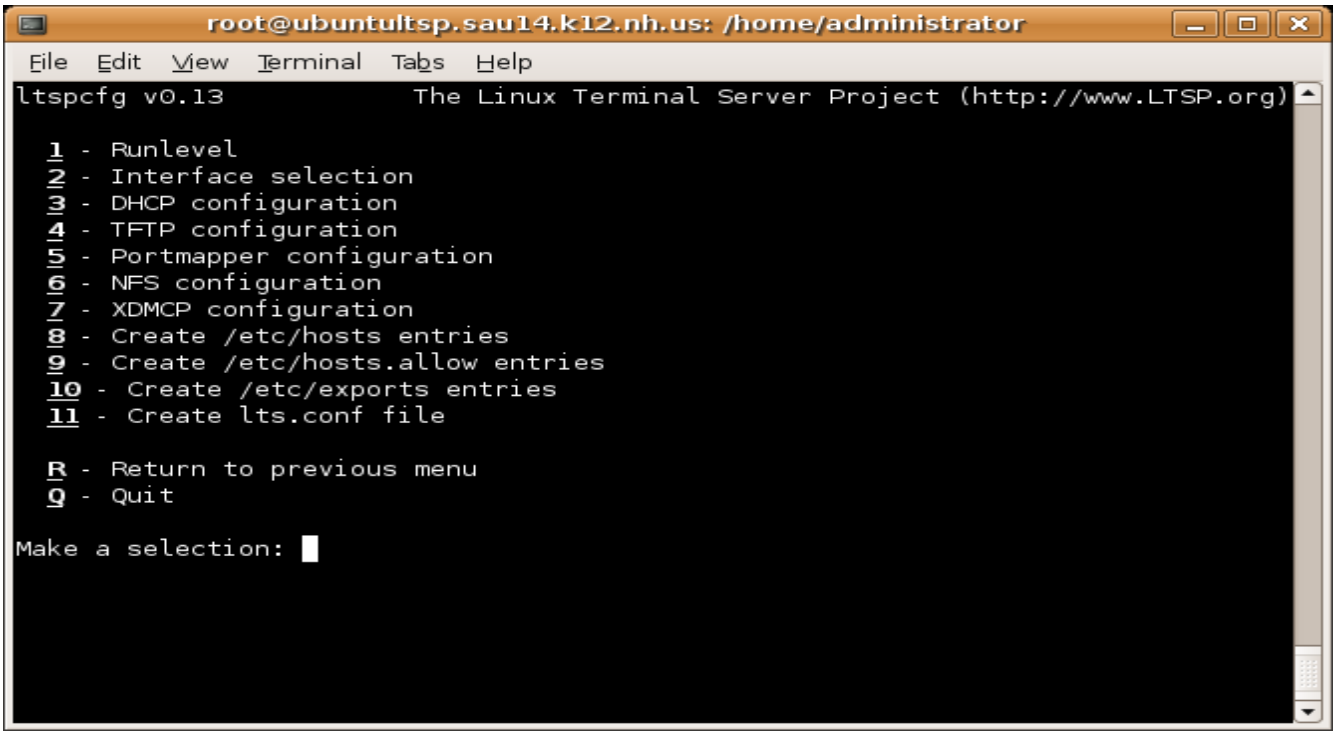


Go ahead and hit enter to continue....



This is the ltspcfg utiltiy screen. For future purposes, you can get to this screen by opening a terminal and typing **ltspcfg**.

The first thing we want to do is configure our services manually. So press the C key then hit “Enter”. You will be brought to the following screen:



I am now going to go through the first 4 options that are on this screen:

1. **Runlevel** – Set the runlevel to 5
2. **Interface selection** – If you have only one NIC card, no need to bother with this option, otherwise you need to select the interface you want to listen for requests.
3. **DHCP configuration** – In this selection you will want ltspcfg to create a sample dhcpd.conf file. It will be called dhcpd.conf.sample and will be located in /etc/dhcp3. Let's go to that location and configure dhcp.conf

As said above, the location of dhcpd.conf is in /etc/dhcp3. You will already have a dhcp.conf file in that folder that we will replace with our dhcp.conf.sample file. What you want to do is configure the dhcp.conf.sample file and save it as your dhcp.conf. I have what my dhcp.conf file looks like on the following page.

```
# dhcpd.conf

option subnet-mask              255.255.0.0;
option broadcast-address        172.21.255.255;
option routers                  172.21.16.253;
option domain-name-servers      172.21.30.254, 172.21.16.13, 172.21.16.10;
option domain-name              "sau14.k12.nh.us";
option option-128 code 128 = string;
option option-129 code 129 = text;


get-lease-hostnames         true;

next-server                 172.21.30.254;
option root-path            "172.21.30.254:/opt/ltsp/i386";

subnet 172.21.0.0 netmask 255.255.0.0 {
   range   172.21.30.1 172.21.30.253;
   if substring (option vendor-class-identifier, 0, 9) = "PXEClient" {
      filename "/lts/2.6.16.1-ltsp-1/pxelinux.0";
   }
   else{
      filename "/lts/vmlinuz-2.6.16.1-ltsp-1";
   }
}
#
# If you need to pass parameters on the kernel command line, you can
# do it with option-129.  In order for Etherboot to look at option-129,
# you MUST have option-128 set to a specific value.  The value is a
# special Etherboot signature of 'e4:45:74:68:00:00'.
#
# Add these two lines to the host entry that needs kernel parameters
#
#       option option-128     e4:45:74:68:00:00;       # NOT a mac address
#       option option-129     "NIC=ne IO=0x300";
#
```

Your sample dhcp.conf file will already come with the information you need in it by default. For example, when you create the dhcp.conf.sample through ltspcfg then it will already change the option routers information to be that of the server's IP address. The only information you will need to change will be the **option domain-name** so that is matches the name of your current domain or just change it to a domain name of your choice, **subnet**, and **range**. You could also add additional name servers to **option**

domain-name-servers if you wish and even change **option routers** to point to your network router versus the LTSP server. Once you have dhcp.conf.sample modified to your liking save it as dhcp.conf and overwrite the current dhcp.conf file in /etc/dhcp3.

NOTE: You will need to have root privileges to overwrite the old dhcp.conf in /etc/dhcp3 or chmod the /etc/dhcp3 directory temporarily.

Now that you have modified dhcp.conf saved and ready, it's now time to start the DHCP service. In a terminal type the following command:

/etc/init.d/dhcp3-server start

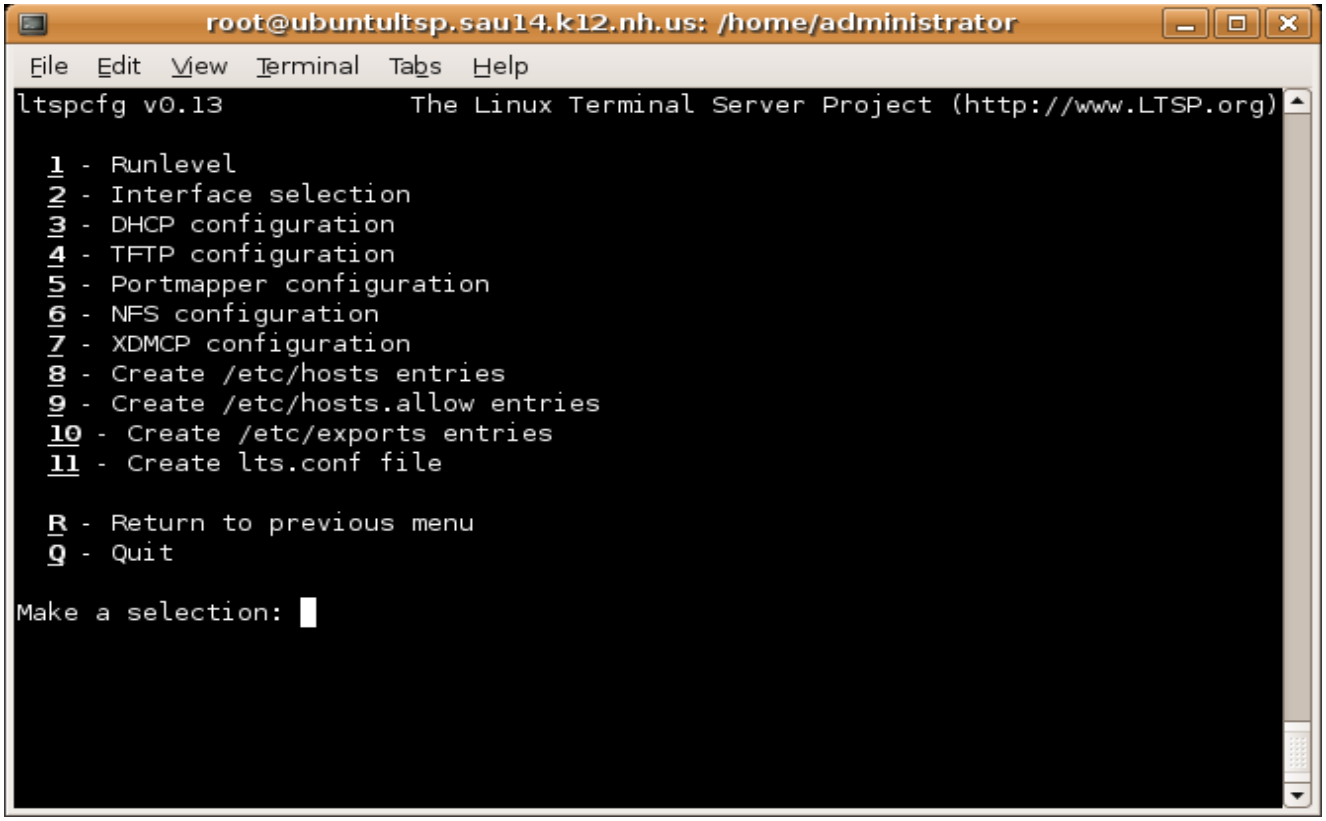
You should see it say it is starting the DHCP server and then it should say "[ok]". Now our DHCP server.

4. **TFTP configuration** – In this area it is going to ask if you want to start TFTP. First we must configure TFTP to run then we will come back to this and say yes (y). I will now show you how to configure xinetd for TFTP.

You will want to go to the following directory **/etc/xinetd.d**. In this directory is where you will want to create a new file called **tftp**. With your favorite editor (gedit, vi, etc.) you are going to want to edit the tftp file with the information you see below:

```
service tftp
{
  disable          = no
  socket_type      = dgram
  protocol         = udp
  wait             = yes
  user             = root
  server           = /usr/sbin/in.tftpd
  server_args      = -s /tftpboot
}
```

After you have put the information shown above in your **tftp** file then save it and go back to **ltspcfg**. Go back to option four "**TFTP Configuration**" and tell it to start. It should start tftp.

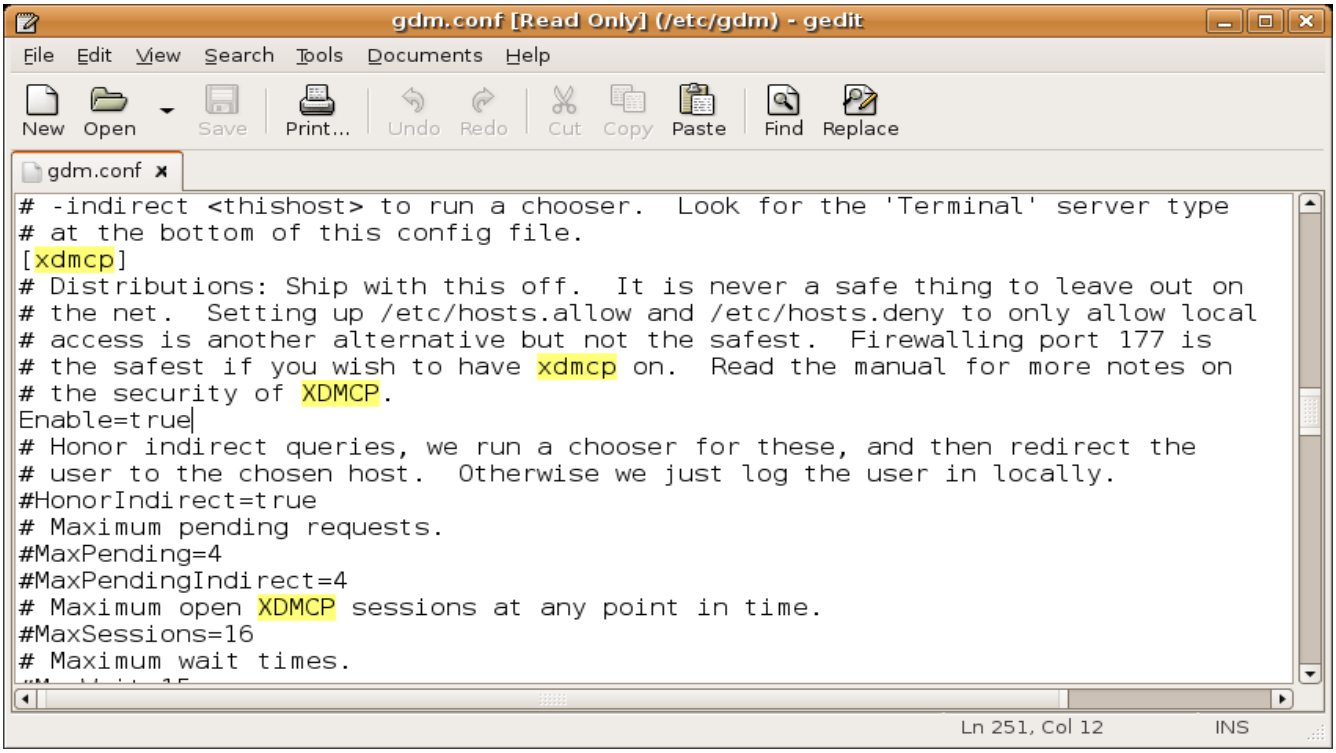


As you can see, we will have steps 5-11 left on our **ltspcfg**. This part of the job is fairly easy. Steps 5 and 6 can be fixed by issuing the following commands in a terminal:

/etc/init.d/nfs-kernel-server start
[This will start the nfs server]
and
/etc/init.d/portmap start
[This will start port mapper]

Again, by default XDMCP is always running. One way to make sure it is enabled for your system is to go into your systems desktop manager configuration file (EX: gdm, kdm, xdm, etc.) and ensure XDMCP is enabled. I have gone into my gdm.conf file which is located in **/etc/gdm** and ensured XDMCP is set to **Enable=true**. In gdm.conf you can also change things like max number of connections a concurrent time. To show you where it is in gdm.conf I have posted what it looks like on the following page.

NOTE: If you are finding that things you copy and paste out of this document into your terminal aren't working there is a reason for that. **DO NOT COPY AND PASTE FROM THIS DOCUMENT**. The reason why is because hidden characters will be added when you paste the information into a terminal or configuration file. Hand input everything.



As you can see above, I have XDMCP set to **Enable=true**. This concludes Step 6 of the **ltspcfg** utility "**XDMCP configuration**".

Steps 8-11 are simple. All you do is go through each Step and have it create the file it says it is going to create. So for example, when you go to Step 8 it is going to create the /etc/hosts entries file, Step 9 will create the /etc/hosts.allow entries file and so on.

You're pretty much done. You have installed LTSP, you have your services configured and running, now all you need to do is edit your **/etc/hosts** file to match your network information.

Modifying your /etc/hosts file is very easy, but can be time consuming. Below is an example of what the /etc/hosts file looks like:

172.21.0.211	ws211.ltsp	ws211
172.21.0.212	ws212.ltsp	ws212
172.21.0.213	ws213.ltsp	ws213
172.21.0.214	ws214.ltsp	ws214
172.21.30.215	ws215.ltsp	ws215
172.21.30.216	ws216.ltsp	ws216
172.21.30.217	ws217.ltsp	ws217
172.21.30.218	ws218.ltsp	ws218
172.21.30.219	ws219.ltsp	ws219

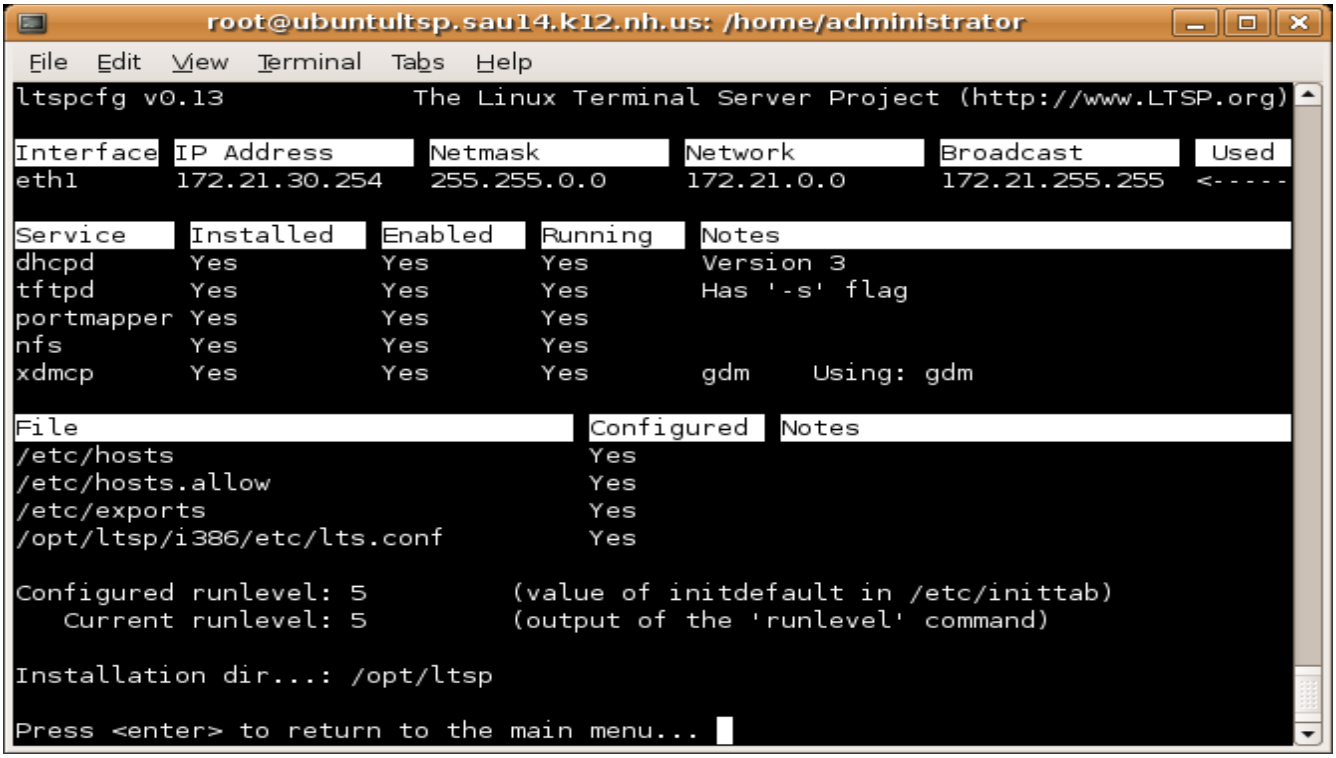
You're probably wondering why this is two different colors. Well, let me explain.

Let's go over the orange section first. The reason why the section that has the 172.21.0.x is orange is because by default that is what the /etc/hosts file looks like. It creates IPs based off of your subnet and workstations names based off of the domain name you supplied in DHCP.conf.

The grey area is the /etc/hosts file modified to your network settings. So if you have a range from 172.21.30.1 through 172.21.30.253 then you don't want to have your hosts file having the range 172.21.0.1 through 172.21.0.253. If this information doesn't properly reflect what you are handing out then a booting client will fail.

The End:

Alright, you have DHCP running, TFTP running, NFS running, Port mapper running, XDMCP running....but do you? One easy way to find out it all of your services are running is to run **ltspcfg** and choose the "**Show the status of all services**". Your page should look like the following:



There you go, you are ready to start booting clients! The only way to know is to try. If all fails I point you to Googling AND look at Jim McQuillan's LTSP Official Guide which has troubleshooting information. Also, you can modify LTSP to add sound servers, other video information and etc. However, you are now up and running an LTSP environment! I hope this tutorial was helpful and easy to follow! Have fun LTSPing!!