# How to install LTSP (Linux Terminal Server Project) on Ubuntu Server

## Overview

I've had a lot of people ask me how I achieved my thin client setup so I thought it's about time I added a guide or two! This particular guide will show you how to create thin Ubuntu Clients. Later guides will show you how to run MS Windows thin clients.

Whilst there are plenty of other LTSP guides out there on the internet they fell short of being helpful to me in 3 ways:

- They assume your starting point is from a full-blown Ubuntu gnome desktop. Mine isn't, I'm running a headless 64bit Ubuntu Server.
- They assume your server has two NICSs. Mine doesn't, it only has the one.
- They assume your Ubuntu desktop/server is performing DHCP duties for your whole network. My ADSL router does that on mine.

So, if you're running a headless server with a single NIC and your router performs the DHCP duties for your network then you might find this guide helpful.

*NOTE: If you're jumping into this site here then it's worth mentioning that this guide has been written for Lucid Lynx 10.04 but it may well work on earlier or later versions of Ubuntu.*

*TIP: If you're going to be following this guide step by step using Putty then you can save yourself some typing by simply highlighting each command below, right-clicking on it and selecting **Copy**. Then toggle over to your Putty Session and right-click once more. The command you've just copied from here will be automatically pasted into your Putty Session.*

## Give your server a Fixed IP Address

There are two ways to do this. The first way is called IP Address Reservation. Address Reservation is where you tell your router to always give your server the same IP address. The second way is what's commonly called a Static IP Address. This is where you change the settings on your server to tell the

server not to obtain an IP address from your router but to instead always use the one you've hard coded. It is important that you make sure that this static IP address is outside the range issued by your router otherwise you might find you router giving this address to another device on your network. This would not be helpful!

Obviously I can't document here how to change the settings on your particular router to reserve an address for your server so I'll just cover the latter, assigning a static IP address to your server.

If you've been following my guides then you'll already have a static IP address for your server. And if you've been following ALL my guides then you'll also be running KVM which means you'll be running your NIC as a network bridge so you can omit this step in either case.

So, in a Putty session type or paste the following command:

```
sudo vim /etc/network/interfaces
```

By default your file should look like this:

```
# This file describes the network interfaces available on your system
# and how to activate them. For more information, see interfaces(5).

# The loopback network interface
auto lo
iface lo inet loopback

# The primary network interface
auto eth0
iface eth0 inet dhcp
```

We need to edit the last two lines and add a few more. The settings you will use depend on your own network environment so you'll obviously need to use your own values rather than just paste mine! Once done your file should look like something like this. The # character masks a line out so it does not get executed:

```
# This file describes the network interfaces available on your system
# and how to activate them. For more information, see interfaces(5).

# The loopback network interface
auto lo
iface lo inet loopback

# The primary network interface
#auto eth0
#iface eth0 inet dhcp
auto eth0
iface eth0 inet static
        address 192.168.1.200
        netmask 255.255.255.0
        network 192.168.1.0
        broadcast 192.168.1.255
        gateway 192.168.1.254
        dns-nameservers 192.168.1.254
        dns-search home
```

When you're done editing the file press the [Esc] key once and type the following:

```
:wq
```

This should save the changes and bring you back to the command line. If you make a mistake then issue **:q!** instead of **:wq** to abort your changes.

## Install LTSP

Now we need to install LTSP. We do this by issuing the following command:

```
sudo apt-get install ltsp-server-standalone
```

## Edit the dhcpd.conf file to suit your environment

This is probably the trickiest part to get right since the settings you use will depend on your own environment. However I'll explain what settings I changed (shown in red below) so you should be able to adjust this file to suit your network. First off, let's open the dhcpd.conf file for editing by issuing the following command:

```
sudo vim /etc/ltsp/dhcpd.conf
```

By default the file should look like this:

```
# Default LTSP dhcpd.conf config file.
#

authoritative;

subnet 192.168.0.0 netmask 255.255.255.0 {
      range 192.168.0.20 192.168.0.250;
      option domain-name "example.com";
      option domain-name-servers 192.168.0.1;
      option broadcast-address 192.168.0.255;
      option routers 192.168.0.1;
#     next-server 192.168.0.1;
#     get-lease-hostnames true;
      option subnet-mask 255.255.255.0;
      option root-path "/opt/ltsp/i386";
      if substring( option vendor-class-identifier, 0, 9 ) = "PXEClient" {
            filename "/ltsp/i386/pxelinux.0";
      } else {
            filename "/ltsp/i386/nbi.img";
      }
}
```

If you're currently viewing this guide using a Windows machine connected to your router and your machine has been assigned an IP address via DHCP then issue the **ipconfig /all** command in a Command Prompt to see what settings you're currently using. Alternatively you can obtain the required settings from your router interface.

Change the first three sets of numbers of the **subnet** to match your IP address. The IP address of the machine I'm using currently is 192.168.1.112 so I'd change the **subnet** value above from 192.168.0.0 to 192.168.1.0

For the **range** you need to make sure you set these to be **outside** the DHCP range dished out by your router. My router issues IP addresses from 192.168.1.64 to 192.168.1.253 so I had to firstly change my router to issue address in the range 192.168.1.64 - 192.168.1.199. I then set the **range** in the dhcpd.conf file to be 192.168.1.202 to 192.168.1.253 (my servers are using .200 & .201)

Set the **option domain-name-servers** to be the same as the IP address of your router. In my case this is 192.168.1.254. Note, this would be the value of your "DHCP Server" in the output from your ipconfig /all command.

Set the **option broadcast-address** so the first 3 sets of numbers are the same as the **subnet** setting plus the 255. So, 192.168.1.255

Set the **option routers** to be the same as the **option domain-name-servers**.

All other settings can remain the same.

Here's mine. The red indicates the values which are different from the defaults:

```
#
# Default LTSP dhcpd.conf config file.
#

authoritative;

subnet 192.168.1.0 netmask 255.255.255.0 {
      range 192.168.1.202 192.168.1.250;
      option domain-name "example.com";
      option domain-name-servers 192.168.1.254;
      option broadcast-address 192.168.1.255;
      option routers 192.168.1.254;
#       next-server 192.168.0.1;
#       get-lease-hostnames true;
      option subnet-mask 255.255.255.0;
      option root-path "/opt/ltsp/i386";
      if substring( option vendor-class-identifier, 0, 9 ) = "PXEClient" {
            filename "/ltsp/i386/pxelinux.0";
      } else {
            filename "/ltsp/i386/nbi.img";
      }
}
```

When you're done editing the file press the [Esc] key once and type the following:

```
:wq
```

This should save the changes and bring you back to the command line. If you make a mistake then issue **:q!** instead of **:wq** to abort your changes.

## Restart the DHCP server on the host

We should now restart the DHCP server by issuing the following command. With any luck we'll see an [OK] to say the DHCP server successfully started:

```
sudo /etc/init.d/dhcp3-server restart
```

## Build the LTSP environment and the client image

Now we're done configuring the basics let's build the LTSP environment and client image by issuing the following command. This will take some time so be patient. Note, the command will build a 32bit image. If you want to build a 64bit image (which is obviously not recommended if your thin clients don't support it) then omit the "--arch i386" from the command below:

```
sudo ltsp-build-client --arch i386
```

This will churn through for quite some time but eventually you should see **info: LTSP client installation completed successfully** displayed at the bottom of the screen. Now it's time to reboot the host server:

```
sudo reboot -h now
```

## Time to boot up a Thin Client

Once the host server has rebooted we should now be able to boot our thin client and be presented with the Ubuntu Thin Client logon screen as shown below:


Once you've typed in your username and password you should see a black box (which is actually a Terminal session) appear at the top left corner of the login screen. This is because we've not yet installed a GUI on our LTSP server but carrying out this step does at least show that our basic setup is working properly. Type **exit** in the Terminal session to quit back to the login screen. Then on the login screen click on Preferences in the bottom left-hand corner of the screen and choose Shutdown.

NOTE: If you've previously followed my **VNC guide** then you'll be presented with the core gnome desktop rather than a Terminal Session. In which case select Log Out from the System menu before selecting the Preferences option on the Thin Client login screen to Shutdown the thin client.

## Configure the LTSP environment

We now need to configure our LTSP environment to run a GUI and configure stuff to suit our needs which is explained the **How to configure LTSP** guide.

Still stuck? Not what you were looking for? Then head over to the **Discussion Forum**

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