

# Setting up your K12LTSP or LTSP load-balancing and dhcp failover.

## What you'll need:

- ✓ Two servers running K12LTSP or LTSP in single NIC mode
- ✓ A good solid high speed connection (gigabit recommended)
- ✓ An external home directory location is preferred, but not necessary...(example: Samba/LDAP running on a 3<sup>rd</sup> server)

First, set up your network in such a way that the two LTSP servers can be used as the dhcp servers for your network. Both servers should be set up as close to identical as possible...including DHCP. (In fact the dhcpd.conf files will be almost identical except for one section which will identify each as either the primary or secondary...and some IP addresses).

Edit your /etc/dhcpd.conf file to look something like this...begin with the server you wish to be the primary server. (Note: the highlighted part is essentially what I've added...also note that the whole vendor class section is missing....this will be declared in an included file calle dhcpd.master) REMEMBER...this is the configuration for the primary server.

```
# Sample configuration file for ISC DHCP
#
# Don't forget to set run_dhcpd=1 in /etc/init.d/dhcpd
# once you adjusted this file and copied it to /etc/dhcpd.conf.
#

default-lease-time      21600;
max-lease-time          21600;
ddns-update-style none;
one-lease-per-client true;
authoritative;
allow booting;
allow bootp;

option subnet-mask      255.255.240.0;
option broadcast-address 10.0.0.255;
option routers          10.0.14.253;
option domain-name-servers 10.0.14.253;
option domain-name      "vcs.u52.k12.me.us";
option root-path        "10.0.14.253:/opt/ltsp/i386";
option option-128 code 128 = string;
option option-129 code 129 = text;
option option-221 code 221 = text;

#####
###DHCP Failover and load balance statements###
```

```

#####
failover peer "ltsp" {
    primary;
    address 10.0.14.253;

    port 519;
    peer address 10.0.15.253;
    peer port 520;
    mclt 3600;

    max-response-delay 30;
    max-unacked-updates 10;
    load balance max seconds 3;
# split 128;
    hba ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:
        00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00;
}
include "/etc/dhcpd.master";
#####
#####

# example configurations for specifying specific kernels to specific clients
group {
    use-host-decl-names    on;
    option log-servers     10.0.14.253;

# Apple Specific Settings
# host ws007 {
#     hardware ethernet    00:30:65:69:23:60;
#     fixed-address        10.0.0.4;
#     option root-path     "10.0.14.253:/opt/ltsp/ppc";
#     filename              "yaboot";
#     option vendor-class-identifier "AAPLBSDPC";
# }

#####Static Workstations#####

host bs001.vcs.u52.k12.me.us {
    hardware ethernet 00:03:93:21:55:99;
    fixed-address 10.0.0.201;
}
host bs002.vcs.u52.k12.me.us {
    hardware ethernet 00:03:93:21:41:9d;
    fixed-address 10.0.0.202;
}
host bs003.vcs.u52.k12.me.us {
    hardware ethernet 00:03:93:20:f0:43;
    fixed-address 10.0.0.203;
}

```

```

}
host bs004.vcs.u52.k12.me.us {
    hardware ethernet 00:03:93:21:96:f9;
    fixed-address 10.0.0.204;
}

```

-snip-

Ok...now let's move over to the secondary server and edit the dhcpd.conf file on that machine. Following the guidelines above...make it look something like this...

```

# Sample configuration file for ISC DHCP
#
# Don't forget to set run_dhcpd=1 in /etc/init.d/dhcpd
# once you adjusted this file and copied it to /etc/dhcpd.conf.
#

```

```

default-lease-time      21600;
max-lease-time          21600;
ddns-update-style none;
allow booting;
allow bootp;

```

```

option subnet-mask      255.255.240.0;
option broadcast-address 10.0.0.255;
option routers          10.0.15.253;
option domain-name-servers 10.0.15.253;
option domain-name      "vcs.u52.k12.me.us";
option root-path        "10.0.15.253:/opt/ltsp/i386";
option option-128 code 128 = string;
option option-129 code 129 = text;
option option-221 code 221 = text;

```

```

#####
###DHCP failover and load balancing stuff###
#####

```

```

failover peer "ltsp" {
    secondary;
    address 10.0.15.253;
    port 520;
    peer address 10.0.14.253;
    peer port 519;
    max-response-delay 30;
    max-unacked-updates 10;
    load balance max seconds 3;
}
include "/etc/dhcpd.master";

```

```
#####  
#####
```

```
# example configurations for specifying specific kernels to specific clients
```

```
group {  
    use-host-decl-names    on;  
    option log-servers     10.0.15.253;
```

```
# Apple Specific Settings
```

```
# host ws007 {  
#   hardware ethernet    00:30:65:69:23:60;  
#   fixed-address        10.0.0.4;  
#   option root-path     "10.0.15.253:/opt/ltsp/ppc";  
#   filename             "yaboot";  
#   option vendor-class-identifier "AAPLBSDPC";  
# }
```

```
#####Static Workstations#####
```

```
host bs001.vcs.u52.k12.me.us {  
    hardware ethernet 00:03:93:21:55:99;  
    fixed-address 10.0.0.201;  
}  
host bs002.vcs.u52.k12.me.us {  
    hardware ethernet 00:03:93:21:41:9d;  
    fixed-address 10.0.0.202;  
}
```

Be sure to pay attention to the IP addresses in this file and make sure they are appropriate for that particular server.

Note that in the configuration for the primary server we put in an option for “split=128” which is commented out and just below it is a “hash” declaration. Hashes allow for more fine tuning as to how the actual load may be split up. My servers are nearly identical so I chose a 50/50 split (or 128), but you can fine tune this....there's a good description of how this works here...

[http://theseus.sourceforge.net/projects/ets/supplemental.html#Supplemental\\_Information](http://theseus.sourceforge.net/projects/ets/supplemental.html#Supplemental_Information)

Now we need to make the /etc/dhcpd.master file. In a text editor create a file called /etc/dhcpd.master and make it look similar to this..be sure to use you own IP addresses and make sure you put the correct IP addresses for the server you are working with...this file (with it's appropriate IP addresses) needs to be created on both servers.

```
subnet 10.0.0.0 netmask 255.255.240.0 {  
    pool {  
        failover peer "ltsp";
```

```

range 10.0.0.100 10.0.15.252;
deny dynamic bootp clients;
}
option routers 10.0.15.253;
use-host-decl-names on;
option log-servers 10.0.15.253;

# trick from Peter Rundle <peter.rundle@au.interpath.net>
# newer Macs
if substring (option vendor-class-identifier, 0, 9) = "AAPLBSDPC"
{
filename "yaboot";
option vendor-class-identifier "AAPLBSDPC";
}
# really old iMacs
elseif substring (option option-221, 0, 5) = "Apple"
{
filename "yaboot";
option vendor-class-identifier "AAPLBSDPC";
}
# Intel PXE
elseif substring (option vendor-class-identifier, 0, 9) = "PXEClient"
{
# NOTE: kernels are specified in /tftpboot/lts/pxe/pxelinux.cfg/
filename "/lts/pxe/pxelinux.0";
}
# default to an i386 BOOTP image
else
{
filename "/lts/vmlinuz.ltsp";
}
}

if substring (option vendor-class-identifier, 20, 3) = "ppc" {
option root-path "10.0.15.253:/opt/ltsp/ppc";
elseif substring (option option-221, 0, 5) = "Apple"
{
filename "yaboot";
option vendor-class-identifier "AAPLBSDPC";
}
# Intel PXE
elseif substring (option vendor-class-identifier, 0, 9) = "PXEClient"
{
# NOTE: kernels are specified in /tftpboot/lts/pxe/pxelinux.cfg/
filename "/lts/pxe/pxelinux.0";
}
# default to an i386 BOOTP image
else
{

```

```
    filename    "/lts/vmlinuz.lts";
}

if substring (option vendor-class-identifier, 20, 3) = "ppc" {
    option root-path "10.0.15.253:/opt/lts/ppc";
} else {
    option root-path "10.0.15.253:/opt/lts/i386";
}
}
```

Believe it or not...that's it! Start DHCP on both servers and set it to start when the server starts.

If you are not using something like Samba/LDAP you will need to set up something like rsync to synchronize your usernames, passwords, groups, and home directories between servers. If you are using Samba/LDAP simply point the two LTSP servers to authenticate to Samba/LDAP using something like "authconfig". You can find a how-to for setting up Samba/LDAP here... <http://www.vcsvikings.org/linux/smbldap> and you can download the latest smbldap-installer from here... <http://www.majen.net/smbldap/> (if using FC4 or K12LTSP 4.4....use the 2.0 version)

Testing it out! What I did was changed the background on my gdm login screen so that I could easily tell which server the LTSP terminal booted from. You may want to reboot both servers after setting them up and then once they are ready....start turning on terminals. You should get a pretty even split of terminals booting up alternately to the two servers. This is the load-balancing in action, and the other bonus is "failover"....should one server fail....the other will take over (the client may need to be rebooted to connect to the other server, but the DHCP operation will switch over seamlessly).

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