

Re: How to setup effective school network

Source: <http://linux.derkeiler.com/Newsgroups/comp.os.linux.networking/2005-01/2066.html>

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upro wrote:

- > *I have a problem – so many questions and no one there with whom to*
- > *discuss them:*
- >
- > *I have a very nice quality server ...*

What are the specs on the server, ie., cpu, ram, hard disks, raid, nic(s), etc.

- > *... and around 50 clients in my*
- > *school. At that moment the setup is quite nothing: All machines are*
- > *connected to hubs/switches, ...*

Hubs and switches are very different beasts when connecting computers. Use no hubs if possible and if you must use them put the least used/needed machines on them and as "far away" from the server and firewall as possible (drop them from "leaf" switches). You need to preserve as much bandwidth for "good" use as possible. Check that all nics are operating at full capabilities (100 Mbps–full duplex?). Could you provide an ascii art diagram of your network layout. Or a "real" diagram on a web page?

- > *... which are connected to the DSL modem.*

What is the connection speed?

- > *This goes also for the server. User authentication goes by one*
- > *central user account, which is set up on al machines. No networking*
- > *here.*
- >
- > *What I want is:*
- >
- > *1) Connect the server only to the DSL modem, and throughn my 2nd*
- > *Network card all hubs and switches to my server and serve dhcp.*

This is an edge postion suitable for a router/firewall — something you definitely need. It is not a good place for an internal server, especially a dhcp or file server. And think twice about using dhcp

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until you get the network design/layout working. 55 static IPs are not that onerous and will save you initial headaches — many headaches.

Do you provide any public services, eg., web server? You will need to set up a dmz from a third nic on the firewall.

> 2) *Get dhcp to run. I have tried the following rules:*

Which dhcp server are you using? ISC's? Which dhcp client(s)?

Is below the complete contents of the dhcpd.conf file?

```
> ddns-update-style none;  
> default-lease-time 86400;
```

You might want your default to be shorter — say the length of a school day. 8 hours=28800. 86400=24 hours. It forces clients to attempt renewal at 4 hours. Depends on your needs.

<http://www.j51.com/~sshay/tcpip/dhcp/dhcp.htm>

```
> max-lease-time 86400;  
> subnet 10.0.1.0 netmask 255.255.255.0 {  
> #subnet 192.168.2.0 netmask 255.255.255.0 {  
> range 10.0.1.10 10.0.1.220;  
> option domain-name "www.waldorf.lu";
```

This is not a domain name — it's a DNS entry/name of a host running httpd on port 80. Its domain is waldorf.lu. Likely not what you want to do for internal machines. Give them a separate domain name.

You might also want to revert to the 192.168.0.0 addressing — there is no magic and some gotchas that might accompany your use (misconfiguration) of 10.0.0.0/24. The "normal" tools will default to "classful" netmasks if you forget, eg. 10.0.0.0/8 instead of 10.0.0.0/24 ;(

```
> option domain-name-servers 194.154.192.101,  
194.154.192.102;
```

Provided by ISP?

```
> option netbios-name-servers 10.0.1.1;  
> option netbios-node-type 8;
```

Is this a Samba server?

```
> option subnet-mask 255.255.255.0;  
> option broadcast-address 10.0.1.255;  
> option routers 10.0.1.3;  
> }  
>
```

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- > *But somehow it doesn't work. I'm not sure about any of these*
- > *lines... Especially the "domain-name-servers" line. THE IPs there are*
- > *the ones I use with my ISP.*

See, you would not be worrying about this at all with static IPs. From the listing it appears you are running samba/windows clients. Correct? Networking requires more exactness/completeness re: your setup to configure correctly and to avoid problems.

Are your clients set up properly to use dhcp? Not sure? Then probably not.

- > *Would the switches/hubs update themselves?*

Huh? Hubs are completely dumb -- think multi-port signal repeaters.

Switches "learn" the info (MAC addresses) they need to function automatically (most of the time).

- > *And is it problem if I want*
- > *to use the 10.0.0.x range when the switches/hubs use the 192.168.0.x*
- > *range?*

Switches/hubs don't have an IP address. Every machine connected to them is on the same subnet. Switches avoid collisions on the net medium, hubs don't. Both "provide" a single broadcast domain.

- > *I also want to run a nameserver on my server and have no idea which*
- > *one to choose.*

<http://www.thekelleys.org.uk/dnsmasq/doc.html>

You will have to download the source to get the complete documentation.

This will also make using static client IPs for your private subnet easier while providing a "safer" dns forwarder for public dns lookups. It will also cache dns lookups, thus saving bandwidth. Don't even try to set up bind/named properly. You have enough headaches you will have to deal with.

If you need a firewall and can use a "dedicated" solution you might look at IPCop (or something similar):

<http://www.ipcop.org/> << includes dnsmasq

- > *3) I would like to set user accounts in a way that no matter on which*
- > *machine a user sits he gets his home directory on the server,*

This is called "single sign on" or SSO. Don't even attempt it till the basic network is laid out and confirmed working properly. Don't try to implement everything at once -- it will go much quicker and with fewer hassles to set up one thing at a time. That way the number of

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variables/configs caught up in the additions/changes are kept to a minimum. Do SSO for just a few hosts initially to get some experience.

- > *possibly as an icon on the desktop (clients run Aurox Linux 10.0,*
- > *some few run Windows 2000 or XP).*

When SSO is working properly, this is not necessary. Logging in will automatically mount the home dir of the user. Logging out unmounts it. Till then you don't have what you want.

- > *4) I want to filter content. I guess squid or safesquid would work*
- > *once I'd have solved problems 1) and 2).*

Not entirely sure what you mean by "content". WWW content? Try here: <http://dansguardian.org/?page=whatisdg>

- > *Believe me, I have consulted the O'Reilly networking bookshelf, but*
- > *somehow it doesn't help me. Could someone out there, please?*
- >
- > *Btw, I run Slackware 10.0 on my server.*

If you're comfortable with slack this is OK. Generally I prefer to keep to a single distro base -- eases administration/maintenance/updating and keeps down possible compatibilty glitches resulting from updates/upgrades.

With only 50 machines I would give up on dhcp for now. You have enough to do getting the rest working properly/reliably. You also make it more difficult to do other tasks that you may (should?) undertake -- SSO, logging, accounting, auditing? It also uses bandwidth. Save it for later ;)

When you have more experience with/confidence in your basic network functioning -- local dns, SSO, Samba file server, firewall and web filter -- then you can tackle dhcp. DHCP is not *_really_* that difficult, but it has many implications/gotchas and rather scattered documentation. Takes a while to understand *_what_* you need from it and *_how_* to implement your needs. You will probably want host declarations and fixed-address entries, eg. Makes monitoring the clients easier even if the initial setup is more tedious.

You do not mention if the Linux clients will also be using Samba to access their home dirs or if you intend to use nfs for them. It will be easier to adopt a single set up since you also want SSO. You will have to try out Linux Samba client software to make sure you get the one you want. May depend on the desktop you use, eg., KDE vs Gnome.

For general Linux use in schools (K-12 here in US) you might want to check with these is you haven't already:

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<http://www.k12tsp.org/> << many good links

<http://www.lfsp.org/> << good example info

May be useful, single reference to have handy (together with the tldp how-tos):

<http://www.linuxhomenetworking.com/#Linux>

<http://www.tldp.org/HOWTO/HOWTO-INDEX/howtos.html> << on-line

<http://www.tldp.org/docs.html#howto> << download all

For SSO check:

Google this search string:

linux samba sso + "single sign on"

or click this:

http://www.google.com/search?num=50&hl=en&lr=lang_en&ie=ISO-8859-1&q=linux+samba+sso+%2B+%22single

<http://www.zytrax.com/tech/howtos/samba.html>

and many other links ...

And check your Samba docs -- you have them all, don't you?

<http://samba.org/~samba-bugs/docs/samba-docs-latest.tar.bz2>

<http://www.samba.org/samba/docs/>

You will need a "central repository" of user account info using LDAP.

It's not easy/intuitive to set up, but once you understand what's going on, it's not that bad ;)

<http://www.openldap.org/>

It will be easier to implement/test with fewer clients now than with more clients later ;:-)

hth,

prg

email above disabled