

Introduction

This document describes some techniques that simplify the administration of a home network.

The website <https://lazyadmin.nl/home-network/home-network-diagram/> shows the situation graphically in the Router Switch Network Diagram. Refer to that diagram as we go.

Assume that you have a bunch of Linux computers in your LAN (local area network) – with the same username, and hostnames `alpha`, `beta`, `gamma`, &c – all on the same subnet as the router in your home, each one connected, by wire or wireless, to the router, which connects to an NBN modem connected to the internet via your ISP. If connected by ethernet cable instead of wireless, there might be a handful of switches involved.

Each computer on booting requests an IP address from the router so it can connect to the WAN (wide area network, the internet) for upgrading, browsing, email, etc. Depending on the boot-up order, each generally gets a different IP address – e.g. `alpha` might get `192.168.1.106` today and get `192.168.1.123` tomorrow. If there are many computers, this gets confusing.

Let's examine two techniques that can simplify everything a lot: [1] ensure each interface always gets the same IP address; and [2] arrange to log in without entering a password each time.

First Technique: establish predictable IP addresses

This reserves a fixed unique IP address for every interface that requests one from the router.

Consider computer `beta`. Find its MAC (media access control) address by typing:

```
$ /sbin/ifconfig wlan0|head -4
wlan0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
    inet 192.168.1.234  netmask 255.255.255.0  broadcast 192.168.1.255
    inet6 fe80::a2d3:7aff:fea2:295c  prefixlen 64  scopeid 0x20<link>
    ether a0:d3:7a:a2:29:5c  txqueuelen 1000  (Ethernet)
```

Above, the `wlan0` interface got `192.168.1.234` from the router this time, but you might want `beta` to always get `192.168.1.102`. The MAC address is the 6 hex numbers after the word `ether`.

Log in to the router via a browser as administrator. Choose the `Advanced` tab and select `Network`, find `LAN Settings`, then find `DHCP Server Address Reservation`. Click `add` and enter the MAC address (eg: `a0:d3:7a:a2:29:5c`) and the Reserved IP Address (`192.168.1.102`) that you have chosen for the interface which has that MAC address. Click `save` and log out.

As root, edit `/etc/hosts` and add this line linking the IP address and the computer name:

```
192.168.1.102 beta
```

From now on, every time computer `beta` boots up the router hands out `IP=192.168.1.102` to its `wlan0` interface. Repeat this procedure for every computer in your LAN.

Second Technique: configure login without a password

When you administer any computer in the LAN you will need to enter a password each time. You can avoid this by creating an OpenSSH public and private RSA encryption key pair, thus:

```
user@alpha $ ssh-keygen -t rsa
```

Generating public/private rsa key pair.

Enter file in which to save the key (/home/user/.ssh/id_rsa):

Just press ENTER at each question. Now transfer the public part of the key to the computer you want to log into from alpha, and append it to its `authorized_keys` file:

```
user@alpha $ cat ~/.ssh/id_rsa.pub \  
    | ssh user@beta "mkdir -p ~/.ssh; cat >> ~/.ssh/authorized_keys"
```

user@192.168.1.102's password:

From now on, you can log in to beta without being prompted for a password. The IP address is picked up from `/etc/hosts` and the encryption key is matched to `.ssh/id_rsa`, thus:

```
$ ssh beta
```

```
Linux beta 5.8.0-3-amd64
```

```
The programs included with the Debian GNU/Linux system are free software;  
the exact distribution terms for each program are described in the  
individual files in /usr/share/doc/*/copyright.
```

```
Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent  
permitted by applicable law.
```

```
No mail.
```

You can use this same technique as well to access your internet website, if you have one.

Conclusion

Every computer on the same home subnet can be accessed by any one of them. You can now administer your local network, and your website, from alpha, by first logging in to alpha and from there, without trying to remember myriad IP addresses and passwords, you can:

log in to a local computer: `$ ssh beta`

execute a command on a local computer: `$ ssh beta "command"`

copy files between local computers: `$ scp beta:~/file gamma:~/`

log in to your website: `$ ssh username@website`

transfer files between you and your website: `$ sftp username@website`
