

## Managing the Network Numbers

### TR December TIP-of-the-Month

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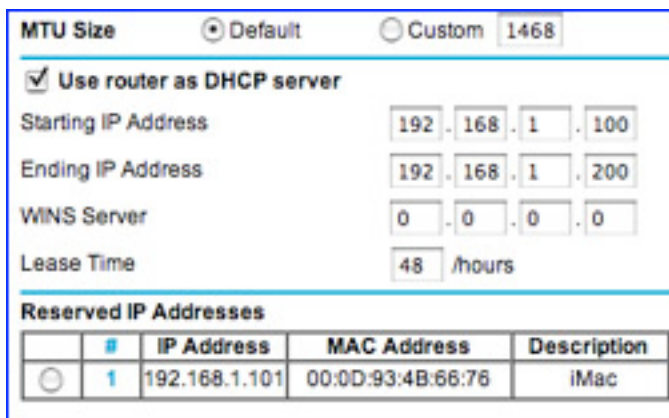
This month's tip is for anyone that deals with installing, configuring, and servicing home data networks. Home networks require you to keep track of dozens of numbers, addresses, address ranges, passwords, etc. Even if you document all the configuration carefully when you originally installed the network, it can be time consuming to sort through when you're back out on the job trying to figure out why your customer's IP camera or music server is suddenly nowhere to be found on the network and you don't have the documentation handy (this usually happens when you went to service one thing and the customer says "while your here could you..."--words we all love/hate).

The solution is to use a standardized, foolproof, configuration algorithm that you or anyone in your company can easily remember, even without the documentation to quickly troubleshoot the customer's network. Here is what has worked for me for many years.

### Router Numbers

In a typical home network installation, you should be configuring the following in the router:

- network address
- IP address of the router
- subnet mask
- DHCP start and end address
- Reserved address range or addresses



The screenshot shows a router configuration interface. At the top, there are radio buttons for 'MTU Size' with 'Default' selected and 'Custom' with the value '1468'. Below this is a checked checkbox for 'Use router as DHCP server'. The DHCP settings include: 'Starting IP Address' (192.168.1.100), 'Ending IP Address' (192.168.1.200), 'WINS Server' (0.0.0.0), and 'Lease Time' (48 /hours). At the bottom, there is a section titled 'Reserved IP Addresses' with a table containing one entry.

	#	IP Address	MAC Address	Description
<input type="radio"/>	1	192.168.1.101	00:0D:93:4B:66:76	iMac

I highly recommend setting up a company **network addressing standard** that everyone uses. That way, when you walk into a customers home (or access it remotely), you don't have to think about or look up what was set during installation.

First, establish a standard LAN network IP address for all your customers. You want it to be 192.168.X.Y Where X is a number that you use for all your customers and Y is the host/device address.

I would choose a number that is not commonly used "out of the box" like 0 or 1. Try 168, it's hard to forget! Therefore the network address of everything in the home is 192.168.168.Y.

Next choose a standard dynamic vs. static IP address split that your company uses for each installation. Everything in the home that doesn't "have legs" should have a static IP address. That includes desktop computers, printers, servers, etc. I recommend setting aside 1 – 99 for static IP addresses, therefore the router should be configured to use 100 – 255 for it's DHCP address range. Next set the router address to 1 (192.168.168.1).

Everything so far is easy to remember in the field.

### **Configuring Devices**

Everything else in the home should be set to a static IP address, but what address to use? Here is where you need to set-up another standard. I recommend preassigning IP address for each type of device in the home. I use the following defaults:

Print Servers	10..19	
Printers	20..29	
WAP's	30..39	
NAS	40..49	(Network Attached Storage)
Servers	50..59	(music or video servers)
Cameras	60..69	
Security/automation	70..79	(security systems, automation systems)
Media centers	80..89	(includes MC's, media clients, games)
PC's	90..99	(usually desktop)

This means the first printer will have a static IP address of 192.168.168.20, the second printer will be 192.168.168.21, etc. It is easy to remember the most common devices.

### **Passwords**

Passwords are another real nuisance. Many devices that you install require a username/password to gain access to a configuration page or use them (such as an IP camera). Deciding on a password policy and standard is a little more difficult since each manufacturer has restriction on what is a valid username and/or password. For example all Netgear devices require a username. But you can't change it from the factory default of "admin". So what's the point of having it!? Stupid or what?

Anyway, setting up username/passwords is a security issue and should be taken seriously and with the customers permission. Basically, you need to be concerned with anything that can be accessed from outside the house, such as router remote access or any "port forwarded" devices such as cameras or file servers.

If all the devices you install allow you to change the username (a rarity), then change it to a company standard like the customers last name or the customers account/job number. If there are devices where the username can't be changed, then I recommend setting all user names to the same thing like "admin". The goal is to be consistent for everything so it can be easily remembered.

Developing secure passwords is an art. They should be long, not made from common words, and contain both letters and numbers. Here you should NEVER use just the customers name, pets, kid's names, etc. You should also NEVER leave the factory default. I found using a password generation algorithm is the best practice since you (or the customer) can always recreate the password if it's lost. This also means it doesn't have to be written down.

I've used several algorithms such as the customers last name interleaved with the street address (easy for the customer to remember). For example if the customers last name is Johnson and they live at 1746 E. Something, then the password would be: J1O7H4N6S Another variation is the name/phone number interleaved. The customer will resist anything that isn't drop-dead stupid like "1234". Try your best to convince them of the serious security threat of anyone connected to the internet and get them to use at least 8 letter/numbers in a non-obvious pattern.

**So...**while having a standard for numbering will never be a substitute for good documentation, it can be a real time saver when you just need to quickly check whether a device is working or properly connected.

### **A subTIP**

I'll pass on another quick tip for when you have to work on someone else's install—someone that didn't do a good job of installing the network and you have no documentation. When you need to find the IP addresses of everything on the network there's a handy tool to keep on your PC. It's a utility called **AngryIP**, available for free online at [www.angryziber.com/ipscan/](http://www.angryziber.com/ipscan/)

You enter the start and ending IP address (typically 192.168.X.0 to 192.168.X.255) and it will tell you what's at each address. Cool.

Please email me (grayson@trainingdept.com) if you have questions or comments on this TIP.

Catch you next month.....Grayson