

Zero Configuration VPN Clients for Mobile Users

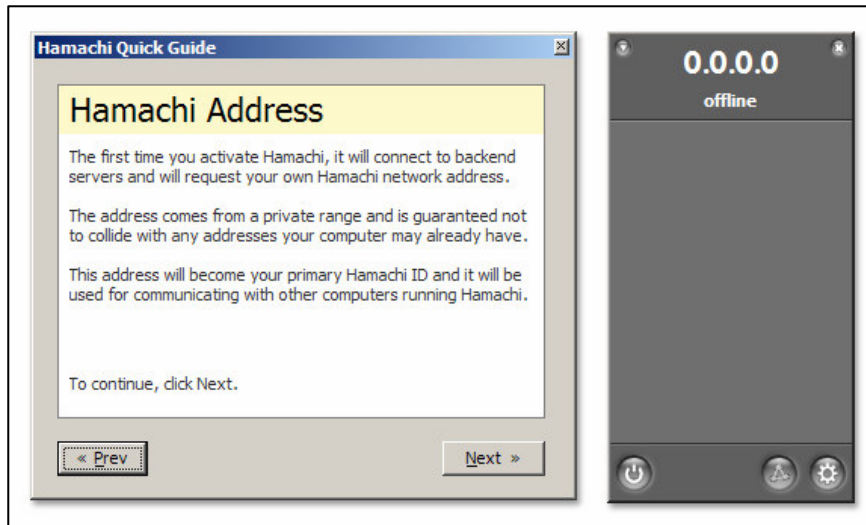
There are a lot of things that I love in life. In technology though, all the things that I love can be summed up into four main categories. Number one, I love free stuff. Now, that's a given with most people. There are a ton of free things on the net, but most of them lets be honest are useless. I'm sorry I want something a little more than a world clock. And I can hear the Linux people now, "but all of our stuff is free!" and while you are correct there's a reason why you only hold a 3% market share. Two, I love web based applications. In fact I love them so much I'm actually writing this article on one right now (<http://www.writely.com>)! There's another great site out there called 37 Signals (<http://www.37signals>) with tons of free organizational type things. Check them out! Three, I love VPN's. There something so simplistic about it all. Being able to connection distant computers together and have them act as if they are on the same network. [3] Not only that but you can access things like computers, network storage, and email as if you were sitting right there in your office. And lastly, I love wireless. The idea that I can be almost anywhere and sit down with my laptop and access the internet without being tethered by a cable is well...awesome. Now, what if I could tie all four things together...well I can't but I'm close with three. We're going to take a look at three VPN services that are designed to be used at wireless hotspot for either SOHO (small office/home office) or small business users.



The first service we're to look at is Hamachi

(<http://www.hamachi.cc>). Developed by Applied Networks Inc.,

an easy to use VPN software that is as close to zero configuration as you can get. *Now, for those that are new or might not know what a VPN is or does it allows user to use the public internet while having a secure connection as if they were on a private network.*[1] The first thing you'll



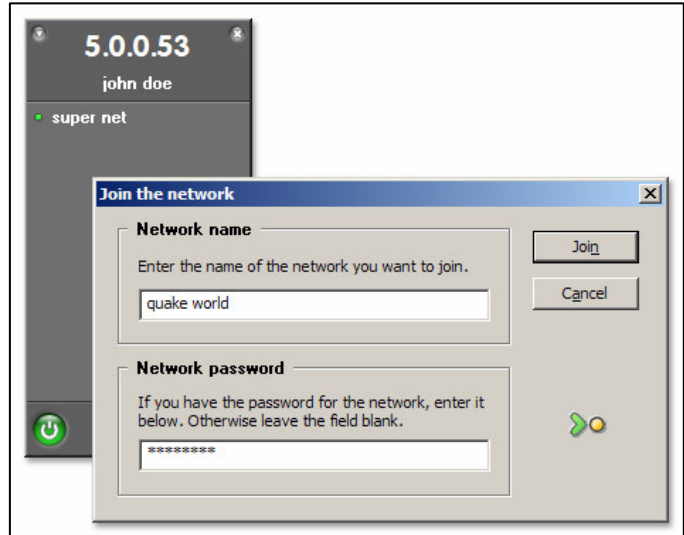
notice after you download and install Hamachi is that it gives you an address in the 5.0.0.0 range. Why do they use address in this range? According to IANA (Internet Assigned Numbers Authority)

addresses in this range have not been assigned to anyone as of yet. Yes, there is the possibility that at some point and time someone could buy addresses in that range, but with IANA trying to conserve addresses as much as possible and with the boom of private IP addressing I doubt this will ever happen. Now, this IP address you're assigned will never change so you can go ahead and write it down. Next, you will be asked to select a user name. This is the name that will be used to identify you on the networks. Once you've chosen a name you're given the option of either joining a network or creating a new one. Since this is our first time using the program we're going to create a new network. During the configuration all you're asked to do is supply a name for your new network and a key that will be used for others to join your network.

Remember the key is only as strong as you make it. For my own personal network I used a complicated 63 character key, which I promptly lost. At this point you should be asking yourself "so what?", and you'd be justified in saying so but Hamachi has a ton of features that set it apart from your traditional VPN clients.

The problem with most VPN's is that they can be blocked at the firewall. Depending on which protocol your VPN is using there are a number of ports that have to be opened on your

router in order for your connection to be made. The converse is also true. Depending on how tech savvy the wireless hotspot provider is they could easily block those ports but with Hamachi that shouldn't be a problem. Hamachi does not use the traditional ports most VPN use therefore blocking of well known ports shouldn't be a



problem. If for some reason your network administrator blocks everything but ports 80 and 443 you can change which ports Hamachi listens on. Another smart feature of Hamachi is that it uses UDP instead of TCP. The standard VPN client wraps a TCP packet in a TCP packet. Your information becomes the payload of the second packet which is in turn encrypted. This works very well for encryption but it tends to slow down your connection. When you wrap a TCP packet in a UDP packet you don't run into that problem of network slow down. [1]

Hamachi also uses what is called NAT traversal. If you deal with VOIP or teleconferencing then you know what I'm talking about. [2] For those not sure this is how it works. We all know that NAT routers block incoming connections unless they are a part of a previous conversation. This becomes a problem when you're at your wireless hotspot trying to access your computer behind a NAT router. What NAT traversal does is set up a "mediation server" outside of both networks. The mediation server gives the machines behind NAT routers a place to connect to first. Once the client computers connect to the mediation server the two client machines are connected to each other. [2] Don't worry, once the two clients computers are connected no information passes through the Hamachi servers.

The last interesting feature of Hamachi is it rewrites the protocol stack so packets never have to be segmented because they're too big. A standard packet can be 1500 bytes; when you wrap a TCP packet with UDP the packet size might exceed 1500 bytes causing the computer to fragment the larger packet in order for it to be sent. This can cause a flooding of fragmented packets on the network slowing down your connection even more. Hamachi purposefully makes packets small enough so once they are wrapped in the UDP packet they will not exceed 1500 bytes. If you want to get more into the nuts and bolts of how Hamachi works you can visit their security page (<http://www.hamachi.cc/security>) where they go into more than enough detail.

It should also be noted that there is a paid version of Hamachi. The paid version has several advanced administrative features like the ability to run Hamachi as a service, have up to 256 members per network and turn off encryption if latency is a problem. A full list of features can be found at <http://premium.hamachi.cc/compare.php>. Also for those slightly more paranoid individuals you can purchase the Hamachi server software. This way you can be your own mediation server.

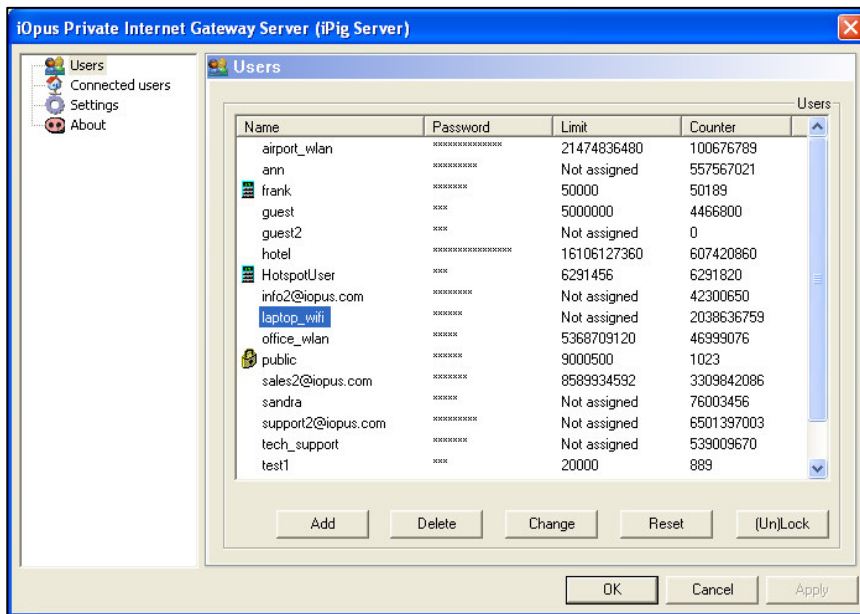


The next service I want to talk about is iPIG (iOPUS Private Internet Gateway) by iOPUS (<http://www.iopus.com>). Before you download iPIG you should decide how you want your network set up.

You have two options. The first option involves you downloading the software and using the iOPUS servers to connect to the internet. The downside to this is you are limited to only five gigabytes and once you've reached your limit your account is deactivated but there is nothing stopping you from creating a new account.

You also have the option of downloading the iPIG server software and running your own server. There is a pro edition that allows you to have an unlimited amount of users where the free version limits you to five. If you're going to use the first option I wouldn't use it for more than checking email and other limited activities. Since I'm going to be tunneling all of my traffic through my iPIG connection will be installing the free server edition.

According to the iPIG website there are only eight steps to set up the client software and five steps to set up the server software. If you're not installing the server go ahead and set up an account before you download the iPIG client software. When you have the software installed all



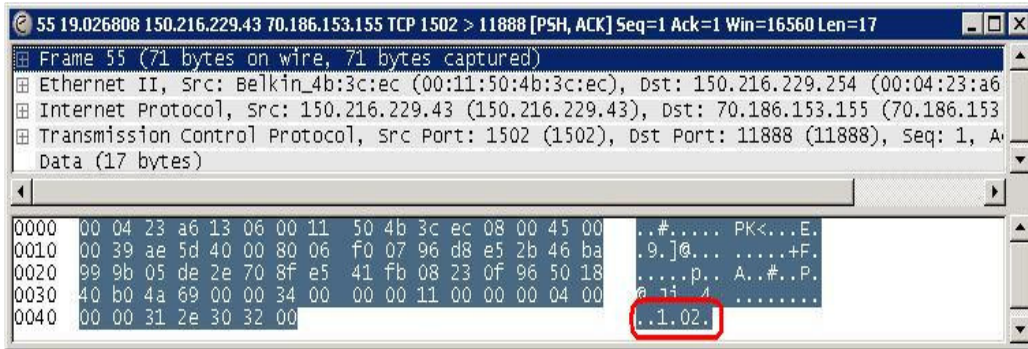
you have to do is log in.

The installation for the server is just as easy. When you have your server installed all you have to do is add users. There is no need for configuration on the client side. That being said by default iPIG does

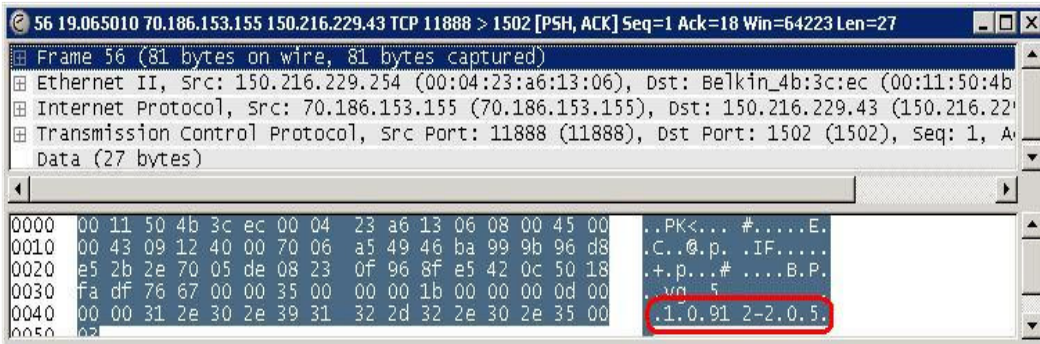
use port 11888 for incoming connections. You can easily change the default port but you do have to change it on the server and the client. Also if you are behind a NAT router you will have to set up port forwarding. What I really like about iPIG that Hamachi does not do is automatic tunneling of all traffic through the VPN connection. Be warned that the tunnel is not established until after you connect to the iPIG server and your user name is sent in clear text, but the passwords are never exchanged. The password you enter is actually used to encrypt a "fixed

phrase" using 256-bit AES on the client side and the password is used on the server side to decrypt the fixed phrase. If the fixed phrases match then the client is authenticated. [5]

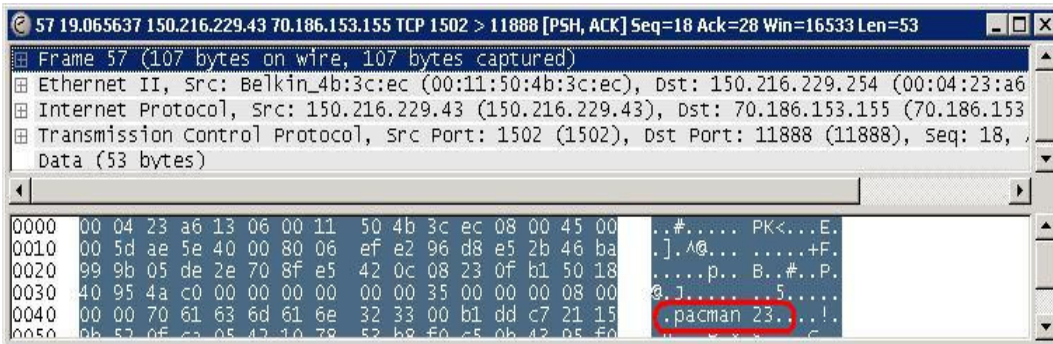
The main draw back to iPIG is the client starts to authenticate before a tunnel is established so things like client and server version numbers are sent in clear text along with your username.



client version number



server version number



user name

The only other down side to iPIG is it doesn't use UDP packets but there wasn't as much latency as I expected. I'm sure once you start adding more users there will probably be a significant slow down for SOHO users. Another nice feature of iPIG is it lets you limit the bandwidth on a per user bases. I will admit I have had some problems running the server. The set up was easy but it did crash on me several times. And once the server is open there is no on/connect button so there were many a times I wasn't sure if the server was working. Also there's no way to minimize it to the system tray. Despite that I still found it to be a very effective program and would recommend it to SOHO users.



The last service I wanted to talk about is HotSpotVPN (<http://www.hotspotvpn.com>). Yes, I know it's not exactly free but with plans costing as little as \$8.88 a month or \$88.80 for a year it's as close to free as you can get. HotSpotVPN has two levels of service. The first one is HotSpotVPN2. With the HotSpotVPN2 plan you have access for two computers and you can choose your encryption type. Because many companies and according to the HotSpotVPN website several countries block traditional VPN connections HotSpotVPN2 uses a SSL based VPN solution. This way there is no software to download since you access the VPN through your web browser. As it was mentioned before, you can also choose the type of encryption that is used. The stronger the encryption the more per month you pay. For 128-bit Blowfish encryption you're looking at \$10.88 per month, 192-bit AES is \$11.88 a month, and 256-bit AES is \$13.88 per month. If you wanted to go the less expensive route there is the HotSpotVPN1 package that uses standard PPTP for \$8.88 a month. There is also a one, three, and seven day packages that will run you \$3.88, \$5.88, and \$6.88 respectively. The nice thing about HotSpotVPN is that it works on a wide variety of platforms. iPIG for example only works on Windows and Hamachi will only run

on Windows and Linux with a Mac version coming soon. HotSpotVPN on the other hand works on Windows, Mac, Linux, Pocket PC, Palms, Treos, FreeBSD, OpenBSD, and Solaris.

I hope from this short introduction you can see there are a wide variety of options for a SOHO or small business user when it comes to VPN solutions. All of these services will provide an effortless VPN connection for most users. From my personal experience I can tell you either program will do the job but with its easy installation, sleek design, and use of NAT transversal Hamachi wins hands down. For the more advanced users who have a little money to burn I'd have to recommend HotSpotVPN because of its multiplatform support and various encryption standards. To be totally honest you cannot go wrong with any of the three products mentioned here today.

Work Cited

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- [5] <http://www.iopus.com/ipig>
- [6] <http://www.hotspotvpn.com>