**DSL Health in Menlo Oaks**
Over the last several months, I have been corresponding with several neighbors in Menlo Oaks about their DSL service. Several have commented on how slow their service is compared to ours. It is true, with DSL the farther you are from the phone company the slower or non existent the service becomes. With regard to how the phone network is wired into our neighborhood, we are all relatively the same distance from the central office (in Palo Alto). I was not surprised to hear how poor their data rates were. My service has been running for 5 years and I have found a few things that might explain some of the discrepancies. How good is your service?

To check the health of your service (DSL or otherwise), open up a web browser and search for "DSL Speed Test". You should see numerous links to choose from. Some sites require your computer to run a java client. If you don't have one installed or don't know what that is, the test won't work. Once you have the test up and running, it will take a minute or two. What you should see when the test completes is a result page showing the speed results for downstream and upstream data rates. Downstream describes the data being delivered to your house, upstream is the opposite direction. DSL or ADSL service is asymmetrical meaning the downstream is faster than the upstream.
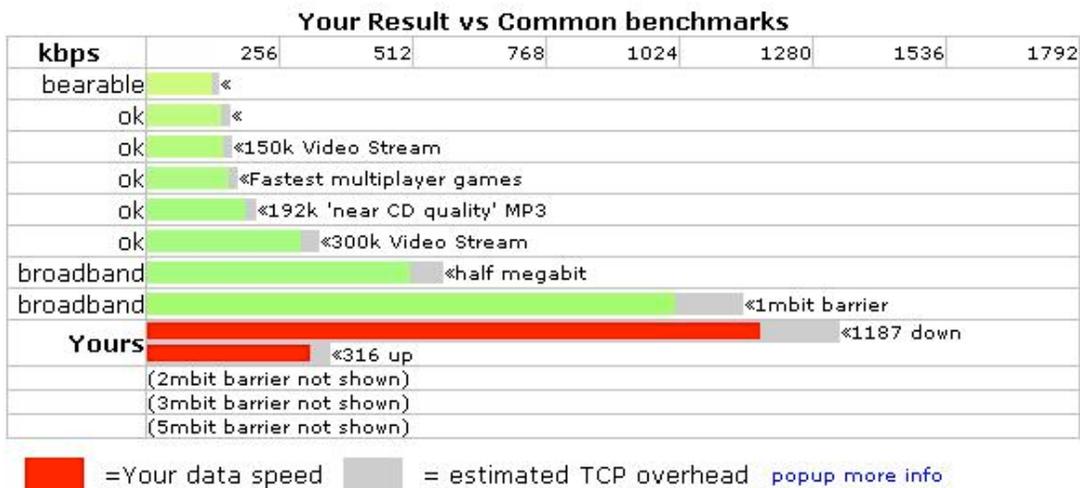
These tests are a simple way to check the speed performance of the connection from your computer to the test computer. Since the test file size is known, the speed at which the file was transferred can be calculated by dividing the file size by the time it took to transfer which gives the result in bits per second. The test computer at the other end performs the calculations for you and gives you graphical display like the one above showing a comparison of your link to other benchmarks. If you selected a test server in a far away city you'll be testing more of their network instead of the one in your house.

On average, the numbers from the test usually don't change much but if they do, then this could be a clue that something is wrong or you are on a Cable modem which operates on a totally different system. In the case with DSL, if your results are always slow compared with the example above, then it is time to roll up the sleeves and go to work.

My test data indicated my downstream was nearly 1.2Mb/s (mega bits per second or million bits per second) and 316kb/s upstream (kilo bits per second or thousand bits per second) of which they only guarantee the upstream rate of 256kb/s in my case. If your DSL service doesn't run within twenty percent of those rates then most likely the link is not operating properly.

Since all of our homes are the same distance from the central office (or C.O. for short) we should all expect to get roughly the same numbers. When my DSL connection was first installed, it too wasn't nearly as fast as it is today. I found the solution to the speed problem buried in the technology. By simply moving some devices and changing a few wires, I was able to go from 300kb/s downstream to the speed I am clocking today.

How it all started…
The crew that came out to install the DSL service was desperately trying to get in and get out as fast as possible. The very second they saw green lights and could ping a web site, they packed up their truck and left. This is standard operating practice as they are trying to perform as many installs as possible in a day. What they won't do is optimize the installation for speed and this is where a little knowledge makes a huge difference. When the contractors came to install the service, they asked me where my computer would be and placed the equipment next to my computer. The picture below shows roughly what I ended up with.
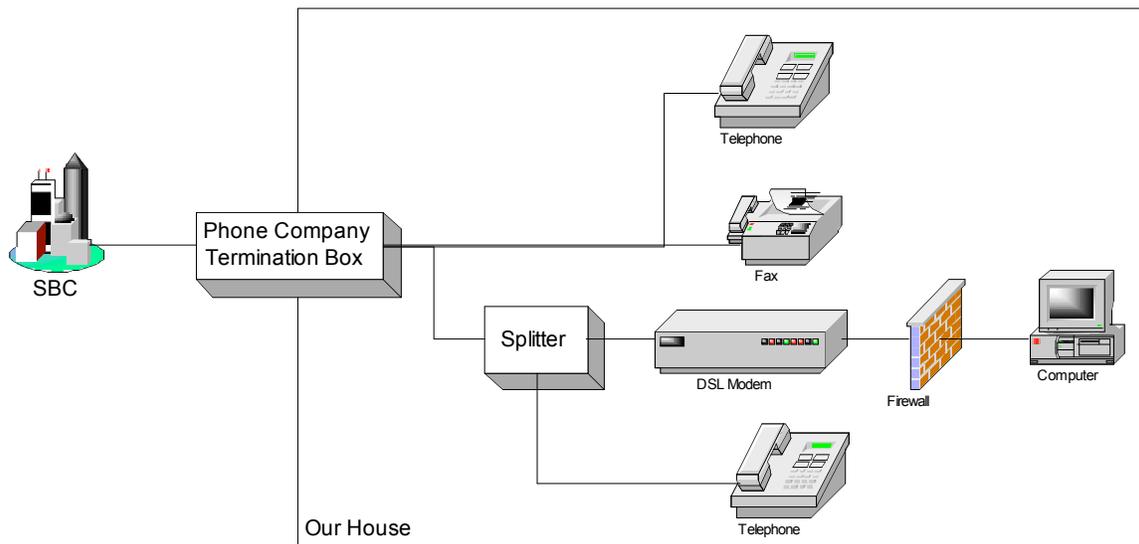

When the phone company installed the service at our house they added a "splitter box" and put it next to the DSL modem where the phone was previously. The splitter box was connected into an existing phone connection and splits the line into two circuits, one for data and the other for voice. The phone connection is reconnected to the voice side and the DSL modem is connected to the data side. The other side of the DSL modem is connected to a firewall and eventually into my computer.

What the installers don't tell you is that long wires are notorious for attenuating high frequency energy like high speed data. In other words, the farther down the wire the energy travels, the lower the energy level becomes. This effect makes it harder for modems to recover the energy the farther it is from the CO and why some people can't get DSL. To receive the best possible service, the DSL modem must be able to get as much signal from the CO as possible. What I discovered was the huge improvement when I moved the splitter as close as possible to the box where the wires from the phone company terminate.

Discovering High Speed
When we decided to rearrange our furniture it was time to move the computer. I looked into the instructions we had and of other installation directions I could find on the web and noticed some rather startling differences. One set of directions included steps to install filters at every analog phone, modem and fax machine (why have a dial up modem when you have DSL?) in the house. According to their diagram, the inside house wiring is OK for passing DSL to any connection in the house. They of course live in a perfect world where all houses are of brand new construction and never considered the 1920's vintage wires in Menlo Oaks. Having a bunch of filters for each phone also didn't make sense to me since our installation package originally included one main splitter.

The crucial element for improving or maintaining the quality of the DSL carrier I discovered is to move the equipment as close as possible to the phone box. The next best technique is to put the DSL modem on a dedicated connection to the splitter box. The important concept is to intercept as much of the high frequency energy (your data) as soon as possible and not let any of it get into other wires feeding extension phones in the house. By keeping the modem connection to the splitter as short as possible and putting the splitter as close to the outside box as possible, more of the DSL energy can be preserved. The voice connection doesn't care where the splitter box is placed because those signals aren't affected by longer wires.
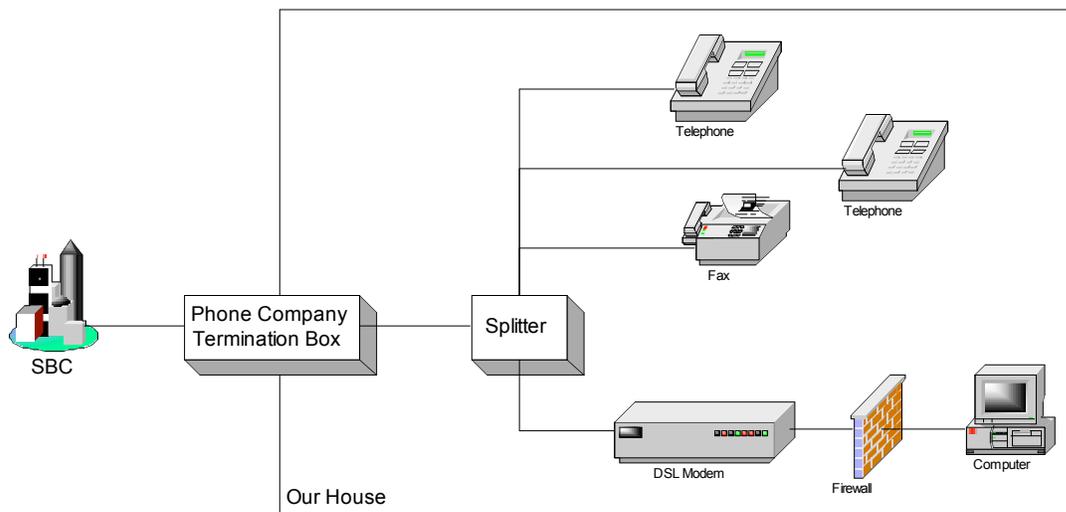
Most DSL modems are not rated for outdoor use, but the splitter box was. Since the Ethernet signal can travel over 1000 feet using CAT5 cable, the DSL modem can be placed in an out of the way location but somewhere near a power outlet.

My splitter box is now inches away from the phone company box. I used a foot of twisted pair wire to connect between the phone box and the splitter box. The DSL modem is only 3 feet from the splitter. After making those few changes my link has never been slower than 1.1Mb/s. I also connected the power supply to a small UPS to protect the equipment since it deserves as much protection as the computer you would use with it. Since then, my network has never failed with only a few DNS server problems which are out of my control. I occasionally telecommute from home or simply enjoy the high speed bandwidth and the fruits (except the spam) of the Internet in general.

The future holds a bright future with new DSLAM and ASAM technology right around the corner. I expect that within a year or two SBC will ask me to upgrade to higher speed service. My ADSL modem will soon be eclipsed by ADSL2, ADSL2+ and VDSL technology where the speed is expected to jump to greater than ten fold. Now won't that will be a hoot? If we ever change over to a new service or not will depend on the cost and what kind of service to expect. With the service I have today, I have no reason to change right away. But now that our family is watching High Definition television and making VoIP (voice and or video over IP) phone calls to grandma and grandpa, chances are I just might consider going to a higher bandwidth circuit in the near future.

If you want to learn more about DSL service and or high speed DSL technology, I recommend you go to the following web sites and simply search on DSL.

www.sbc.com
www.alcatel.com
www.nortelnetworks.com
www.cisco.com
www.lucent.com

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