

# Medical Office Systems, LLC

## March 2010 Newsletter

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### How Fast is FAST?

A common issue for many computer users is that their internet connection seems slow. Perhaps it is slow, or maybe it's time to get a faster connection. This month, we'll explore the various data transmission technologies. You may want to upgrade to a faster connection, or try some easy fixes to speed up the connection you have.

If you have any questions about internet speed or networking, please call me at 630-852-1736 or 630-373-7429.

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### How Fast is FAST?

An internet connection has a lot of "moving parts", so to speak. Even though the design of internet protocols is to be fast and fault-tolerant, that is not always the case. Many things can influence actual and perceived speeds of your internet connection and make it seem slow. Let's start with some "tech talk" about measuring speed, internet connection types, and finally some tips to diagnose and correct a slow connection.

#### **Measurement:**

Data transmission speed is measured in "bits per second" (bps) – a bit is the smallest piece of data that can be transmitted. Note that this is not the same as the more-familiar and far larger "byte" (Bps), commonly used to describe hard disk storage or memory capacity. As data technology improved, the descriptions had to change as well: bits per second became thousands (Kilo, Kbps), millions (Mega, Mbps), or billions (Giga, Gbps).

#### **Speed Comparisons:**

We'll skip the early days of data transmission technology, such as acoustic couplers and dial-up modems. My first high-speed modem in 1990 was rated at a whopping 48,000 bits per second, also stated as 48kilobits per second, or 48Kbps. Everything we have available now is much faster!

#### **Connection Types:**

- **Cable:** Also known as Broadband Cable, this service is delivered via Coaxial TV cable. It has very high theoretical speeds, but suffers from serious slowdowns during periods of heavy usage.
- **DSL:** This service is carried through existing phone cables. While not as fast as Cable, DSL does not suffer from slowdowns during heavy usage. DSL is limited to a 2-mile radius from the main connection point in each area of a town. If you are beyond the 2-mile limit, you'll have to select a different service.
- **T-1:** A business-class service, T-1 is commonly used to carry both voice (phone) and data (internet). Relatively expensive, it's attractive to businesses because it is a guaranteed service level: no slowdowns.
- **Wireless Broadband:** Delivered via wireless signal to a stationary receiver in the home, or a mobile receiver for laptops. It is approximately the same speed as DSL, however, signal strength varies widely depending on the location and size of obstacles between transmission antenna and your receiver.
- **Satellite:** Delivered via Satellite radio signal, the speed is relatively slow, and subject to environmental conditions, such as rain, snow and fog.
- **Wireless 3G (Cell):** A wireless cell service, similar to a cell phone. It is also relatively slow, and subject to signal loss based on obstacles between transmitter and receiver.

Note that all the above connection types (with the exception of T-1) are provided on a "best efforts" basis, meaning there is no guarantee that the service will perform at or near the rated speeds. There is also no guarantee of uptime, or repair priority in case the service fails.

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Below is a text chart of relative data transmission speeds, ranked by service type. The Rated Speed Column is the top theoretically attainable speed. The Actual Speed column takes signaling overhead and other real-world factors into account and more closely matches average actual speeds delivered.

Service Type	Rated Speed	Actual Speed
High-Speed Cable, Business +	50Mbps	42-48Mbps
High-Speed Cable, Business	22Mbps	18-20Mbps
High-Speed Cable, Basic+	6Mbps	5Mbps
High-Speed Cable, Basic	3Mbps	2.4Mbps
DSL, Fastest	6Mbps	5Mbps
DSL, Fast	3Mbps	2.8Mbps
T-1	1.5Mbps	1.5Mbps
DSL, Basic	768Kbps	650Kbps
Wireless Broadband	3,4 or 6Mbps	2.4 – 5Mbps
Satellite Broadband	400Kbps	384Kbps
3G Wireless Cell	400Kbps	384Kbps

### Testing your Connection Speed:

There are a variety of speed tests available, here are a few of my favorites:

- Speed Test: <http://www.speedtest.net>
- Comcast: <http://speedtest.comcast.net> (only available to Comcast subscribers)
- ATT: <http://helpme.att.net/cgi-bin/speedtest/>
- SpeakEasy: <http://www.speakeasy.net/speedtest/> (my personal favorite)

### Tuning Your Connection Speed:

Once you have tested your connection speed, you can compare the service level you are paying for with the actual speed level you are receiving. If the actual speed varies by more than 20% from the service level you purchased, call your provider and have them test the connection to be sure it is working properly. If the actual speed matches what you have purchased, then your internal network may be slowing things down.

### Check these items:

- Empty your computer browser's cache of cookies, temp files, and history.  
A large amount of temp files can slow down browsing speeds. The option to remove temp files is typically located under the "Tools"- "Options" menu of your browser.
- Check your internal network connections – make sure your cables are firmly connected, and that routers and switches are functioning properly. Also check that wires and cables are not pinched, nicked, or bent at right angles – this can severely limit data transmission speeds.
- If your internal network is wireless, check your wireless signal strength and speed: you may be in a "dead zone" within your home or office. Move to a better signal location, or connect via a cable.
- Check your router: older routers have an incoming speed limit of 10Mbps, if your cable service is delivering over 10Mbps, you will experience slow speeds - half of your bandwidth is "wasted". You'll need to upgrade to a newer router to handle the higher incoming speeds.

If you have questions about this article or general network questions, please call me: 630-852-1736.

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