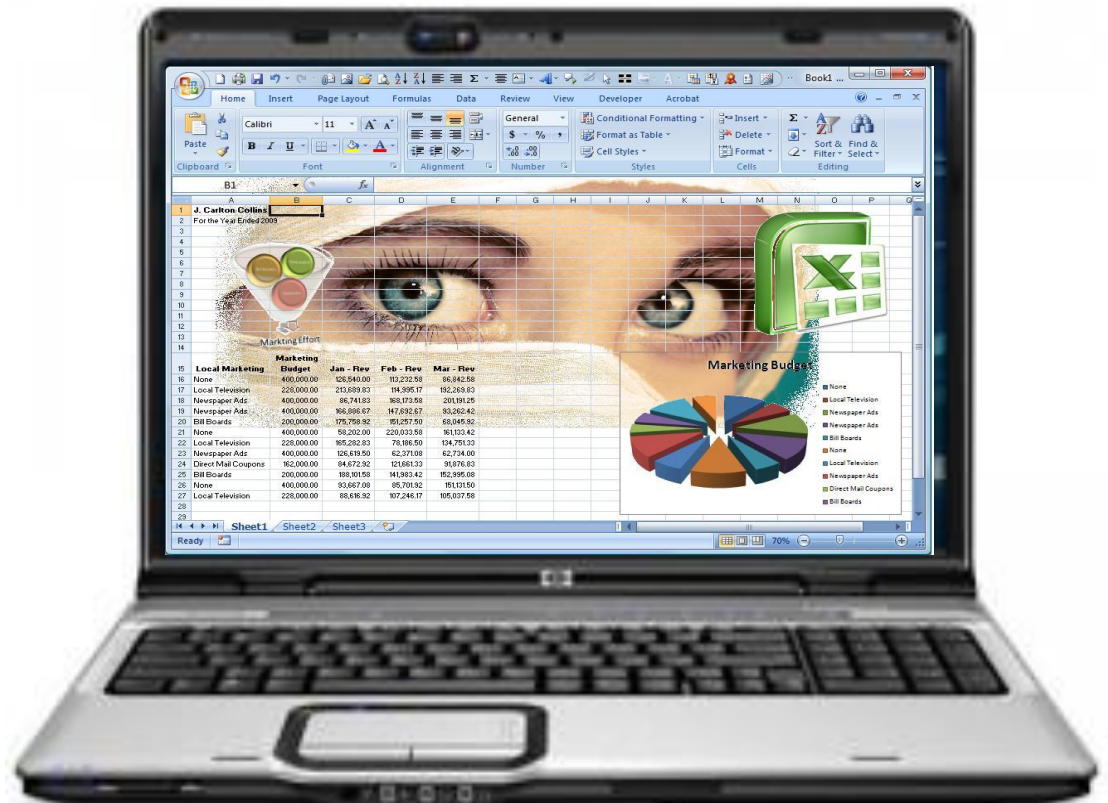


# 2011 North Dakota Management Conference

# The Tech Savvy CPA

2011 North Dakota Management Conference  
May 23<sup>rd</sup>, 2011 (10:20am to 12:00pm)



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# The Tech Savvy CPA



## **It's a Technology World - Are You in It?**

*The following article by J. Carlton Collins appeared in the Journal of Accountancy*

Are you a technology champion or a technology laggard? Do you embrace technology or shun it? Presented below is a series of questions and explanations created by technology expert J. Carlton Collins to help you determine how technology savvy you really are, and perhaps help you to identify where you could improve your technology performance.

1. Do you use a full sized computer, monitor and keyboard to get most of your work done (ie: do you avoid using a laptop)?

*Why this matters* - A laptop computer is not an ergonomic device which makes it harder for you to be productive over extended periods of time. Your keyboard should be below located below desk height so your arms are parallel to the floor. Your monitor should be even with your eyes. This allows your head to sit up straight atop your spinal column so that your neck muscles are not fatigued throughout the day – hence you can work longer and be more productive. Likewise a full sized keyboard, especially an ergonomic one, is more comfortable and allows you to work longer hours and avoid injury such as carpel tunnel syndrome.

2. Does your computer have more than one processor chip?

*Why this matters – A fast computer waits on rather than the other way around. In the same way that a small water leak wastes thousands of gallons over the course of a year, a slow computer steals your time and productivity. For the past 4 to 5 years, newer computers have multiple processors in order to gain speed. Excel should launch in one second, documents should start printing in 3 seconds, and web pages should pop up almost immediately. Anything short of this means that you are waiting around. Just 10 minutes of lost productivity each day adds up to more than a week of lost time each year.*

3. Does your computer have more than 2 gigs of RAM?

*Why this matters – Today's operating systems (such as Microsoft Windows Vista) and applications need 3 gigs or more of RAM to operate fast and without glitches. Any less RAM, and you are probably encountering frustrating glitches and losing time throughout the year.*

4. Are you using Windows Vista 64-bit or another 64-bit operating system?

*Why this matters – For more than 15 years personal computers have employed 64-bit architecture, yet only recently have 64-bit operating systems emerged to take advantage of that power. If you are still using a 32-bit system, you are "old school" and your computer's lack of performance is hindering your productivity.*

5. Do you have a flat panel monitor on your computer?

*Why this matters – The older CRT style monitors used an oscillating beam of light which shined from the back of the unit onto the monitor screen and directly into your eyes. This makes working on an older CRT hard on the eyes and hinders productivity. A flat panel monitor of 19 inches or more will be a welcome addition to your computer that will enable you to work longer without eye fatigue and possibly avoid the health risks associated with using CRT monitors.*

6. Does your computer have 2 or more monitors?

*Why this matters – You need to try it to fully understand it. Having two monitors allows you to view multiple applications at the same time such as Word and Excel, e-mail and Excel, or Word and your web browser. This makes it much easier to refer to data on one screen while creating content in the other screen, cut and paste data, or monitor multiple sources of information simultaneously.*

7. Do you have a printer that duplexes (prints on both sides of the paper)?

*Why this matters – You can cut your paper costs in half by printing on both sides of the paper. Storage costs are also reduced and if you ship manuals or booklets, your shipping costs will decrease as well.*

8. Is your printer hooked up via a network connection (ie: not connected via printer cable)?

*Why this matters – The traditional printer port on your computer is slow by today's standards. Setting your printer up as a node on the network will increase printing performance by as much as eight fold. Producing a document in 30 seconds instead of 8 minutes will make you more productive.*

9. Does your e-mail address include your own domain name (ie: Not AOL, Gmail, Yahoo, or Hotmail)?

*Why this matters – Your image matters. It takes only a few minutes and costs less than \$30 per year to purchase a domain name and a few hundred e-mail accounts based on your company's name. This allows you to avoid using free e-mail accounts that end in AOL, Gmail, or Hotmail as your primary e-mail address. To many, the use of a free e-mail account addresses is a sure sign that you work for a "rag-tag" organization. When I see an AOL.com e-mail address, I typically assume the person to be a less sophisticated computer user.*

10. Do you have a default signature block on all of your e-mails with complete contact information?

*Why this matters – If you are like most professionals, you send out thousands of e-mails each year. That said, you should not take the time to create thousands of signatures. Instead your e-mail system should insert a complete signature block for you. Further, your signature block should contain your complete contact data including company, city, state, phone, e-mail address and possibly the complete mailing address. To leave this data out is less than professional and will cause your recipient unnecessary effort should they wish to contact you or forward your contact information to a prospect or colleague.*

11. Have you ever created an e-mail group (in Outlook or elsewhere)?

*Why this matters – You probably have at least one, if not several groups of people that you communicate with frequently. A list of employees, friends, members, colleagues, etc. can be set up as a single e-mail group fairly easily, and thereafter you can communicate with that group just by sending an e-mail to the group name, rather than individual e-mail addresses. It takes only a minute to set up an e-mail group which could save you a significant amount of time down the road.*

12. Do you leave your e-mail up and running all the time?

*Why this matters – Your computer should wait on you, not the other way around. If you leave your computer on all the time, your e-mail reader (such as Outlook) will retrieve your e-mail every 3 minutes, and therefore your e-mail will be instantly ready to read when you are ready to read it. If you must boot up your computer, log into the Internet, launch your e-mail reader, and retrieve your e-mail messages, then checking e-mail will seem more of a chore than a useful tool.*

13. Do you have more than one e-mail address (ie: one for business and one for personal)?

*Why this matters – Everybody has the need to maintain a professional e-mail address, but it is also a good idea to have a free e-mail address (from Google or Microsoft for example) to use for personal correspondence or signing up for web site passwords (like that recipe web site). This helps keep your professional e-mail from becoming a spam target; whereas if your personal e-mail is targeted, you can just drop it and get a new one.*

14. Do you typically leave your computer on over night?

*Why this matters - It takes about 4 to 5 minutes to boot up a computer, launch the applications you were using the previous day, and retrieve the data files you were using. Likewise it takes 2 to 3 minutes to close applications and power down at the end of a day. This task could cost you 20 to 40 hours of wasted time each year. Instead, set up a password protected screen saver and make sure your monitor and printer shuts down automatically after 15 minutes of inactivity, but keep your computer up and running. This also allows virus checks, spam checks and backups to run in the wee hours of the night. As a bonus, your computer will always be available to you via remote access from any internet connection in the world.*

15. Have you ever logged into your computer remotely?

*Why this matters – Remote access allows you to access your computer from any internet connection in the world – be it from home, a client’s office or on a cruise ship half way around the world. With this technology you can check your e-mails, use your applications, and have access to all of your files via a secure connection. This also works well for remote training, troubleshooting, or for providing access to satellite locations.*

16. Have you ever connected to a wireless Internet signal?

*Why this matters – The world is fast becoming one giant hot spot where you can hook into the internet from practically anywhere. Once connected you can access your computer, read the latest news, check stock prices, communicate via Voice over IP, etc. Connecting to a hot spot is usually an easy process.*

17. Have you ever copy and paste-linked between two applications?

*Why this matters – It is easy to copy data and paste it into another application, and it is just as easy to paste-link that data so that when the original data changes, the destination data is updated automatically. Using the paste-link command can save you time and help you avoid errors.*

18. Have you ever performed a Mail Merge to e-Mail in Word?

*Why this matters – There are numerous reasons for using mail merge. Perhaps you would like to send a personalized letter to all of your clients, produce a stack of custom contracts, or prepare an address booklet from a list or database of names. Word can*

*extract data from a database, Outlook, Excel or other sources on a field by field basis to produce personalized letters or even personalized e-mails.*

19. Have you ever created a Pivot Table in Excel?

*Why this matters - One of Excel's more powerful features is the PivotTable – but you need a heavy amount of data to fully appreciate its power. The PivotTable command can instantly convert detailed transactional type data into sleek, drillable reports. Why spend hours churning and manipulating data into a report format by sorting, moving data around, and inserting formulas when the PivotTable command can accomplish this same feat in two seconds?*

20. Have you ever had your computer read to you?

*Why this matters - Your computer can read to you. In some cases it may be more productive to have your computer read you that document or e-mail so that you can multi-task while listening.*

21. Have you ever created or sent an electronic survey (ie: Using InfoPath or through Zoomerang)?

*Why this matters – Not only is feedback important, it has been shown that the act of asking for feedback is also important – whether you actually receive any feedback or not. There are many survey tools that will help you create a survey, send the survey, and automatically tabulate the survey results. When was the last time you asked your clients (or employees) how well you are doing or how you could improve?*

22. Have you ever searched your computer using Google Desktop or Vista Fast Find?

*Why this matters - Windows XP and older computers take forever to search your computer – but Windows Vista can find all of the files on your computer containing the word “Budget” in less than two seconds, even if there are hundreds of them. With this feature, finding that file you want is always easy. Once you have experienced this powerful search tool, you’ll never again use the old search tools.*

23. Do you filter your Internet searches?

*Why this matters – Most search engines (such as Google) allow you to turn on filters to block inappropriate web sites. Using these filters will help you find the information you are seeking faster and will help you avoid distractions and inappropriate sites.*

24. Do you have high speed internet?

*Why this matters – The Internet represents the greatest opportunity to small business since the Renaissance. If you are surfing the Internet at slower speeds, then the Internet will seem more of a pain than a tool. Your computer should display web pages in about 2 seconds or less. Using dial up or slow internet access is like preparing a lengthy tax return by hand – they are both inefficient by today's standards.*

25. Do you produce your business and personal checks on a computer (ie: don't write them by hand)?

*Why this matters – Are you still writing manual checks? Why? There are many tools, (including free tools like Microsoft Office Accounting Express) that will print the checks for you and each time you print a check your general ledger and income statement is updated. I pay my personal bills each month in about 6 minutes, how long does it take you? Whether for business or personal, manual checks will eat your time.*

26. Do you have at least one social network set up (Linked In, FaceBook, Plaxo, MySpace, Twitter)?

*Why this matters – Who you know does matter – right? Social networks help you maintain your relationships be them business, personal, or casual. Linked-In is geared more for business relationships whereas FaceBook is geared more as a social tool that helps you maintain more personal relationships – but they both work well helping you keep track of all the people you know that might enrich your life professionally or personally.*

27. Have you ever printed out driving directions from Google Maps, Map Blast, or similar web site?

*Why this matters – Getting lost wastes time, wastes gasoline, pollutes the atmosphere, and makes you late to the event. Internet based map tools can provide excellent driving directions that will prevent you from getting lost and hearing your spouse say “I told you so!”*

28. Do you read frequently on the internet?

*Why this matters – The bulk of the information that is printed in newspapers and delivered on television shows up on the Internet days earlier. There are thousands of web sites you might read to stay current, but free sites like the AP Wire online and Digg.com will keep you well-informed.*

29. Have you ever made a Skype phone call?

*Why this matters – Voice over IP is now 20+ years old and is better than ever. You can call any computer in the world free of charge, or call any cell phone or land line in the world for a couple of pennies per minute. One cell phone call from Europe to the United States might cost you \$50 – but that same Skype call will costs less than twenty-five cents.*

30. Have you ever published a web page to the Internet?

*Why this matters - There are billions of web pages out there – many of them obviously published by complete idiots - therefore you know that it must be easy – right? It is time for you to publish your own pages to the web. Pick your interest or expertise, write about*

*it and publish it. If your content is useful or interesting to others you may attract interested parties to collaborate with, or customers to hire your services. Hint: In Word select "File, Save As A Web Page..."*

31. Do you have a decent web site (ie: fair substantial, not lame)?

*Why this matters – The internet reaches out to more than a billion people in the world and costs practically nothing to create. Why wouldn't you utilize this medium?*

32. Have you ever visited your State's camera based traffic web site?

*Why this matters – Most states and major cities display online road maps with live speed feeds, camera shots, and accident reports which can help you plot your trip and avoid heavy traffic.*

33. Have you ever shopped for and purchased an item over the Internet?

*Why this matters – Virtually everything in the world is 20% to 25% cheaper when purchased over the Internet. Further, the Internet typically provides detail explanations, pictures, video clips, schematics, etc. to help you become more knowledgeable before you purchase. Unless I planned to eat it right away, virtually all of my purchases since 1996 have been made through the Internet.*

34. Do you keep your contacts, calendar, and to do list electronically (ie: in Outlook, not on paper)?

*Why this matters - The three most important things to CPAs are their contacts, their calendar, and their To-Do lists. Maintaining these items electronically allows you many advantages. For example, calendars are updated automatically when you accept meeting requests via e-mail. Calendars can be shared with one another. Calendars can be overlaid with other calendars to identify mutually available time slots. Contacts can be automatically updated via Plaxo. To-Dos items can be linked to time sheets. Most computer-based day planners will print paper versions that fit into the paper based day planner binders.*

35. Do you carry a cell phone so that you are reachable?

*Why this matters – Business never stops. Emergencies happen. Sometimes you are needed right away and a cell phone can make you the "hero" instead of a "zero".*

36. Do you text on your cell phone?

*Why this matters – Texting is like e-mail in your pocket. People can reach you and you can reach them anytime, anywhere without interrupting. Texting also creates a permanent record that voice calls do not.*

37. Have you ever synced a handheld device or cell phone to your computer before?

*Why this matters – Entering large amounts of names and phone numbers into a cell phone is difficult and time consuming. Enter this information into Outlook instead, and the information will flow right into your cell phone via simple cable connection. Thereafter an occasional quick connection will transfer newly entered data from your phone to your computer, and vice versa so both devices have up to date data. Cell phones do become lost or stolen therefore backing up your information is a good idea.*

38. Do you have a cell phone ear piece or head set?

*Why this matters – Multi-tasking increases your productivity and an ear piece enables you to talk on the phone with your hands free. A hands free ear piece makes driving safer as well.*

39. Do you have wireless internet running in your office, home, or both?

*Why this matters – There is no longer a need to be tethered to the wall by a cable. Wireless technology allows you to network with other computers, print, and surf the Internet from anywhere in your office or home. This also saves money by eliminating the need to purchase cables, hubs and routers.*

40. Have you set up encryption on your wireless router?

*Why this matters – Installing a wireless router is like running a network cable out to the street so strangers can plug into your network. Setting up wireless encryption will solve this problem and it takes only a couple of minutes. Simply launch a browser and type the IP address that appears on the bottom of the router. This will enable you to turn on WPA encryption and assign a password. You will need to use this password the first time you through your computer, but afterwards your computer remembers the password and the connection will be automatic – and safe from strangers.*

41. Have you ever used a GPS system to find your way when driving?

*Why this matters – A GPS system not only gives you turn by turn directions to prevent you from getting lost, it also points you to restaurants, gasoline stations, and other services close to you.*

42. Have you ever used a video projector before in a business situation?

*Why this matters – CPAs work with data, and ultimately that data needs to be delivered. In many cases the use of a full color projection system will help the CPA deliver that data and make the key points in a more informative and professional manner.*

43. Have you ever burned a CD?

*Why this matters – Sharing data, or saving data is a fact of computers. Burning data to a CD represents an inexpensive way to share, back up, or manage data.*

44. Have you ever used a USB thumb drive?

*Why this matters – Floppy disks are extinct; they have been replaced by USB thumb drives which can hold up to 20 gigabytes or more of data.*

45. Is your computer protected by a UPS device?

*Why this matters – Power surges and power outages happen. A UPS device can keep the power up long enough to protect your computer against spikes and power surges, and will give you adequate time to power down your computer if the electricity is out for an extended period of time. Without a UPS, your computer and hard drive could be zapped at any time.*

46. Have you ever password protected a Word document, Excel file, or Adobe Acrobat PDF file?

*Why this matters – Some data is mission critical and needs to be protected. Almost every application provides the ability to password protect a file. Make sure to use the 128-bit encryption option as 40-bit encryption is not strong enough.*

47. Have you encrypted your data folder or computer hard drive?

*Why this matters – The data on a lost or stolen computer can easily be retrieved, even if a computer BIOS or Windows password is used. To absolutely protect data on a lost or stolen computer, you must encrypt that data. Windows XP Professional and Windows Vista Professional allow you to encrypt a file, folder, or entire hard drive in less than 5 seconds. With this level of protection, your data is absolutely safe even if the computer is lost or stolen, (assuming the password you used to encrypt that file, folder or hard drive is strong).*

48. Do you maintain regular offsite backup of your data files?

*Why this matters – Like insurance, you hope that all backup efforts are a complete waste of time – but just in case the worst happens (such as a fire), you need to maintain a current backup of your data off site.*

49. Have you backed up your entire computer in the past year?

*Why this matters – It is not enough to back up your data, you should also back up your entire computer periodically to preserve applications, e-mails, e-mail settings, etc as well as data files.*

50. Do you remove the hard drives before disposing of computers?

*Why this matters – Old computers, cell phones, and hand-held devices often have data left behind that hackers can exploit. Don't take a chance, remove the hard drives before disposal and either lock them away or smash them with a hammer. Or you could use a Rocket Fish device to convert that old drive into a useful USB drive.*

Give yourself 2 points for each Yes answer. Use the following grading system to determine how tech savvy you are.

A 90 to 100	B 80 to 90
C 70 to 79	D 60 to 69
E 50 to 59	F Below 50

How well did you do? I admit that technology will always frustrate you to some degree, but in the end the benefits derived from technology far outweigh any minor frustrations and pains that accompany those new technologies. All it takes is a little effort and a good attitude to transform oneself from a “computer loser” into a “computer user”.

# Justifying Technology



## Justifying the Cost of Technology

The adoption of new technologies takes time, effort and money; however, I have found that the implementation of the right technologies always pays for itself in terms of time savings and improved accuracy. Technology can improve employee performance and save labor costs far in excess of the cost of that technology; therefore technology really costs you nothing. You can test this theory by comparing the revenue per employee generated by the Fortune 500 companies before the computer craze (say 1980) to revenue per employee generated today. The comparison is staggering. Today's employee generates from five to twenty times the revenue today compared to 1980 (even after adjusting these amounts for inflation). People aren't that much smarter today, they just work far more efficiently. Consider these examples:

**Letter Writing** – *I started my career in 1980 when the process of producing a letter involved handwritten drafts deposited in secretarial pools where eventually the letter would be typed and routed back to the author. A series of handwritten edits and revisions followed, including a typed envelope. This process could take several days to complete, copies were then made and filed away, sometimes in duplicate or triplicate. Later these files were archived or shredded - a process requiring yet more labor. Recording archived papers and retrieving them could take up to a half hour. At the time Xerox estimated that each page of paper produced by a corporation in 1980 cost about fifty dollars to produce, handle and store once all costs are considered. Today, letters are prepared faster on computers. Built in tools check spelling and grammar. E-mail systems send these letters immediately and archive them as well. The cost of producing that same letter today is estimated to be less than three dollars, and some estimates are far lower.*

**Time Sheets & Expense Reports** - *In the 1980's the manual time sheets and expense reports I prepared required handwritten reports including detailed calculations. Other employees would manually gather these reports and re-enter the data. Both procedures were prone to human error. Today many employees operate far more efficiently by entering their time and expenses into web browsers using convenient drop down boxes. Input time is dramatically reduced, the need for hand calculations are eliminated, errors are far less frequent, the need to re-enter data is eliminated, and built-in logic rules automatically check data for errors as entered.*

**Ordering** - *In the 1980's, companies employed a labor intensive reordering process which included manual inventory counts, comparisons to desired stock levels, preparation of purchase orders, mailing orders or manually phoning them in to the suppliers, re-entering orders by the suppliers, etc. This process was slow and subject to redundancy and errors. By contrast, today's automated supply chains track goods sold and automatically reorders those goods when optimum re-order points are reached. Electronic orders are sent to the suppliers accounting system automatically for immediate processing.*

*There is virtually no labor involved. Built-in logical rules ensure that goods are reordered at the optimum times, and at optimum quantities. Just-in-time inventory systems have dramatically reduced the order to shelf time from about 90 days (for J C Penny's in 1980) to less than 3 days (for much of Wal-Mart's goods today). Quicker orders allow companies to carry lower levels, which in turn reduces the carrying costs and interest on the floor plan note.*

Hundreds of similar examples regarding direct deposits, bar code scanners, cellular phones, financial reporting, the Internet, CRM tools, printers, faxes, e-mail, spreadsheets, etc. offer proof that technology has dramatically reduced the expenses for all business large and small. Given the dramatic impact technology can have on a company, it is folly to believe that one-time investments in computers alone are enough. Companies should embrace and update their technologies each year including computer hardware, software, training, peripherals, and infrastructure. If a microwave oven took 8 hours to bake a potato, you would never use that microwave oven. Likewise, if your slow Internet connection takes 10 minutes to dial up, get connected, search, surf and find what you are looking for, it is doubtful that you will use that Internet technology to its fullest.

It has been said that “the latest thing these days is computer dating – if you don’t know how to use one it really dates you”. Don’t get left behind, roll up your sleeves and embrace the latest technologies that will make you more efficient and competitive in the market place. These days “thinking cheap” may be the most expensive mistake you can make.

# 2011 Computer Technology



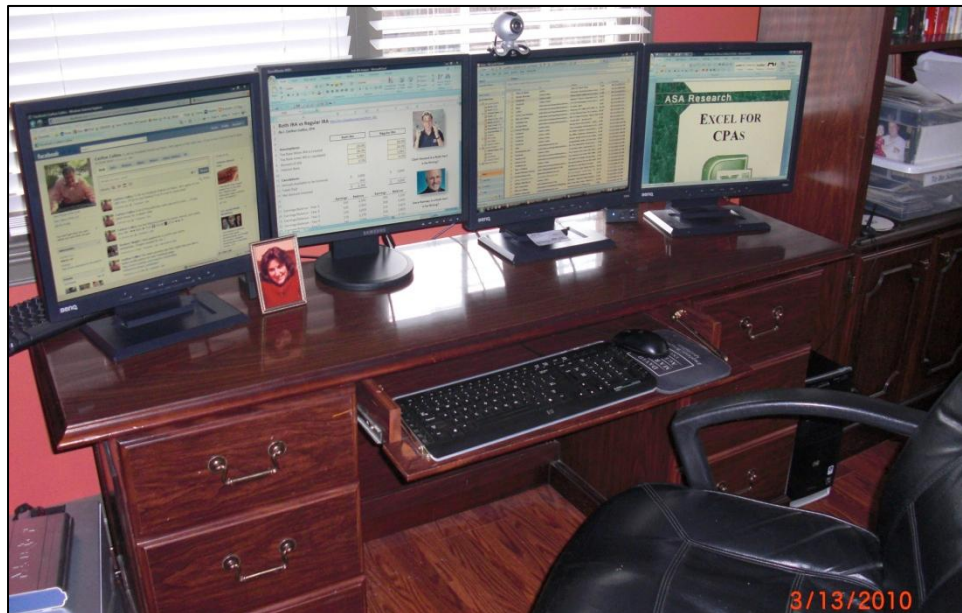
# 2011 Computer Technology

The arrival of new computer technology makes Office 2003 and Windows XP obsolete. Why? Because Office 2003 only sees up to 1 GB of RAM and can only use one microcomputer processor chip. Likewise, Windows XP can only see 3 GB of RAM and use one microcomputer processor chip. Computers these days are stronger, but in order to take full advantage of that strength, your operating system and applications must be stronger as well. The key factors you need to consider as you purchase a new computer, operating system, and applications are as follows:

1. Do you want a 32 Bit or 64 bit system?
2. How much RAM do you want?
3. How many CPU processors do you want?
4. Which Operating System Do you want?

## Example:

As an example, in January 2009, I purchased a desktop computer with 4 processor chips and 8 GBs of RAM. I am running a 64 bit version of the operating system, not an older 32 bit version. The computer is an HP Pavilion Model a6750f. I paid \$701 for the computer, and about \$94 each for the monitors. To support four monitors, I also added a Matrox M9120 Plus PCIe x16 video card (\$289) and a quad video cable (\$89). The total cost of my system is \$1,455. The computer is lightning fast – it launches Excel in about 1/3<sup>rd</sup> of a second and loads web pages in about 1/3<sup>rd</sup> of a second. I routinely have 30 to 50 applications and web pages open at the same time, and I reboot the system about once every two months. Here is a picture:



I also have an older HP 4350 duplexing laser printer with third drawer which I paid \$2,000 for 1.4 million pages ago, and you can buy the same printer today for about \$389. For color printing and scanning I have an Epson RX680 printer which I paid \$228 for. I use Comcast high speed Internet which costs \$89 a month including DVR television, and I use a Netgear MIMO

wireless router which cost me \$119. I back up my system online via XCenteric and I also have several 300 to 500 GB USB drives which I backup my files to as well.

The primary software I use on my computer is as follows:

1. Norton Internet Security - \$49 a year to protect 3 computers.
2. Microsoft Office Ultimate 2010 beta (free).
3. Adobe Photoshop Elements (\$139).
4. Adobe Acrobat (\$286)
5. Skype (Free)
6. GoToMyPC (\$16/month)

## Let's Dig Deeper

Further, to help you better understand the issues at hand, presented below is a summary of today's newer technologies.

### 32 Bit vs 64 Bit

Just as more highway lanes accommodate more traffic flow, 64-bit computers accommodate more data flow.



**64-Bit is 8 Times Faster** - Since the early nineties, all computers have been built with a 64-Bit architecture, but only recently have 64-Bit operating systems and applications been embraced. If your computer is more than 2 years old, chances are good that you are still operating in the older 32-Bit environment – which is technically 2 to 8 times slower, depending upon what task your computer is doing.

**Micro/Mini/Mainframe** - Many years ago, 32-bit computers were commonly referred to as "micro computers"; 64-bit computers were commonly referred to as "mini computers" (like an IBM AS/400 or Digital VAX); and 128-bit computers were commonly referred to as "main frame computers". All of these computers have always used the same memory chips, same drives,

same CPUs, same components, etc – the only difference has been the number of lanes of traffic provided for data flow. Ten years from now it is very likely that your desktop computer will actually be a mainframe.

## RAM



**How Much RAM?** - The old adage these days is you can't be too rich, too thin, or have too much RAM. For the past three decades, stronger computers have needed an increasing amount RAM, and this will not change. When Windows Vista was released in January 2007, almost no one had more than 1 GB of RAM, but Vista actually needed 3GBs of RAM to run well. Microsoft did not tell us this, and we installed Vista on our computers with less than desirable results. Eventually we started installing Vista on computers with 3+GBs of RAM, and found that Vista is a truly great operating system – but by then, the damage to Vista's reputation was wide spread. Since then Microsoft has released Windows System 7 – which is really Vista 2.0, with about 500 minor enhancements thrown in.

As of 2010, the standard for RAM is 4 GBs for laptops and 8 GBs for desktop systems.

**RAM Speeds** - You should know that RAM comes in different types and speeds, and of course the faster your RAM, the faster your computer will perform. Although “**DDR**” memory chips are still available, in 2008, most memory suppliers started transitioning from “**DDR2**” memory chips to the more efficient and higher density “**DDR3**” technology. Basically DDR2 allows the computer to “fetch” four times more data than DDR chips, and DDR3 chips allow the computer to “fetch” twice as much data as DDR2 memory chips. It's like using a small shovel, bigger shovel, and really big shovel to dig a hole.



DDR2 is available at 800 and 1066 speeds, while DDR3 reaches speeds from 800 to 1600. Presented below are tables which summarize the clock speeds and data transfer rates for commonly available memory chips.

2 DR3 Speeds						
Standard name	Memory clock	Cycle time	I/O Bus clock	Data transfers per second	Module name	Peak transfer rate
DDR2-400	100 MHz	10 ns	200 MHz	400 Million	PC2-3200	3200 MB/s
DDR2-533	133 MHz	7.5 ns	266 MHz	533 Million	PC2-4200 PC2-43001	4266 MB/s
DDR2-667	166 MHz	6 ns	333 MHz	667 Million	PC2-5300 PC2-54001	5333 MB/s
DDR2-800	200 MHz	5 ns	400 MHz	800 Million	PC2-6400	6400 MB/s
DDR2-1066	266 MHz	3.75 ns	533 MHz	1066 Million	PC2-8500	8533 MB/s

Source: Wikipedia

DDR3 Speeds						
Standard name	Memory clock	Cycle time	I/O Bus clock	Data transfers per second	Module name	Peak transfer rate
DDR3-800	100 MHz	10 ns	400 MHz	800 Million	PC3-6400	6400 MB/s
DDR3-1066	133 MHz	7.5 ns	533 MHz	1066 Million	PC3-8500	8533 MB/s
DDR3-1333	166 MHz	6 ns	667 MHz	1333 Million	PC3-10600	10667 MB/s[4]
DDR3-1600	200 MHz	5 ns	800 MHz	1600 Million	PC3-12800	12800 MB/s

Source: Wikipedia

**For Example, Take Kingston** - To explain this using easier to understand terms, Kingston offers three classes of memory chips as follows: Value RAM, High speed RAM, and High Performance RAM for gaming. I would recommend that you stay away from the value RAM, and at a minimum purchase high speed RAM instead.

### CPU Processors

**Clock Speed Hits Wall** - For two decades, computer manufacturers made computers faster primarily by cranking up the clock speed. This worked well until the early 2000's where computer manufacturers hit a wall. Clock speeds of 4.0 Ghz generated more heat than a computer could handle, and the chips basically melted. Manufacturers' tried adding more fans and bigger fans, but the problem persisted. Short of adding chilling towers loaded with liquid nitrogen, manufacturers were forced to find speed elsewhere.

**Multiple CPUs to the Rescue** - Computer manufacturers turned to adding multiple CPUs to a computer to gain more speed. This is not a new idea, a Cray Super computer has always been a regular computer with a lot of CPUs glued together. For example, in 2009 Cray produced the Xt5 system called "Jaguar". This system has 224,000 CPUs working in tandem and as of Nov 2009 is the fastest computer in the world with a speed of 1.75 petaflops, beating out IBM's Roadrunner 1.04 petaflops mark set in June 2009.

FLOPS is an acronym meaning **F**loating point **O**perations **P**er **S**econd. Here is your table:

Computer Performance	
Name	FLOPS
yottaFLOPS	$10^{24}$
zettaFLOPS	$10^{21}$
exaFLOPS	$10^{18}$
petaFLOPS	$10^{15}$
teraFLOPS	$10^{12}$
gigaFLOPS	$10^9$
megaFLOPS	$10^6$
kiloFLOPS	$10^3$

**Not So Fast** - While a lot of hoopla is splashed on these theoretical calculations, having two CPUs really speeds up your computer, but adding more CPUs has a diminishing return on performance. Here's why:

**Not Really Multi-Tasking** - Your computer is usually doing three or four things at the same time. For example, it might be performing these tasks all at the same time:

1. Reading the C drive;
2. Writing to the USB drive;
3. Displaying progress on the monitor; and
4. Printing a report

If you have just 1 CPU, your computer spends  $1/50^{\text{th}}$  of a second on each of these 4 tasks until all tasks are complete. For example, the CPU will spend  $1/50^{\text{th}}$  of a second reading drive C,  $1/50^{\text{th}}$  of a second writing to the USB drive D,  $1/50^{\text{th}}$  of a second displaying the progress on the monitor, and  $1/50^{\text{th}}$  of a second printing the report. It will continue this process and it will appear as though your computer is doing four things at once, but it is not. The CPU is only performing one task at a time. By contrast, if you have four CPUs, then each CPU will perform each task at the same time. Hence your computer is exactly four times faster with four CPUs compared to just one CPU.

**Really is Multi-Tasking** - However, your computer is seldom doing 8 things at once, therefore if you have 8 CPUs, 4 of them are probably just sitting there with nothing to do. I guess that if you frequently had extremely complicated calculations which could be spread across multiple CPUs, then the extra CPUs might come in handy. But most of us use our computers to create word documents, send and read e-mail, and make simple calculations in Excel – so the utility of the Cray Jaguar mentioned above is basically useless in all but the most extreme cases. It does however make for good bragging rights at cocktail parties. The conclusion is that adding an unlimited number of CPUs to your computer is not really practical, but makes for a good show. Right now it seems to make sense to have a computer with at least 4, and perhaps 8 CPUs, and no more.

## Operating System

**OS** - It doesn't help much to have more RAM or CPUs if your operating system doesn't see all of that RAM. That is why it is important to choose an operating system wisely. Windows XP supports just one CPU, Vista supports 64 CPUs and Windows 7 supports up to 256 CPUs. As shown below, different operating systems see different amounts of RAM.

Product	Maximum RAM
<b>Desktop Operating Systems:</b>	
Windows 7 Ultimate - 32 Bit	4 GB
Windows 7 Enterprise - 32 Bit	4 GB
Windows 7 Professional - 32 Bit	4 GB
Windows 7 Home Premium - 32 Bit	4 GB
Windows 7 Home Basic - 32 Bit	4 GB
Windows 7 Starter - 32 Bit	2 GB
Windows 7 Ultimate - 64 Bit	192 GB
Windows 7 Enterprise - 64 Bit	192 GB
Windows 7 Professional - 64 Bit	192 GB
Windows 7 Home Premium - 64 Bit	16 GB
Windows 7 Home Basic - 64 Bit	8 GB
Windows 7 Starter - 64 Bit	2 GB
Windows Vista Ultimate - 32 Bit	4 GB
Windows Vista Enterprise - 32 Bit	4 GB
Windows Vista Professional - 32 Bit	4 GB
Windows Vista Home Premium - 32 Bit	4 GB
Windows Vista Home Basic - 32 Bit	4 GB
Windows Vista Starter - 32 Bit	1 GB
Windows Vista Ultimate - 64 Bit	128 GB
Windows Vista Enterprise - 64 Bit	128 GB
Windows Vista Professional - 64 Bit	128 GB
Windows Vista Home Premium - 64 Bit	16 GB
Windows Vista Home Basic - 64 Bit	8 GB
Windows XP - 32 Bit	2GB or 3GB
Windows XP - 64 Bit	2GB or 4GB
<b>Server Operating Systems:</b>	
Windows Sever 2008 - 32 Bit	4 GB or 64 GB
Windows Sever 2008 - 64 Bit	8GB, 32 GB, 128 GB, or 8 TB
Windows Sever 2003 - 32 BIT	2 GB, 4 GB, 8 GB, 16 GB, or 128 GB
Windows Sever 2003 - 64 BIT	16 GB, 64 GB, 512 GB, 1 TB, or 2 TB

If you study the table carefully, you will conclude that the 64-bit operating systems are the ones to choose, the 32-Bit versions of these operating systems simply don't see enough RAM.

## Apple versus Microsoft



**I Like Apple** - I am a fan of Apple computers. I've owned a lot of Apple computers in the past, and in the early nineties I even appeared on a television commercial with Apple President John Scully promoting Apple solutions. I own a big chunk of Apple stock and I am no stranger to Apple solutions.

**Apple is Not Superior** - With that said, over the past two years I have challenged several of my Apple friends to contests using my \$550 HP pavilion laptop against their \$2,200 to \$2,800 MacBook and MACAir computers. Even though their computers cost more than three of my HP laptops – my HP laptop did everything their computers would do, and did them faster. My Apple bigot friends are usually left stunned and speechless, especially after they start trying to show me graphic and video things that they assume my computer can't do; and I shown them that I can easily do those things.

**Complaints from Apple Users** - I teach full day hands on Excel courses and typically there is at least one MAC user in the class, and before the day is done, that MAC user is disgruntled because their system is more complicated to use than the Windows based system the rest of us are using.

**Apple is More Proprietary** - Add to the mix that Apple solutions tend to be more proprietary whereas Windows solutions tend to use a more open architecture and cost far less. You can easily make the case for a Windows based computer over a Mac.

**Hackers Target Windows More** - It is true that there are twelve times more Windows users than MAC users, therefore Windows users are targeted more by hackers and writers of computer viruses; but Apple is still prone to similar attacks and viruses as well.

For accounting systems, there are very few good choices available for the MAC.

The bottom line is that I never buy Apple myself. I figure that you can pay \$550 for a faster HP computer with less expensive applications, or \$2,200+ for a slower MAC computer with more expensive proprietary applications. For me, this is an easy decision.

## Microsoft Windows Vista

When Windows Vista was released in January 2007, Vista needed 3GBs of RAM to run well, which no one had at the time. Microsoft did not tell us this, and we installed Vista on our computers with less than desirable results. Eventually we started installing Vista on computers with 3+GBs of RAM, and found that Vista is a truly great operating system – but by then, the damage to Vista’s reputation was wide spread.



## Vista’s Bad Rap Explained

Most people cringe by the mere mention of “Vista”. I hated it too when it first came out. However within one year, I considered Windows Vista to be the most outstanding operating system the world has ever seen. Here’s how the product got such a bad reputation:

1. **Changed the Kernel in the name of Security** - To make Vista far more secure than Windows XP, Microsoft changed the kernel – the core of the Vista operating system. It was an excellent improvement from a security standpoint, but this meant that all applications (like QuickBooks) had to be slightly modified in order to run on Vista. Microsoft asked the various application developers throughout the world to modify their products to launch on Vista’s new and improved kernel, but for the first time in

Microsoft's history, the company was unsuccessful at getting developers to immediately update their products.

**Tweaking Needed** - Therefore when the Vista operating system was launched in January 2007, many applications would not run without a little tweaking. I myself counted 15 applications that would not run on Vista including QuickBooks, MAS 90, and Microsoft's own LiveCam. It was a disaster. However, by September 2007, almost all significant applications were updated to launch on Vista. Unfortunately by then, the damage to Vista's reputation had already been done.

**A Small Tweak is Really a Big Deal** - In defense of the application developers, making this slight change seems easy, but it is actually very costly because this change means a new version number. In turn, a new version number means new product packaging, updated help files, new license agreements, updated web sites, updated manuals, new brochures and collateral marketing material, etc. While they are at it, they might as well throw in the other new updates they have been working on as well - right. These vendors simply told Microsoft that they would work in the new code change with their next product release, and that seems reasonable. The problem is that Microsoft had made this request years earlier, and the application developers simply ignored Microsoft's request until Vista actually started shipping.

2. **RAM Needs** - The second problem was that Vista needs at least 3 GBs of RAM to run well, but Microsoft failed to tell us this because at the time, almost no one had this much RAM – that knowledge would have been a huge barrier to sales.

**Vista is Great** - Despite the initial problems, in my opinion, Vista is outstanding. In early 2008 I purchased a \$599 HP laptop running Vista Professional (64-bit) with two processors & 4 GBs of RAM. The computer is smoking fast – Excel launches in just one second. In January 2009 I purchased a \$701 HP desktop running Vista Home Premium (64-Bit) with 4 processors and 8 GBs of RAM. Excel launches in 1/3<sup>rd</sup> of a second.

**Windows 7 is Great** - In June 2009 I purchased an HP pavilion running Windows System 7 with 2 CPU processors and 4 GBs of RAM. It too has been outstanding. It is not a well kept secret that Microsoft Windows 7 is really Vista 2.0 with about 500 minor enhancements thrown in; and since I was already a huge fan of Windows Vista, I am also a huge fan of Windows 7. In May 2011, I purchased a new Lenovo desktop computer running Windows 7 for \$599, and added a 500 watt power supply for \$79.99 to support a bank of four monitors.

## Vista's New Features

Vista provides many new features. Here is a recap, with my favorite new features underlined.

1. Explorer Improvements
  - a. Instant Search - Finds files rapidly.
  - b. Navigation Pane - Contains quick links to documents and folders.
  - c. Command Bar - Displays tasks appropriate for the files being displayed.
  - d. Live Icons - Display thumbnail image of the actual contents of each file.
  - e. Details Pane - Provides rich information (metadata) about files.

- f. Preview Pane - Preview a file's contents.
  - g. Enhanced title bars, borders, and Address Bar.
- 2. BitLocker Drive Encryption – Encrypt your entire hard drive.
- 3. Encrypting File System - User-level file and folder encryption.
- 4. Fast Sleep and Resume – New sleep power state is quick and saves battery life.
- 5. Windows Aero Technology
  - a. 3-D Flip – 3-dimensional view of open windows for better switching.
  - b. Windows Flip – Traditional ALT-TAB flip with thumbnail previews.
  - c. Glass – Transparent window edges enforces concept of layered windows.
- 6. Built-in diagnostics – Built-in troubleshooting, and resolution logic.
  - a. Disk Diagnostics.
  - b. Monitor Backup activity.
  - c. Detects impending disk failures.
  - d. Memory Diagnostics.
  - e. Network Diagnostics and troubleshooting.
  - f. Resource Exhaustion Prevention.
- 7. Ease of Access Center - Adjust accessibility settings and manage accessibility programs.
  - a. Speech Recognition – Dictation and control your computer with you voice.
  - b. Magnifier - Enlarges part of the screen while you work.
  - c. Narrator - A text-to-speech program that reads aloud on-screen text.
  - d. On-Screen Keyboard - Visual on-screen keyboard.
  - e. Keyboard shortcuts - Alternative to the mouse.
  - f. Mouse Keys - Use the arrow keys to move the mouse pointer.
  - g. Sticky Keys – Helps one armed people press simultaneous keys.
  - h. Filter Keys - Ignore keystrokes that occur when key is held down unintentionally.
  - i. Visual Notifications - Replaces system sounds with visual cues..
  - j. Captions - Animations and video indicate activity happening on your computer.
- 8. DirectX 10 - heavily enhanced 3-D graphics-rendering capabilities and helps noticeably improve your computer's performance in games and high-end 3-D applications.
- 9. Internet Explorer 7 in Windows Vista
  - a. Tabbed browsing
  - b. Protected mode
  - c. Dynamic Security Protection
  - d. Phishing Filter
- 10. Other Vista Improvements to:
  - a. Network and Sharing Center & Networking
  - b. Remote Access & Remote Desktop Connection

- c. Sync Center
- d. Windows Calendar Publishing
- e. Windows Fax and Scan
- f. Windows Mail
- g. Wireless Networking
- h. Photo Gallery
- i. Windows DVD Maker
- j. Windows Media Center
- k. Windows Media Player 11
- l. Windows Movie Maker
- m. Windows Sidebar and Gadgets
- n. Performance
- o. Search Folders
- p. Self-Healing System
- q. SuperFetch
- r. Windows Mobility Center
- s. Windows ReadyBoost
- t. Windows SideShow
- u. Windows Update
- v. Search and Organization
- w. Tablet PC Support
- x. Windows Easy Transfer
- y. Windows Meeting Space
- z. XPS Documents
- aa. Shadow Copy
- bb. User Account Controls
- cc. Windows Backup and Restore Center
- dd. Windows Defender
- ee. Windows Firewall
- ff. Windows Security Center
- gg. Windows Update

## What's New in Windows 7?

As mentioned below, Windows 7 is in reality Windows Vista 2.0, but the product name was changed in an effort to shed some of the negative image created by the Vista brand name. There are no significant changes between Vista and Windows 7; however, there are hundreds of small changes and improvements. A list of some of the more prevalent changes and improvements in Windows 7 is presented in bullet form below.



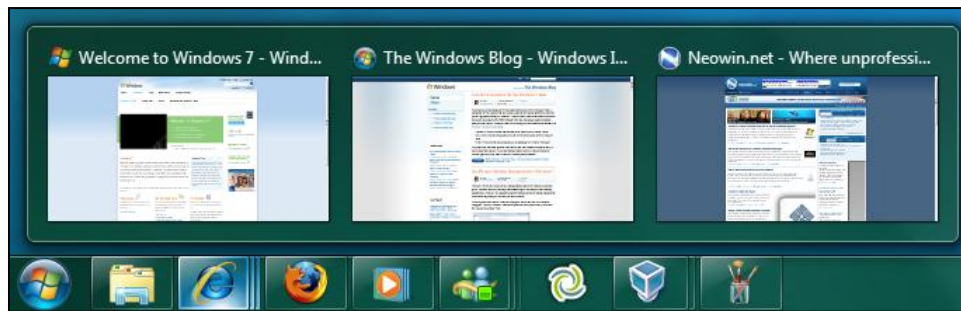
1. **Less Nagging** – The User Account Control in Vista was constantly popping up and hovering over you to nag you constantly: “Are you sure you want to continue?” This pop up box may have our best interests in mind, but it can harass you bonkers in the name

of “security”. Windows 7 allows you to modify this behavior by reducing the unnecessary and redundant UAC dialogs, making the prompts more informative, and providing users with more control.

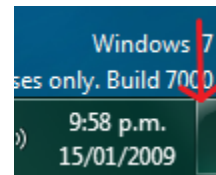
2. **Explorer is Better Behaved** - Vista sometimes made the left navigation pane in Windows Explorer a moving target. In Windows 7, the navigation pane stays still, so you no longer risk getting seasick from all the swaying back and forth.
3. **Consolidated Security Messages** - In Windows 7, all the security messages have been consolidated into one icon. When you click the icon, you’ll see all messages related to firewall, Windows Defender, Windows Update, etc.
4. **Side-by-side Windows with Auto-size** - Windows 7 includes a cool new feature in which if you drag two windows to each side of the screen, they will automatically size themselves to take up half the screen. Even better, when you drag the window back away from the edge, it returns back to its’ original size.
5. **Windows Media Player** - In Windows 7 you can stream the music and videos on one PC in the network to another, and even play back songs from iTunes libraries on other computers.
6. **Connecting to A Wireless Network is Easier** - Click the Wi-Fi icon in the system tray and select a network from the list, instead of opening up a separate dialog box to make the connection.
7. **Multi-touch** – Windows 7 now supports multi-touch displays which allows the user to lose the keyboard and instead use their fingers to touch menu selections on the screen to navigate and input data. You might have used this technology on your cell phone. <http://msdn.microsoft.com/en-us/magazine/ee336016.aspx>
8. **Handwriting Recognition** – When you write on a Multi-Touch screen, handwriting recognition is supported for 19 languages. [http://technet.microsoft.com/en-us/library/dd367848\(WS.10\).aspx](http://technet.microsoft.com/en-us/library/dd367848(WS.10).aspx)
9. **Superbar** - Redesigned Windows Shell with a new taskbar. A few improvements are discussed below. <http://www.neowin.net/news/main/09/01/15/windows-7-superbar-overview>.



10. **Improved Thumbnails** – Windows 7 taskbar also provides thumbnail previews of the running applications. But with the new superbar, you can now see previews of all running instances of that application. For example, if you have three IE tabs open, you can see previews of all the three tabs and easily switch between them by just hovering or clicking over the IE icon in the taskbar.



11. **Show Desktop** - Provides a preview of all windows open away into glass sheets when you hover over the icon. This to have a peek of your desktop before you switch. Clicking on icon switches to your desktop.



faded helps the

12. **Pinning** – Buttons for pinning applications are integrated with the task buttons as well as the various office applications.



13. **Jump Lists** - Allows easy access to common tasks, recently used applications, and pinned applications.

14. **Customize the Notification Area** - Users can customize which applications show notifications.

15. **Reorder Taskbar Buttons** - According to your likes and dislikes.

16. **Aero Snap** - Automatically maximizes a window when it is dragged to either the top or left/right edges of the screen, similar to Linux. This also allows users to snap documents or files on either side of the screen to compare them. When a user moves windows that are maximized, the system restores their previous state automatically. This functionality is also accomplished with keyboard shortcuts. Unlike in Windows Vista, window borders and the taskbar do not turn opaque when a window is maximized with Windows Aero applied. Instead, they remain translucent. <http://windows.microsoft.com/en-US/windows7/products/features/snap>

17. **Aero Peek** - Peek gives you the power of X-ray vision, so you can peer past all your open windows straight to the Windows 7 desktop. Simply point to the right edge of the taskbar—and watch open windows instantly turn transparent, revealing your desktop icons and gadgets. (Tip - To quickly reveal a buried window, point to its taskbar thumbnail. Now only that window shows on the desktop.) <http://windows.microsoft.com/en-us/windows7/products/features/peek>

18. **Aero Shake** – To cut through a cluttered desktop and quickly focus on a single window, just click a pane and give your mouse a shake. Voila! Every open window except that

one instantly disappears. Jiggle again—and your windows are back.  
<http://windows.microsoft.com/en-us/windows7/products/features/shake>

19. **HomeGroup** – Microsoft’s new home networking system. HomeGroup enables you to sharing files and printers on a home network. If you connect two or more PCs running Windows 7, HomeGroup makes it easy to automatically start sharing your music, picture, video, and document libraries with other people in your home. HomeGroup is password-protected and you decide what gets shared and what stays private. You can join a HomeGroup in any edition of Windows 7, but you can only create one in Home Premium, Professional, Ultimate, or Enterprise. <http://windows.microsoft.com/en-us/windows7/help/homegroup-from-start-to-finish>
20. **Removed Applications** - The classic Start Menu user interface, Windows Ultimate Extras and InkBall.
21. **Windows Live Essentials** - Windows Photo Gallery, Windows Movie Maker, Windows Calendar and Windows Mail are not included with Windows 7, but are instead **available for free** in a separate package called Windows Live Essentials which can be found on the Microsoft website.
22. **Support for Virtual Hard Disks** – VHD enables you to run a DOS Windows, Windows XP, Linux, UNIX, or other operating system in a given window. A VHD can be used as the running operating system on designated hardware without any other parent operating system, virtual machine, or hypervisor. [http://technet.microsoft.com/en-us/library/dd440864\(W.S.10\).aspx](http://technet.microsoft.com/en-us/library/dd440864(W.S.10).aspx)
23. **Improved Performance On Multi-Core Processors** - **Windows 7 can support as many as 256 processor cores compared with 64 for Vista.** Windows 7 also does a better job of distributing tasks across all of your processor cores, so none remain idle when needed. As mentioned previously in this manual, most computer users don’t uses numerous applications simultaneously or tackle extremely complex calculations on a regular basis – therefore your computer will rarely need to use more than 8 processor cores. [http://news.cnet.com/8301-30685\\_3-10372095-264.html](http://news.cnet.com/8301-30685_3-10372095-264.html)
24. **Improved Boot Performance** – While Vista computers boot in approximately 30 to 50 seconds, **Windows 7 computers boot in just 15 seconds.**  
<http://windows7center.com/news/microsoft-to-improve-boot-performance-in-windows-7-manages-to-boot-in-under-15-seconds-in-the-lab/>
25. **DirectAccess** – Gives mobile users seamless access to corporate networks without a need to VPN. [More](#)
26. **BranchCache** - Decreases the time branch office users spend waiting to download files across the network. [More](#)
27. **Federated Search** - Finds information in remote repositories, including SharePoint sites, with a simple user interface. [More](#)

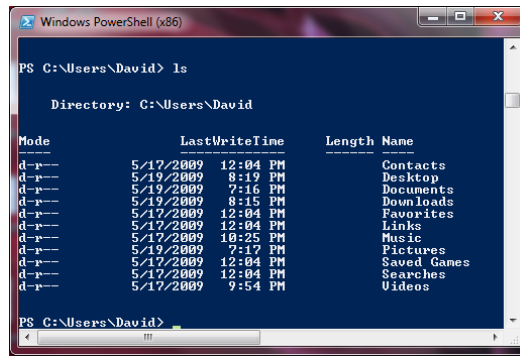
28. **BitLocker and BitLocker To Go - Enforce encryption** and backup of recovery keys on PCs and removable drives. [More](#)
29. **AppLocker** – You can specify which software is allowed to run on a user's PCs through centrally managed but flexible Group Policies. [More](#)
30. **Virtual Desktop Infrastructure (VDI) Optimizations** - Use virtual hard drive (VHD) images to boot a physical PC. [More](#)
31. **Multilingual User Interface** - Create a single OS image for deployment to users worldwide. [More](#)

### Kernel Improvements:

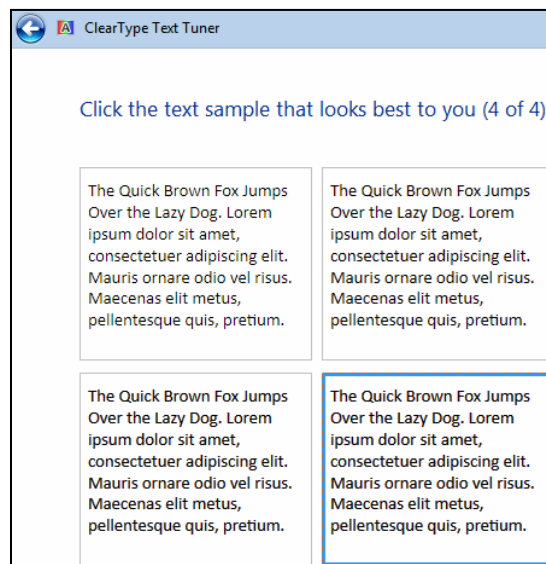
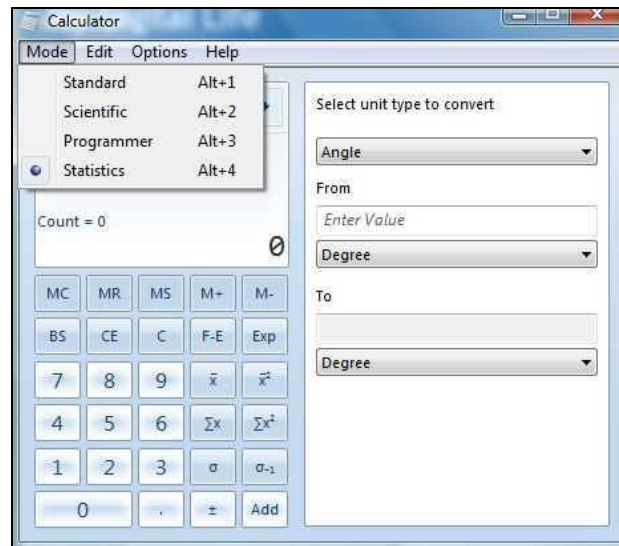
32. **AVCHD Camera Support** - (Advanced Video Coding High Definition) is a format for the recording and playback of high definition video. The format has been jointly developed by Sony and Panasonic primarily for use in high definition consumer camcorders. AVCHD has been designed to be **compatible with Blu-ray** Disc format and can be used for authoring and distributing of high definition video on DVD media, though not all Blu-ray Disc players are compatible with AVCHD discs.
33. **Universal Video Class 1.1 Support** - The USB Video Class (UVC) driver is a Microsoft-provided AVStream minidriver that provides driver support for USB Video Class devices. When your device uses UVC, you do not need to supply your own driver. Instead, the device works automatically with the system-supplied driver.
34. **Protected Broadcast Driver Architecture (PBDA)** – Basically this enables TV tuner card. Microsoft's new worldwide platform to integrate broadcast TV services into Windows Media Center on a Windows PC. It integrates virtually any free or premium TV service into Windows Media Center, while satisfying the TV industry's requirements for strong content protection in the case of pay TV.
35. **Up To 256 Logical Processors** – **XP supported just 1, and Vista supported 64.**
36. **Timer Coalescing** – Allows processors and chipsets to transition to **very low power usage** levels while the CPU is idle.
37. **Improved Multi-function Device Support** – Better handles combination printer/fax machine/scanner, or web-cams with a built-in microphones.
38. **Windows Installer 5.0** - Provides developers with more control over setting permissions during software installation.
39. **User-Mode Scheduling** - Database servers can benefit from having a thread scheduler in-process. This is because the kernel no longer needs to be involved in context switches between threads, and it obviates the need for a thread pool mechanism as threads can be created and destroyed much more quickly when no kernel context switches are

required. (In other words – **it takes the kernel out of the database reading and writing process to speed things up.**)

40. **New FireWire (IEEE 1394)** - Full support for IEEE 1394b with S800, S1600 and S3200 data rates.
41. **Trusted Installer** - Secures some of the core operating system registry keys and prevents other users, including the system, from making changes.
42. **Internet Information Services (IIS) – The world's second most popular web server** in terms of overall websites behind the industry leader Apache HTTP Server. As of March 2010, it served 24.47% of all websites according to Netcraft. The protocols supported in IIS 7 include: FTP, FTPS, SMTP, NNTP, and HTTP/HTTPS.
43. **Disk Partitioning** – As a default Windows 7 creates two partitions: 1. The first for booting, BitLocker and Windows Recovery and 2. The operating system.
44. **Removable Media** - Improvements to **ejecting** just one camera card at the same time (from a single hub) and retain the ports for future use without reboot. Further, removable media is now also **listed under its label, rather than just its drive letter**. Also, Windows 7 Explorer now (by default) only shows ports from a card reader in the My Computer menu **which actually have a card present**.
45. **Video Support** - Windows 7 adds playback of media in MP4, MOV, 3GP, AVCHD, ADTS, M4A, and WTV multimedia containers, with native codecs for H.264, MPEG4-SP, ASP/DivX/Xvid, MJPEG, DV, AAC-LC, LPCM and AAC-HE.
46. **Ability To Join A Domain Offline** - This makes it possible to join computers to a domain in locations where there is no connectivity to a corporate network. For example, an organization might need to deploy many virtual machines in a datacenter. Offline domain join makes it possible for the virtual machines to be joined to the domain when they initially start after the installation of the operating system. No additional restart is required to complete the domain join.
47. **Support for Multiple Heterogeneous Graphics Cards** - XP allowed you to mix and match graphics cars but Vista required you to use the same driver for all graphics cards. In Windows 7, you can now once again mix and match graphics cards.
48. **XPS Essentials Pack** - Microsoft has released Version 1.1 of the XPS Essentials Pack, allowing Windows XP and Vista users to view and generate documents in **the .XPS format, Microsoft's alternative to the .PDF format**. Windows 7 already incorporates this functionality.
49. **Windows PowerShell** - Windows PowerShell™ is a command-line shell and scripting language designed especially for system administration. Built on the Microsoft .NET Framework, Windows PowerShell helps IT professionals control and automate the administration of Windows operating systems and of applications that run on Windows.



50. **Improved Calculator** - Redesigned Calculator with multiline capabilities including Programmer and Statistics modes along with unit conversion.



51. **ClearType Text Tuner** - Use Clear Type Tuner for the best look on your LCD monitor or laptop screen. **Run 'cttune.exe' from the Start Menu** search box, or go to the Control Panel Display applet, and select Adjust ClearType Text.

52. **Display Color Calibration Wizard** – Helps you set your display colors just right. In particular, Photoshop users and video editors will find built in gamma and color balance controls and you are no longer dependant on you graphics cards' control panel. As an added bonus, it works for multiple monitor setups as well.
53. **Gadgets** - Gadgets are small single-purpose applications, or software widgets, that can sit on a Microsoft Windows user's computer desktop, or are hosted on a web page.



There are hundreds of gadgets available and some of the more popular gadgets used today are as follows:



eBay Auction



System Monitor



Shutdown Control



YouTube Downloader



Messenger Gadget



Google Gadget



Digital Frame



Office Tips



Calculator

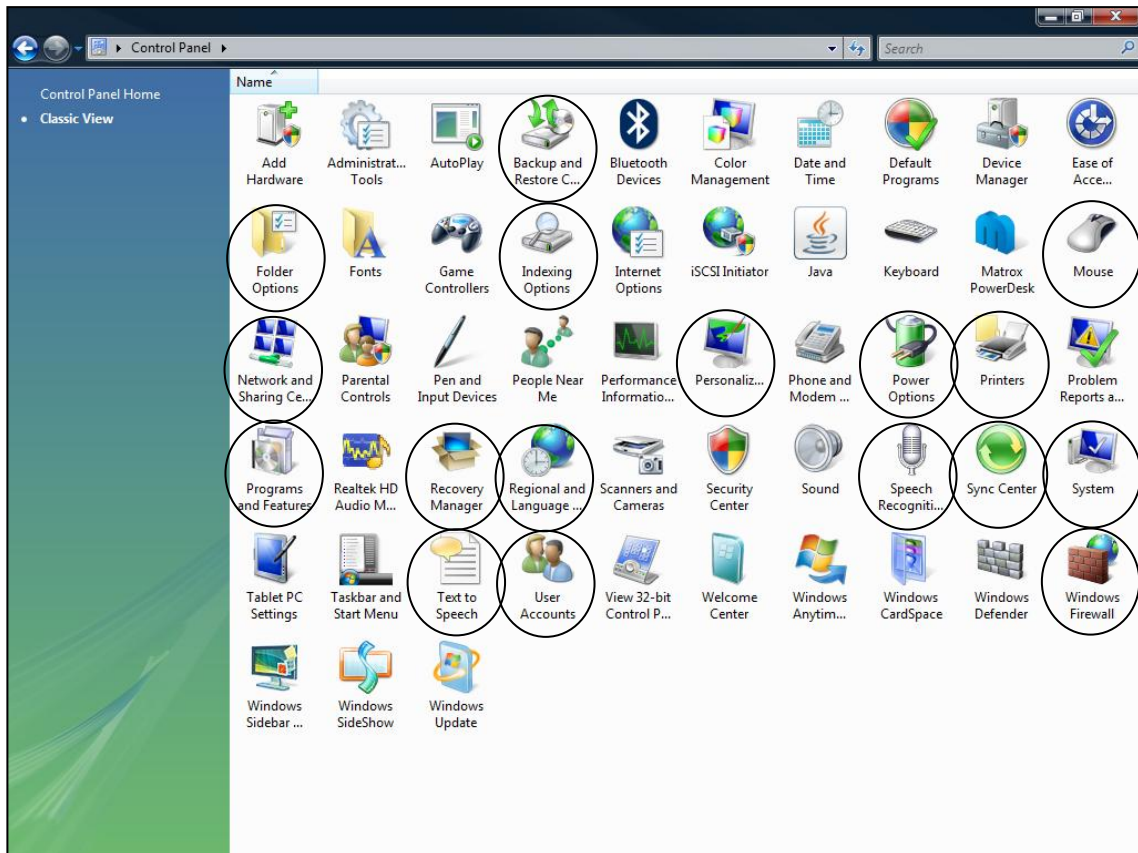
54. **Recovery** – Windows 7 allows you to create a system repair disc. – To do this click Start; Back Up; Create a System Repair disc.
55. **Troubleshooting** – Microsoft provides a Troubleshooting guide here <http://msdn.microsoft.com/en-us/library/dd776530.aspx>. It includes links to blogs, support groups, and technical support staff who can help you if needed.
56. **Workspaces Center** – **Formerly called SharePoint Services**, this allows distant people to **work together** better by improving workflow, reducing shipping and travel costs; and by sharing all of your information through a single location. **Features shared task list with progress, and library check out system for opening documents.**
57. **Location and Other Sensors** - Enables your computer and applications to adapt to the environment. For example, **location sensors (including GPS devices, WWAN radios, and even triangulation technology) your applications and gadgets can know exactly where they are**, enabling them to provide more locally relevant content and functionality. **Ambient light sensors**, can allow your computer to automatically adjust your screen's brightness based on the current lighting conditions.
58. **Credential Manager** - Allows you to **store user names and passwords** that you use to log on to websites or other computers on a network. By storing your credentials, Windows can automatically log you on to websites or other computers. Credentials are saved in special folders on your computer called vaults.
59. **Biometric Devices** – Support for **fingerprint and retina scanner** devices. <http://windowsteamblog.com/blogs/windows7/archive/2009/01/08/windows-7-puts-it-s-finger-on-enhanced-biometric-support.aspx>
60. **Windows Security Center** - Has been **renamed “Windows Action Center”** and encompasses **both security and maintenance** of the computer.
61. **WIC-Enabled Image Decoders** - Mac-like RAW image viewing which enables raw image thumbnails, previewing and metadata display in Windows Explorer, plus full-size viewing and slideshows in Windows Photo Viewer and Window Media Center.

## Desktop Market Share As Of April 2011 & January 2010 (source: Wikipedia)

	<b>2011</b>	<b>2010</b>
Windows XP -	40.26%	66.31%
Windows Vista -	13.95%	17.39%
Windows 7 -	27.49%	7.51%
Windows 2000 -	-	0.58%
Windows NT -	-	0.11%
Windows 98 -	-	0.08%
Windows CE -	-	0.06%
Windows Me -	-	0.05%
Non-Windows -	7.98%	
<b>Total Windows -</b>	<b>87.08%</b>	<b>92.02%</b> <small>(Numbers do not foot – Median average from Wikipedia)</small>
Mac OS X	7.12%	5.90%
Linux	1.82%	1.12%
Other	2.20%	1.96%

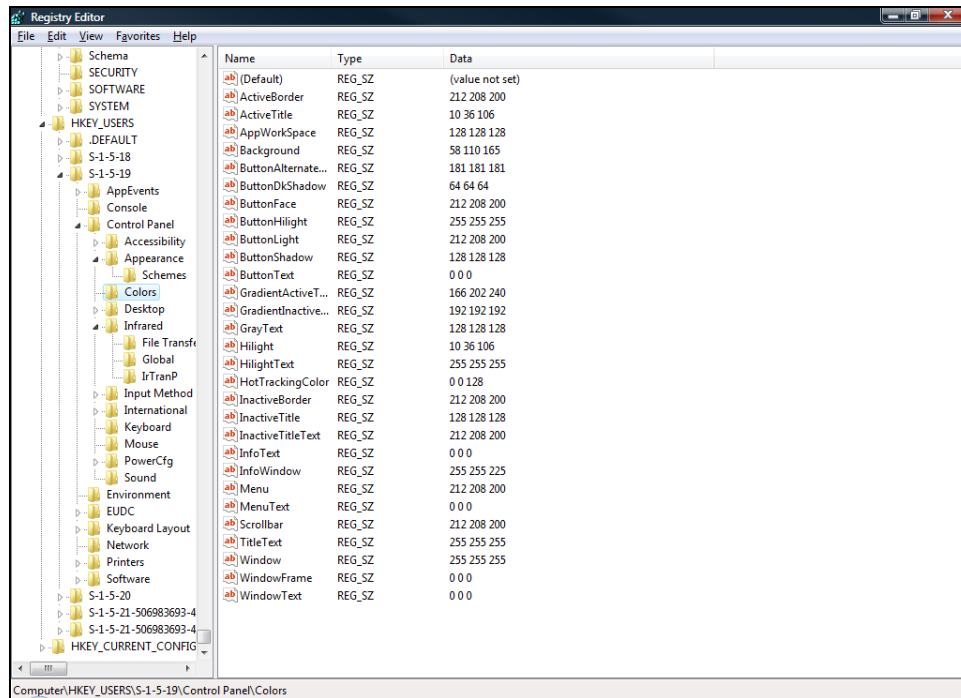
## Windows Control Panel Settings

Windows 7's Control Panel contains 53 tools that allow you to configure and control the way Windows 7 looks and operates. You can view these tools in their newer categorized view, or if you are old school like me and prefer the older look and feel, click the Classic View option to display Control Panel as follows:



While all of these tools have utility, I've circled those tools which I would like to discuss in class.

Before delving into Control Panel, it is helpful to understand that Windows 7 saves all of your setting adjustments in the Registry. You can view your Registry by typing REGEDIT in the Start Search Box. This is a rather cryptic set of folders and honestly, Microsoft does not want you messing around with the Registry unless you really know what you are doing. Here is what the Registry looks like:



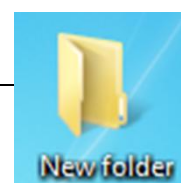
What I want you to know is that as you make adjustments in Control Panel, those adjustments are recorded in the registry, usually with a series of “0” or “1” answers to setting questions. If you wanted to, you could accelerate your mouse by adjusting the Registry settings – but why? The graphical Control Panel tool is much easier to use, and it adjusts the Registry for you.

This understanding is helpful in terms of backing up or restoring the registry. When you create a Restore Point using the System Restore option, all it really does is make a copy of the Registry. Thereafter, if your computer or an application stops working correctly, or if you get a virus, you can restore a previous Restore Point which simply copies the older Registry settings back to you Registry.

## God Mode

*(Apologies to anyone who might be offended by this use of the Word God, I did not come up with this terminology)*

Windows 7 has many settings to adjust how Windows operates. The majority of these settings adjustments must be made using the Windows Control Panel. Although Control Panel does a good job of organizing the various tools, it can be a little difficult to use because often you must toggle back in forth between windows. There is a way that gives you all adjustment options in one place... and it's called Windows 7 “God Mode”.



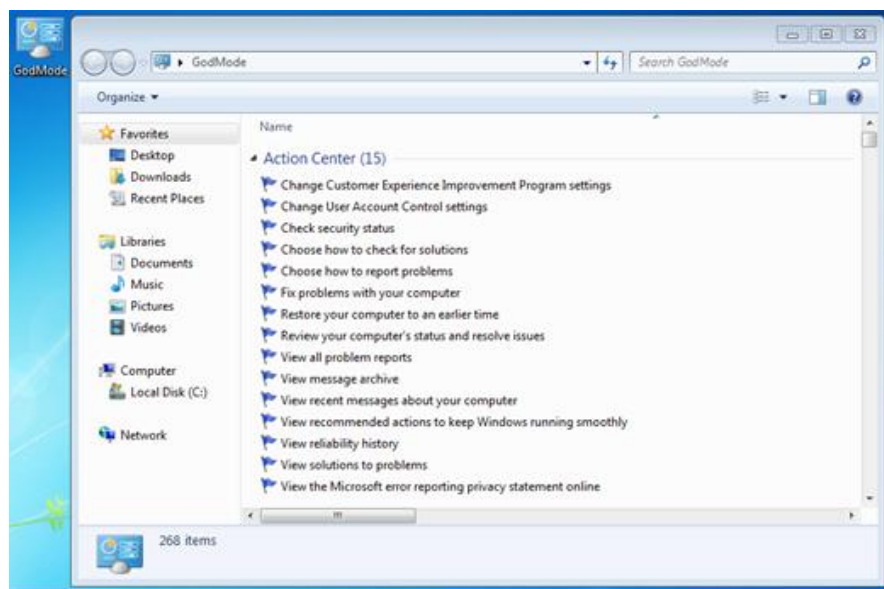
To set up God Mode, first create a new folder on your desktop. Next, change the name of the New folder by right clicking on the folder, select **Properties** from the drop down menu, under the General tab select the name of the folder text box and type in the following code to change the name of the folder:

**GodMode.{ED7BA470-8E54-465E-825C-99712043E01C}**

Now, the folder should have changed from the default blank folder icon to a Control Panel looking icon.

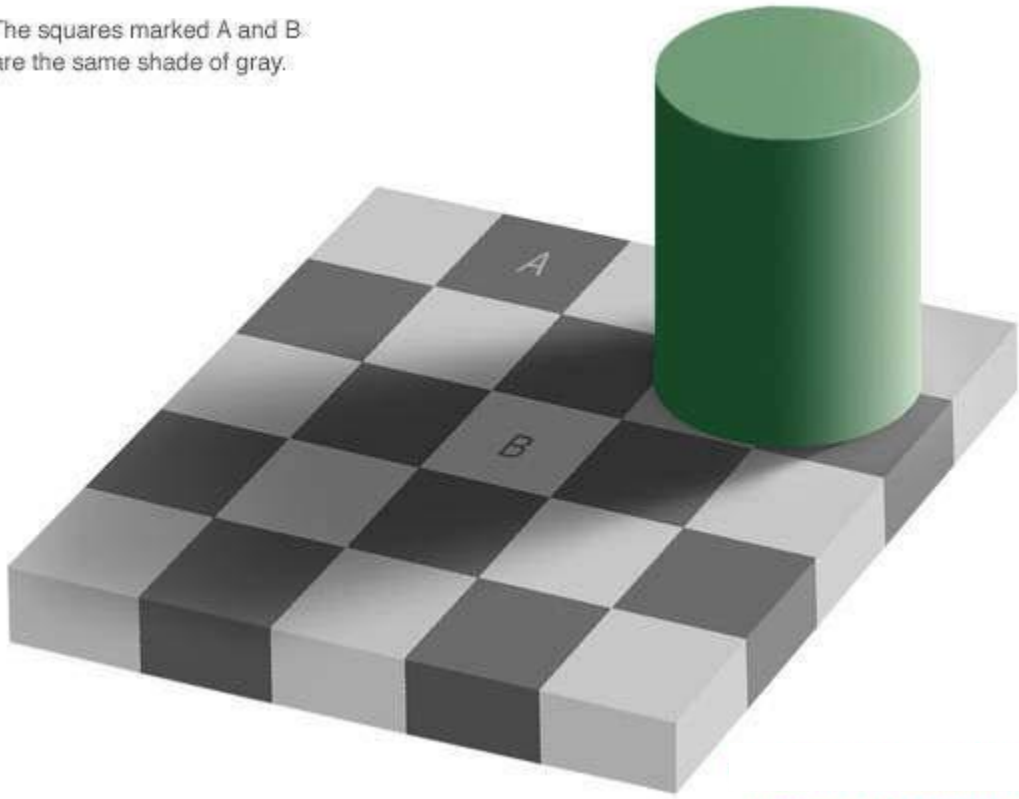


Thereafter, when you double click on the “God Mode” icon to open it, you will notice that it looks similar to the Control Panel window, with all options placed in single list. This allows you to view all the Windows 7 settings in one spot as shown below.



# Computer Settings

The squares marked A and B are the same shade of gray.



(Squares A & B are the same shade of gray)

# Computer Settings

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When I purchase a new computer, there are typically many setting adjustments I like to make before I start using the computer. Presented below is a listing of 42 of those adjustments.

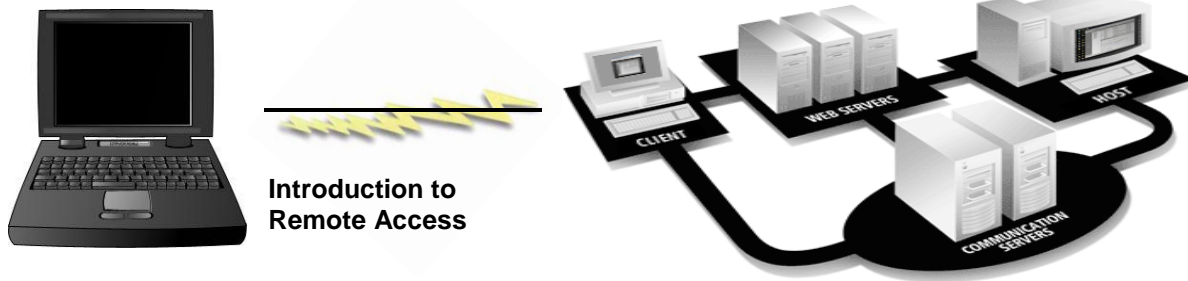
1. Browser - Set Google Preferences to 100 web sites
2. Browser - Set up Links bar on your browser (with links to frequently used web sites)
3. Browser – Set up default page when launching a new browser (I use a page of links that I created)
4. Browser - Enable content advisor for children and employees, check box “users see sites with no rating”.
5. Desktop - Drag and drop LAN icon onto desktop (for quicker access)
6. Desktop - Drag and drop My Computer icon onto desktop (for quicker access)
7. Desktop - Set up short cuts to any frequently used network connections.
8. Display - Change background on desktop (to pictures of family)
9. Display - Setup password protected screen saver (to help prevent unauthorized access)
10. Download - Install Adobe acrobat reader (free) (this is a must-have application)
11. Download - Install Flash (free) (this is a must-have application for viewing many web sites)
12. Download - Install Google Pop Up Blocker or setup IE popup blocker (free)
13. Download - Install QuickTime (this is a must-have application for viewing many web sites)
14. Download - Install virus protection software (duh)
15. Download – Install and setup Skype (free) (so that you can call people using your computer)
16. Download – Install remote access such as GoToMyPC or LogMeIn (So you can access your computer)
17. E-mail - Setup Outlook e-mail accounts and import contacts
18. E-Mail - Set up automatic signature block (to save time and provide recipient with proper information)
19. Folders - Set up a data folder (I save all data files in a folder named DATA, and subfolders labeled by year)
20. Folders - Set data folders settings “to view detail” (I prefer this view because of it’s rich file information)
21. Folders - Set default data folder in Excel (So that all Excel files save to and open from the correct folder)
22. Folders - Set default data folder in Word (So that all Word files save to and open from the correct folder)
23. Folders- Set picture folders settings to “Pictures and Videos” so you can play slide shows/
24. Mouse - Accelerate your mouse (so the pointer moves across the screen before you run out of mousepad)
25. Mouse - Accelerate your scroll button (so that less finger rolling produces more scrolling)
26. Mouse – Check the “hide while typing” box (so the mouse pointer won’t jump around)
27. Periodically - Delete internet history files periodically (this helps your browser run faster)
28. Periodically - Download all Windows and Office updates regularly (this should now be automatic)
29. Periodically - Make an emergency boot disk, tape it to side of computer (Just in case the worst happens)
30. Periodically – Reboot - shut down computer gracefully, don’t just shut off power
31. Quick Launch - Set up Quick Launch Bar (To establish quick access to frequently used applications)
32. Quick Launch – Drag copies of icons to Quick Launch Bar for your frequently used applications
33. Set Control Panel to Classic View (I like this view better)
34. Office – Set menus to “show full menus” (to avoid lag 3 second time between click and full menus)
35. Office – Set Office Assistant to only pop up via the F1 key (to keep help from interrupting your work)
36. Vista – Setup Indexing to index all data files and e-mail files in your computer (for fast searching)
37. Camera – Install web camera for use in many uses, including Skype phone calls
38. Control Panel – Setup Backup routine to run regularly
39. Control Panel – For laptops, adjust power settings so that computer does not turn off too quickly
40. Control Panel – For laptops, adjust power settings so monitors and printers do turn off quickly
41. Speech – Train system to recognize your voice so that you can dictate to your computer
42. Devices – Setup synchronization with your handheld devices
43. Photos – Set up automatic download and red eye removal for all photos when you plug in photo card
44. Control Panel - Set your clock to stay in sync itself with the Internet time clock.
45. Control Panel - Make sure that you set a screen saver to save your monitor and to save energy.
46. Control Panel - Set your default Internet page.
47. Control Panel - Set Security levels to high.
48. Control Panel - Set up printers, including multiple instances of the same printer, with different preferences such as printing landscape, draft quality, or multiple copies.

# Remote Access



# Remote Access

## Remote Desktop Control



Remote access becomes important when you travel away from your computer, or when two or more separated people need to share the same data. For more than 15 years, Citrix MetaFrame was the defacto standard for establishing high performance remote access while pcAnywhere was the defacto low cost solution. In recent years new solutions have risen to challenge both of these solutions. In particular, Microsoft Terminal Services is arguably as good as Citrix, and priced far lower (30% to 40% lower). In addition, web based solutions such as "GotoMyPC" and LogMeIn have become the preferred low cost and easy solutions. In addition, Microsoft Windows includes a remote solution as well. There are more than 425 downloadable solutions located here: [http://www.download.com/Remote-Access/3150-7240\\_4-0.html](http://www.download.com/Remote-Access/3150-7240_4-0.html); however the main solutions are as follows:

### Some Low Cost Remote Access Solutions



### Some High End Remote Access Solutions



## **Benefits of Using Remote Access**

There are numerous situations that call for a remote access solution. Traveling employees often need access to their e-mail, calendar or contact list. Traveling sales representatives need access or to the accounting system for entering orders or looking up inventory levels and customer history information. Work-at-home employees need access to their office computer. Multiple location companies need to connect remote locations to a centralized accounting system. Troubleshooting/support professionals need to log into the customer's remote system for maintenance purposes.

## **Disposing of Computers**

You can dispose of a computer by giving it to your employee to take home. Your employee may be very happy with this, and you won't have to dispose of it otherwise. Data and software applications should be removed before disposal, formatting the hard drive is your best bet. Many charities no longer accept computer donations.

It is estimated that 45 million computers become obsolete each year. This situation creates two problems – protecting information and disposing of your old computers. Most organizations store their old computers, which serve as backup equipment in case newer computers break down. These old computers often sit in storage well beyond their potential useful life. At some point, a decision must be made about disposal of this equipment. Continuing to store it is often not a viable option, because it eventually takes up a considerable amount of space. The least desirable option is to throw old computers in the garbage. Not only are there the potential liabilities and disposal costs imposed by state and federal environmental agencies, there is also the possibility of someone removing hard drives and recovering sensitive data. To combat these problems, you should follow a good disposal strategy.



## Where to Buy Cheap

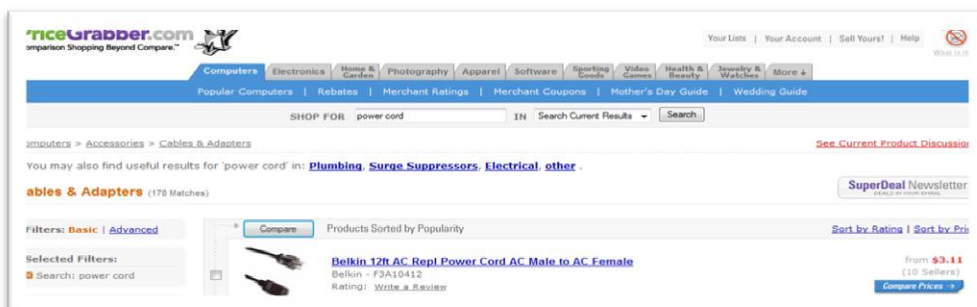
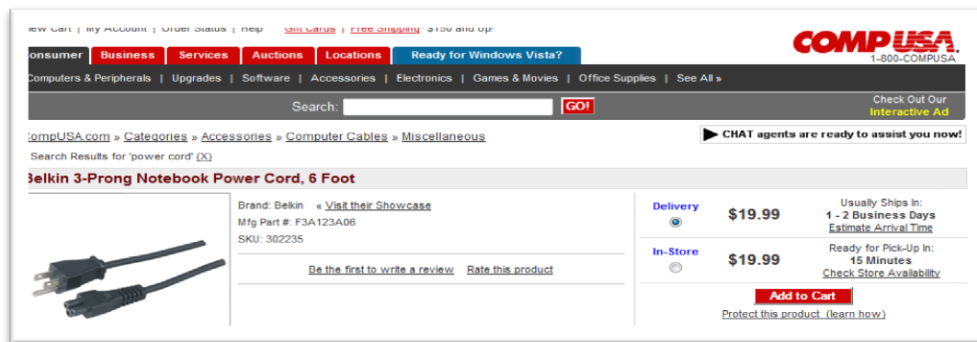
A little shopping around can easily save you \$200, \$300 or even \$1,000 or more. You owe it to yourself to shop around. Here is our standard shopping approach to buying a computer for the lowest cost:

1. **Price Grabber** – I usually start my search for computer gear at [pricegrabber.com](http://pricegrabber.com), and web site that enables you to search 12,880 merchants. This site offers an excellent selection tool which narrows your list of potential solutions by feature criteria you specify. Once I've identified a price, I am rarely able to find a better price elsewhere. However, I offer these comments:
  - a. Some merchants play a game in which they advertise a cheap price, but when you click on that price to go to the merchant's web site, they switch you to a higher price. Don't get caught in this deceitful trap.
  - b. I often find the best prices by purchasing refurbished gear. This has worked fairly well for me.
  - c. I don't buy from merchants with few reviews or bad reviews, no matter how good the price is.

[www.pricegrabber.com](http://www.pricegrabber.com)

2. **MicroCenter beats CompUSA and Circuit City** – In 2010, I started to notice that MicroCenter often has pricing as good, or better than the prices I was finding at PriceGrabber, and I've started buying from MicroCenter. I am shocked that a retail outlet can compete head to head with internet on pricing. It has always been my experience that Micro Center has decent prices and far more knowledgeable sales representatives, but as of 2010 I am a huge MicroCenter fan. (I have no interests in MicroCenter, no relationship, and I receive no special favors from MicroCenter).
3. **Pricescan** – Pricescan is a good alternative to Pricegrabber. [www.pricescan.com](http://www.pricescan.com)
4. **CDW** – I sometimes use this web site to get a feel for the brand, size, speed, and price of computer you want. This is a good site for comparing current systems. But don't buy your computer here – while CDW prices are fairly decent, I find that you can save another 10% to 20% buy shopping further. [www.cdw.com](http://www.cdw.com)
5. **Dell** – Most CPAs buy Dell, why I don't know. I rarely buy Dell. Oh, I think the quality is good, I just find the pricing to be way too high, especially if you configure your own. Nonetheless, I usually visit the Dell web site to look for systems comparable to the best ones I've already found. I also look for rebates, online coupons and special deals as well, and search for refurbished computer systems and consider these options. Usually, an equivalent Dell computer costs far more than the computers I've already found through PriceScan and PriceGrabber. [www.dell.com](http://www.dell.com)

6. **HP** – I also visit the HP web site and look for systems comparable to the best ones you’ve already found. Be sure to look for rebates, online coupons and special deals as well. Also search for refurbished computer systems and consider these options. [www.hp.com](http://www.hp.com)
7. **Continue Shopping Online** - Depending upon how much time and effort I want to expend, I continue to identify potential systems and compare them to my potential selections by also visiting IBM, eCOST, The Nerds, Tech Bargains, Pricewatch, PC Connection, Buy.com, Staples, etc.
8. **Shop Stores** - You are now armed with enough ammunition to shop a neighborhood store such as OfficeMax, Office Depot, or Staples. Sometimes (albeit rarely) these places have a deal that beats an internet price. Many stores, such as Circuit City, will match any advertised price, and that might be an avenue you want to take. SAM’s Club also provides some good deals from time to time.
9. **Avoid Most Retail Computer Stores** – It is a general rule I find that that many retail computer stores such as CompUSA and Circuit City are overpriced. In all my years it has been my experience that buying from CompUSA and other retail computer stores will cost you at least 20% more, if not a great deal more. I have nothing against CompUSA and I visit their showrooms often just to see what’s out there but they rarely get my business.
10. **Advanced Web Shopping** – If you want to take some more time to search for those really fantastic bargains, we suggest you visit Tech Bargains and Fat Wallet. These two sites list hundreds of internet specials daily, but you need to be ready to react fast – these deals don’t hang around long (sometimes an hour or less) [www.techbargains.com](http://www.techbargains.com) & [www.fatwallet.com](http://www.fatwallet.com).



Wow, I just noticed that the PriceGrabber cord is 12 feet long and sells for just \$3.11 while the CompUSA cord is only 6 feet long and sells for \$19.95. Once again we see that shopping around online can save you big bucks.

**Conclusion** - Computers have reshaped our world. Whole industries have fallen while others have emerged based solely on computers. Today, companies that don't keep up, will most likely fail. You should make sure that you, and everyone of your employees is using a fast, solid, dependable computer. You should replace all computers at least every three years. You should buy computers that are about two steps below the top technologies. You can save a bundle by shopping computers on the Internet.

## Mice

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### Optical Wheel Mice

If you are not already using a laser mouse or optical wheel mouse, you should be. Users of traditional roller ball mice that try an optical mouse never go back. The roller ball mice pick up dirt and hair and as a result, do not always roll smoothly. Optical mice always roll smoothly, and since they do not pick up dirt and hair, they never need cleaning. Optical mice glide with little friction across virtually any surface. They shine a red light emitting diode at any flat surface which when reflected back allows the mouse to gauge the movement of the device and guide the pointer/cursor accordingly. Unlike conventional mice, optical devices do not contain moving parts and cannot be worn down or caked with dust over time.

**Wheel** – The wheel (or scroll button) allows the user to easily scroll up and down a web page, word document or spreadsheet with the roll of a finger. This process is easier and more efficient than clicking and grabbing the scroll bar on the right hand side of a window. Once again, after you have experienced the scroll button, you will never be satisfied with a scroll-less mouse again.

### Wireless Mice

For prices starting at about \$45, you can purchase a wireless version of any mouse. A wireless mouse can significantly improve user comfort because a user's positioning of the mouse is unlimited. This is a good point, but some older wireless mice have a slight time delay between hand movement and pointer movement – a condition which can be irritating. Also, without the tethered cable, it is easier to lose the mouse just like losing the remote control on your television set. Wireless mice need batteries and they weigh more. Many people think that a wireless mouse is worth the extra cost; however for the reasons mentioned, let us conclude that the decision to go wireless is more of a personal preference issue.



I recommend that you choose a wireless mouse that uses radio frequency (RF) technology as opposed to infrared. Infrared requires line of sight to work properly, whereas RF does not.

## A Few Mouse Pointers

1. **Plugging in Your Mouse** - Today's mice can plug into the older PS/2 port or the USB port. When it comes to performance, it does not matter which port you use, but we recommend that you use the PS/2 port, even if you have to employ the use of a USB/PS/2 port adapter. Most mice include this adapter. The reason is that this keeps your USB ports free for other devices.
2. **Extra Mouse Buttons** – Some mice offer extra buttons on the sides, or multiple scroll buttons on top. These are fancy additions to be sure, but we find that most people do not use these extra buttons – therefore don't bother.
3. **Ergonomic Shape** – Many mice have an ergonomic shape that allows you hand to fit more comfortably on the mouse. If you have discomfort in your arm, you should give one of these ergonomically designed mice a try – they do allow you to tilt your arm to a more comfortable and natural position. An ergonomically shaped keyboard and mouse are shown below.
4. **Miniature Mice** – Some manufacturers make miniature mice that are about half the size as regular mice. I find that these miniature mice fit much better in a laptop bag and are far better for traveling. I highly recommend them.

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## Printers

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As you evaluate printers, the key features you should be aware of are as follows:

1. **Page Per Minute (PPM)** – The number of pages printed per minute range from 1 to 50 for business grade printers. The faster the better. Many people tell me that “*speed does not matter*”, which is a ridiculous statement. Given the same price, wouldn't you always choose the faster printer? Of course you would. Take our word for it and purchase a 45 ppm printer, you simply will not regret it.
2. **Cost Per Page (CPP)** – The cost per page is really the more important factor to evaluate. Older printers such as the HP LaserJet 5 printed documents at a cost of approximately 2.5 cents per page before paper cost, while the HP LaserJet 4300 costs just .8 cents per page before paper costs. Based on these numbers, each printed page from the HP LaserJet 4300 saves 1.7 cents, or \$85 per box of paper (5,000 sheets). At this rate of savings, a new HP 4300 which costs about \$1,400 today, will pay for itself in just 16 boxes of paper. In the meantime, you will enjoy faster printing and higher resolution as well.
3. **Resolution (DPI)** – Today's resolution standard for laser printers is basically 1200 by 1200 dots per inch. However inkjet printers are capable of achieving much higher resolutions up to 5760 x 1440 DPI. The trade off is speed.
4. **Color** – Color printing is the fastest trend in printers, and the cost of color printing continues to fall. For example, Xerox claims that its color printers cost about 10 cents a


page before paper costs for its Phaser 6200, 7300, 7700, and 8200 printers. Other color printers report that their cost per printed page ranges from 2.5 cents before paper for the Canon printer, to as high as 50 cents per page for other color printers.


5. **Oversized Printing** – Some printers can handle oversized paper, 11 inch by 17 inch for example. These printers will cost much more.
6. **Duplex Printing** – Some printers can turn a paper over and print on the reverse side automatically. Usually duplex devices are add-on attachments to laser printers and they typically cost from \$200 to \$1,000.
7. **Collating & Stapling** – Some printers can collate reports and even staple them. Depending upon the type of output you produce and the quantities you print, this can be a great savings or a complete waste.
8. **Printer Memory** – All laser printers have memory, and as you might expect, adding more memory to your printer yields benefits. However you will typically only see those benefits when printing large documents or when several heavy users share a printer. For the casual user, the base installed memory is usually sufficient to meet your needs.

### Printer Advice & Tips

It is impossible to make a specific printer recommendation because there are so many printers and so many different types of printer needs in the marketplace. However here are our best pieces of advice regarding printers.


1. **Network Connection** – Never connect a printer through the parallel port on the back of your computer. Instead, always hook your printer up as a node on your network. It will perform much faster, sometimes 50 times faster when printing large documents with heavy graphics.
2. **Separate Laser & Color** – It is better to purchase one laser printer to meet your black and white printing needs, and a separate inkjet printer for your color needs. You will save money up front and over the long haul with this approach.
3. **HP Brand** – We like to recommend HP printers because they are very compatible, and the drivers are probably already preinstalled on your computers.
4. **Top Business Printer** – For high end laser printing, we recommend the HP 4300 dtn.

	<p><b>HP LaserJet P4014n Printer \$699.99</b></p> <ul style="list-style-type: none"><li>• Print speed, black (pages per minute) - Up to 45 ppm</li><li>• Recommended monthly volume, maximum 250,000 pages</li><li>• Toner cost \$154 but lasts 10,000 pages</li></ul>
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 <p data-bbox="370 577 521 604"><b>HP 4350dtntl</b></p>	<p data-bbox="634 100 781 128"><b>HP 4350dtntl</b></p> <ul data-bbox="683 174 1414 636" style="list-style-type: none"> <li>• Print speed, black (pages per minute) - Up to 55 ppm</li> <li>• 2 trays, 600pg input, 800pg output 750 down/50 face up</li> <li>• First page out, black - Less than 8 secs</li> <li>• Processor speed - 460 MHz</li> <li>• Recommended monthly volume, maximum 250,000 pages</li> <li>• Duplex printing - Automatic (standard)</li> <li>• 96 MB RAM std. upgradeable to 512MB, HP Jet direct 10/100Base-TX print server card, additional 500-sheet tray, and duplex printing accessory.</li> <li>• Optional 20GB HD</li> <li>• Dimensions (w x d x h) - 16.4 x 20.9 x 19.2 in</li> <li>• Weight - 74 lb</li> <li>• Toner cost \$129 but lasts 10,000 pages</li> <li>• 2009 Street Price - \$279</li> </ul>
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(I actually purchased the earlier model of this same printer for my own use at the office in early 2004 for \$2,200, so you can see that I put my money where my mouth is. This printer still sold for the same price as of 2008, but now in 2009 is amazingly affordable at just \$279. In 2010, the prices have jumped higher to the \$450 to \$600 range due to the devaluing of the US Dollar.

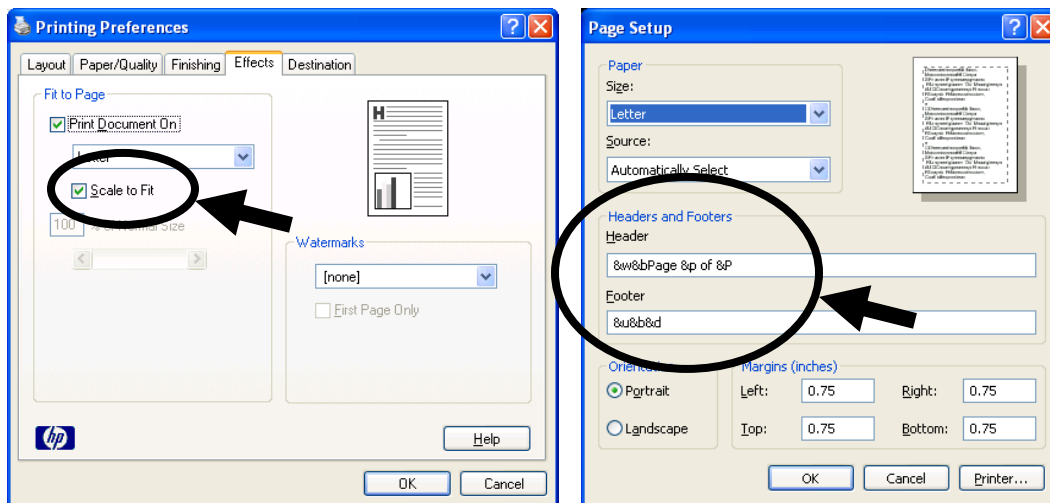
5. **Top Color Printer** – For color printing we recommend the Epson Stylus CX6400.

	<p data-bbox="683 1031 1268 1058"><b>Epson Stylus Photo RX680 All-In-One Printer</b></p> <p data-bbox="683 1104 927 1251">40 PPM 5760x1440 DPI Color, PC/Mac MPN: C11C686201</p> <p data-bbox="683 1297 748 1325">\$120</p>
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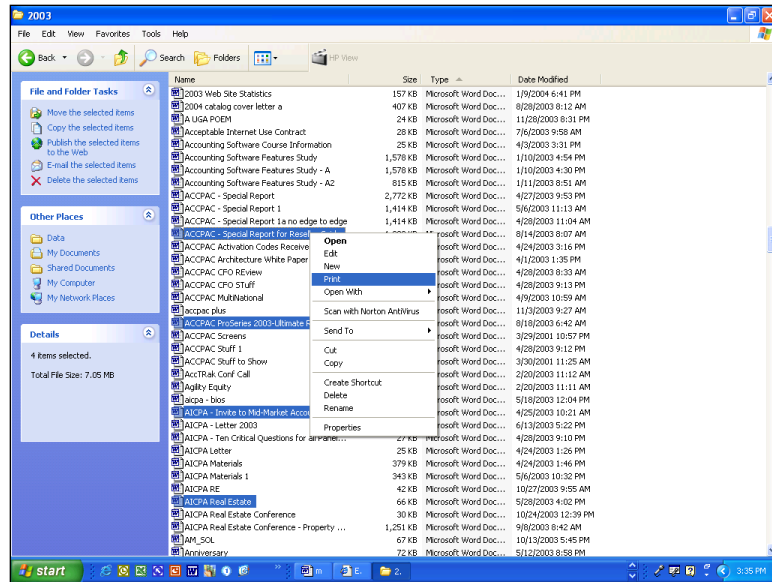
6. **Top Power Printing** – For high performance printing, we recommend the HP LaserJet 9000hns.

 <p data-bbox="349 1892 592 1919"><b>HP LaserJet 9000 MFp</b></p>	<p data-bbox="683 1568 927 1596"><b>HP LaserJet 9000 MFp</b></p> <ul data-bbox="732 1642 1406 1934" style="list-style-type: none"> <li>• 50 ppm, 1200 x 1200 DPI</li> <li>• Network ready</li> <li>• Hard disk, 128MB of RAM</li> <li>• Automatic duplex</li> <li>• 3100 sheet input capacity,</li> <li>• HP 2000-Sheet Input Tray</li> <li>• HP 3000 Sheet Stapler/Stacker LJ9000</li> <li>• Dimensions: 49.75 Inch (W) x 27.5 Inches (D) x 40 Inches H</li> <li>• Weight : 317 lbs.</li> </ul>
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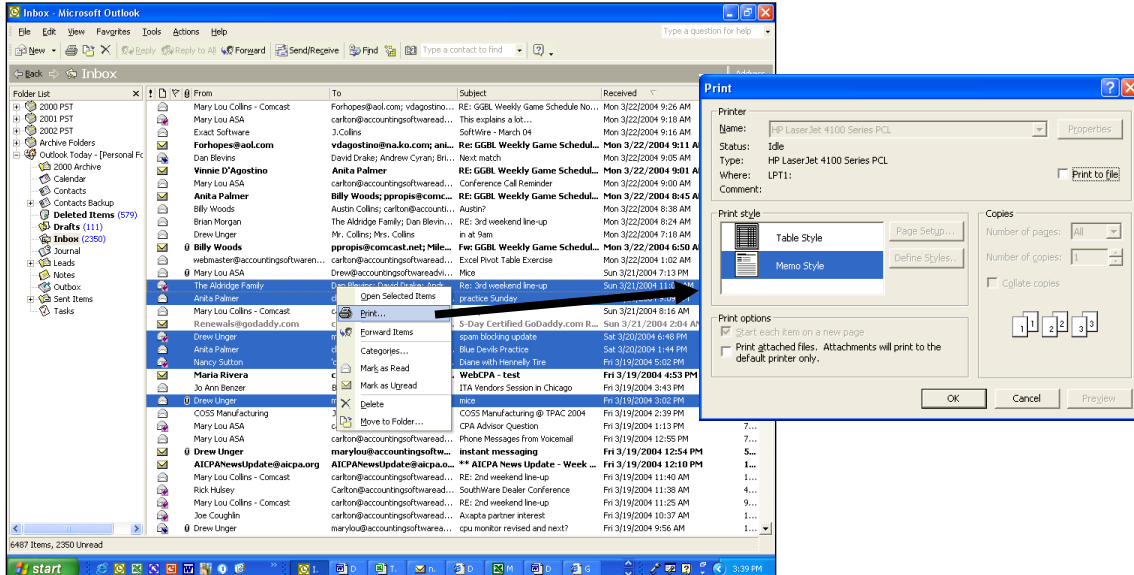
5. **Ink Refills** – We generally recommend against refills. The ink nozzle built into most printer cartridges is not meant to be run for refill after refill. When you replace your ink cartridge, you also replace your old nozzle with a brand new one. Each time you refill a cartridge, you keep using the same old nozzle. This can be especially important if you're trying to print out photographs.
6. **Printer Set Up** – You can set up the same printer multiple times in your printer dialog box, each time with different settings. One option may produce landscape results while another produces draft quality results. Just a thought.
7. **Shop The Web** – When searching for the lowest price for a printer, use the shopping procedures outlined in our Desktop Computer section in Chapter 2. You will typically save 20% to 25%.
8. **Printing Web Pages** – When printing a web page, here are two tips. First with some printers, you should check the “scale to fit” box under printing preferences so that your printer will not cut off the edge of the document when printing. Also, under page set up, remove any header or footer controls if you don't want that information to print on the page.



9. **Print from Folder** – You can actually print multiple files without opening them by selecting them in a folder using the CTRL key, and right mouse clicking. This will automatically print to the default printer, so make sure that you set the correct default printer prior to using this action. This dialog box is shown below.



10. **Print E-Mail** – Multiple e-mails can also be printed using the technique described above.



## Conclusion

Printer technology has always been very good, but today's printers make yesterday's printers obsolete. Throw your HP 3s, 4s, 5s, and 6s in the trash can and step up to the newer technology. It's time.

# Scanners

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**Canon CanoScan  
Flatbed Scanner \$44**

With the rapidly evolving state of technology and continually falling prices, today there really is no excuse not to have a flatbed scanner in your home or small business. Techbargains' index site lists 274 consumer grade scanners. At one time flatbed scanners were too expensive to warrant purchase outside the graphic design and publishing industries. However, fully capable scanners can now be purchased new at any consumer electronics or computer store for \$50 while top of the line models reaching about \$200 with transparency or film scanning adapters. Of course these prices can be easily beaten with a little online research. The most popular connection interface for current scanner models is USB 2.0 mainly because of its ability to quickly transfer large files such as scanned images to your PC. High-end scanners may include options such as film and transparency adapters which allow you to scan anything from slides to PowerPoint created overheads. Basically though, there are two major factors to consider when buying a scanner.

**Resolution-** 1) "optical" or hardware resolution and 2) "interpolated"-usually specified as the maximum resolution, this option uses software to interpolate increased resolution into the existing image. Interpolation basically surveys the pixels your hardware was able to scan and adds pixels in between based on averaging algorithms.

**Size-** Most flatbed scanners support scanning standard 8.5 x 11 sheets as well as legal size documents. Larger 11 x 17 solutions are more expensive and may require an enterprise grade scanner to achieve sufficient results.



For big jobs, select a scanner with a built in sheet feeder, and automatic document naming and saving features.

# Document Imaging Management

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The trend in very bold businesses is to banish multiple copiers and printers instead opting for a Document Imaging Management solution. The basic technology behind Document Imaging Management relies on enterprise grade scanning of all company documents, internally and externally in an effort to physically remove paper from the company's operations by converting all written/printed communication into digital image information. While this drastic plan may involve some initial chaos, many solutions and product vendors offer a full complement of support where a representative actually arrives on-site to manually process all existing paper documents to begin integration into the management system. The inherent accessibility of digital media eliminates countless problems associated with maintaining paper files and storage while offering restricted access and document security and privileges in a way never possible with printed material. One type of business that has reported relative success among numerous implementations of the paperless office is law firms. Lawyers essentially deal in an information exchange. From data from clients and other sources, to information gained from research and experience, to pleadings, oral presentations, opinion letters etc. law firms must effectively manage information. Using document management programs such as TimeMatters or GroupWise many firms have been able to cut costs and increase productivity through successful implementation and usage of an 1) enterprise imaging system with auto document feeder such as the one shown here, 2) an imaging program like Adobe Acrobat, and 3) an imaging manager, file server, or network. While carefully organized folders and hard drives can render thousands of pages of material indexed and searchable, some solutions require a hardware investment of \$15,000 and possibly more to effectively create a paperless office.



As an example, the WorkForce Pro GT-S50 document image scanner priced at \$325 offers good value. With a daily duty cycle of up to 1200 sheets, plus a 75-page feeder, Scan everything from business cards to rigid ID cards. The GT-S50 easily scans both sides of one sheet in just one pass in color, grayscale or bi-tonal.

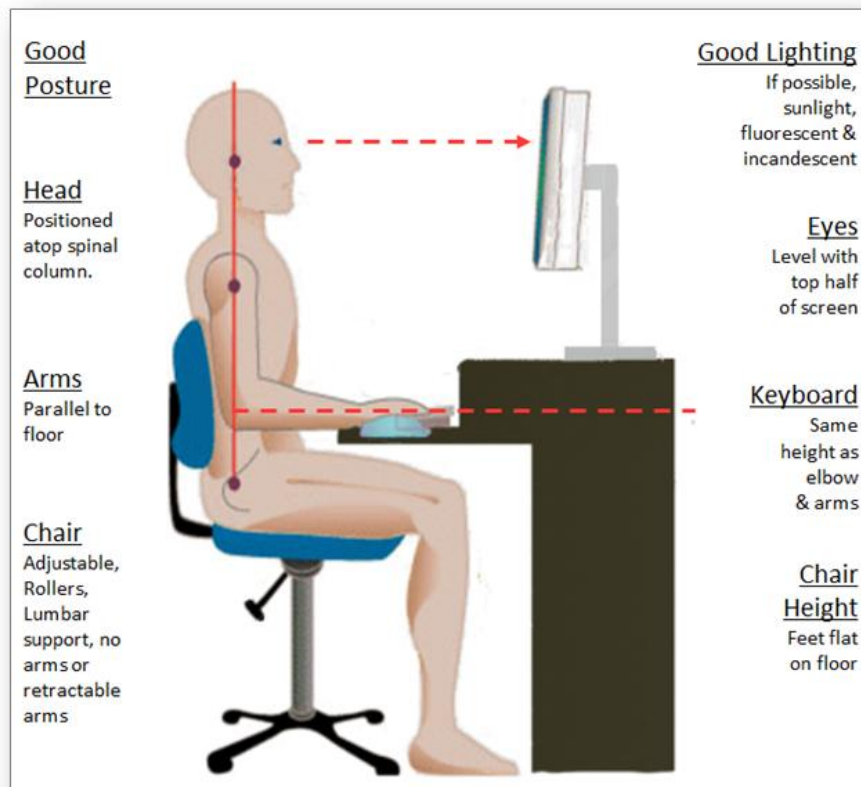


# Ergonomics

## Ergonomics Checklist

### *Ergonomic Tips for Improving Productivity*

As a computer consultant, I frequently sit at client's desks to service their computers, and I am often appalled by the poor quality of their work environment. Unsuitable desks and chairs, as well as improper computer positioning, often make it difficult to work comfortably for extended periods of time. Your employee's workspace should be ergonomically designed to promote good health and improve productivity. Presented below is a brief ergonomics checklist that may assist you in achieving this goal.



1. **Keyboard Height** - Position keyboards at the proper height so that the user's arms are parallel to the ground. In many cases, standard desks are too high and result in the user resting his or her arms on the edge of the desk, which can cut off circulation and interfere with proper blood flow to the hands. A keyboard tray may be needed to position the keyboard at the proper height. Your best approach may be to purchase desks that are designed to serve as computer workstations.
2. **Monitor Height** – The top third of the monitor should be even with the user's eyes. This encourages good posture, reduces strain on neck muscles, and ensures that the head is properly supported atop the spinal column.

3. **Comfortable Chairs** – Chairs should have wheels so users can easily get in or out of the chair and properly position themselves to work comfortably. Ideally, computer chairs should have no arms, retractable arms, or arms positioned at the proper height so the natural position of the user's arms is not inhibited. If the user must lift or spread their arms to avoid the arms of the chair, shoulder and neck muscle fatigue may occur.
4. **Lighting** – The work environment should be well-lit, preferably with sunlight, florescent light and incandescent (if still available) light sources as all three help to maximize readability and to minimize eyestrain. You should avoid or repair lighting that flickers and ensure that there is no glare on the computer monitors.
5. **Monitors** – Newer LCD monitors are easier on the eyes than older CRT monitors, allowing users to work longer and more comfortably. Larger monitors (19 inches or larger) are easier on the eyes than smaller monitors (17 inches or smaller).
6. **Beneficial Devices** – Consider purchasing ergonomic devices such as an ergonomically shaped keyboard and mouse, keyboard tray, monitor riser, padded mouse pad, keyboard wrist pad, padded floor mat (for users who stand), anti-glare screen, back support belt, wrist support brace, and additional lighting.

## Ergonomic Products

Presented below are a few examples of products that can help you create a more ergonomically correct working environment:

Ergonomically Correct Keyboard



Keyboard Wrist Pad



Mouse Pad



Monitor Riser



Keyboard Tray



Wrist Support



Adjustable Chair with Folding Arms



Monrency Arm Rest



Grip Squeeze Balls



Glare Screen



Ergonomic Mouse



Padded Floor Mat



Back Support



Edge Protectors



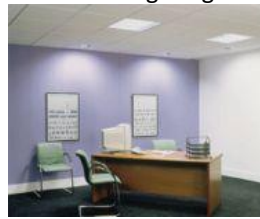
Head Phones



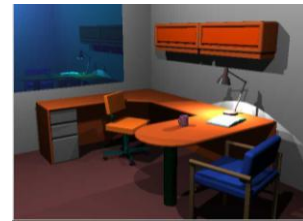
Desk Lamp



Office Lighting



Workstation



Ladder Back Chair



Flat Panel Montitor



No Grip Pen



Adjustable Table

Ball Chair

Knee Chair



Keyboard Lift



## Health at the Workplace

Carpal tunnel syndrome occurs when the median nerve, which runs from the forearm into the hand, becomes pressed or squeezed at the wrist. The median nerve controls sensations to the palm side of the thumb and fingers (although not the little finger), as well as impulses to some small muscles in the hand that allow the fingers and thumb to move. The carpal tunnel - a narrow, rigid passageway of ligament and bones at the base of the hand houses the median nerve and tendons. Sometimes, thickening from irritated tendons or other swelling narrows the tunnel and causes the median nerve to be compressed. The result may be pain, weakness, or numbness in the hand and wrist, radiating up the arm. Although painful sensations may indicate other conditions, carpal tunnel syndrome is the most common and widely known of the entrapment neuropathies in which the body's peripheral nerves are compressed or traumatized.



The risk of developing carpal tunnel syndrome is not confined to people in a single industry or job, but is especially common in those performing assembly line work - manufacturing, sewing, finishing, cleaning, and meat, poultry, or fish packing. In fact, carpal tunnel syndrome is three times more common among assemblers than among data-entry personnel. A 2001 study by the Mayo Clinic found heavy computer use (up to 7 hours a day) did not increase a person's risk of developing carpal tunnel syndrome. During 1998, an estimated three of every 10,000 workers lost time from work because of carpal tunnel syndrome. Half of these workers missed more than 10 days of work. The average lifetime cost of carpal tunnel syndrome, including medical bills and lost time from work, is estimated to be about \$30,000 for each injured worker.

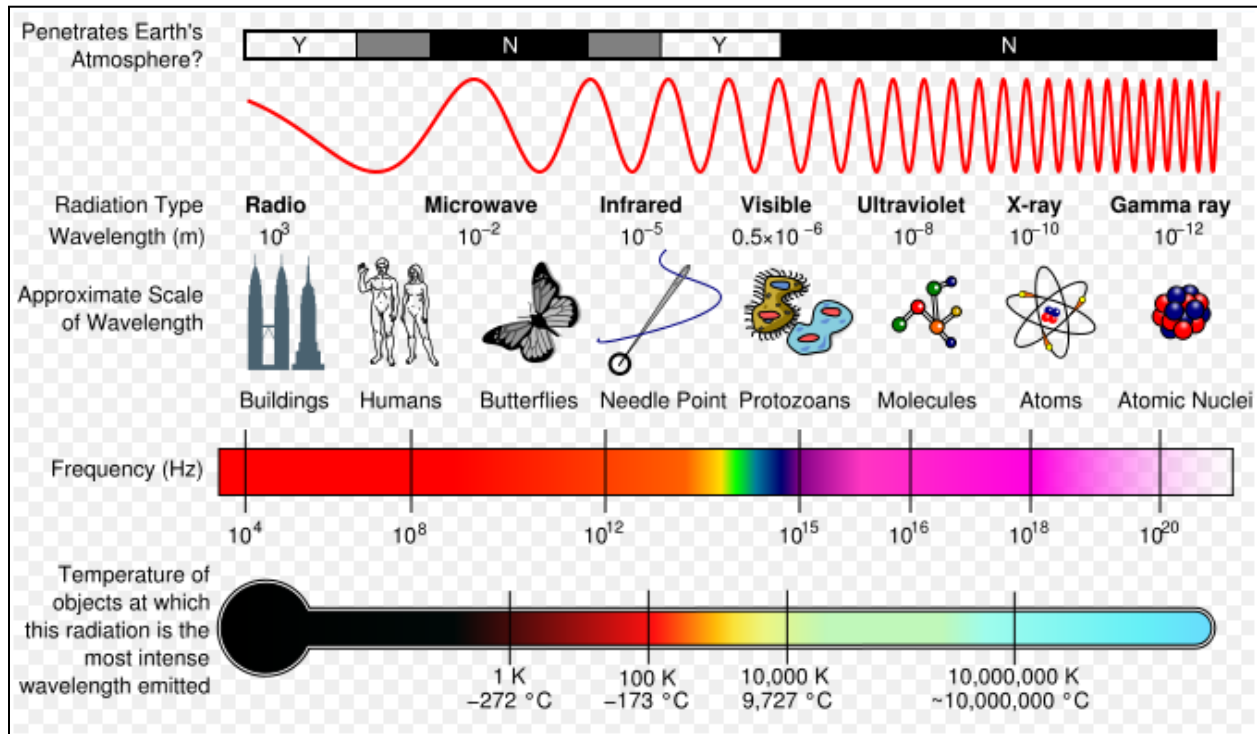


# Wireless Networking & Internet Hotspots



# The Electromagnetic Spectrum

Generally, Electromagnetic radiation is classified by wavelength into radio wave, microwave, infrared, the visible region we perceive as light, ultraviolet, X-rays and gamma rays. The behavior of EM radiation depends on its wavelength. When EM radiation interacts with single atoms and molecules, its behavior also depends on the amount of energy per quantum (photon) it carries.



**Fancy Talk & Impressive Formula** - EM waves are typically described by any of the following three physical properties: the frequency  $f$ , wavelength  $\lambda$ , or photon energy  $E$ . Wavelength is inversely proportional to the wave frequency, so gamma rays have very short wavelengths that are fractions of the size of atoms, whereas wavelengths can be as long as the universe. Photon energy is directly proportional to the wave frequency, so gamma rays have the highest energy (around a billion electron volts) and radio waves have very low energy (around femto electron volts). These relations are illustrated by the following equations:

$$f = \frac{c}{\lambda}, \quad \text{or} \quad f = \frac{E}{h}, \quad \text{or} \quad E = \frac{hc}{\lambda},$$

where:

$c = 299,792,458$  m/s is the speed of light in vacuum and

$h = 6.62606896(33) \times 10^{-34}$  J s =  $4.13566733(10) \times 10^{-15}$  eV s is Planck's constant.

Electromagnetic radiation interacts with matter in different ways in different parts of the spectrum. The types of interaction can be so different that it seems to be justified to refer to different types of radiation. At the same time, there is a continuum containing all these "different kinds" of electromagnetic radiation. Thus we refer to a spectrum, but divide it up based on the different interactions with matter.

Region Of The Spectrum	Main Interactions With Matter
Radio	Collective oscillation of charge carriers in bulk material (plasma oscillation).
Microwave - far infrared	Plasma oscillation, molecular rotation
Near infrared	Molecular vibration, plasma oscillation (in metals only)
Visible	Molecular electron excitation (including pigment molecules found in the human retina), plasma oscillations (in metals only)
Ultraviolet	Excitation of molecular and atomic valence electrons, including ejection of the electrons (photoelectric effect)
X-rays	Excitation and ejection of core atomic electrons, Compton scattering (for low atomic numbers)
Gamma rays	Energetic ejection of core electrons in heavy elements, Compton scattering (for all atomic numbers), excitation of atomic nuclei, including dissociation of nuclei
High energy gamma rays	Creation of particle-antiparticle pairs. At very high energies a single photon can create a shower of high energy particles and antiparticles upon interaction with matter.

While not technically accurate, it helps to visualize communications this way: Electrons vibrate more slowly at one end of the EM spectrum, and faster at the other end of the EM spectrum. When you speak through a cell phone to a person in New Zealand, your voice is converted into digital signal which is then carried to New Zealand by atoms vibrating at the same speed. Each vibrating electron affects the adjacent electron with the same digital signal, and so on, and so on all the way around the world. This happens eloquently like the silver balls in the Newton's Cradle pictured below.



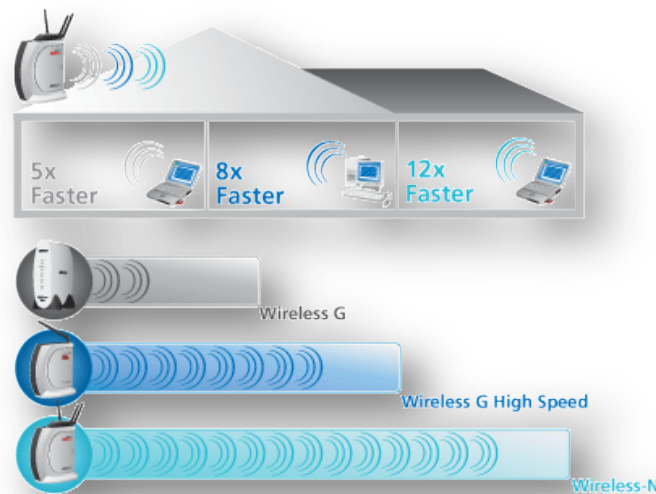


# Wi-Fi - MIMO and N

Wireless technology has become the de facto networking standard, from hotspots to homes, even small businesses are beginning to reap the benefits of low installation costs and convenient fast throughput. While any Wi-Fi connection, even a weak one, is adequate to surf the Internet and transfer data, if distance and obstacles sap too much bandwidth from a network, high volume or streaming content such as video can begin to break up or degrade. With the growing popularity of home theatre personal computers (HTPCs), Personal Video Recorders (PVRs) such as Tivo, and voice over internet protocol (VOIP), and other bandwidth intensive applications, the need for a long range stable wireless standard is more apparent than ever.



One technology that has delivered greater range and faster more reliable throughput is an innovation called MIMO, short for multiple input, multiple output. This new technology was originally referred to initially as Pre-N, and later as DRAFT-N and now as "N" or "MIMO". It uses a number of antennas to overlay the signals of two or more Wireless-G compatible radios, MIMO effectively increases the wireless data rate from 54 Mbit/s to 600 Mbit/s with the use of four spatial streams at a channel width of 40 MHz.



MIMO overcomes the weaknesses of other wireless networking technologies that are confused by signal reflections, instead using reflections to increase the range and reduce "dead spots" in the coverage area. The stronger signal allows for wireless connections up to 3 times farther than standard than those possible with regular G networks. Additionally, by utilizing the reflected signal, MIMO can also hypothetically increase throughput about 8x more than regular G. MIMO routers avoid interference by dynamically switching to the clearest channel available.

MIMO technology uses multiple antennas to resolve more information than possible using a single

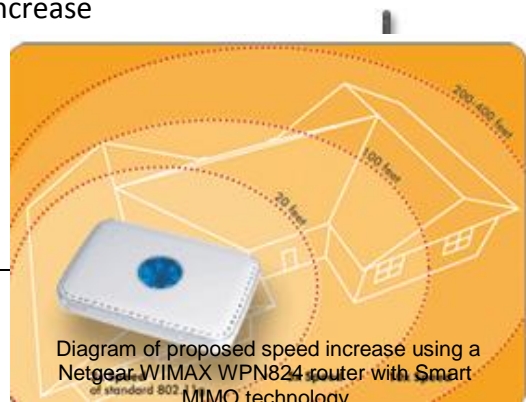


Diagram of proposed speed increase using a Netgear WIMAX WPN824 router with Smart MIMO technology

antenna. One way it provides this is through Spatial Division Multiplexing (SDM). SDM spatially multiplexes multiple independent data streams, transferred simultaneously within one spectral channel of bandwidth. MIMO SDM can significantly increase data throughput as the number of resolved spatial data streams is increased. Each spatial stream requires a discrete antenna at both the transmitter and the receiver. In addition, MIMO technology requires a separate radio frequency chain and analog-to-digital converter for each MIMO antenna which translates to higher implementation costs compared to non-MIMO systems.

40 MHz channels is another feature incorporated into 802.11n which doubles the channel width from 20 MHz in previous 802.11 PHYs to transmit data. It can be enabled in the 5 GHz mode, or within the 2.4 GHz if there is knowledge that it will not interfere with any other 802.11 or non-802.11 (such as Bluetooth) system using those same frequencies.

## WiMAX

WiMAX (Worldwide Interoperability for Microwave Access) is a telecommunications technology that provides fixed and fully mobile internet access. The technology provides up to 30 Mbps in real world end-user throughput. WiMAX is based on the IEEE 802.16 standard (also called Broadband Wireless Access). WiMAX offers an acceptable alternative to cable and DSL.

Because of its ability to span long distances up to 34 miles and deliver data at 1 gigabit per second, WiMAX is dramatically superior to the previous wireless standards such as “a”, “b”, “g”, and even “n”.

On May 7, 2008, Sprint, Nextel, Google, Intel, Comcast, Bright House, and Time Warner announced a pooling of an average of 120 MHz of spectrum and merged with Clearwire to form a company called “Clear”. The new company hopes to leverage this technology along with their combined services offerings to springboard past their competitors. The cable companies will provide media services to other partners while gaining access to the wireless network as a Mobile virtual network operator to provide triple-play services.

## The Basics - What is Wi-Fi?

Wireless Fidelity hardware uses radio technology in the 2.4GHz or 5GHz range. Wi-Fi technology currently supports three main standards called 802.11a, b, and g, each with varying degrees of compatibility and connectivity.

Wireless Standard	Frequency	Range/ Interference	Maximum Possible Throughput
802.11a	5GHz	short range, easily obstructed	54Mbps
802.11b	2.4GHz	long range, high signal integrity	11Mbps
802.11g	2.4GHz	long range, high signal integrity	54Mbps
Super G G standard using dual channels	2.4GHz	long range, greater vulnerability to interference due to using greater amount of available spectrum	108Mbps Only possible with other Super G devices
802.11n	2.4GHz or 5.0 GHz	Long range	300 Mbps
802.16e 802.16m	10 GHz to 66 GHz and 2GHz to 11GHz	long range, covering 18 to 34 miles	1,000 Mbps
<i>Bluetooth- Typically used to connect cellular phones and wireless headsets</i>	2.45GHz	<i>No native support for IP, so it does not support TCP/IP and wireless LAN applications well. Not originally created to support wireless LANs. Best suited for connecting PDAs, cell phones and PCs in short intervals.</i>	<i>2 Mbps</i>

**Backward compatibility** - When 802.11g was released to share the band with existing 802.11b devices, it provided ways of ensuring coexistence between the legacy and the new devices. 802.11n extends the coexistence management to protect its transmissions from legacy devices, which include 802.11g, 802.11b and 802.11a.

**Access Points** - A Wi-Fi hotspot is created by installing an access point to an internet connection. The access point transmits a wireless signal over a short distance — typically covering around 300 feet. When a Wi-Fi –enabled device, such as a Pocket PC, encounters a hotspot, the device can then connect to that network wirelessly. Most hotspots are located in places that are readily accessible to the public, like airports, coffee shops, hotels, book stores and campus environments.

### Where can I find a Wi-Fi hotspot?





Other than ISP and hotspot provider websites, users can locate hotspots using the internet prior to traveling. [www.WiFreespot.com](http://www.WiFreespot.com) and [www.Wifinder.com](http://www.Wifinder.com) both feature databases of active hotspots. Wi-Fi internet access costs vary depending on the Wi-Fi service provider and the access plan type, typically daily, monthly, or hourly.



Like a public hotspot, homes and businesses can support a Wi-Fi network by adding a wireless access point and equipping the PCs and networked devices with wireless network adapters or WLAN cards.

### Equipment needed for Home or Office Wi-Fi network

1. **Access Points** – Many companies offer wireless routers that perform all the functions of an access point and with the additional security of an integrated firewall.

	<p><b><u>NETGEAR Wireless-N Router WNR2000 - wireless router</u></b></p> <p>N Router WNR2000 - Wireless router + 4-port switch - Ethernet, Fast Ethernet, 802.11b, 802.11g, 802.11n (draft 2.0) - external</p> <p>MFG #: WNR2000-100NAS   CDW #: 1638558</p> <p>See All: <a href="#">Wireless Broadband Routers</a></p>	<p><u>In Stock</u></p>	<p><b>\$79.99</b></p>	<p>Add To Cart</p>
	<p><b><u>Linksys Wireless-N Broadband Router with Storage Link</u></b></p> <p>Wireless-N Broadband Router with Storage Link</p> <p>MFG #: WRT160NL   CDW #: 1753092</p> <p>See All: <a href="#">Wireless Broadband Routers</a></p>	<p><u>In Stock</u></p>	<p><b>\$106.99</b></p>	<p>Add To Cart</p>
	<p><b><u>Cisco WRVS4400N Wireless-N Gigabit Security Router - VPN</u></b></p> <p>• Secure, high-speed wireless network access for small business • Gigabit Ethernet connections enable rapid transfer of large files • Advanced security, including intrusion prevention, helps keep assets safe</p> <p>MFG #: WRVS4400N   CDW #: 1028226</p>	<p><u>In Stock</u></p>	<p><b>\$224.99</b></p>	<p>Add To Cart</p>
	<p><b><u>D-Link DIR-615 Wireless N Router</u></b></p> <p>802.11n Wireless N Router</p> <p>MFG #: DIR-615   CDW #: 1220620</p> <p>See All: <a href="#">Wireless Broadband Routers</a></p>	<p><u>In Stock</u></p>	<p><b>\$62.99</b></p>	<p>Add To Cart</p>

- 2) **Wlan Cards And Adapters** – For desktop computers, notebooks and PDAs without integrated Wi-Fi, the addition of a wireless adapter is a simple and convenient way to enable wireless connectivity on your device.



**Linksys Wireless-G PCI Card**

In Stock

**\$49.99**

54Mbps Wireless G Wireless PCI Network Interface Adapter Card (NIC)

MFG #: WMP54G | CDW #: 452911

See All: [Wireless Adapters](#)

Add To Ca



**Hawking HWUG1 Wireless-G USB Adapter**

In Stock

**\$53.99**

108Mbps 802.11b/g Wireless USB Network Interface Adapter with Removable Antenna

MFG #: HWUG1 | CDW #: 1038208

See All: [Wireless Adapters](#)

Add To Ca



**3Com 11a/b/g Wireless PCI Adapter - network adapter**

In Stock

**\$89.99**

Network adapter - PCI - 802.11b, 802.11a, 802.11g

MFG #: 3CRDAG675B | CDW #: 849210

See All: [Wireless Adapters](#)

Add To Ca



**Belkin Wireless G USB Network Adapter**

In Stock

**\$39.99**

Network adapter - Hi-Speed USB - 802.11b, 802.11g

MFG #: F5D7050 | CDW #: 674432

See All: [Wireless Adapters](#)

Add To Ca

## Wireless Security

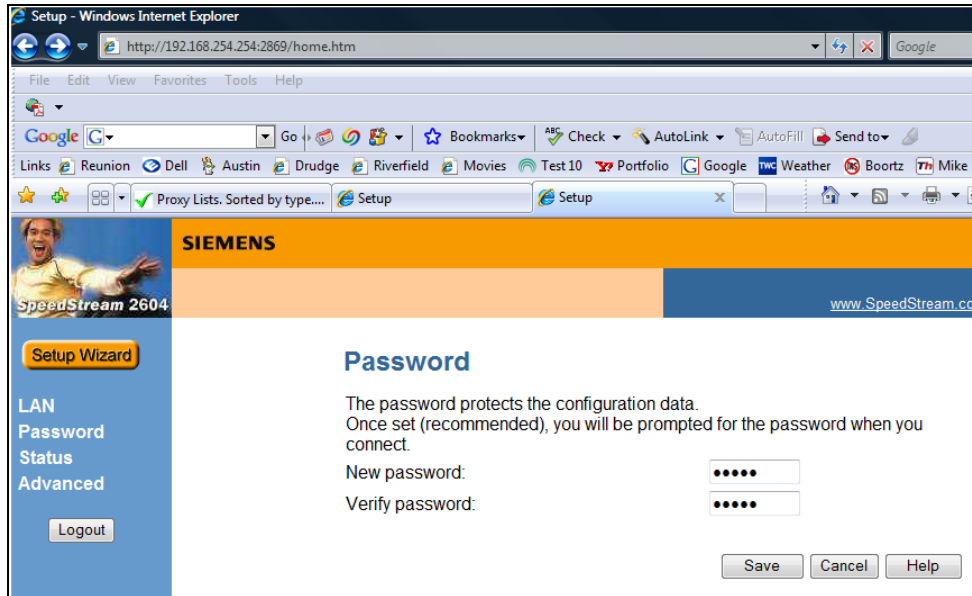
The use of a wireless device provides an invisible access point into your computer network in a range up to 300 feet radius from your wireless device. Hackers use empty tennis ball cans to build devices designed to detect and boost your signal, like the device shown below.



Many users setting up wireless home and small office networks rush through the job to get their Internet connectivity working as quickly as possible, but they fail to take the additional measures needed to properly lock down this new access point. The recommendations below summarize the steps you should take to improve the security of your home wireless network.

1. **Change Default Administrator Passwords (and Usernames)** – The first order of business is to log into your wireless device settings and change the default username and password. The default login name and password is usually “admin” and “password” – and all of the hackers out there know this. Therefore you should change these settings immediately. Here’s how:

- a. *First, you must be connected to the wireless device with a physical wire (such as an Ethernet cable), you sometimes cannot do this wirelessly.*
- b. *Log In to the Network Router by typing the following into your browser: HTTP://192.168.0.1 or whatever IP address is printed on the bottom of the wireless device, if different.*
- c. *Navigate the menu to the Router's Change Password Page.*
- d. *Choose and Enter a New Password.*
- e. *Save the New Password.*

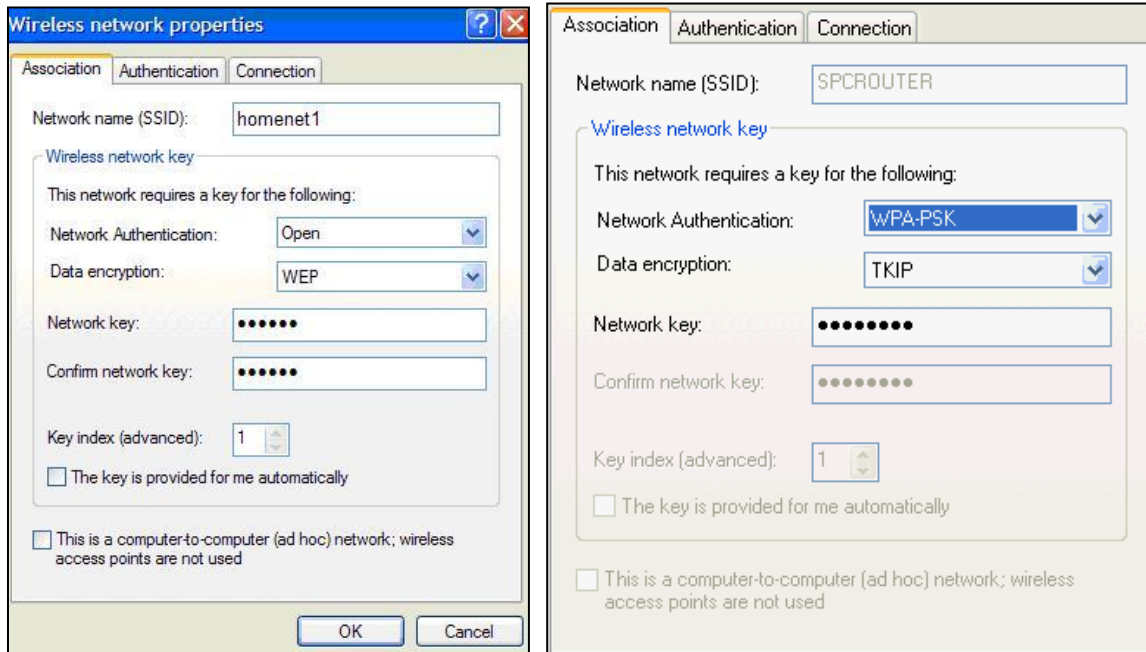


2. **Turn on WPA2 or WPA Encryption** - All Wi-Fi equipment supports some form of encryption scheme as follows:
  - a. **WEP** (Wired Equivalent Privacy) – Found to have serious shortcomings in 2001.
  - b. **WEP 2** – Also, found deficient, WEP2 mutated into TKIP.
  - c. **WEPplus** – Lucent’s attempt to correct WEP shortcomings, but this fell short.
  - d. **Dynamic WEP** – 3COM’s attempt to correct WEP shortcomings which fell short.
  - e. **WPA** (Wi-Fi Protected Access) - the answer to WEP.
  - f. **WPA2.0** – Better than WPA, but does not always work with older devices.
  - g. **WPAPSK-TKIP** – Software driven
  - h. **WPA2PSK-AES** – Hardware driven
  - i. **WPA2PSK-TKIP** – Software driven

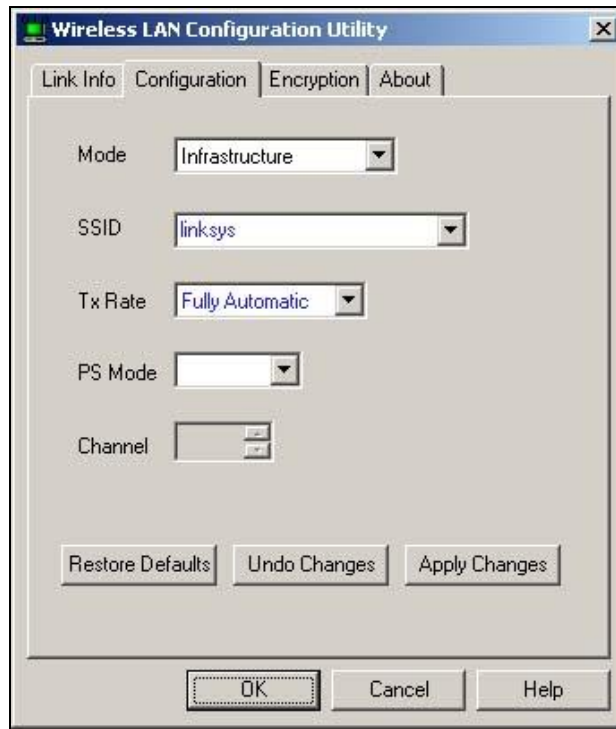
Encryption technology scrambles messages sent over wireless networks so that they cannot be easily read. Several encryption technologies exist for Wi-Fi today. Naturally you will want to pick the strongest form of encryption that works with your wireless network. However, the way these technologies work, all Wi-Fi devices on your network must share the identical encryption settings. Therefore you may need to find a "lowest common denominator" setting. Here’s how you set up WPA:

- a. *First, verify that each computer is running Windows XP Service Pack 1 (SP1) or later.*
- b. *On each computer, verify that the client's network adapter is compatible with the **Wireless Zero Configuration (WZC) service**. (To do this, consult the adapter's product documentation, manufacturer's Web site, or appropriate customer service line for details. Upgrade the network adapter driver and configuration software to support WZC on clients where needed).*
- c. *For each computer, download and install the [Windows XP Support Patch for Wi-Fi Protected Access](#), walk through the installation dialog boxes and following the instructions.*

- d. Continue following the instructions and configure all **Wireless Access Points** (your wireless devices).
- e. Continue following the instructions and configure all **Wireless Network Adapters** (your LAN cards).

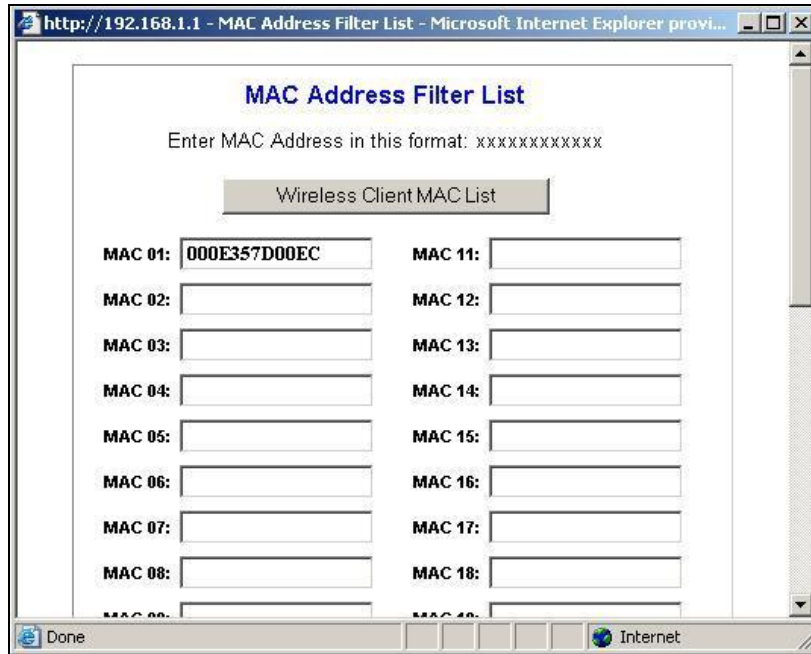


3. **Change the Default SSID** - Access points and routers all use a network name called the SSID. Manufacturers normally ship their products with the same SSID set. For example, the SSID for Linksys devices is normally "linksys." True, knowing the SSID does not by itself allow your neighbors to break into your network, but it is a start. More importantly, when someone finds a default SSID, they see it is a poorly configured network and are much more likely to attack it. Change the default SSID immediately when configuring wireless security on your network.



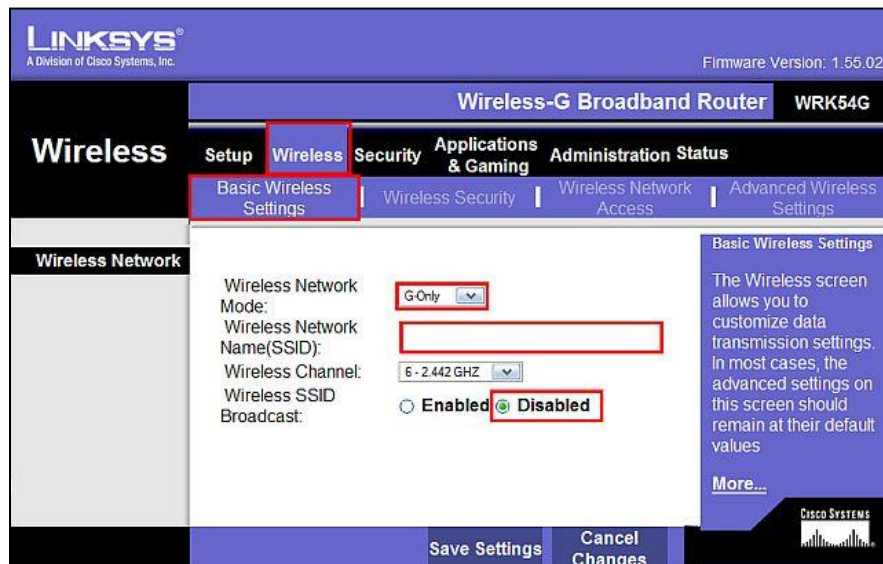
- a. Log In to the Network Router
  - b. Navigate to the Router's Basic Wireless Settings Page
  - c. Choose and Enter a New SSID
  - d. Save the New SSID
4. **Enable MAC Address Filtering** - Each piece of Wi-Fi gear possesses a unique identifier called the physical address or MAC address. Routers keep track of the MAC addresses of all devices that connect to them. Many routers offer the owner an option to key in the MAC addresses of their home or small business equipment which restricts network connections to those devices only. Here's how:

- a. To set up MAC address filtering, first prepare a list of computers and devices that will be allowed to join the network.
- b. Next, obtain the MAC addresses of each computer or device from its operating system or configuration utility.
- c. Next enter those addresses into a configuration screen of the wireless router. An example screen is shown below.
- d. Finally, switch on the filtering option.
- e. Once enabled, whenever the wireless router receives a request to join with the WLAN, it compares the MAC address of that client against the administrator's list. Clients on the list authenticate as normal; clients not on the list are denied any access to the WLAN.



(While this feature represents yet another obstacle/deterrent to hackers, there are many software programs available that enable hackers to defeat this measure by easily faking a MAC addresses.)

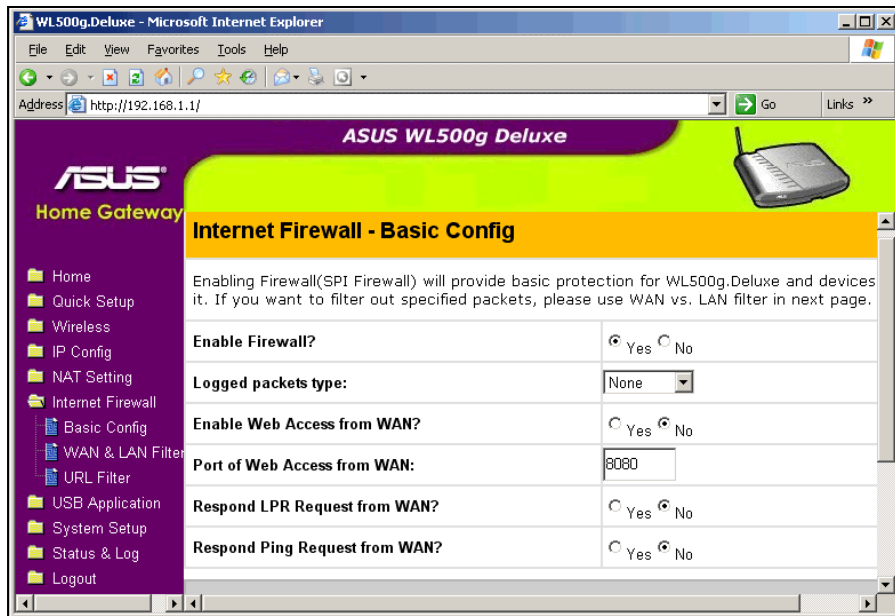
5. **Disable SSID Broadcast** - In Wi-Fi networking, the wireless router typically broadcasts the network name (SSID) over the air at regular intervals. This feature was designed for businesses and mobile hotspots where Wi-Fi clients may roam in and out of range. In the home or small business, this roaming feature is probably unnecessary, and it increases the likelihood someone will try to log in to your home network. Fortunately, most Wi-Fi access points allow the SSID broadcast feature to be disabled by the network administrator. To do this simply log into your wireless router device, navigate to the SSID menu, and click the disable button as shown below.



6. **Do Not Auto-Connect to Open Wi-Fi Networks** - Connecting to an open Wi-Fi network such as a free wireless hotspot or your neighbor's router exposes your computer to security risks. Although not normally enabled, most computers have a setting available allowing these connections to happen automatically without notifying you (the user). This setting should not be enabled except in temporary situations. Here's how:

- a. To verify whether automatic Wi-Fi connections are allowed, open Control Panel.
- b. Click the "Network Connections" option if it exists (otherwise first click "Network and Internet Connections" and then click "Network Connections.")
- c. Right-click "Wireless Network Connection" and choose "Properties."
- d. Click the "Wireless Networks" tab on the Properties page.
- e. Click the "Advanced" button.
- f. Find the "Automatically connect to non-preferred networks" setting. If checked, this setting is enabled, otherwise it is disabled.

7. **Assign Static IP Addresses to Devices** - Most home and small business networks use dynamic IP addresses because DHCP technology is easy to set up and use. Unfortunately, this convenience works to the advantage of network attackers, who can then obtain valid IP addresses from your network's DHCP pool. To be more secure, you may want to turn off DHCP on the router, set a fixed IP address range instead, then configure each connected device to match. Use a private IP address range (like 12.12.12.x) to prevent computers from being directly reached from the Internet. The specific procedures to follow will vary on the devices you are using, therefore you should refer to the user manual or web for detailed instructions for each device you have on your network.
8. **Enable Firewalls On Each Computer and the Router** – Wireless routers contain built-in firewall capability, but the option also exists to disable them. Ensure that your router's firewall is turned on. For extra protection, consider installing and running personal firewall software on each computer connected to the router. To do this simply log into your wireless router device, navigate to the Firewall menu, and click the Enable button as shown below.



- 9. Position the Router or Access Point Safely** - Wi-Fi signals normally reach beyond the walls of a home or small office. A small amount of signal leakage outdoors is not a problem, but the further this signal reaches, the easier it is for others to detect and exploit. Wi-Fi signals often reach through neighboring homes and into streets, for example. When installing a wireless home network, the position of the access point or router determines its reach. Try to position these devices near the center of the home rather than near windows to minimize leakage.

- 10. Turn Off the Network During Extended Periods of Non-Use** - The ultimate in wireless security measures, shutting down your network will most certainly prevent outside hackers from breaking in! While impractical to turn off and on the devices frequently, at least consider doing so during travel or extended periods offline. Computer disk drives have been known to suffer from power cycle wear-and-tear, but this is a secondary concern for broadband modems and routers.

If you own a wireless router but are only using it wired (Ethernet) connections, you can also sometimes turn off Wi-Fi on a broadband router without powering down the entire network.



# Speech Recognition



# Speech Recognition

Speech recognition converts spoken words to text. Speech recognition applications include:


1. Voice dialing (e.g., "Call home"),
2. Call routing (e.g., "I would like to make a collect call"),
3. Simple data entry (e.g., entering a credit card number),
4. Speech-to-text processing (e.g., word processors or emails)


The first speech recognizer appeared in 1952 and consisted of a device for the recognition of single spoken digits [1] Another early device was the IBM Shoebox, exhibited at the 1964 New York World's Fair.


## Windows Speech Recognition


Windows Speech Recognition is a speech recognition application included in Windows Vista and more recently, Windows 7. Windows Speech Recognition allows the user to control the computer by giving specific voice commands. The program can also be used for the dictation of text so that the user can control their Vista or Windows 7 computer.


Windows Speech Recognition relies on Microsoft SAPI version 5.3 (included in Windows Vista) to function. The application also utilizes Microsoft Speech Recognizer 8.0 for Windows as its speech profile engine.

 [Start Speech Recognition](#)  
Start using your voice to control your computer.

 [Set up microphone](#)  
Set up your computer to work properly with Speech Recognition.

 [Take Speech Tutorial](#)  
Learn to use your computer with speech. Learn basic commands and dictation.

 [Train your computer to better understand you](#)  
Read text to your computer to improve your computer's ability to understand your voice. Doing this isn't necessary, but can help improve dictation accuracy.

 [Open the Speech Reference Card](#)  
View and print a list of common commands to keep with you so you always know what to say.

To use Speech Recognition, the first thing you need to do is set it up on your computer. To learn how to do that, see Set up Speech Recognition. When you're ready to use Speech Recognition, you need to speak in simple, short commands. The tables below include some of the more commonly used commands.

# Strategy



# Employee Agreements

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Selected portions of the strategy section of this manual are available at the following web site address: [www.cpaadvisor.us](http://www.cpaadvisor.us). This section is being provided online as bonus material. Please be aware that this entire manual is always available to you on the Internet, where links, pricing, and other materials are continually updated for your convenience. If the section you want to read is password protected, please use the following username and password to access this information:

User name: cpa

Password: integrity

## Top 25 Computer Mistakes

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1. **Slow Internet Access** – If your microwave oven took 8 hours to bake a potato, you would likely never use it. The same is true about Internet access speed. Those who rely on pitiful dial up Internet connections fail to use the Internet to its fullest potential.
2. **Purchase the wrong products**
3. **Pay too much, fail to shop around**
  1. Internet
  2. Computer stores
  3. Resellers
4. **Failure to educate themselves before making a purchase decision**
5. **Failure to look for coupons or rebates**
6. **Failure to look for refurbished items**
7. **Failure to be adequately trained in the system/application**
8. **Paying good money to update rather than replace old technology**
9. **Selecting software based on the old legacy hardware system you have**
10. **Buying too cheap**
11. **Buying CRTs when Flat panels provide much better performance and value per dollar**
12. **Failure to properly configure computer settings**

- 13. Failure to implement virus protection** – Obviously one of the biggest threats
- 14. Failure to take proper security measures.** – Wireless is great, but opens you up to attack, lock access to your systems with WEP encryption, NAT and SPI enabled wireless routers
- 15. Failure to implement a high speed LAN.** It does little good to purchase and implement 100 megabit Cat 5 cables if you plan to hook those cables up to 10 megabit hubs, routers or cards. You should have a certified network technician install your LAN properly and use a LAN speed tester gun to certify the performance of each network location
- 16. Failure to download software updates in a timely manner**
- 18. Using one password for all products/access**
- 19. Failure to have a second e-mail address for chat /personal purposes**
- 20. Turning your computer off each day-this has not been necessary for some time**
- 21. Not backing-up regularly, not backing-up entire system, not backing-up offsite**
- 22. Failure to have a web site** – At a minimum companies should have a web site that provides company overview and contact info. Summary of products, services, mission
- 23. Failure to put contact info on each of your web page addresses**
- 24. Using old printers** – new printers can save as much as 1.5 cents per page because they use toner more efficiently, therefore assuming you print 20 cases of paper a year, you can save \$1500 - much more than you pay for some new printers.
- 25. Turning on search tool controls**



## Bio for J. Carlton Collins, CPA

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J. Carlton Collins, CPA is a Certified Public Accountant with experience in technology, tax, auditing, accounting systems, financial reporting, and bond financing. He is an author, lecturer, and technology & accounting systems consultant. He has published books, articles, and web pages and is the author of the monthly technology Q&A column for the [Journal of Accountancy](#). As a public speaker, Mr. Collins has delivered more than 2,000 lectures in 44 states and 5 countries addressing more than 500,000 CPAs and business professionals. As a consultant, Mr. Collins has assisted 275+ large

and small companies with the selection and implementation of accounting systems. Mr. Collins has a Bachelor's degree in Accounting from the University of Georgia, is a 25+ year member of the American Institute of CPAs and the Georgia Society of CPAs, and is also a licensed realtor.

### Summary of Selected Positions, Awards & Accomplishments:

1. Honored as one of the CPA Industries Top 25 Thought Leaders by [CPA Technology Advisor Magazine](#)
2. Author of the monthly Technology Q&A column for the [Journal of Accountancy](#).
3. Recipient of the AICPA's Lifetime Technical Contribution to the CPA Profession Award.
4. Chairman of the Southeast Accounting Show - the South's largest CPA event.
5. Recipient of the Tom Radcliff Outstanding Discussion Leader Award.
6. Named "Top Ten CPA Technologists" by [Accounting Technologies Magazine](#) (multiple years).
7. Named "Top 100 Most Influential CPAs" by [Accounting Technologies Magazine](#) (multiple years).
8. Has personally delivered over 2,000 technology lectures around the world.
9. Recipient of the Outstanding Discussion Leader Award from the Georgia Society of CPAs.
10. Lead author for PPC's Guide to Installing Microcomputer Accounting Systems.
11. Has installed accounting systems for more than 200 companies.
12. Chairperson of the AICPA Technology Conference.
13. Recipient of the ACCPAC Partner of the Year Award.
14. Determined by SAP to be one of the country's "Top Ten Most Influential ERP Systems Consultants".
15. Has delivered keynote and session lectures at dozens of accounting software conferences.
16. Sworn in as a Certified Public Accountant on September 18, 1985.
17. Member of the American Institute of CPAs since 1985.
18. Member of the Georgia Society of CPAs since 1982.

As an auditor, Mr. Collins has audited businesses in the areas of health care, construction, distribution, automobile dealerships, insurance, manufacturing, and general business. Mr. Collins' tax experience includes corporate, individual, partnership, fiduciary, and estate tax planning work. In the area of finance, Mr. Collins has prepared (or assisted in preparing) feasibility studies and financial forecasts for nearly 300 projects seeking more than \$3 billion in startup capital. Mr. Collins is familiar with bond issues, Medicare and Medicaid reimbursement, and conventional financing matters. In 1992, Mr. Collins contributed and demonstrated more than 500 pages of suggested design improvements to the Microsoft Excel development team of programmers - and many of those improvements are found in Excel today.

At the University of Georgia, Mr. Collins was elected President of the Phi Eta Sigma Honor Society, was initiated into the BIFTAD Honor Society, served three years in the Judicial Defender/Advocate program, and was a member of Alpha Tau Omega fraternity. At Glynn Academy High School, Mr. Collins was Senior Class President, Class Valedictorian (1 of 6), and received a principle nomination to Annapolis Naval Academy. Mr. Collins has been married for 27 years and has two children. He devotes his leisure time to family, travel, tennis, fishing, snow skiing, and riding motorcycles (both dirt and street). Mr. Collins is president of his homeowners association, participates in the Gwinnett Clean and Beautiful program, and volunteers for Cooperative Ministries food drive.

Because I had an extra page left in this book, I'll throw in a few jokes and quotes to brighten your day. Enjoy!

- I'm so poor I can't even pay attention
- I have enough money to last me the rest of my life...unless I buy something.
- It's so simple to be wise. Just think of something stupid to say and then don't say it!
- I'm searching for fun and happiness that does not involve food or money...
- We make a living by what we get, we make a life by what we give.
- Count your age with friends but not with years.
- Never play leapfrog with a unicorn.
- Friction can be a drag.
- When I want your opinion, I'll remove the duct tape.
- Light travels faster than sound. That's why some people appear bright until you hear them speak.
- Football is a combination of two of America's worst elements: Violence and committee meetings.
- I haven't spoken to my wife in years; I don't like to interrupt her.
- My fake plants died because I did not pretend to water them
- Never let a computer know you're in a hurry.
- I totally take back all those times I didn't want to nap when I was younger.
- I planned to surprise my wife with a new centerpiece for the table...but the taxidermist was closed.
- I have kleptomania, but when it gets bad, I take something for it.
- For every action, there is an equal and opposite government program.
- Even free advice costs more than it used to.
- Love is holding hands in the street. Marriage is holding arguments in the street.
- I always try to hold hands with my wife...because if I let go she'll start shopping!
- My back goes out more than I do.
- An Adult is a person who has stopped growing at both ends and is now growing in the middle.
- The journey of a thousand miles ... begins with a broken fan belt.
- I'm getting serious about exercising - I've moved my TV set much farther away from my refrigerator.
- A Freudian slip is when you say one thing but mean your mother.
- While in the army, Will never liked the phrase "Fire at will".
- Studies have shown that you can live longer by having more birthdays.
- My wife keeps saying that I don't listen to her...or something like that.
- My life goal is to be filthy stinking rich...well, 2 out of 3 ain't bad.
- A child of five would understand this. Send someone to fetch a child of five.
- Warning: Dates in Calendar are closer than they appear.
- Because of these hard economic times, I have started selling furniture on the side. The trouble is, it is my own.

### **Carlton's CPE Prayer**

Now I lay me back to sleep.  
The speaker's dull; the subject's deep.  
If he should stop before I wake,  
Give me a nudge for goodness' sake.

