Conversational Geek (in 7 days!)

By J. Peter Bruzzese

Second Edition

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Dedication

For my wife Jennette
and my two beautiful children
Lucas and Bethany

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Author Biography

J. Peter Bruzzese has been working in the world of corporate networking since the early 90's as a teenager. Starting in document processing departments of Manhattan-based legal and corporate banking firms he worked his way up the ladder in Goldman Sachs and Solomon Smith Barney. This was a time of great change in the computing and corporate world as the Internet was just about to become a household name. J. Peter returned to school for networking on a leap of faith (with support from his wife) and he eventually would become one of the most certified IT professionals of his time. He passed certification exams for Microsoft networking, as well as exams through CompTIA, Novell, CIW and other vendors. In the late 90's he established two different networking schools (NetEssentials Training and LAN-Slide Technologies) before being asked to write his first book for Coriolis on Active Directory Design, which he co-wrote with Wayne Dipchan. He would go on to write and contribute to over a dozen titles sold internationally and translated into just as many languages.

More recently J. Peter Bruzzese formed an online company with Tim Duggan called ClipTraining. ClipTraining was formed in 2006 to provide training content through an online learning system that controls access and provides reporting for both individuals and corporate users. The goal is to assist in providing training and support for Windows, Office and other skills through short, task-based videos. J. Peter, as a noted expert on video creation (screencasts) and Microsoft technology has also worked with TrainSignal in recent years to provide administrative training for Exchange and SharePoint.

As a result of his community effort J. Peter has been awarded the prestigious MVP Award for Microsoft Exchange several years in a row. This adds to his credibility as a Microsoft Certified Trainer and technical journalist. In addition to books, J. Peter writes for a variety of different in-print and online tech periodicals. He has written the Enterprise Windows column for InfoWorld for several years. And he speaks at technical conferences like TechMentor, MEC, FETC, Connections, TechEd and the Microsoft WPC.

2nd Edition Acknowledgements

As always, my wife Jennette deserves the greatest amount of thanks. She has put up with my geek side for 15+ years and continues to support me. I said in the first edition of this book "That's why, after years of being completely Microsoft in my home, I bought her an iPad. Now if that isn't love I don't know what is." Well, I'm about to buy her a new iPad so my love and appreciation for her is apparently as strong as ever.

There are truly too many to acknowledge and thank if I really start thinking about it. I might start with my parents who purchased my first Commodore 64 back in the day. It was on that system that I learned how to do Basic coding and changed a simple Black Jack program into one that allowed betting with my uncle Ritchie. But even prior to this time I can remember my cousin Ron Barrett taking apart his computer, which I believe was a Vic 20 and that was the first time I saw a circuit board. Years later it was David Perez who taught me my first DOS commands and taught me all about the pains of finding a driver for a 2400 baud modem in my first 386 system.

I have to thank my cousin Barbara for getting me into Goldman Sachs in my teenage years. That corporate training in document processing led to my career in networking. Once I decided upon my path in IT, it was Yolanda Miceli who gave me a bunch of old equipment when I was learning NT networking, which really helped learn hardware basics. Ron Brockelman who is truly a geek, in a good way, taught me the real depths of computers and networking and also helped me get into online gaming with all-night games of Descent. Our first computer school together, NetEssentials, gave us a great place to geek-out with in-house Descent gaming for students and those were great times. Thanks to Steve Reina who put a $15,000 underwater repeater into my hands and explained to me the inner workings of the global Internet. Certainly thanks to my dear friend David Solomon for guiding me in a good direction early on in my career.

I'd like to thank Wayne Dipchan, my co-author on our first book together while putting together Lan-Slide Technologies, another fun adventure. And in modern times I have to thank Tim Duggan

who really helped me tap into my inner geek side by forming ClipTraining with me and letting me focus completely on my artistic, computer side while he handles the business end (like Jobs and Wozniak or Gates and Allen). Thanks to John Duggan for believing intensely in ClipTraining and what we've created, and for traveling all over with me when I speak at conferences and when I have to take trips to Microsoft. I certainly wish to thank John Van Horn for taking the many ideas and concepts regarding ClipTraining and helping turn those into realities. I'd like to thank Nick Saccomanno for being my right hand for years and Jaclyn McGovern for being a great assistant. I'd like to thank those who have worked with ClipTraining over the years including Donna Bruzzese, Jaime Lindsay, Sarah Severino, Trisha Grencer, Diane McSorley, Jack Blovits, Sally Slack, Patricia Ciszek, Emily Swartz, and Heather Fitzpatrick. And I'd also like to thank my friends and colleagues at TrainSignal who continue to both challenge and inspire me, including Scott Skinger, Gary Eimerman, Iman Jalali, Gosia Niklinski, along with the whole TrainSignal team.

I'd like to thank InfoWorld and Galen Gruman, Eric Knorr, Jason Snyder and Ted Samson who I have thoroughly enjoyed working with for the past few years with my Enterprise Windows column. I'd like to thank the folks at MSExchange.org, SearchExchange (TechTarget), Redmond Magazine and 1105 Media as well as Windows IT Pro/Penton. I'd like to thank Loretta Yates, my acquisitions editor from Que/Pearson. Certainly the entire Exchange Team, Navin Chand and my MVP Lead Melissa Travers. Matt Gervais from TechTarget. Sean Buttigieg and Barbara Matysik-Magro from TechGenix (MSExchange.org) Jay Gundotra (ENow), Ray Downes and Peter Melerud (Kemp Technologies), Julian Martin (Mimecast) and many more. And all of my friends and fellow speakers at TechMentor including Jeff Hicks, Don Jones, Greg Shields, Mark Minasi, Matthew Parks, Bruce Mackenzie-Low, and the list goes on. Thanks to all of you for working with me over the years.

One of the persons I'd like to thank and who was partly an inspiration for the premise to this book is Colton Giarrano. Colton, although young in years, has an excitement about technology and computers that had me eager to explain so many

of the things that I take for granted as 'techie stuff everyone knows'. The truth is many of our young people don't know the basics of binary code, or how the Internet really works. It's not that it is too difficult to learn really, as you'll see, but it just isn't taught as basic education - although I feel it should be. Having a single resource to help them learn these things is what this book is meant to be. Not a textbook about everything (that would be huge) but the basics of many things, all in 7 days.

In addition I'd like to thank all of those who helped work on this book and who helped to sponsor it. It is more of a fun project for me and one that I've been hoping to do for some time so I'm grateful to the following for helping me make this a reality: Nick Saccomanno, my Project Editor; Falen Oestrike-Todaro, my Copy Editor; Ed Liberman, my Technical Editor, and David Davis, Brien (and Taz) Posey, Steve Reina and Brian Green, my official Super Geek Reviewers. I'd like to thank Katelyn Sweeney for reviewing the Second Edition and helping put a younger slant to the content. I'd like to thank the cartoonist Simon Goodway for putting my inner geek into a character that represents the inner me.

I call the geek in the pictures J. because while my friends all know me as Peter when I write and speak I use J. Peter. So apparently the J. represents my geek side.

J. P. B.

Greetings! I'm J.

Introduction from the Author

What exactly is Conversational Geek all about? Part of it is technology; part of it is the history of how that technology developed and the culture that has developed around it. And certainly there is an element to conversational geek that revolves around the entertainment choices of a "geek".

Let's clarify the term "geek" right at the outset.

Definition of a Geek: A person with an eccentric devotion to a particular interest: "a computer geek". The people you pick on in high school and end up working for as an adult (UrbanDictionary.com). It is important to clarify the concept of what we mean by 'geek' because this term is often confused with the term 'nerd'. The terms geek and nerd are not interchangeable. Geek is more computer-oriented and while nerds typically have no or low social skills, geeks use the Internet to practice their social skills and master a 'cooler online' presence that nerds may never obtain. So, while a geek might be a nerd, it's not a given. Nor is it a given that every nerd knows a ton of stuff about computers per se.

http://www.mastersinit.org/geeks-vs-nerds/

The purpose of this book is to help a person who has little technical background and know-how to understand the terms, history and concepts that geeks use every day. I try to make the explanations as easy to swallow as I can. It won't always be easy to grasp every point but don't stress about that. If you are dating or married to a geek, have a son or daughter who is a geek, want to be able to converse with your IT guy/gal or simply want to understand what some of the jokes mean on the TV show "The Big Bang Theory", this book will help you to both converse and understand "traditional" geek. I say traditional geek because there are certainly dialects as well for those who are programmers, IT, hackers, gamers and so on. Each side speaks their own flavor of geek but we will stick with traditional geek in this book unless we feel a dialect term needs to be included.

My motive in writing this book is to bridge a gap of both young and old with regard to the wonderful history and cool developments that have led us to the information age. Each year it becomes more obscure as we get further and further away from the start of the computer era. I realized this even more so when speaking to a younger developer geek (my good friend Eric Hoanshelt) when I mentioned the movie War Games, thinking he would know exactly what I was talking about. He had no idea. This told me it was time to draw a line in the sand between the future and the past and create a book that would fill people in up to this point on the inner workings of the technology around them and of the geek mind. In doing this I knew I couldn't do it alone, I needed the help of other geeks who have contributed to the contents of this book to ensure it is well rounded.

One note about the structure of this book. There are 7 chapters (and with the 2nd Edition, some Appendix items), one for each day of the week. Hey, the cover does say "(in 7 days)" right? Within the chapters you'll see some notes with a V hand next to them that might be reminiscent of a special extraterrestrial greeting. These are deeper explanations revolving around the subject at hand. Other times you might see a sword of light note. These help to give further insight on a subject, perhaps a trivia point or just a personal point that I'd like to make. And finally, you might see our main character J. in a mirror which are "You might be a geek…" jokes, meant to help keep the mood light even if the subject matter is, at times, unavoidably heavy.

Note that there are also page number items to be aware of. For page numbers we use Decimal, Binary and Klingon.

It is my hope that you enjoy this book and learn a great deal from it. May it bridge the gap between geeks and non-geeks.

Chapter 1: Desktop Computers
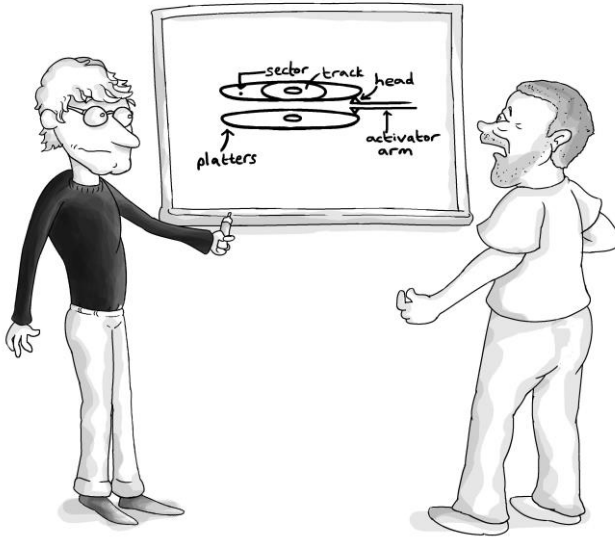
"Dude, why does the hard disk look like the Enterprise?"

Even though home computers have been around for quite some time, it is still a huge mystery for most folks in terms of how computers work and what is actually inside the box. This chapter will help readers to demystify 'the box' and it's not so stealth contents.

The 10 Parts to Virtually Every Computer

Computers are made up of mainly 10 parts. It's true! Sure there are specialty items like water cooling systems and fancy glow lighting you can add if you want to trick out your system ("pimp your computing rides" so to speak). For the most part we will look at the 10 different pieces contained within most desktop computers.

The 10 parts include the following:

> Power Supply
>
> Motherboard
>
> Processor
>
> Fans, Heat Sinks and Cooling
>
> Memory
>
> Hard Drive
>
> Optical Drives (CD/DVD/Blu-ray Burners)
>
> Video Card
>
> Additional Cards (Sound, Network, etc…)
>
> Peripherals

The goal here is not to make you an expert on every little detail involving computer parts but rather, give you a better understanding of how each part is used. Let's start with the Power Supply.

The Power Supply

The Power Supply is not named correctly. It doesn't officially supply power. In actuality, it dummies power down to meet the low voltage needs of your motherboard and other connected items (aka peripherals); like your hard drive and other items requiring specific power to be supplied. Whatever voltage of power is coming from your wall (110 or 220V) is way too much for the tiny pathways running on your motherboard to handle. So, the Power Supply takes power coming in from the wall and releases it out in 3V, 5V or 12V increments. In addition, the Power Supply takes the AC (alternating current) coming out of the wall and converts it to DC (direct current) which is more stable for the very sensitive computer equipment.

The Motherboard

The motherboard (also known as the logic board in Apple computers) is a printed circuit board that has what looks like mini highways of copper running everywhere connecting all the components together to allow for power to run to a variety of different components including the processor, memory, peripherals and so on. Modern motherboards include on-board features such as: video, sound, networking, keyboard and mouse, and USB ports; just to name a few.

When you get a shock from walking across a rug you might only be dealing with 10 to 12,000 volts, which doesn't kill, you need to be more worried about amps. On the other hand, you will feel it once it reaches 3,000 to 4,000 volts. Warning: you can zap an integrated circuit on the motherboard with an unfelt 400 volts (some say less). Don't reason that your system is safe just because you worked on it and didn't feel anything "bad" happen or see a spark.

The pathways and components on a motherboard are quite sensitive to electrostatic discharges. That's a fancy word for a static shock, or the sparks that come off your fingers. Those sparks might not be visible or even felt but they can do a tremendous amount of damage to the pathways on your motherboard. Imagine giant bolts of lightning coming out of the sky and destroying literal highways. There may be alternate routes for cars to travel, but it sure will slow things down. The same is true of going into your computer and touching things

without wearing some kind of Electro Static Discharge (ESD) device such as a wrist strap to dissipate the static electricity.

The motherboard has a special set of instructions built into it called the BIOS (Basic Input/Output System). Before you see anything resembling your operating system or anything graphical showing on the screen there has to be something that tells the computer what and how to display information on the monitor, as well as how to use the various peripherals plugged in; both those you can see like the keyboard and those you cannot see like the hard disk. When the computer boots up it does a little wake up test (called a Power On Self-Test or POST) that just makes sure everything is working spot-on. You might see a geek access the BIOS from time to time by hitting a key like F12 and then the screen is somewhat blue with white text.

> The BIOS solution is being replaced by modern, more secure solutions like the Extensible Firmware Interface and the Unified Extensible Firmware Interface (UEFI) to hopefully assist in protecting systems from bootkit malware. Microsoft is requiring systems that say "Designed for Windows 8" stickers to have UEFI with secure boot enabled by default.

Now, you may have heard of something call CMOS which stands for Complementary Metal-Oxide-Semiconductor, and wondered what the difference is between CMOS and BIOS. Well, I'm here to give you the answer. While the BIOS is responsible for the basic instructions on how to boot into an operating system, the CMOS is a chip on the motherboard which stores the settings of the computer system itself. CMOS is technically volatile, meaning that it will lose its settings if it loses power. For this reason the motherboard will have a CMOS battery which will allow the CMOS chip to maintain its settings even when the computer is turned off or even unplugged.

The Processor

The Processor (aka CPU) is like the brain of the computer and it sits firmly on the motherboard. The two go hand in hand in the sense that you cannot just buy any motherboard and any processor and hope the two work together. The motherboard has to be designed to work with the form factor of the processor you are using. The processor is responsible for processing (logically) all the data coming its way and in some cases computing information to obtain results. In other cases it displays items on the screen like letters, pictures, video and so on.

Most folks don't realize that the processor only executes instructions. It has no idea what you are really doing and everything that comes through it is in binary. That means it gets inputs of 0's or 1's that are bits grouped together into groups of 8, which are called bytes. (We'll get into this fun topic that is sure to be a favorite party conversation game later on in this chapter.) Some wonder how the processor "sees" the binary even when there is no literal binary in the sense that zeros and ones cannot fly through the processor literally but rather these are represented by signals. High and low voltage signals can represent to the processor the 0's and 1's and it handles the many bits/bytes coming its way at super-fast speeds to play that video or display that document and so on.

> Younger geeks know that Intel and AMD processors go head to head. But older geeks remember the processor that first gave Intel some competition and that was Cyrix. It was thanks to both Cyrix and AMD that Intel had to sell CPU's more reasonably priced, eventually pushing Intel selling the cheaper Celeron processors.

The two big players in the PC desktop processing world are Intel and AMD. It's a huge debate on which one is better but ultimately it has come down to a 'religious war' which is a term we use to describe the battle amongst geeks over one solution or

another. A good example is Apple vs. PC (or vs. Microsoft really). Each processor has features that, in the eyes of each hardware geek, have greater significance over other features.

<u>Note</u>: The modern processor war revolves more around mobile computing processors with ARM architecture (aka RISC-based) going up against Intel's Atom brand of mobile processors. We'll discuss this more in Chapter 5.

Some motherboards have the ability to hold more than one processor with multiple CPU slots. In addition, a term you might hear when talking about processors involves 'cores'. So some will boast a dual core or a quad core processor (more modern ones boast hexa or octa-core). Essentially it means the processor, although a single component has additional independently functioning processors inside. Obviously this improves the speed of the system because these processors work to perform functions parallel to one another.

Gordon Moore, co-founder of Intel, made an observation in 1965 that said the number of transistors that could be in a chip doubled each year. The time frame was adjusted to 2 years in 1975 and it was tweaked by David House, an executive at Intel, to 18 months so folks have all sorts of different views on what Moore's law really is. Moore was speaking literally about transistors whereas David House was speaking about performance due in part to the ability to have more transistors.

Fans, Heat Sinks and Cooling

As you can imagine the processor gets hot because of the billions of cycles per second it has to perform. If it gets too hot it will explode! Well, not quite… but it will stop working and a computer that is running too hot will either cause permanent damage or reduce the life of your system. To keep the processor cool there are things called heat sinks that help to pull the heat off the processor. The processor also has a fan. Contrary to

popular belief, the fan isn't blowing on the heat sink and processor to cool it down but rather blows the heat (being pulled away from the processor by the heat sink) away from it. This adds more heat to the inside system itself. Then the entire system usually has a fan (or fans) of its own to remove the hot air. If you have ever been working on your laptop or desktop and put your hand where the fan is blowing out you can feel how hot that air is and now you know why. In addition to fans and heat sinks there are all sorts of other ways to keep the system cooler like a liquid cooling system.

The case plays a very important role in cooling the system. People sometimes remove the side panel to help cool the system more if they think it is getting hot but that may actually do more harm than good. Removing plates or opening the cover works against the design to keep the system and CPU cooler.

You'll hear hardware geeks talk about 'overclocking' their systems. According to the Overclockers Club (http://www.overclockersclub.com) "Overclocking is the process of increasing the clock frequency of your Central Processing Unit (CPU), Graphical Processing Unit (GPU), Memory, PCI, and/or AGP devices. In other words, making your computer run faster without having to spend the money on upgrades."

Memory

Imagine you are working at a desk and you have a big file cabinet in a room down the hall from your office. Obviously you don't want to walk back and forth every time you need a new file; thus you might take a few files and put them in a little bin on your desk. As you finish with files you might put some back and take other files out. Unfortunately the size of the bin dictates how

much you can take at one time. Well, your memory is like that bin and your hard drive is equal to the file cabinet which holds all sorts of files. To make working with the files faster they go to the memory bin. The size of your memory varies with each system and you'll see some systems advertising 2GB, 4GB or more.

A computer that is advertising over 4GB of memory must have an operating system that can handle and work with that much memory. A 32-bit Windows client operating system can handle all RAM that is addressable below the 4 GB physical memory address; but a 64-bit system can handle more GB. So if you buy a system that says it has 4GB (or more) of RAM, you want to make sure you have a 64-bit operating system.

Don't worry too much about the terms 32 and 64-bit; it is simple math… 64 is better. You might think of it like a highway that has 32 lanes. Traffic can only move at the speed limit. But if you open up 64 lanes, even if the speed stays the same, more traffic can get to where it needs to go. The processor speed is like the speed limit which is why overclocking (like we mentioned earlier) is like driving over the speed limit and not recommended by the manufacturer.

When purchasing a computer you may want the fastest system with the most memory because you want the best. The question you need to answer is: Do you need the best? Some folks buy the latest, greatest and fastest system they can find; but aren't really "Power Users", that is, they never really use the system to its maximum potential as a result of their intense use of applications.

If you ever decide you want to increase the amount of memory in your system you need to make sure you are purchasing the right memory for your motherboard and then figure out how it snaps in. It usually slides in easily and snaps into place.

Sometimes you'll hear the term 'cache' or more specifically L1 or L2 cache. This is a high speed memory that helps to make the transition of data work a bit faster. The L1 cache is right within the processor and helps move data faster from the processor to the L2 cache. Whereas, the L2 cache helps data move in and out of memory.

The Hard Drive

Like memory and the cache, hard drives store data files. However, memory and the cache are volatile while hard drives are non-volatile, which means if you lose power or perform a hard shut down of your machine, you'll lose the data in memory and the cache, but your hard drive will retain data saved there.

A hard disk drive, or HDD (introduced in 1956 by IBM) has metallic platters that spin and there are controller arms that have read/write heads to read and write data to the platters. Think of it like a record player where the needles can read both the top and bottom of the record; but in this case the needles (or heads) can also write to the record (or platter). In case you couldn't figure it out by looking at it, the cartoon at the beginning of this chapter is a drawing of the internals of a hard drive and I was told once that my drawing of it looked like the Enterprise.

The data is written in binary data. Again, binary (0's and 1's) is the way computers really operate. All the documents, pictures and videos on your computer are actually being stored in your hard drive in 0's and 1's.

Hard drives are located inside the computer where they are attached to the Power Supply which is connected by a ribbon cable to the motherboard (with older drives) unless it's a SATA drive, which uses a SATA cable that is more narrow and slightly thicker. The cable carries data between the motherboard and the hard drive. There are also external drives or USB drives that can be plugged into the computer for external storage.

Solid-state drives (SSDs) are a newer type of storage technology that don't have all the moving parts of HDDs. They run much more quietly, have less latency and require less power to run,

although they are more expensive than HDDs when comparing. A hybrid option is the Solid State Hybrid Drive (SSHD) which has both in the same unit with the disk holding data while the SSD acting as a cache to improve performance.

Hard drive sizes and speeds have grown since they were first created by IBM in the 1950's. These days you can pick up a hard drive that is hundreds of Gigabytes in size or even a Terabyte or two for under $200, depending on the vendor. Brien Posey, friend and super geek in the world of IT says "In the early 1990's I can remember paying an astronomical amount of money for a 20 MB drive." Hard drive prices have come down but they have also gone up in terms of capacity. The first computer I ever built has a 500 MB hard drive. Now I have a 1 TB drive and a little USB thumb drive that holds 32 GB of data!

To understand what we mean by Gigabytes, Terabytes and so on, let's break this down for you. Remember we said binary is made up of bits (0's and 1's) and these come together in groups of 8. One group of 8 is called a byte. A simple way of understanding a byte: Imagine each letter you type in a document is represented by an additional byte of data for that document, and these will add up as you enter more text.

At some point these bytes build up and you get about 1000 of them, this is now called a Kilobyte (KB). We say 1000 because it is close but it's actually a little higher. After you get 1000 Kilobytes you have 1 Megabyte (MB). One thousand MB's is called a Gigabyte (GB). One thousand GB's is called a Terabyte (TB), and it goes up from there. Petabytes, Exabyte's and so on.

We're saying 1000 to make it easier but the chart below shows the literal size. This is important because sometimes you get a hard drive that says it has 500GB of space or an optical disc (discussed shortly) that claims to have a certain amount of space but in reality the vendor is rounding up. So you look and you don't quite have as much as was advertised sometimes.

To see this in a nice chart form:

1 Byte = 8 bits
1 KB = 1024 bytes
1 MB = 1024 KB
1 GB = 1024 MB
1 TB = 1024 GB

Although most computer geeks know about TeraBytes and PetaBytes, they may not know that the next levels: ExaBytes, Zettabytes, Yottabytes and BrontoBytes. You possibly now know something that they don't!!!

Optical Drives

In addition to the hard drive there are optical drives that are attached to power and to the motherboard through a ribbon cable. An optical drive might be a CD, DVD or Blu-ray player and/or burner. There are many different types of speeds and prices; and all this depends on what you need in your computer or what you plan on doing with your computer. You might want to play a Blu-ray disc on your computer or perhaps not, determining what you are going to use your computer for will help you decide the amount of speed you need or the amount of money you want to spend.

Optical drives use laser light or electromagnetic waves to read and write data to discs. Modern drives are both readers and writers (or burners). Most CD/DVD writers use a red laser to read/write to the optical disc while the Blu-ray player uses a blue laser which allows it to hold more data than CDs and DVDs.

The normal amount of data that can be held by CDs, DVDs and Blu-ray can be seen in the following chart:

CD: An average sized CD can hold between 650 and 700 MB of data (depending on the packaging slant)

DVD: An average single layer DVD can hold about 4.7 GB of data. A dual layer DVD can hold about 8.5 GB of data. There are also double sided DVDs that hold twice the data on the disc. Most readers don't have double lasers to read them so you have to flip the DVD over to access the other side's data.

BLU-RAY: A single layer disc can hold 25 GB of data and a dual layer disc can hold 50 GB of data.

Video Card

The ability to connect a monitor may be built right into the motherboard (or a video card will come with the system). A purchased video card typically provides more than what you get with onboard video, therefore it is usually worth the expense. The video card fits into an expansion slot on the motherboard that is specifically designated for the video card. The kind of card you install depends on your needs. You might need a powerful card for playing video games or you might need a card that allows you to plug in multiple monitors.

Modern video cards typically have their own processor called a Graphics Processing Unit or GPU. The GPU has varying amounts of memory, depending on the price of the card. The different types of outputs that you look for include DVI (digital visual interface) and VGA (video graphics array). Of those two, VGA is the older standard and really the DVI option is better for the modern LCD monitors most people use nowadays. It's good to note that HDMI is becoming the new standard interface for computer monitors. Almost every video card and monitor being manufactured today has an HDMI port.

People ask me all the time how to buy a monitor. Personally, I buy Samsung monitors because I love the quality even if the price is a bit more.

Additional Cards (Sound, Network, etc…)

Your motherboard has expansion slots that can be used to add cards. Now you might have some items on the motherboard, like sound or a network connection. Other times you may want to add in your own cards because they have special features that you don't get with the built-in motherboard features (much like with your video card).

For example, you might want to add more USB connections to your system. You can purchase a card that includes more USB connections. Maybe a combo card that includes FireWire ports. Or maybe a TV tuner card, which are great for connecting your incoming cable to a video recorder to capture shows. Perhaps you have a network connector built into your motherboard but no wireless. Thus, you may need a wireless card to connect to a wireless network. The wireless connection is just that, "wireless". Your computer communicates to another computer or network via a radio signal.

Peripherals

Your peripherals include your keyboard, mouse, speakers and other items you might plug into the system. Depending on the motherboard you may need a keyboard and mouse with the circular connection type called a PS/2 connection. The same with your mouse, it may need a PS/2 connector. Although, many modern keyboards and mice use USB connections or are wireless with a USB wireless connector.

You know you're a geek if you have ever changed your keyboard from QWERTY to Dvorak (or if you even know what those terms mean).

In addition you may need a web cam for video calls or a headset that has a microphone included, which can be used for making calls over your computer or recording your voice.

As for my favorite kind of headset, I like the Sennheiser PC 151 noise cancelling mic, priced for under $50 on Amazon.com. The real trick to the headset, in my opinion, is to pick up a USB stereo audio adapter for under $10. This will allow you to plug the headset into any system and it will work the same, whereas if you just use the regular plugs you are at the mercy of whatever sound quality the system has available.

Putting it All Together

When you see an ad that says "Intel Core i3-540 3.06GHz, 4GB DDR3, 500GB HDD, DVDRW, Windows 7 Home Premium 64-bit" there is quite a bit of information included in that one little line. Now, you pretty much know that it has an Intel i3 processor, 4 GB of RAM, a 500 GB hard drive, a DVD writer and an operating system (in this case Windows 7).

I can remember my father saying he wanted to always buy the best computer. The fastest! I would remind him that he didn't need the best or the fastest. He would never tax that system out or even come close to the hard drive limits. But when you go into a store the sales people often try and sell you on the best and fastest they have to offer. Personally I have a pattern for purchasing systems, which I'll share at the end of this chapter. First, I want to fill you in on the whole binary code thing.

Breaking the Binary Code

The best t-shirt place for geeks (and really for all things geek, not just t-shirts) is ThinkGeek.com. They have one that says "Only 10 types of people in the world: Those who understand binary and those who don't." Now most folks have no idea where the joke lies in that t-shirt. It looks more like they made a mistake, but it all comes down to understanding the code to binary code.

It's all about the 0's and 1's because it is a number system based upon two. Now maybe you flipped right to this part of the book because you instinctively knew that it would be awesome to know and perfect for party banter. Nothing says 'chick magnet' like a guy who can do binary in his head.

I can still remember who taught me binary code. It was Bill Gates. That's right, Bill Gates. Okay, well he didn't teach me face-to-face per se, but I was reading his book, "The Road Ahead" published in 1995 and he explains how binary works.

Again 0's and 1's = an 8-bit segment called bytes. For example: 01000001 Now it would probably surprise you to know that all those zeros and ones, that is actually the binary representation of the letter A (due to the US ASCII Code Chart) and the decimal equivalent to the number 65.

Eight bits is called a byte or an octet so what are 4 bits (half an octet) called? A nibble -it's true. See how many geeks know that!

The way you take a number in binary and convert it to decimal is simple. Just apply a code to each bit in the number.

The code is 128 – 64 – 32 – 16 – 8 – 4 – 2 – 1

When you see the number 01000001 you only add up the numbers that have the bit turned on. So 128? Nope. 64? Yes. 32, 16, 8, 4 and 2? Nope. 1? Yes. Add up 64 and 1 and you come up with the number 65.

Let's try a few: 01010101? 10001000? 11111111?

The answers are: 85, 136 and 255.

It's important to note that all 0's (00000000) = 0 and all 1's (11111111) = 255. You might also take note of the numbers from left to right. So if we have 11000000 it is the number 192.

What about taking a decimal number and making it into binary? It just takes a little effort using the code to work backward. To make decimal 27 in binary, you will need a : 1 in the 16's place, a 1 in the 8's place, a 0 in the 4's place, a 1 in the 2's place and a 1 in the 1's place. It looks like this 11011. You may think of it like this; add, 16+8+0+2+1. Each binary 1 can be a "yes" in that place holder in the chart, and a binary 0 is a "no" in that place.

Binary is going to come in handy in our next chapter when we discuss networking. So have some fun with this and do your best to play around with numbers converting them from decimal to binary and vice-versa. As I've said you will be the hit of the party. I didn't say it would be an awesome party, mind you. One of our tech reviewers, Brian Green says "I disagree. Geek parties are the best. Would anyone rather attend a party full of salesmen? Accountants? Doctors? Lawyers?" Good point Brian. Geeks may not be at the top of the party chain but we aren't at the bottom either apparently.

You know you're a geek if you have to explain what your t-shirt means

So do you get the joke on the t-shirt now? Only 10 types, in binary, means only 2 types of people. That is pure genius.

While binary is used within the computer itself and is important to learn, another type of numbering system is called hexadecimal and is based off groupings of 16 ranging from 0 through 9 and then a, b, c, d, e, f which represents numbering 10-15 (0-15 for a total of 16).

Why It All Happens in Binary
(Contributed by our super geek consultant Steven Reina)

Keep in mind, this portion gets a little geeky, even for me.

"Here is why it all happens in binary. It is the conversion from a logic "idea", yes or no, to the physical state of electronics. This is all connected back to the transistor.

A transistor is basically an amplifier. It makes a very small electronic voltage larger, like increasing volume. It cannot exceed full volume, nor can it surpass all the way off. Think of full volume 1 (yes) and all the way off as 0 (no).

Electronic engineers have figured out quite easily that they could configure the circuits to be either full volume or off. Meaning, the circuit has no other position. The volume control has only off and on. This is actually a lot easier than making a circuit have a sweeping volume control.

Some geniuses understood that off and on is likened to the binary number system. These geniuses figured out that if they used a comparable circuit but added a time element to it, they could use this circuit to convey information, or an idea. If you break time into 5 segments, let's say 5 seconds, and then you turn on your circuit to have a volume of either all the way on or all the way off, the listener could then be relayed a code or information. If you turned the volume all the way on, or to 1 for the first second, then 1 again for the second, off for the third, on again for the fourth, and on for the fifth; you just told the listener "27" in binary. If you make the listener another circuit, you just made the Internet and emailed your friend "27". The smaller sections of time you use, or the faster you change from 1 to 0 are directly measured off the clock speed of your computer. A 2Ghz CPU computer changes its logic states 2 billion times per second, or transmits 2,000,000,000 1's and 0's around your motherboard per second as all the chips "talk and listen" to one another.

They designed some circuits (amplifiers) to accept multiple levels or volumes, but the output is only full on or full off, either 0 or 1. They break down the analog level at any instant into a

corresponding code of 1's and 0's. If you speak into a microphone and your voice is at "7" on the volume scale, the circuit will produce a binary 7, or 111. This is the Analog to Digital Converter. It makes your music digital instead of vinyl, converts video from film, tape to YouTube vids, and many more cool things.

Technology just keeps going and going. What if you used a light and turned it on and off and used that like 1's and 0's? You just made the fiber optic communications system that transmits the 1's and 0's at 186,282 miles per second. Whoa, now that's awesome!"

Buying Computers and Computer Stuff

I don't know why people ask me about what computer they should buy. I find that no matter what I tell people they would rather listen to the local Costco person who doesn't even work in the computer department who wandered over from another section to help you out and all of a sudden they're giving my people conflicting advice. And who do they believe? You guessed it, the Costco person. I get phone calls "but the Costco person said…" and my blood pressure goes so high that I check out of the conversation after I hear the word Costco. (No offense to my friendly Costco workers reading this book… I'm just making a point).

But I digress…

Depending on your needs, here is my advice for purchasing computers. Keep in mind, all of this is just my opinion. Every computer geek has their own favorites with regard to what they purchase. Some prefer Microsoft systems; others go with Apple, or Google Chrome, while others use Linux (very few). Not to worry, we'll discuss operating systems in Chapter 4.

DISCLAIMER: I may make some recommendations here but that is all they are… recommendations. Some of you reading may have had bad experiences with these companies and may never purchase their products or from a certain vendor. I would

feel the same way. I happen to have had good experiences with these ones so I'm simply giving readers a starting point. But I recommend you, the reader, take your time to explore your options. If you buy something based upon my recommendation alone and it doesn't go well I'll feel horrible. It's also good for you to know that I don't work for any of these companies but some of them have given me some toys to play with over the years and so I might be a bit partial.

When someone asks me what desktop computer to purchase I usually recommend Dell. The reason is the support provided by Dell, which I have always found to be quite good. The Dell website is easy to use and they have good deals on new systems. More recently I purchased an Acer with an infinity screen (no edges) for my wife because it has Windows 8 and I liked the 10-point touchscreen all-in-one systems they were offering.

Now, when someone asks about buying a laptop I typically recommend Toshiba laptops. Again it comes down to personal experience. I've used many different types of laptops but I had a Toshiba that lasted me for years and never gave me a problem even when I was traveling through South America with it. What I like about Toshiba is the international support policy. I had friends who also had Toshibas and when one of their computers had a problem I saw firsthand how Toshiba responded.

Now I say I recommend these systems to others, but what about my own personal choice of desktop and laptop? For me, the best computers on the planet are Alienware systems. The company was bought by Dell a few years back but they've been left as their own separate line. The reason I don't recommend these to everyone is because they are power house systems and slightly expensive when compared to a basic system which is what most people need (at least the people asking me for help).

You know you're a geek if at any given point in your life you had a computer worth more than your car.

Alienware systems are easy to spot because they have a cool glowing alien head on the system. You might notice these in some popular movies or TV shows. For example, in the recent Bruce Willis Movie "Live Free or Die Hard" they used Alienware laptops. Also in the TV show "The Big Bang Theory" (a favorite of geeks) they use an Alienware and a Dell XPS all the time (along with other systems). We all know these are paid-for advertisements so let's not make more of it than what it is. It's not like geeks have come together to recommend the laptops for a geek show. But it is a question asked often by viewers of the show.

You know you're a geek if you are watching a movie or TV show and can't help but notice what systems they're using. And then if they say something that isn't technically accurate you can't enjoy the rest of the film or show.

What about computer parts? Or what if you want to build your own computer? Well, for parts if I am desperate I'll go anywhere -BestBuy, CompUSA, Office Depot, Office Max, basically anywhere they sell computer parts. If I have time to plan and/or I know I want to buy or fix, enhance or build a system then I order everything from an online vendor (like TigerDirect.com) and have it shipped right to my door and in the process I propagate the myth that tech geeks don't leave their homes and buy everything online and have it shipped to them at home.

Building your own computer isn't difficult. Now I know I said there are only 10 parts but in all honesty there are more than 10 when you build your own computer. You have to consider everything from the case to cables to monitors and so on. Sometimes the most difficult part is deciding what to buy to put into your system. Companies like TigerDirect.com have 'barebones' kits you can purchase that provide the main parts already mapped out and you can purchase extra pieces to add on. The first time you build one I would recommend you do it with someone who is experienced.

A Computer Without a Case
(Story contributed by our tech-editor and super geek Ed Liberman)

The first computer I truly ever built from scratch was an Apple Macintosh IIx. Now this was no ordinary computer. Back in the early 90s I worked for a Macintosh dealer where we put together high-end custom computer systems. As a result, there were always a lot of spare parts lying around. I decided one day that it would be fun to see if I could build a functioning computer with these spare parts. Unfortunately, there was one problem…we didn't have any spare cases available. I decided to go with the logic that is being presented in this chapter that although many computers have a lot of bells and whistles, it really only takes a few required components to build a working computer. I wanted to see if I could create this computer without a case to put it in and hold it all together. I started by placing an anti-static sheet on my desk, and placed the motherboard on it. Next, I installed a 16MHz Motorola 68030 processor with a heat sink and fan, and then 4 megabytes (Yes, I said 4 MEGABYTES!) of memory. Then I grabbed a block from one of my kids' play sets, put a power supply on it, and connected the motherboard. At this point the computer could technically turn on, but it couldn't really do anything and I couldn't see anything. I installed a VGA video card into one of the NuBus expansion slots and connected a monitor to it. Now I could see the computer turn on, but it still needed a couple more components to make it truly functional. I stole 2 more blocks, placed a 40 megabyte hard drive on one, a floppy drive onto the other, and connected them to the power supply and motherboard with the appropriate cables. That's it! I was done. I now had a fully functional computer which I used while I was learning how to program C++. Was it pretty? No. Did it work? Yes!

You know you're a geek if you get emotional when switching systems. Like you are betraying a loyal friend. Sure you can move files and settings to the new model. But it's just not the same right? Right? <Sniff> Right.

Going To the Next Level

If you want to learn more about the inner workings of the computer and the hardware that makes it all work here are my recommendations:

First, Wikepedia.com is a great site that has information about just about everything with lots of pictures and diagrams included.

Next, you might peruse TigerDirect.com to see all the different parts that are sold or go to a CompUSA (or other computer store) so you can see some of these pieces up close. DO NOT take your computer apart to get a closer look (even though I did… and ruined my old 486 the first time around) unless, again, you have someone who is experienced with you.

If you really want to learn a ton of information about computers I recommend "Smart Computing in Plain English" (www.smartcomputing.com), which is perfect for newbies to the tech world. You might really love the simple explanations that go into all sorts of technical directions.

Chapter 2: Networks

"Well, Mr Big Shot Computer Guy... why is it my computer can never find a network connection?"

Networks are not just for businesses any longer. Practically every home has its own network with all these crazy terms like TCP/IP, routers and WiFi; that have all entered the modern vernacular. Geeks have been using these terms for years and it is time we bring you into the inner circle. You might think you don't need to know this stuff but even TVs come with WiFi (aka Smart TVs), as are add-on boxes like your game console, Apple TV or Blu-ray players which all have wireless access for movie services like iTunes/Netflix/Hulu or music services like Pandora/Spotify/iTunes Radio. (Yes, my geek friends, we know we use torrents, but remember this book is for the non-geeks and we have to build a bridge on what they know and use.) And indoor WiFi is essential for tablet users (especially those that can only connect through WiFi). With that being said, networking is playing a bigger part in your home life than you may realize.

How Your Home Network Works

If you understand the way a small network works you will also understand, to some degree, how large networks operate. Keep in mind; while pretty much all geeks know how to set up a home network, they all don't necessarily work in the IT field. Reading this chapter may put you right on the same level as most geeks and their knowledge of networking.

One thing I want to mention to the geeks reading this chapter is that it's not going to be 100% technically accurate. I'm trying to convey an idea and give non-geeks something to mentally grab onto, not provide the depth that you and I might typically enjoy.

The Physical Pieces to a Network

In the next chapter we will explain how the Internet works, but for now let's discuss the inner workings of the network. Most home networks are designed not just to connect computers to each other or printers; rather, they are designed to link to the Internet connection coming into the home.

The incoming connection might be a DSL line or cable modem or satellite, depending on your local providers. Hopefully no one reading this book is still dealing with dial up. Now the Internet providers usually set up the connection to one computer in your home. Their little box has an Ethernet connection that uses a cable to connect to your computer's network port.

This cable is called a Category 5 Ethernet cable. Why Category 5? Well, as you might expect there were earlier categories, 1 through 4, which are not used anymore. The future categories are: you guessed it, 6 and 7; these are new to the Ethernet cable scene. Cat 6 is used for Gigabit Ethernet and is backward compatible with 5.

Some of the terms you might see with Ethernet cables include: 10BaseT, 100BaseT and 1000BaseT. These indicate the amount of data the cable can transmit per second, either 10 Megabits (not bytes but bits), 100 Megabits or 1000 Megabits (often referred to as Gigabit speed).

The cables you might use in a home network are easy to distinguish from your phone cables but they do have some things in common. For example, the connectors look similar. If you look at the end of a phone wire you see a little head with a clip. If you look closer you'll see that there are copper looking pins inside. That is an RJ-11 connector. Now if you look at the end of an Ethernet cable you'll see that it is slightly bigger and has more pins, eight to be exact. That is called an RJ-45 connector.
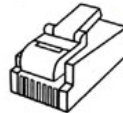
RJ11   RJ45

You know you're a geek when you dream of the day you can teach your children how to network computers together, as opposed to how to ride a bike.

Most wired networks are going to use the Category 5 Ethernet cables with RJ-45 connectors on the end. One end plugs into the back of your computer, either into the motherboard itself or into

a network card. The other end plugs directly into the cable modem or FiOS that is provided by your Internet Service Provider (ISP). Your provider (or ISP) may be the same company that provides your cable television and/or home phone. However, to increase the use of that Internet connection toward other computers within your home you will need a special device called a "router".

A router is like a post office. Communication between the Internet, your home network and computers within your home network is handled through 'packets'. These are like pieces of mail that travel from one home to the next. If you want to mail something officially to your neighbor you would take your mail to the post office and put it in the Local box. If you want to mail it to another state or country you would put it in the Out-of-Town box. The post office would handle it from that point.

Your router will send packets from one computer to another computer; and from the Internet to your computers. One thing to note is that when your router is simply connecting computers in your home it is actually acting as a switch, not a true router. That little point isn't meant to confuse you but to help you when you decide to purchase a router at some point because you may want a router that also has a 4-port switch.

You know you are a geek if you have ever tried to make a WiFi antenna out of a Pringles can (also called a Can-tenna). Think I'm kidding? Google it.

What about wireless? Well, most routers have the ability to be wireless access points. This allows your systems with built-in wireless connectivity like: most modern laptops, iPads, other tablet systems, and desktops with wireless cards installed or USB wireless connection, to access the router, each other and the Internet.

Whether wired or wireless, how do these devices actually talk to each other? How does the router know to which computer to send information?

MAC Addresses and TCP/IP

All devices that are on a network, on the Internet have a built-in MAC address (Media Access Control). These are typically assigned by the manufacturer of the device and are assigned using hexadecimal numbers, for example: 00-21-6A-3E-D5-5E.

> You can easily find a PC computer's MAC address by opening a Command Prompt (click the Start orb and type **cmd**) and then within the command prompt type in either **getmac** or **ipconfig /all**

We now have a clear way of seeing that every device is unique and that is great because it helps prevent confusion. Nonetheless, the numbers are not that easy to work with; and there is no order to them amongst devices. Let's say in your house you have a couple of different computers and some Wi-Fi enabled devices, like a tablet PC or mobile device or eReader (Kindle); you wouldn't want to write down and remember the Mac address of each device to communicate, would you?

You might be thinking, doesn't my computer also have a name? Can we use these names instead of the Mac numbers? You can use the name on your local area network (LAN), which is the network in your home. (Note: A LAN is different from a wide area network or WAN, which you don't have to worry about for your home). Then again the names don't really help your network keep track of all the devices and Mac addresses for easy communication. Instead all the devices on your home network and on the Internet use a TCP/IP Address. The computers locate each other using TCP/IP addresses and only then does it acquire the true MAC address of a computer to link for communication.

TCP/IP stands for transmission control protocol/Internet protocol and it is actually more than two protocols but a whole suite of them. Now, you may be wondering what we mean by protocols. Well, protocols are sometimes used to mean a language or a set of standards. Having standards causes the different manufacturers to follow a protocol when developing things that will work together on a network. Think of trying to follow a recipe when everyone has a different size teaspoon and cup measurement. It would never work. The standard measurement allows everyone to cook the same meal in much the same way TCP/IP has standards or protocols.

Going back to our post office analogy, in much the same way you might follow certain standards when boxing packages you send to someone; TCP/IP has a standard set for packets that go out on the wire and framed or boxed properly. You also need to make sure that the packages are addressed properly. The same is true with TCP/IP. To send a simple document from one computer to another, even on the same network, the document needs to be broken up into packages and then sent over the wire to the other computer. The two computers might both be plugged into, or connected wirelessly, to the router. Yet, like a post office needs an address to locate the recipient, the router uses the TCP/IP address to locate or route its packages to its recipient.

Note the following graphic. It's meant to illustrate how TCP/IP uses IP addressing to deliver email in much the same way we have an address system that works for real mail.

1 Main Street

Systems
(Local Homes)

Router
(Post Office)

Internet
(Out of Town)

192.168.1.1

What have we evaluated so far? A local area network (LAN) uses Ethernet cabling with RJ-45 connectors to connect computers to routers or the wireless router wirelessly; and the router helps to make sure packets of data get from one system to another. TCP/IP is the set of standards (or protocols) that make it possible for this communication to take place.

TCP/IP addressing also makes it much easier to bridge the gap between the MAC address and the computer or device. What is great about TCP/IP is that even though it is all numbers, it is a lot easier to work with and organize than MAC addresses.

How Does TCP/IP Addressing Work?

Alright, now I don't want to scare you right out the door, but the addressing is made up of a 32-bit binary number expressed in dotted decimal notation. We have four octets of binary, that when written in decimal look something like this: 192.168.1.20

If we take that same number and put it in binary code it looks like this: 11000000.10101000.00000001.00010100

Gratefully you won't need to translate the binary to your IP addressing for a home network. We don't want to drive you crazy learning too much, but ultimately every computer on your

home network needs to have an IP address. Say you have three computers and a router, which also has an IP address. Here is how you might number them:

Computer 1: 192.168.1.1

Computer 2: 192.168.1.2

Computer 3: 192.168.1.3

Router Internal Port: 192.168.1.100

With the router I went with 100 just to show you that you don't have to go sequentially. In fact you can number your systems from 1 to 254 (don't use 0 or 255 because these have been reserved with 0 being a network identifier and 255 being a network broadcast). Then again you most likely will not have 254 devices in your home that need to be connected. Not yet anyway.

Now if you were sending a letter to someone through the post office, even if you were sending it to a person on your own block, you would still need to put the full address on the envelope. Assuming you knew the correct block and if you had the house number (1, 10, 100…) the mail could be delivered easily.

With the TCP/IP numbering scheme two different numbers are actually represented: the house number and the street number. However, in TCP/IP they call it the node and the network.

It's funny but we write addresses like this: 101 Dreamtime Ave.; but the delivery person doesn't read the number first, they read the street first. You have to go to the street before you can find the house, right?

Well, with TCP/IP addresses it is written as street-house or network-node. When we look at the number 192.168.1.101 this is actually saying the street/network is 192.168.1 and the house/node is 101.

The way this is done within the network is through the use of a subnet mask. The mask in this case is 255.255.255.0. In binary it would read: 11111111.11111111.11111111.00000000

Now if you only look at the binary and think about the full binary of the IP address you can see that all the ones are revealing where the network ends and the node begins. Under different circumstances you might use different IP addressing schemes and/or subnet masks but for most home networks this is what you will see.

You know you're a geek if you know what supernetting is and if you think class oriented addressing is too boring for your home network.

For example, you might see an addressing scheme that uses 10.1.1.1, 10.1.1.2, 10.1.1.3 with a subnet mask of 255.0.0.0. In that case the network is 10 and the nodes are numbered 1.1.1, 1.1.2, 1.1.3 and so forth. With the other scheme we can only have 254 houses on the block, but with this scheme you can have many more houses because you have three octets for node addresses.
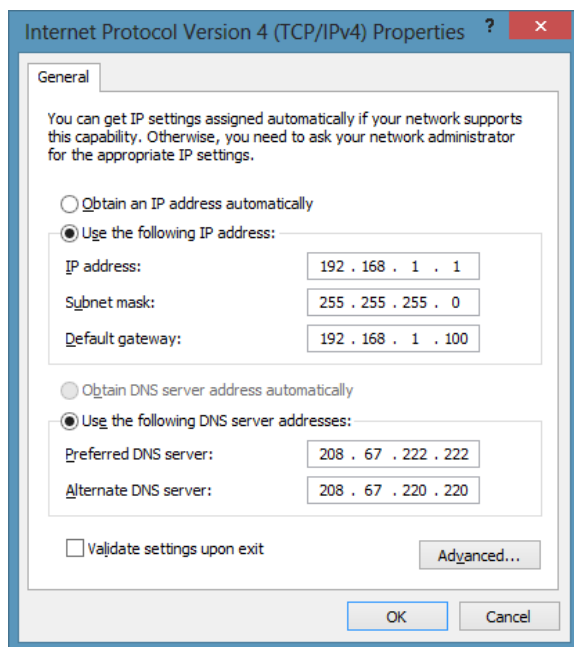
The Default Gateway

At this point we have a basic overview of TCP/IP addressing and how networks get an IP address and a subnet mask. Now if you want the system to be able to access the Internet, then it also needs to have a default gateway. This is where the out-of-town box for your system comes into play. It is the router's IP address for the internal network. Thus, if your router IP is 192.168.1.100 or whatever, that is what you need to put as the default gateway between the Internet and the systems. The gateway is your router.

Manual IP Addressing

Depending on the device itself (an iPad, your Windows PC, your Apple TV, etc…) there are many ways to manually configure the IP address, subnet mask and default gateway for your device. You will also need to define the DNS server address settings (discussed in Chapter 3).

Although each device is different and the location for these manual configuration settings will also differ, here is an example of IP v4 configuration settings from a Windows 8 PC:

Internet Protocol Version 4 (TCP/IPv4) Properties ? ×

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

○ Obtain an IP address automatically
◉ Use the following IP address:

IP address: 192 . 168 . 1 . 1
Subnet mask: 255 . 255 . 255 . 0
Default gateway: 192 . 168 . 1 . 100

○ Obtain DNS server address automatically
◉ Use the following DNS server addresses:

Preferred DNS server: 208 . 67 . 222 . 222
Alternate DNS server: 208 . 67 . 220 . 220

☐ Validate settings upon exit   Advanced...

OK   Cancel

The DNS address settings in the graphic above are using OpenDNS servers for DNS (www.opendns.com). OpenDNS is an excellent place to start when considering Internet safety, parental control information and more.

Dynamic IP Addressing

One of the nice things about modern routers is that you can configure them to only give out IP addresses to exclusive devices to which it connects. You might set up a router that has four ports for direct connections but wireless access for everyone else in the nearby area.

Thanks to a feature called DHCP (dynamic host configuration protocol) the router can assign out addresses to devices. Still, two more puzzle pieces are required. First, you have to tell the

router what addresses to assign. Maybe you tell it to give out addresses from 192.168.1.10 to 192.168.1.60. That allows for 50 devices to be connected to your router and have addresses. With each one, the router will know the IP address and MAC address of the computer that is connected.

The second part of the puzzle is to configure your network adapter. This needs to be connected through a local connection or a wireless connection, to automatically obtain an IP address.

There is another type of "automatic IP addressing" where your computer can receive an IP address if it doesn't have one assigned and can't communicate with a DHCP server. That IP addressing is called the APIPA (or Automatic Private IP Addressing). While this may seem like a "helpful" feature, if your computer has one of these IP addresses that start with 169.254.x.x then you won't be able to communicate with other computers or out to the Internet. Thus, these 169.254.x.x IP addresses are a BAD thing and usually indicate a network or configuration failure.

On a PC running Windows you can verify the computers IP address by opening a command prompt and typing **ipconfig**. If the IP address is a 169.254.x.x address you will need to track down the problem and then get a new IP address. To try and get the IP address again type: **ipconfig /renew**.

Wireless Router Security

When you take your Internet connection and attach it to a wireless router and offer automatic IP addressing you are essentially providing free Internet access to any device that can pick up your signal. Remember, routers and computers communicate by radio. Someone walking nearby or a neighbor can pick up that signal and use your Internet for free. Sometimes geeks have been known to drive around looking for free Wi-Fi connections using either a laptop or mobile device. There are plenty of places that currently offer free Internet access, so

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driving around looking for free wireless isn't as common in this technological day and age. It is still best to protect your router using some kind of password security. And the data should be encrypted. Encryption is a way for the devices to send the data in a code that an unintended listener cannot figure out even if they do receive it.

Searching for open wireless access points (without <u>using</u> the network services) is known as wardriving. Connecting to networks without explicit permission is called piggybacking and this is controversial with conflicting laws (or lack thereof) depending on your location.

Some of the most common forms of security include WEP, WPA and WPA2. It's good to know that most routers support various forms of security but it is hard to know off-hand which is best. WEP (wired equivalent privacy) is an older standard and isn't really adequate security. WPA (or Wi-Fi Protected Access) is better protection because it uses TKIP encryption. And WPA2 is even better as it employs AES encryption. Ultimately you are going to come up with a passphrase that you will need anytime you access your network through the router. When you attempt to connect to the Wi-Fi connection it will ask you for this passphrase.

Cool Network Devices

First and foremost you need to have a starting point and that is typically your incoming Internet connection. As previously stated, we are going to save the "How the internet actually works," for the next chapter. Before you get the Internet into your home you first need to get the router connected. Some providers will do the home network setup as a courtesy for subscribing to their services. Otherwise, you can hire someone to come and setup the network. Either way, it's fine but I look at it this way -I know how to change the oil in my car but that doesn't

mean I do it myself. It is okay to have someone else set up your home network. The purpose of this book is to help you hold a decent conversation with someone about networking, not necessarily to make you a network guru.

In the event that you want to have a more hands-on approach to your home network you'll need to start with a router. You can hop on over to your local retailer (Best Buy, Wal-Mart, Target, CompUSA, etc…) and pick up a standard router. Normally the brands are Linksys (now owned by Belkin), Belkin and Netgear amongst others. The current price is under $50 for a cheap home router.   Be advised though that more expensive ones ($150 to $200) may be necessary in your home depending on the number of devices and the needs you might have for speed.

Be advised: you will see all sorts of scary wording on the box. Please, don't worry too much about terms like: 802.11n or Wireless N Router (or G or B, for the older flavors). If you want to plug systems directly into the router you'll want to make sure it says something like 4-port switch. Some may promise extended range or other features like parental controls, but this is a lot to take into consideration. You may also want to purchase a wireless USB connection if you are going to access it from a system that doesn't have an on-board wireless adapter.

Note: The 802.11ac (aka 5G Wi-Fi) is the latest on the market and offers speeds up to 1.3 Gbps. Most routers that offer 11ac also offer 11n for backward compatibility which is good because there aren't a lot of clients that are ac ready for connection (yet).

The 802 standards are established by the IEEE, (pronounced eye-triple-E) Institute of Electrical and Electronics Engineers, and they cover all sorts of items like Ethernet (802.3) wireless (802.11) and a variety of other solutions although many have been disbanded due to advancements over the years. You can do a quick search to learn all 25 (802.1 to 802.25) working groups if that interests you.

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Over the years I've used just about every type of router. Some are easier to use, but almost all home routers offer an easy setup; and a more advanced configuration setup if you know how to use all the bells and whistles. Personally, at this time, I use a Phantom Technologies iBoss Parental Control home device. It provides Wi-Fi, has a 4 port switch and includes some of the best parental control protection I've seen. We will discuss this further in Chapter 3.

Wireless Repeaters

For many folks, the router and a few network cables for devices you need to connect directly is sufficient. On the other hand, some may have a problem with their wireless connection being strong enough for the whole house. You might try and move the router itself, reposition the antenna, purchase a stronger antenna, or you might consider a wireless repeater. This is especially helpful when you have your router in the basement but want wireless access that is strong enough to stream movies on the top floor. Or you might have block walls and the connection isn't strong enough that far away from the signal source.

A wireless repeater might be just what you are looking for to get more signal power to other devices in your home.

There are many wireless repeaters to choose from but I personally like the Diamond Multimedia wireless range extender that I recently picked up for about $50. It took the signal from my office and brought it through to my family room where I have Apple TV with Netflix/iTunes etc... Prior to the repeater I had only a 30% signal, now I can have anywhere from 80% to 100%.

Servers, Storage and Printers

Sometimes you may want to take the home network to the next level. Maybe make it a home office or simply utilize some of the same technology found in larger businesses but on a small home-size scale.

One example of this is networked printers. You can share a printer on the network through your computer; but you can also buy a printer that connects directly to your network so that all the systems in the home can print with it directly. WiFi printers make connecting and using so easy these days.

Another example is networked storage, also called network attached storage or NAS. This is where you can save files in one location, which allows all devices to access that data and all you have to worry about is one backup location.

You might even consider using a real "server" in your home or home office environment depending on how much you feel you need that strength of technology. Microsoft has/had a solution called Home Server but with the release of Server 2012 it has replaced Home Server with Windows Server 2012 Essentials. Technically though a "home server" can run any kind of operating system that supports services like file/printer serving, media center services, web services and so forth. So you might use a Windows system, or Linux or OSX, etc… More on operating systems coming up in Chapter 4.

Media Center Extenders

Windows systems that have Media Centers included, like Windows 7/8, allow you to use your system as a recorder for TV and a place from which to share your pictures and home videos. It even gives you the ability to stream that data to your TV, but you will need an extender which is also connected to the network.

Keep in mind that an Xbox 360/720 is also an extender. Thus, if you have an Xbox 360/720, a Windows 7 or 8 system (or XP/Vista with Media Center), and a wired/wireless network you

will be able to share your pictures and video content on your TV by simple using your system.

Additional Devices

As we mentioned earlier, you may have a wired or Wi-Fi enabled DVD or Blu-ray player that is connected to your local area network. You might have Apple TV, which also requires an Internet connection to stream movies from Netflix or the iTunes store. Or maybe you have a gaming system (like the Xbox, Wii or Sony PlayStation) that allows you to connect with other online players with an Internet connection.

I'm sure there are other devices or devices that will come out in the near future, but you get the point. Having a home network set up with a strong signal is essential in our modern world.

Basic Network Troubleshooting

First rule of thumb: make sure everything is plugged in. Sounds silly but user error or forgetfulness is a legitimate troubleshooting highlight.

You know you're a geek if you get a kick out of telling someone that they have an ID 10-T error. For non-geeks just put it together: ID10T. Get it?

Often times the easiest way to identify a connection is to test it out by trying to connect to another system or by trying to access the Internet. If you don't have a connection you will recognize the lack of signal pretty quickly. The question is: how do you troubleshoot the problem since it could be any number of different issues. Problems with your computer perhaps, or with the router, or with your ISP, or with the very website you're trying to visit.

When you cannot connect to the Internet don't assume the problem is with your computer. Before you jump to that conclusion you might see if you can access a different website. If so, then the problem is not your computer or anything in your realm of troubleshooting but the keepers of the site you are trying to reach. If you cannot reach another site you might see if another computer in your environment can access it, if you happen to have another computer available. If it can access the site than the problem is not the network itself, it must be your computer.

Once you have narrowed down the problem to your computer you might consider some of these options. First off, many operating systems have troubleshooting tools for network connection loss. Windows, for example, can run a diagnostic to troubleshoot the connection. Oftentimes it performs some behind the scenes tests by disabling the network connection and re-enabling it. It will test naming resolution and a few other things but if it doesn't find a fix it will just say 'sorry, no fix available' or something to that effect. You should know how to run this kind of test on whatever system you are using.

If you want to go a little deeper and perform your own tests you can try to PING various IP addresses and see if you get a response. What is a PING, you might ask? It's like throwing a ball at someone; if they catch it and throw it back you know they are alive. If it bounces off their head then you know there is a problem. The same can be done with a network connection.

You know you're a geek if you can perform the auto-destruct sequence like Kirk in Star Trek III: Search for Spock:

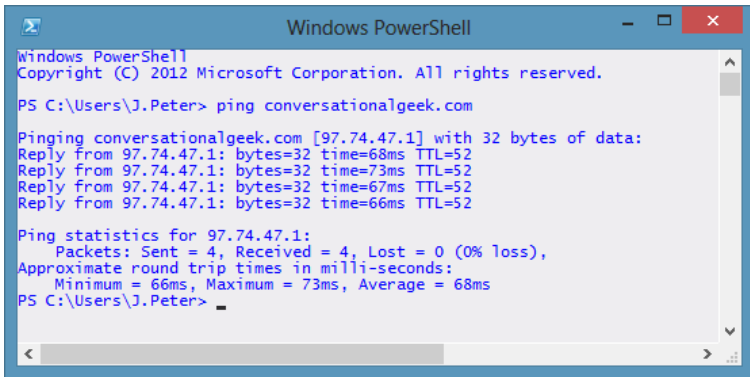Captain: Code 11A
First Officer: Code 11A2B
Chief Engineer: Code 1B2B3
Captain Final Sequence: Zero, Zero, Zero
Destruct Zero

Some folks will start by pinging the furthest thing from them, perhaps an internet website. While others will ping the system they are working on first, using either the IP address of the system or an address called the loopback address: 127.0.0.1.

To ping a system you open a command prompt (or Windows PowerShell if installed) and type: **ping** (name or IP address of system that you are testing connectivity.) You might start by pinging your own system. Then ping the default gateway IP address, the LAN side of the router. If that works then try pinging the other side of the router. Then try an address on the Internet.

If you are having difficulty pinging another system you might check your own IP settings. You can also do this from a command prompt, by typing **ipconfig** or for more detail **ipconfig /all**.

Going to the Next Level

Let's say you just love everything you learned in this chapter and you want to know more. Well obviously there is a ton more to learn about networking and TCP/IP. This is just one chapter in one book about many geeky subjects. You might try something a little more specific to your needs.

For example, there is a book called "Home Networking Do-It-Yourself for Dummies," by L.C. Miller. This would take you to

the next level with regard to many of the networking subject matters you know now. There is also "Networking for Dummies," by Doug Lowe. In fact, as I look at all the Dummies titles there are several that are about Networking, Home Networking, Wireless Networking, etc. Pick one you think will be most interesting. The "Networking All-in-One for Dummies," is nearly 1000 pages so that might be your best option.

With regard to the different pieces to networks you can go to your local computer store (Best Buy, etc.) and take a look at network cables, routers and wireless adapters.

If you are thinking you want a career in IT after reading all this networking stuff well I recommend you pursue a certification in networking called Network+. There are lots of great options to help you learn more about networking to prepare for the Network+ exam and I personally recommend TrainSignal.com Network+ training, which was actually created by Ed Liberman, this books Technical Editor. They provide video-based training so that you get a full class right from the comfort of your home.

If you want to learn a little more about troubleshooting a Windows network you might appreciate David Davis' article "7 Steps to Successfully Troubleshoot a Windows Network". David is one of our Technical Reviewers for this book and he thought this article might be helpful.

Note: If you do plan on studying networking and TCP/IP, I recommend you start with IPv4 and eventually progress to IPv6 (which is quite a bit more complex). v6 is the present and future of the IP protocol so having a better grasp of it is worthwhile.

Chapter 3: The Internet

"...so these cables are fiber optic lines that are running along the ocean floor..."

The Internet is an amazing tool that we can use to research pretty much anything, share pretty much anything, and buy pretty much anything. Most folks know how to use the Internet but have no idea how it really works. How does simply typing in www + dot + Microsoft + another dot + com suddenly yield a web page on your computer screen? What is happening behind the scene to make surfing the web really work? And how is it you can see sites from all over the world? This chapter will explore the way the Internet really works so that you can enjoy all the wonders while also avoiding some of the dangers.

The History of the Internet

Contrary to popular belief, Al Gore did not invent the Internet and it is good to note that he never said he invented the Internet. Rather, he said "I took the initiative in creating the Internet," which was taken out of context. While everyone laughed and it was the joke of the month I kept thinking, "Does everyone know who really invented the Internet? Probably not."

> Even though Gore wasn't saying he truly invented the Internet, he was taking credit for supporting legislation that was the driving force during the conception of the Internet. In researching Gore's time in Congress from the 1970's forward it is easy to agree that Al Gore has done more than any other elected official when it comes to supporting Internet growth and development. In addition it was actually Al Gore who popularized the term, "information superhighway" with regard to the Internet. Bet you didn't know that!

Let me take you through the Cliff's notes version of this story. The true story spans back decades beginning in the 1950's and 1960's and consists of too many experts to list here. We'll just hit the highlights.

The official Internet Timeline begins, for some, in the year 1962. It was at that time that J.C.R. Licklider (from the Massachusetts Institute of Technology, aka M.I.T.) writes ideas about an "Intergalactic Network" connecting everyone on the planet. It was in October 1962 that Licklider becomes the first head of the research program for computers at the Advanced Research Projects Agency (ARPA). It was renamed Defense Advanced Research Projects Agency (DARPA) in 1972. Strangely enough it was renamed ARPA again in 1993 and then DARPA again in 1996, virtually an odd game of tennis over the name. Learn more about DARPA here: http://www.darpa.mil/ .

Keep in mind that while we may see the Internet as a great way to share information; the main reason so much effort was put into its development was the fact that it was designed to ensure communications could continue in the event of a nuclear attack. The fact that the Internet has no centralized point of origin ensures that communication would continue even if part of it was knocked out. At least that is the expectation.

Around this same time, Leonard Kleinrock of M.I.T., and later UCLA, was working on a new form of connectivity through 'packet switching'. You may not realize this, but there was already a global communications system formed through the use of telephone 'circuit switching,' which was used for voice communications.

It was in 1965 that Lawrence Roberts, also of M.I.T., (note a pattern here?) was able to connect a computer in Massachusetts with a computer in California. It was the first dial-up connection proving it could be done. In the process though it showed that the telephone networks using circuit switching wouldn't be good enough and so packet switching was pushed forward.

Obviously there was more than just Licklider, Kleinrock and Roberts involved in the foundation of the Internet. There were persons developing ideas all over the globe and working on new computers. Every idea and discovery was an aid to the advances of the Internet that we currently use. Thus, we don't want to ignore the many others that were true visionaries in the process.

The first operational packet switched network was called ARPANET and was funded by the DARPA. In 1969 there were four computers connected at four different University locations: UCLA, Stanford Research Institute, UCSB and the University of Utah. From those it would grow to include other universities like M.I.T.; and then from this point many other locations. Keep in mind, ARPANET wasn't the only network being created at that time. There were many other people working on packet switched networks at this same time.

A protocol was needed to help with host to host communications, and while many other things were being invented and improved upon; the Network Working Group (NWG) finished developing the Network Control Protocol (NCP) in 1970. At this same time other protocols were developed in 1971 by the NWG including the Telnet protocol and the File Transfer Protocol (FTP). FYI: We still use FTP today to send files!!!

It was in 1972 that Ray Tomlinson created a program to send electronic mail (yes, the first e-mail!) over ARPANET and he is the one who came up with the idea to use the @ symbol. Not everyone agreed with that and it wasn't until the late 1980's that the @ symbol becomes the de facto method for email.

It was in 1973 that some more exciting things begin. Remember we mentioned that there was more than just the ARPANET packet switched network. It was then that creators decided to commence connecting some of these packet-switched networks together. Unfortunately, they all used different methods of packet switching. This is when, two men: Bob Kahn and Vinton (Vint) Cerf worked for Larry Roberts and ARPANET to make this happen. Because of the challenges ahead of them , Kahn and Cerf worked together on a protocol that is called the Transmission Control Protocol (TCP) which, you guessed it, is what we already discussed in Chapter 2. You'll remember too that it was this same year that Robert Metcalfe was working on the Ethernet for Local Area Networks (LANs).

You know you're a geek if someone asks you for your address and you give them your IP address or 127.0.0.1. "There is no place like 127.0.0.1"

There is some discrepancy on when the first use of the word Internet was used. Some say 1977 when Cerf and Kahn demonstrate 'internetting' between different networks. Ultimately by the early 1980's the Internet Protocol Suite (TCP/IP) was the standard moving forward. There were a lot of

cool things popping up at this time like Usenet newsgroups, an archive of FTP sites called Archie, a simple menu system called a 'gopher' was created and much more. You can research any one of these different solutions that make up the history of our modern day Internet.

We could almost make a song out of it using the theme to Billy Joel's, "We didn't start the fire"

"M.I.T. and Licklider, ARPA, DARPA, Kleinrock, Roberts connects two machines, ARPANETs the first start. Tomlinson makes email work, @ symbol causes header wars, FTP and Usenet soars. Oh, we didn't start the Internet. Since 69 it's been churning, 40 years and burning. Oh, we didn't start the Internet. Neither did Al Gore, but he helped legislate more." (You can keep it going from there if you like… or make your own song in the spirit of REM's 'End of the World as we Know It' or one of your choosing).

But wait… there is more, lots more.

In 1984 a solution called Domain Name Services (DNS) that host domains like .gov, .mil, .com and .net is introduced. We'll explain this a bit more later on in this chapter. It wasn't until 1992 that you could register for domain names for these different domains.

It was in 1989 that Tim Berners-Lee, as well as others, from the Laboratory for Particle Physics (aka CERN) helped to develop a protocol for information to be distributed using hypertext pages. The protocol is still in use today as the Hypertext Transfer Protocol (http) which you see at the beginning of every web site address you type in, and THIS was the beginning of what we know now as the World Wide Web. The original goal of the HTTP protocol was to get pages written in HTML (hypertext markup language).

It's important to note that there is a difference between the Internet and the World Wide Web. The Internet is a global network that uses TCP/IP to transmit data between systems. The World Wide Web is a computer network that has sites available on the Internet that allow you to see sites using HTTP.

The Internet is used for more than just the WWW; it is also used for email and a host of other services.

When you type in a web page address like http://www.conversationalgeek.com the protocol HTTP uses a TCP connection to a port on the server, which is hosting the pages you are looking for, and that default port is 80. Ports are like channels on a TV. You have one TV but you might have hundreds or even thousands of channels. Every networked computer has the ability to have thousands of channels, or ports, open to serve up different details. Computers that serve web pages (called Servers… see it isn't all difficult to understand!) will have port 80 open for requests for pages that are hosted. One of the nice things about using ports is that they are consistent. Like your favorite TV show that is always on the same channel, port 80 always serves up web pages for HTTP requests.

In 1990 ARPANET officially shuts down and was officially replaced with NFSNet. At the time the Internet had grown to such a degree that the shutdown of ARPANET was barely noticed by most, although officially mourned by others

Vinton Cerf wrote the following requiem to mourn the conclusion of ARPANET titled "Requiem of the ARPANET". Here is part of what he wrote (the extended version is worth reading though: http://www.sith.org/MCI/cerfsup/docs/req.shtml)

It was the first, and being first, was best,
but now we lay it down to ever rest.
Now pause with me a moment, shed some tears.
For auld lang syne, for love, for years and years
of faithful service, duty done, I weep.
Lay down thy packet, now, O friend, and sleep.

You know you are a geek if you have ever set up a Web Server and even more of a geek if you set up an Apache Web Server as opposed to an Internet Information Server because you felt Apache was more secure.

Did you know that starting in the mid-1800's, to make telegraph communications international they began working on ways to insulate cables from water; and then set out to sinking these cables between countries. If you do a Wikipedia search for, 'Submarine Communications Cable' you will learn a ton about those cables and how they have been advanced for modern day's data communications traffic. I can remember when my buddy Steve Reina handed me an underwater repeater worth $15K and explained how these underwater cables were fiber optic (light pulses over thin glass core wires) and the repeaters help to keep the signal strong as it moves from one point to the next. The first one called TAT-8 went into play in 1988. There are many cables connecting countries and continents nowadays, with Antarctica being the only continent that hasn't been reached by the cables.

Moving Into Modern Internet Times

What took the place of ARPANET started in 1985 and was called the National Science Foundation Network or NSFNET. Without going into great detail on all the politics that took place and the deals made, this essentially began the great backbone work of the Internet that we know today. The backbone is the main trunk of communications within the Internet. Off of that backbone, which was gradually increased in terms of speed and data transmission ability from 56 kilobits per second (kbit/s to 1.5 Megabits per second (Mbit/s), aka a T1 backbone; to 43

Mbit/s, aka T3 speed (43.232 to be exact). Keep in mind today's backbone is all fiber based and makes even the T3 seem slow.

NSFNET would last until 1995 when it was transitioned into a new architecture and several commercial backbone carriers took over. This is when we start to see commercial Internet Service Providers (ISP's) begin to pop up and it was during this time that the beginning of pay-based online services like Prodigy, CompuServe, GEnie and eventually America Online (AOL;) which actually debuted in 1985.

> In 1990 CompuServe was the largest provider of pay-based online services with around 600,000 members; Prodigy had about 450,000. Personally, I had my Commodore 64 and used CompuServe. And the only thing I could think about was the movie, "WarGames." (See Chapter 7 if you are unfamiliar with this movie.)

> You know you're a geek if you cannot order a Whopper from Burger King without giggling and thinking of the W.O.P.R. (War Operation Plan Response) military system from WarGames.

In 1995 Java, a really cool programming language was created by Jim Gosling at Sun Microsystems. That same year Yahoo! was founded. In 1997 Lucent Technologies (an AT&T spinoff) developed the first solution to make calls through the Internet, a solution we would come to call Voice over IP or VoIP. In 1998 Google was founded. In 2001 Wikipedia was created, and without a doubt you will find a ton more information within Wikipedia about many of the terms and stories mentioned. In 2004 Facebook was founded; in 2005 YouTube was launched; and in 2006 we see the start of Twitter. These are just some of the more interesting developments. Not counting things like Mosaic, Netscape, Napster, Gnutella, BitTorrent, ICQ, Skype,

online gaming, Weblogs (aka blogs), Internet worms and much, much more.

And it grew; and got faster. It's grown to the point where about two billion people are connected worldwide. Connected through their home computers, through their tablets and e-readers, connected through their phones; really… connected through everything.

There is a really cool poster that shows the History of the Internet and how it has grown over the past 30 years. The poster can be found at the Computer History Museum, located in Mountain View, CA. To learn more about the first 30 years of Internet development in much greater detail go here: http://www.computerhistory.org/internet_history/

Google Fiber

Google Fiber is an effort to provide broadband Internet using fiber-optics, meaning it is super fast at 1 gigabit per second (download and upload). They boast connection speeds 100 times faster than modern broadband. In 2011 a free trial was offered in a residential community near Stanford University in California. The first places to get it were Kansas City, Kansas and then it was rolled out into Kansas City, Missouri and other communities in Kansas and Missouri. After that it was announced that Austin Texas and Provo Utah would also be Google Fiber cities. Will they continue and go nationwide eventually? Perhaps. More likely though other cable providers will follow suit and upgrade their networks to provide comparable speed.

How Does the Internet Work?

Okay, you now have a good idea of how the Internet was developed and how we are globally connected; but at this point let's bring things up to the present day. You probably have some kind of Internet Service Provider like Comcast, AT&T,

Brighthouse, CenturyLink or one of the main ones available. Thus, you have a connection coming into your home. That connection might allow you to plug in one computer or you might connect it to a router. Internally you may have a local network connected off that router with IP addresses that you have chosen. However, the Internet uses IP addresses that are given out specifically for use on the global network. (See Chapter 2 for more details on routers and TCP/IP).

The router has an internal IP address, which is also called the default gateway once you configure your in-house computers to access the Internet. The router also has an external IP address, which connects it to the ISPs network. The router basically transfers data back and forth between the ISPs network and your internal home network.

You know you're a geek if you get mildly annoyed when you hear the common folk talk of "being on the Net" as in "yeah, I'm on the Net". Your geek blood boils just a little bit. "I surf the World Wide Webs on the Internets." Arrgghhhh!!!!

Now when you open up your Internet Browser, (maybe you like Internet Explorer, maybe Firefox, maybe Google Chrome, maybe Safari or some other option) you type in the URL to the website you are looking to access. URL stands for Uniform Resource Locator which is a fancy way of saying website address.

The URL is made up of the protocol you want to use followed by a colon and two slashes, like: **http://**

Then you add the path to be able to locate the web site. That web site is being hosted on a server, or group of servers, and to access it you need to know the IP address of the server or server group. But, how can you know the IP addresses of every web site in the world? Well, we don't have to know every IP address, we just type in www.microsoft.com or whoever we are looking to

reach. That path helps us to find the site through the use of Domain Name Service (DNS) servers.

Domain Name Services (DNS)

It's simple. You need to call a plumber but don't remember the number, look it up in the phone directory. The directory is in alphabetical order so you can find who or what you need by subject.

DNS Services are servers that are on the Internet to help us find the IP addresses of web sites or send emails to mail servers and so on. These servers are organized by domain, just like an alphabetical phone directory.

The root for the whole DNS system is a period (.) which is odd because we never type that in. If we typed a period (.) it would be at the end of the URL, because it is assumed we would leave it out. Instead we end our URLs with .com, .gov, .net, .org and so on. For countries, there may be ones like .uk, .cn and so on. That is why not all URLs we type in are .com, but can include other ending points.
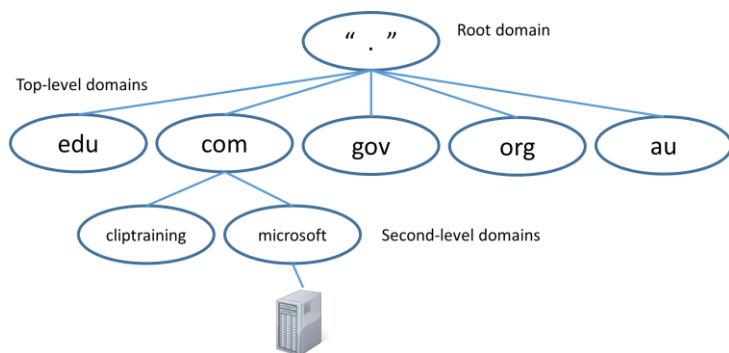

The servers are registered under the domain that is chosen by the person who is setting up their domain name. For example, you might go to a popular domain name registration site like GoDaddy.com; and there is usually a domain finding dialog box for you to check to see if your domain name you want to register is already taken. Keep in mind you don't ever have to register a

domain name. However, if you want to have your own web page for personal or business use you will need to register the domain name first.

When a domain is registered, the Domain Name Server (DNS) keeps a record of where the location of the web server is for that domain; and for other servers, if you have them, like email servers and so on. When you type in something like www.microsoft.com your computer has no idea where the web servers are for Microsoft. Instead it very quickly checks in with a DNS server. That DNS server looks to see which category is needed. It sees .com and says okay; let's check to see if Microsoft is registered. It finds Microsoft and finds the DNS servers that are configured to tell you where the www services are hosted. An IP address is provided back to the computer to tell it how to find the servers for the web site. Now your browser knows the IP address on the Internet to connect to that www service and enables viewing of the web page. Remember, it already knows to use the HTTP protocol because that is in the beginning of the URL. It also knows to use Port 80 to make this connection to the channel on the web server hosting the pages. And after that expeditious process; viola… the page appears before you.

When you want to access a more secure site you type in **https://** which requests a secure page type through Secure Socket Layers. Without going into great detail, SSL sites are more secure for your banking, purchasing and other secure transaction needs. The SSL connections are usually shown in your browser with a lock graphic of some sort to let you know it is safe to proceed. By default, SSL uses port 443 rather than port 80 for this connection.
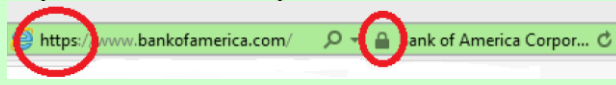
DNS provides this hierarchical, organized set of registered IP addresses and domain names for everyone on the Internet and it is all behind the scenes. This is also true for other services like email. If you type in bgates@microsoft.com the DNS servers are

able to locate the email server for the email to be sent to the correct server. The DNS server uses the same pattern we explained above except instead of the IP address hosting www services it provides the IP address for the server hosting the email services.

Browser and Add-ons

Once you are connected to the Internet you now need to use a browser to get online. What add-on features or plugins should you download? Which browser do you use? How do you search for things online?

The Browser Wars

There have always been different browser types and fights about which one is better. For years folks debated Netscape Navigator vs. Microsoft's Internet Explorer (IE). Over time IE won that battle and Netscape slowly disappeared. Some complained that the reason for this was the fact that Microsoft included IE directly within the operating system and some users felt this was unfair.

At one point, Internet Explorer held a 95% share of the browser market; until a new browser started quickly gaining popularity. Mozilla's Firefox was first released toward the end of 2004. They are, at the time of this books completion, up to version 21.0. However, they release a new version approximately every other month and the numbers jump so quickly, who knows what flavor they are up to now.

Quick Quiz: The reason people liked Firefox was because it:

a) Was not Microsoft Internet Explorer

b) Was faster (initially) than IE, according to many

c) Was filled with cool add-ons that worked incredibly well to make for a more robust browsing experience.

d) All of the above

Then Google put another competitor into the market, Google Chrome. This offers users another streamlined browser with speed as its goal; while also protecting user's identity through secure browsing and anti-tracking options. Keep in mind, both Firefox and Internet Explorer offer similar features.

In addition, there is also Apple's Safari browser. Safari can also be downloaded for use on PC's, and is included with Apple OS's.

Which browser is best? Well, it really comes down to choice. Sure you can compare the browsers side by side and one may be faster than another by a nano-second or might have a feature that the other implements differently. In my opinion, at this point they are all similar in design and functionality.

> With the release of Windows 8 Microsoft offers 2 versions of Internet Explorer. One that is the desktop version and one that is an 'app' that is designed to be more tablet friendly.

Players and Add-ons for Browsers

Many will note, when working within a browser they don't get the same rich experience that they get when an application is installed directly on their system. To enhance your experience and allow for rich Internet applications, you typically need to install plugins or add-ons. The three big add-ons are Flash, Java and Silverlight (although Silverlight has been discontinued due to a lack of community support for it and the release of HTML5.

The first player that everyone immediately installs when working with a new system is Adobe Flash Player (unless it is already installed). Flash was originally created by a company called Macromedia and it is used to add video and other interactivity to a web page. There are flash based games and advertisements, just to name a few. Now just because you install it once for your browser (let's say Internet Explorer) that doesn't mean it works for all the other browsers you might install. You need to install a

new flavor for each browser. You can download the Flash Player
from Adobe at http://get.adobe.com/flashplayer/

You can also download other free add-ons from
Adobe like the Adobe Reader, Adobe Air and the
Adobe Shockwave Player.

Silverlight (discontinued) had 5 different releases and was a free
Microsoft web plug-in that allows for more interactive media
experiences. Even though it is a Microsoft plugin, it is capable of
working on different operating systems and with different
browsers like Firefox, Chrome and Safari.

To enable a richer online experience, Java is another solution that
you may want to download and install on your system. When
you install the Java Runtime Environment (JRE) it includes the
Java Plugin so that applets written in the Java programming
language can run inside your browser.

The term 'applet' was first used in PC Magazine in
1990; this is a small application that might have few
or only one tasks that it runs via a plugin.

HTML 5

With the release of HTML 5 there is a shift away from Flash,
Silverlight and Java. HTML 5 is a new standard that has built-in
capabilities for rich media experiences to be developed without
the need for an add-on or plugin like Flash. However, for quite a
while the browsers people use will not be HTML5 capable so we
will still see these other add-ons for a while. But most experts
would agree that HTML 5 is the future.

Searching or Googling

You may have heard someone say, "I'll Google it," and what they really mean is that, "they'll search for it." That is because Google has become the de facto search engine in the world. Nobody says "I'll Bing it!" just yet.

The first search engine for the Internet was probably Archie in 1990. It wasn't meant to be from the Archie comics; in fact the name was a tweak on the name archive. It would perform a scan of data and respond to basic searches. After Archie came additional solutions like Veronica and Jughead.

With the rapid growing World Wide Web there was a need to index content a bit faster and so search engine, 'spiders' were created to crawl and index web content. These spiders are called bots in that they were designed to do something robotically like a human, in this case search and index. Some of the earlier spider or bot fed search engines were: Jump Station, the World Wide Web Worm and the Repository Based Software Engineering (RBSE). The only problem, these early engines didn't have a ranking system the way we have today. RBSE did implement a primitive ranking system.

After that some may remember Excite, which made advancements by making searches more efficient. Then there was the Yahoo! Directory and a host of other solutions that were proprietary in that they were specific to their needs or network. In some cases these required you to pay to be listed.

Finally we saw some of the more memorable search engines spring up like Lycos, Infoseek and AltaVista (which was my personal favorite back in the day). "Surfing the Internet" began to really take off once we had search engines to help us find what we needed.

The term, "surfing the Internet" was first popularized by Jean Armour Polly in June 1992 in an article she wrote that was published by the Wilson Library Bulletin. She may not have been the first one to use the term since others newsgroups used similar concepts or phrases in the early 1990's. However, she has the first published reference of, "Surfing the Internet" although at the time it didn't mean quite what it means today in terms of moving from one page to another quickly and easily.

Finally, after several different advancements in search engines, we come down to our day. Today Google is by far the most widely used search engine. Google began as a research project by Larry Page and Sergey Brin while they were Ph.D. students at Stanford University California. It was originally called BackRub because it determined site importance by looking at backlinks. Later it was changed to Google, which was an accidental spelling of the word "googol", which is a huge number (1 with a 100 zeroes). Thus, in 1998 Google was launched. Without going much deeper into the science behind search engines it is safe to say everyone knows Google as the search engine of choice. It became so popular that people actually say "I'll Google it" to refer to searching.

To 'Google' is actually registered as a verb by Merriam-Webster's online dictionary meaning: to "use the Google search engine to obtain information".

In 1998, Microsoft released MSN Search and then Live Search in 2006. However, they didn't really get serious about the search game until they released Bing in June of 2009.

In our modern lineup of search players we have Google in first place, Bing in second and Yahoo in third place at the time of this books completion. Google is still dominating two-thirds of the

search engine market even though Bing is growing. In fact, in the first edition Yahoo was second and Bing was third. Bing is growing. There is also Ask and AOL which have very small market shares.

Even though I prefer the broader search engines like Google and Bing, there are also more specific social oriented search sites like Delicious (formerly Del.icio.us) and Digg.com

There are ways for web site developers to help their sites in the search engine rankings and that is called organic search engine optimization (SEO). Developers can also increase their visibility by paying to get their companies name higher in the search engine rankings. Paid-for search words are called Adwords and this is a service that Google and others offer. To businesses, searching is more than just providing search results to people who want them; it's about being at the top of the search results list. Thus, search engine marketing (SEM) is oftentimes about SEO and the use of Adwords and other advertising options.

Improving Your Searches

Most people just jump onto their search engine and begin typing in words that are in their heads. Say, you want to look up, "history of the Internet," so you jump into Google, Yahoo or Bing and type in those words. Then a list of 78 million results appears, way too many to search through. Thus, there are ways to improve and narrow down any topic you are probing.

Keep in mind that usually searches are not case sensitive. For instance, if you type in, 'New York Times,' or 'new york times,' it doesn't matter to the search engine. If you want words searched for in a specific order you would use quotation marks ("") around the words. Remember, if you use quotation marks the search might omit pages that aren't in quotations. If you want to search for something in a specific site you would use a **site:** entry. Perhaps you want to search for an article on the browser wars on

InfoWorld.com, you would type the following: **browser wars site: infoworld.com**. You can also specify an entire domain by saying site: .com or something to that effect. If you want to exclude something from a search you can use a (–) sign. Say, you want to search for fish but not halibut you can type: fish –halibut.

Back in the day you would search using Boolean search operators. This is a term that is named after the British-born Irish mathematician George Boole. It involved the use of AND, OR and NOT. You would use them separately or combine them to refine your searches. You can still use these operators. Boolean searches may need some work but you might play around with Boolify.com to help you get the idea visually.

Let's say you are looking for a file type. For example, you want a PowerPoint file about kites. You can type: kite filetype:ppt and it will return only those results. Or if you want a pdf file or any other file just use the filetype option.

Free Email Services

This is a short section to help you locate the main online services for having a free email address. You can use Yahoo Mail for free email services; Gmail, which is from Google; and Microsoft's Outlook.com (formerly Hotmail) free email services. There are obviously a bunch of others that provide services online or through an offline application like Microsoft Outlook, Mozilla Thunderbird or other solutions.

You know you're a geek if you have to tell your wife or children something so you email them, even though they are sitting right next to you or in the other room. Then you yell out "check your email!!!"

Internet Safety

I'd love to tell you that sitting in your room or having your child safely in their room playing on the Internet is safer than a playground, but the truth is it can be just as unsafe. Young ones are lured to meet predators; naive persons are robbed through scams; and everyday people have their identities stolen. Yep, it can be a dangerous place.

Parental Control Options

There are several ways to offer parental controls that will protect your family. One way is to look within your operating system to see if parental controls are built in. Microsoft Windows Vista has built-in parental controls that can help you determine the times of day your family uses the computer. You can even log what sites are visited and block users from going to specific sites or downloading software. Parental controls in Windows 7 and 8 actually require you to sign up for a Live ID from Microsoft and download Windows Live Essentials Family Safety; (http://explore.live.com/windows-live-family-safety) which helps protect your family by using software.

There are other software solutions you can locate to help you control the access your family has and the degree to which they can use certain aspects of the Internet. Keep in mind that if you give your children a mobile device with Internet access you have to be just as diligent about considering parental controls on their mobile devices.

You might go with a hardware solution that will give you full home protection. Personally I like the iBoss Parental Control router. Then again, you can find parental controls using Open DNS in other routers. A quick search will help you to locate a device that can protect your home.

Phishing Scams

"Phishing" is a term used to describe a method for obtaining personal information like usernames, passwords, credit card information, and social security numbers by pretending to be

someone else thus tricking people with bogus stories or sites that look real but are not.

It's important to have tools in place to help you avoid phishing emails that lead to phishing web sites. Many modern browsers are automatically ready to protect and will try and stop you if you want to go to a site that is a known danger.

Here is what happens; you get an email that says, "Millions would be yours if you just send some money to get things started." Or there is an Iraq war veteran or a Saudi prince that needs your help. Something that should sound ridiculous but it draws tons of people into the scams that are perpetrated online.

Other times you get an email from your bank. Is it your bank? Maybe it is not your bank but another bank where you don't even have an account. It will ask you to click a link and go to a site where you need to put in your username and password or some key information like your social security number or some other form of personal information that can help someone to steal your identity. Do NOT give away your information so easily.

Remember, the biggest security hole on the Internet is you. You need to be cautious when giving out your credit card information or other personal information. You need to make sure you are on valid sites. One way you can do that is by trusting your browser to tell you when something is NOT right. You should see a security lock when you are going to put in credit card information and it should be a secure site with https. Often times when a site is a known danger you'll see a red address bar in the top.

Cookies and Pop-ups

Cookies are left behind when you visit web sites. A cookie is used to help sites track you if you return to the site again. For example, if you go to a site and put some stuff in a shopping cart but don't purchase anything and then you leave the site but then go back to it again, sometimes your cart will still have those items. So there is a positive side to cookies. The negative side is that some people don't want to be tracked. Cookies can be used

to market to you, which again is considered a negative by some because they don't want to be marketed to any more than they already are.

If you like, modern browsers can help you to block all cookies. Or simply delete your cookies along with other aspects of your 'History' should you choose.

Cookies are left behind the scenes. Popups, on the other hand are more in-your-face. You'll be on a site and all of a sudden, pop! Not all popups are bad and some are actually part of the design of the site. You click a link to login or for more information and a popup comes up. Other times a pop up is offering more information or sales from the site. Sometimes pop ups are unwanted because they may contain inappropriate images, that are either spam or malicious in nature. You can also configure your browser to turn off pop ups. Most modern browsers will ask you if you wish to allow a pop up in a given situation.

Malware, Spyware, Adware, Viruses and Rootkits

We'll be talking about operating systems in the next chapter; but many dangers that come your way are coming from the Internet. Often times, by clicking links or downloading items you shouldn't you will get malware, spyware, adware, viruses and rootkits on your system.

Personally I use Microsoft Security Essentials, a free download from Microsoft, to keep spyware, adware and viruses off my home systems. There are plenty of other solutions you can choose to protect your system. Contrary to popular belief other non-Microsoft operating systems, even Apple OS's, are subject to the same problems.

Malware is a shortened form of malicious software. It is software that is designed to disrupt or deny services. It might include

viruses, worms, spyware, and adware… really all sorts of bad stuff… hence the name MAL-ware as opposed to Happy-ware.

Spyware does what it implies. It collects information without your knowledge about your system and how you use it. In addition it might make changes to some of your settings, like your home pages and so on. A keylogger is a form of spyware that may log your keystrokes. There are also hardware-based keyloggers that plug into your computer. These things track every keystroke and can gather the sites you visit, the important emails you write, the passwords you use… everything. They are incredibly dangerous.

Adware is a form of advertising that may or may not be wanted. Many find it irritating like with pop-ups, but other times adware may come along with spyware or other malware that is installed.

A computer virus is something that does more than just harm your system but can replicate itself and jump to other systems too. Sophisticated ones try to hide; such as a virus, it may lay dormant on your system and may simply replicate itself. Others perform malicious actions on the system. There are so many different types of viruses, thus anti-virus software is updated regularly. The update that you get is called a "signature" update to keep you protected.

Rootkits allow for repeated intrusion into a system without having to worry about normal authentication. The rootkit masks itself as an ordinary part of the operating system. This makes it very difficult to locate and remove.

There are many other "bad" things that can come your way through the Internet: Trojan viruses, worms and a host of other elements. The keys to protecting yourself include: making sure your anti-virus software is always up to date; and be careful about what you click, what you download, what information you give out and who you trust. Not to make you paranoid, but it takes effort to remain safe.

For a scary (but realistic) dramatic novel about the dangers of rootkits and viruses you might consider Mark Russinovich's book, "Zero Day" and follow it up with the book "Trojan Horse".

Going to the Next Level

There is only one way to take the Internet to the next level. Use it. Use it wisely, but use it.

Many people say they have no idea what to do on the Internet or where to go. That's amazing to me because I find that there are so many places to go and things to do. However, this is my job so perhaps that is part of it. It really depends on your interest. Here is a list of sites or search topics to help you find information:

www.imdb.com This is the Internet Movie Database and it is a great site for being able to track all movies and who stars in them, various trivia points about the movie, mistakes or goofs in the movie and then biographies and such regarding various actors and actresses.

www.wikipedia.com I've mentioned this before but pretty much anything and everything you need to know can be found through Wikipedia. It's an online encyclopedia that goes beyond books because the content is updated online. One thing worth noting is that Wikipedia isn't always completely trustworthy because it allows casual Internet users to edit content which leads to purposeful sabotage from some and simply misinformation provided by others.

www.mapquest.com If you need to find a map or find directions, mapquest.com is a great option. Google or

Bing maps are also a great option when you don't have a GPS.

www.mapmyrun.com A great site for keeping track of your running and sharing your running routes with others. Plan running workouts for upcoming races and more.

www.khanacademy.com This is a site that offers free educational content and it is quite popular. With several thousand videos you can learn mathematics, physics, history and more for free.

www.ted.com This site has incredible videos that will blow your mind at times. Free stage interviews and talks given by some amazing people.

www.facebook.com If you are looking for the most popular social media sharing site for pictures, videos, personal comments etc, Facebook is the existing winner

www.youtube.com If you want to see all sorts of videos from old Donald Duck cartoons to music videos to kids jumping things with their skateboards and hurting themselves really badly, YouTube is the place. You can post your own videos if you choose. It's free.

www.amazon.com Want to do some shopping? Amazon.com is easy to use and sells pretty much everything, not just books.

www.cnn.com Obviously you can choose whichever news program you like (Fox, MSNBC, etc). This is just an example, but it shows you how your news can be quickly located. You can also use the Internet to locate a local news site. If you don't want all the news but just the weather you should try weather.com

There are certainly more than 10 sites to choose from. Really whatever subjects you are interested in you can find. The Internet is an amazing resource and amazingly it really only started from a World Wide Web perspective less than 20 years ago.

There is a little more room on this page so let's add a few:

http://www.downforeveryoneorjustme.com/ Let's you know if the problem is the site, DNS, your ISP… or just you!

http://youconvertit.com/ Convert media files online.

http://www.jamwithchrome.com/ Play music with friends all over the world.

"The day I made that statement, about inventing the Internet, I was tired because I'd been up all night inventing the Camcorder." – Al Gore

Chapter 4: Operating Systems
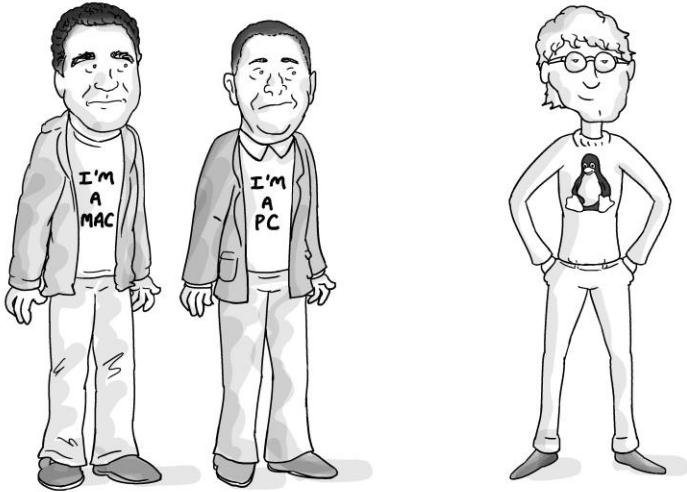
Although we went through the history of the Internet, we aren't going to go through the history of all computer operating systems – just a quick jaunt to catch you up to speed. If you are interested you can certainly search for the history online. Rather we are going to focus on the big three. Mac OS, Windows and Linux. In the process we'll tell some of the story of how companies like Apple and Microsoft formed and review some of the key players in the story.

A Super Brief History of Operating Systems

There were tons of other operating systems for mainframes created at this time. After reviewing them personally, no systems stand out as memorable from my generation; but an older geek might be able to recall systems from their generation. Digital Equipment Corporation (DEC) had their own mainframes and developed the TOPS OS, with TOPS-10 being very popular in universities and was used heavily during the ARPANET development (see Chapter 3 on the Internet for the history of Internet development and ARPANET).

And then came Unix. It was developed by a team at AT&T Bell Laboratories in 1969. It was eventually coded in a programming language called C, which was developed by Dennis Ritchie from AT&T. The value of this new OS with C was its programming language was portable, meaning it could be installed on other hardware. Variations of Unix, like Linux and Mac OS, have been created over the years and you may have heard of some like the Berkeley Software Distribution (BSD) variants and its descendants: FreeBSD, NetBSD, OpenBSD and DragonFly BSD; along with Android, which is also a variant.

Those who know Linux (discussed later in this chapter) appreciate that it is based on Unix and is a Unix-like OS variation. But what many don't know is that Mac OS is also built off of Unix and is the variant that is most used.

As computers got smaller (well, smaller than mainframes); home computers became more popular in the 1980's, and housed systems like the Commodore 64, the Apple II , etc… BASIC, stands for Beginners All-purpose Symbolic Instruction Code, and was the main programming language and operating environment.

> Some of you who had Commodore 64 systems back in the day may remember the computer magazines that would come out with pages and pages of games and other applications that you could type in line for line and execute. It was awesome when you got one to work, but a nightmare when you had to spend hours going through the code trying to find your errors.

That is as short as we can make the History of Operating Systems. Now we need to tell two different stories; that of Steve Jobs and Steve Wozniak; and that of Bill Gates and Paul Allen.

Apple and the Mac OS

It's impossible to truly summarize the entire experience. Nonetheless, for you to be able to speak geek like a pro you need to know some of the background. It's actually an interesting story. You might find it more enjoyable to watch it than to read about it in the "Pirates of Silicon Valley," with Noah Wiley and Anthony Michael Hall. Obviously, it's a movie and it doesn't always follow the true story, but it does have the main facts in play. Let's see if we can review some of those facts.

> Another movie is the Ashton Kutcher's 2013 release called Jobs (which Wozniak says looks "atrocious". A better option, in my opinion, is the Walter Isaacson book "Steve Jobs" which I found to be excellent.

Steve Jobs as a young person was a bit frustrated with the world around him. Most men of genius start off as frustrated young people who can't fit into the normal mold of learning, Jobs was no different. He dropped out of Reed College (Portland Oregon) after 6 months. He worked for Atari in 1974 designing video games and then took off to India for a bit. In 1976 he grouped up with Steve Wozniak, affectionately called Woz, the Wizard of Woz or The Woz; and they formed Apple Computers. Jobs while still in high school; met Wozniak, an HP engineer, while working a summer gig at HP. Jobs was only 21 years old when he and Wozniak ended up using Job's family home garage as a work space.

A third founder, Ronald Wayne (from Atari) was included but sold his shares of the company (10%) back to Jobs and Wozniak for allegedly $800. His 10% today would be worth over 20 billion. Apple incorporates without him.

At Epcot, located in the Walt Disney World Resort Orlando Florida, within the big golf ball there is a communications exhibit called Spaceship Earth. This ride demonstrates the progression of communication from early times until now. One scene is obviously the work on early computers in a garage that is meant to represent that early work between Jobs and Wozniak.

It was in that garage that they would develop the Apple I, released April 1, 1976, and later on the Apple II. Initially it was meant to be a hobbyist machine that could be purchased cheaper and be smaller than existing systems. The Apple I was the first computer that used a single circuit board. Both the Apple I and the Apple II were engineered completely by Steve Wozniak.

To get into the nitty-gritty of each Apple product released you want to check out apple-history.com. It's impossible in one little book to really go through all the major releases of Apple, like the Lisa and the Lisa 2. Apple was doing incredibly well as a company and when it went public in 1980 it was listed with a market value of 1.2 billion. Unbelievable.

Everyone smacks down Microsoft for "stealing" ideas rather than being innovative but they aren't the inventors of that technique. In fact, the Apple Lisa was designed as the first system with a graphic user interface (GUI) and it was based off the technology that Jobs saw when visiting Xerox Corporation at their Palo Alto Research Center (PARC).

The Lisa also had an early commercial 'mouse,' the first sold on the market, which was also seen at Xerox PARC. The mouse had a metal ball below it to track movement initially but when released with the Macintosh it had a rubber ball.

In 1984 Apple released a commercial that is famous. It was shown during Super Bowl XVIII. It's worth watching. Go to YouTube and search for 1984 Apple Commercial. This commercial is considered one of the most memorable and successful commercials of all time. It's certainly one of the Super Bowls best commercials.

In 1984 Apple released the Macintosh, which didn't sell well. In 1985 Jobs resigned as CEO of Apple and he began an interesting new venture called NeXT. In addition, he purchased an animation company from George Lucas which would become Pixar Animation Studies. Jobs invested 50 million of his own money into Pixar and it went on to make movies like Toy Story, Finding Nemo, Cars and others , all which earned them billions.

In 1997 Jobs would return to Apple as CEO and this is when the first iMac and iBook products were released. A system that would become wildly popular and also be the first of the (i) products; iPod, iPhone, iPad would all eventually follow. Jobs also announced in 1997 the selling of computers over the Internet and the online Apple Store took off.

A man who helped Jobs realize his vision of streamlined products is Jonathan (aka Jony) Ive. He was the lead designer for many of the iconic Apple products that appear clean, crisp, and futuristic. More recently Ive has also led the redesign of iOS7.

In the years that followed Jobs would become more than a driving force of innovation for Apple. He became an icon who inspired crowds of people to cheer at Apple conferences when he appeared; like at the exclusive Apple Worldwide Developers Conference.

Steve Jobs was diagnosed with pancreatic cancer and fought it for eight years before passing away on October 5, 2011 at the age of 56. His successor as CEO of Apple is Tim Cook.

As for Wozniak, life went in a completely different direction. He had a private plane crash that he survived in 1981; and from that point he made some new life decisions. He went back to school at Berkeley and obtained his undergraduate degree. In 1983 he worked again with Apple as an engineer but in 1987 he ended full-time employment with Apple and began pursuing a variety of other unique ventures (like the first programmable universal remote in 1987).

I'm watching Dancing with the Stars (Season 8) and low and behold Steve Wozniak comes out on the dance floor. My wife says 'Who?' and I nearly choked. I'm like… 'it's Woz… Wizard of Woz???!!!' and she has no idea. She says "he's not a very good dancer" which was true. Months later we see him on the Big Bang Theory and I'm like "look! It's Steve Wozniak!!!!" My wife says "the guy from Dancing with the Stars?" Noooo….!!!

To learn more about him, check out his book called "iWoz: From Computer Geek to Cult Icon: How I Invented the Personal Computer, Co-Founded Apple, and Had Fun Doing It"

The Mac OS X

You remember we mentioned that Steve Jobs resigned in 1985? Well, that wasn't his original intent. His intent was to wrestle the company back from John Sculley. Sculley was a top Pepsi executive who was brought in by the Apple Board of Directors to be CEO and help Jobs expand and grow the company. Well, as a result of a great deal of wrestling between Jobs and Sculley the Board eventually voted Jobs out.

Jobs would buy into Pixar but he would also form NeXT, which was a computer hardware and software company. Thus, Jobs was back in the computer business creating systems like the NeXT Computer, NeXTcube and then the NeXTstation.

A NeXT Computer was actually used by Tim Berners-Lee in 1991 when he created the first web browser and server. To be honest, I had never heard of NeXT until I wrote this book. You learn something new every day.

NeXT worked on an OS that was eventually called OPENSTEP.

In 1996, Apple purchases NeXT for $429 million. Much of the work that was being done at NeXT was pulled in and incorporated into what we now have as Mac OS X. This was a replacement for the original Mac OS, which lasted up to OS 9. From 1984 until 1999 the original Mac OS survived and then in 1999 it was transitioned into the new Mac OS X.

Mac OS X is based upon Unix, as we mentioned earlier on. It uses Mach as its kernel, well, actually a hybrid kernel that uses Mach as well as the 4.3BSD kernel.

The kernel is part of the operating system architecture that sits between the physical hardware, like the CPU, Memory, devices, and the applications above. Every kernel works differently. For example, Windows uses the NT kernel, which is also considered a hybrid kernel.

The first Mac OS X system (10.0) was released in 2001 and it was called Cheetah. The idea to keep using big cats stuck and here are the versions since:

10.0 Cheetah
10.1 Puma
10.2 Jaguar
10.3 Panther
10.4 Tiger
10.5 Leopard
10.6 Snow Leopard
10.7 Lion
10.8 Mountain Lion
10.9 Mavericks

There are some interesting features to the Mac OS X operating system that make it distinguishable from every other major player. One key element is the Dock. When you look at the desktop of an Apple you see a really cool dock down at the

bottom of the desktop that allows you to add and remove applications for quick click access. This was actually a feature that came over from NeXTSTEP and OPENSTEP. When you hover the mouse over icons on the dock they jump out at you in a 3D fashion, which is pretty cool if you ask me.

Some people really like the whole dock feature, so much so that they want their Windows systems to perform in the same manner. Thus, a dock emulator was designed. There are several options available for download. ObjectDock from StarDock.com is a pretty good one; there is a free version and one available for purchase. You might also check out RocketDock.com or search for others.

My Take on Apple

Personally, the story of Apple and the Mac OS is fascinating to me. And the products developed by the company continue to amaze me. I'm a Microsoft Loyalist, I'll admit it. That's my thing and it has been for 20+ years. On the contrary, I respect what Apple has done and I have to tip my hat to them in terms of their innovative and sleek system designs. My wife has an iPad. I don't touch it… but I admire it from afar. I have both a Windows 8 Samsung Slate and a Windows Surface RT tablet.

Some have asked me how Apple has done so well and what is their winning formula?

Well, I think it depends on what you see as winning. For example, from an enterprise perspective Apple hasn't won the market. Most desktops in offices around the globe are running the Microsoft OS. Microsoft systems are traditionally cheaper and they are more geared toward the working world. However, it is easy to see that Apple has captured the consumer market when it comes to mobile devices and even with desktops in many cases. We'll discuss the mobile lineup in the next chapter.

Now although Apple is not typically noted as an enterprise/business focused company with regard to their products, one interesting result of having such a heavy consumer following is the demand from end-users that they be allowed to bring their own device into their work environment. Bring Your Own Device (aka BYOD) is now mainstream, with organizations allowing employees to bring in their personal devices, keeping costs down for company's while making IT admins scramble for mobile device management (MDM) and virtual desktop solutions.

One thing Apple has done is retain control over both the hardware and the software. Whereas, Microsoft creates the software and sells it on their partner's systems like Dell and HP. Apple controls the quality of their products from beginning to end. By having control of the entire process Apple is able to reduce the amount of problems that could occur. At the same time one has to appreciate that if Microsoft didn't work the way it did, companies like Dell and HP (and others) wouldn't exist.

In an odd move by Microsoft, with the release of Windows 8 they entered the tablet game with an ARM-based tablet called Surface RT and an Intel-based one called Surface Pro. Whether they will remain in this space for long or turn it back over to their partners remains to be seen.

In my opinion, Apple has several marketing geniuses in their corner; although I think they tend to be a bit mean. The first commercial where I saw Justin Long say, "I'm a Mac" had me rolling on the floor. The 10th one just felt mean. Like, alright guys you've done this enough and now you're just being bullies in your own marketing campaign. It hurt a bit more that the campaign hit during the Windows Vista era, which we will discuss shortly. (It wasn't pretty folks)

While Microsoft represents the corporate world, Apple practically shuns it by being the fun loving, "Let's put an Apple sticker on the back of your Prius" type of company.   As a result Apple has won a serious following, and those folks are practically religious

in their support for the company. I haven't heard of too many who go Apple and decide to come back. The kool-aid over there is pretty strong.

One piece of history that many don't know is that when Steve Jobs returned to Apple in 1997 the company was floundering. This was before the success of the iMac and the iBook. At that time Microsoft (yes, you heard correctly… Microsoft) invested $150 million in Apple and a deal was made to put Microsoft Office on the Mac. Some claim the investment was a disguised patent infringement settlement but regardless, it was this boost that helped Apple get back in the game. Jobs said it himself when he announced it on stage at the Macworld Expo, with Bill Gates on a big screen behind him. He said that if they wanted to "move forward and see Apple healthy and prospering again," they had to change their mentality and move away from thinking that for Apple to win, Microsoft has to lose. Well, apparently the help has been forgotten because the commercials from Apple just pummel Microsoft. I guess it's like they say "it's not personal… it's just business".

Microsoft and Windows

The story of Bill Gates, Paul Allen and Steve Ballmer is completely different from Jobs and Wozniak and yet no less entertaining.

Bill Gates was born in Seattle, Washington. I've often wondered on my many trips to Microsoft why I'm going to Washington. I imagine Bill liked it there and so he stayed.

Gates played around with software programming even in his youth, spending time on a GE computer at school and programming in BASIC. He went to Lakeside School, a private school where he met Paul Allen. The two would work together in their youth on a variety of different ventures, including one

called Traf-O-Data, which was a traffic counter that would generate reports. They didn't make a million on that one, but they were only 17, so that was ok. It was a good start to what would come later.

In 1973 Gates went to Harvard University, this is where he met Steve Ballmer (who we will discuss in a moment). It was the January 1975 issue of Popular Electronics that changed all of their lives because right on the cover was the Altair. A quick search for January 1975 Popular Electronics on Google or Bing, will bring up images of the issue and show you what the Altair looked like. It was a simple square box with lots of switches on the front. At some point Paul Allen convinces Bill Gates to leave Harvard and they form Microsoft. Microsoft may have formed with or without the Altair but it played a huge role in them moving forward.

Originally, the Altair was programmed in binary using the switches with the results being shown on the front LED. The programing would take days or even weeks and it was horrendous. They needed a better method to work with, thus Gates and Allen contacted Ed Roberts. Ed was the president of Micro Instrumentation and Telemetry Systems (MITS), the company that manufactured the Altair. Gates and Allen said they were working on a BASIC interpreter. The truth was they didn't have any type of working BASIC code for the Altair. In fact, they didn't even have an Altair. Instead they had a simulator. Well, they wrote up the interpreter and ran out to New Mexico to try it out on the real Altair. They got it to work on the second day of testing and that was the first product Microsoft (then called Micro-Soft) created.

One cool part of the story was that after they got everything ready and Allen was flying to New Mexico, on the plane he realized that they didn't have a bootstrap program. This program is what would read the punched tape to memory. Allen wrote this last part before the plane landed and it worked!

Because MITS was in Albuquerque New Mexico, Microsoft was first established there. In 1979 they moved to Bellevue, Washington which is where the headquarters remain to this day.

Microsoft's main focus was BASIC interpreters up until the 1980's. Microsoft BASIC was the key to their earlier success. We can see that carried down through their continued use and development in Visual Basic and now Visual Basic .NET.

In June 1980 Ballmer becomes Microsoft's 30th employee and is the first business manager. He would go on to become President of Microsoft from 1998 to 2001 and currently serves as CEO since 2000.

The Arrival of MS-DOS

It's a funny story how Microsoft Disk Operating System (MS DOS) got its start. Some of you reading this may not even know what DOS is but it was the first operating system I ever really learned how to work with and it was the base OS for Windows for a long time. Back in the day, it was essential for any of us "old timers" to know how to install and work with DOS.

It begins with IBM approaching Microsoft and asking them to write a BASIC interpreter for the IBM PC. Easy enough for Microsoft but they still needed an operating system. BASIC isn't the OS itself so they needed an OS. There was one called DP/M that was made by Digital Research (DRI) but negotiations weren't working with IBM. Gates suggested they use a similar OS called 86-DOS or QDOS (quick and dirty operating system) that was created by Tim Paterson of Seattle Computer Products. Microsoft made a deal with Paterson to be the owner of DOS; and then turned around and leased it for a one-time fee of $50,000 to IBM as PC-DOS 1.0. They held on to the rights to it though and could then sell MS-DOS to all those PC vendors that would eventually copy the IBM PC.

Microsoft worked with IBM on another operating system venture called OS/2. At one point it was looking like OS/2 would be the future over Windows; but instead Microsoft went in a completely different direction with NT and left OS/2 in IBM's hands to continue development. It's a longer story than that but that's the base of it.

The following year, in 1982, IBM needed DOS to work with a hard disk and this required a near complete revision of DOS. Ultimately, it has changed a lot since the original purchase from SCP. The original creator, Paterson worked for Microsoft several times in 1981, 1982, 1986-1988 and then from 1990-1998.

The mess from the whole DOS and DP/M became a big legal issue questioning whether Paterson really created DOS or did he copy DP/M. To make matters worse, SCP was upset with Microsoft for concealing their true business with IBM. I'll spare you all the details, but basically this was all part of business; and all handled in the courts with various wins, losses and settlements.

Even though legacy Windows ran on top of DOS, currently Windows does not use DOS at its base. However, there is still a command prompt included within the operating system that uses all the same old DOS commands that many have become comfortable with. In recent years however a new command line interface (CLI) has been introduced called PowerShell. While it also can use all the old DOS command, it has a new set of powerful cmdlets (pronounced command-lets) that let you do things through the CLI that is truly revolutionary.

It was around 1982 that Allen was diagnosed with Hodgkin's lymphoma. His treatment was successful, but at that point in his life he pulled away from Microsoft work and resigned completely by November 2000. Since then, he has pursued a ton of other interests with a focus on philanthropy. One recent project is the launching of the Allen Human Brain Atlas, which can be found online at www.brain-map.org .This is a detailed set of information, probably the most detailed set in the world, about genes and the brain.

Allen wasn't the only one to pursue philanthropy. On January 1, 1994 Gates married Melinda French. Together they formed the Bill & Melinda Gates Foundation, which at this time, is the largest charitable foundation in the world. It is transparent that the benefactors can see where their money is being spent. At one point Gates slipped into the role of Chief Software Architect for Microsoft so he could focus more on philanthropy. Ballmer, his longtime friend from college, took over as CEO (and continues

in that role until the time of this printing). From 2006-2010 Ray Ozzie, another legend and super genius known for creating Lotus Notes, became Chief Software Architect (he stepped down in 2010) and the CSA role hasn't been replaced. Rather there are key persons called Technical Fellows that help to monitor and drive development across the many company platforms. At this point, Gates is still a non-executive chairman for Microsoft and is a full time philanthropist.

The Arrival of Windows

The first versions of Windows were not really true operating systems. They are called operating environments because they sit on top of an operating system, in this case DOS.

The first version was released on November 20, 1985 and it had some longtime favorites like Notepad, Paint, Control Panel, and Calculator; just to name a few. This was a graphic user interface (GUI pronounced goo-wee) that sat on top of the DOS CLI.

Windows 2 would come out in October 1987. At the time Windows used a feature called cooperative multitasking which was both a curse and a blessing to people like me back in the day. With cooperative multitasking you could run multiple applications at the same time; like Word, Excel and PowerPoint. That's a blessing. However, if one crashed, all applications crashed. That was the curse.

> With more advanced processing solutions and operating system developments came another feature called preemptive multitasking. With preemptive you can have multiple applications open but if one crashes, it doesn't take out the others (hopefully).

The first versions of Windows I remember is Windows 3.0 (1991) and 3.1 (1992). Then we say Windows 3.11 (aka Windows for Workgroups) with an add-on pack to support TCP/IP in 1994 codenamed Wolverine. It was around this same time that Microsoft started releasing their NT family of Windows. NT 3.1,

3.5 and 3.51 were released from 1993 through 1995. We could discuss the battle between Novell and Microsoft for enterprise server domination but that would not fit into the context of this book (perhaps the sequel).

NT stands for New Technology and even though it isn't used in the name, Windows desktop and server operating systems, it is still used for specific releases. For example, Windows 7 is NT 6.1 and Windows 8 is NT 6.2.

It was in 1995 that a new interface was offered for Windows, one that remains to this day a delight of some and the chagrin of others. Windows 95 offered a Start button in the bottom left corner with a task bar and a system tray. This is when terms like: 'plug and play,' first came into use as opposed to the days of old where you plugged in hardware and tried like a madman to get that 2400 baud modem to work for hours. Now you would plug it in, the operating system would hopefully recognize it and you could provide a driver and move forward. It also supported 32-bit applications. Windows 95 was revolutionary and had people waiting in lines around the block.

Windows 98 would arrive in 1998 and then a second flavor of 98 would arrive in 1999. There was also Windows Millennium Edition or ME released in 2000. ME had some cool new features but ultimately was trashed by the critics and it is the OS to which we don't refer any longer. Well, I thought it was no longer mentioned until Windows Vista bombed with the critics and then they brought up ME again, but only to say, "is Vista the new ME?"

You know you're a geek when you see a blue screen of death (aka BSOD) and say "Challenge… accepted!"

At the same time we see Windows 95 go live; and we see the release of NT 4.0 workstation and server. These were equally revolutionary and started Microsoft's serious foothold in the enterprise server world. It would begin with the small business side but grew with the release of Windows 2000 with Active Directory.

Active Directory is an identity management system and directory service. When you log into your work domain you need a username and password. The identity management system confirms that you are who you say you are and provides you with the ability to log in and access resources on the network (files, printers, etc…). At the same time your name is in Active Directory, which can be used to provide your address, phone numbers, position in the company and a host of other important details that can be searchable as a result of the directory service. There are many different directory services, but Active Directory is the one that Microsoft has created.

At some point it was decided to combine the Windows desktop/workstation products and work off the same kernel for the NT server product line-up.

In October of 2001 we see the release of Windows XP, which is arguably the most beloved flavor of Windows to date. XP will eventually be replaced by Windows 7 or 8, but XP has a great reputation and has worked well for over 10 years. It faces end-of-life in April of 2014 and companies have to move forward or risk complete lack of support. In April 2003, Windows Server 2003 was released.

Five years after XP, Windows Vista was released. It was trashed by all. Drivers weren't available for legacy printers, applications didn't work immediately on it, and the new security feature called User Account Control made people angry because of the many prompts. It just didn't do well. Even after SP1 fixed a variety of issues and many vendors began providing updates of their

software and drivers to work better with legacy items, the damage was done.

You know you're a Windows loving geek if you think re-booting means this is a good time to go make coffee.

Here's my take on Windows Vista. It was awesome. Not just after the Service Pack (SP) but even with the first flavor, the Release to Manufacturer (RTM) version. I've met with a great deal of criticism over saying it was awesome. I've said it in my InfoWorld column for years and you should see the filthy worded responses I get… suffice it to say there are some IT professionals who need to have their mouths washed out with soap. Unfortunately, we needed a more secure system and we needed a change in the OS works to protect us. Vista took a bullet so that Windows 7 can be "wonderful" in everyone's eyes. I should mention that Windows 7 is really Vista with a new cover and some minor tweaks. Vista introduces so many new elements to our Windows world and not just the Start orb (aka jewel) rather than a button. With all that said, Vista is the past and Windows 7 is the present. And Windows 8 (released August 2012), another revolutionary step for Microsoft, is the present and future.

At the same time we have seen the release of Server 2003 R2, Server 2008, Server 2008 R2, Server 2012 and Server 2012 R2 (coming soon).

Windows 8

Windows 8 is considered the most revolutionary change to the look and feel of Windows since Windows 95 introduced us to the Start button (non-existent in Windows 8 without a third-party tool to put it back). Windows 8 is designed for touch screens and uses an opening Start Screen (although you can also go to your Desktop). The Start Screen has tiles that, in some cases like with the weather, are 'live' tiles in that they update when new information comes in. A Microsoft Store was added in so that

apps can be downloaded in much the same way they are with mobile devices.

With Windows 8.1 some of the complaints from end-users regarding navigation and the lack of mouse-friendly control are being addressed with added control over the experience for end-users with regard to tile sizes on the Start Screen and other items being added.

For a free 2-page ClipStart Guide on Windows 8 just go here and sign up: http://www.cliptraining.com/portal.cfm

Most Windows geeks know that the new look of Windows 8 was based on a UI called Metro. Prior to the release of Windows 8 the term 'metro' was dropped due to threats of a lawsuit from a German retailer, like Walmart (named, you guessed it, Metro). Microsoft said that was always just a codename and that it always planned on going with something awkward like "new user interface" or "Windows 8 UI" rather than the cooler Metro UI name. I still call it Metro. Unless I'm in a German Walmart.

Various Flavors of Linux

Now we return to that cartoon at the beginning of this chapter. Why does the last guy have a penguin on his shirt? Ah… well you might believe there are only two mainstream desktop operating systems at this time: Mac OS and Windows. In fact there is a third, and its mascot is the penguin. It's called Linux. (some pronounce it Lye-nux and others Lin-nux).

Linux is a variant of Unix, which we discussed earlier. It was first created and released by Linus Torvalds and believe it or not, it runs all sorts of things behind the scenes. Sure it isn't on your desktop (although in some cases it might be… Dell, for example, was selling Ubuntu Linux on systems for a while. Visit www.system76.com for a lineup of desktops and laptops that run Ubuntu Linux too.

Let's be clear, Linux as an operating system is open sourced. We haven't really addressed this term until now but ultimately when software is a free and open source it means people have the right to freely use it, study it, and make changes to it and so on. The source code is open to all.

There are pros and cons to open source. On the one hand, it is free. It is also a great way for the geek community at large to work together on something. On the negative side there is no driving force, no commercially driven side, to make things happen quickly or in an organized fashion. As a result, even though Linux is free there are companies like Red Hat who sell it because they sell their own support of their flavor of Linux.

Some of the more common flavors of Linux that have shown up over the years include Debian (of which Ubuntu is connected), openSUSE, Fedora, Mint, Sabayon, PCLinuxOS, Arch, Mandriva, Puppy and others. There are so many different distributions of Linux that it is too much to try and go through all of them. Wikipedia has a cool chart if you search for, "list of Linux

distributions;" and some are Debian based, others are Slackware-based; seriously the list is long.

Before Linux got started there were other moves needed to create a free Unix-type solution. One was from Richard Stallman, who began the GNU Project in 1983. BSD, mentioned earlier was another variant. MINIX was written by Andrew S. Tanenbaum. In 1991 Linus Torvalds decided to work on his own Linux kernel. It works with GNU applications and third-party non-GNU components which are developed around the world.

Everyone asks what GNU stands for and it stands for "GNU is not Unix". It's a weird recursive acronym joke that programmers like to play. The g is silent and the n is "not" and the u is "Unix". Get it? Me neither, but that is what you'll find if you research it.

When working on a Linux system you might feel like you are working on an older flavor of Windows. My first experience with it had me feeling like I was back on Windows 3.1. Modern flavors are smoother and faster. It's much more polished than it used to be. What's cool is you can choose your graphical user environment like GNOME, the KDE Plasma Desktop, or one of the others that are available.

Next time a geek makes a snide comment your way that you probably don't even know what Linux is you might reply, "well, my Android phone (should you have one) certainly knows what Linux is because it is running a variant of the Linux OS kernel!" If you don't have an Android phone you might reply, "I'm sure Linus Torvalds would be shocked to hear you using Linux to belittle another."

Our main focus of this chapter is the desktop OS but it's important to note that Linux is more widely used on servers. There are desktop deployments of it, but it has a much stronger server following. In addition, we see Linux used as a base for

other systems including Android devices. So, if you think you have NEVER used Linux before, if you have an Android phone you have a modified flavor of the Linux kernel, and that counts!

Google Chrome and Chromebooks

Another Linux-based OS is Google Chrome OS (which runs on Chromebooks and Chromeboxes). Different vendors like Samsung and Acer have released laptops with the OS on them. http://www.google.com/chromebook

Chrome OS is browser based with a minimal UI. You can use your system to connect to your Gmail, YouTube, Google Search, Google Drive and so forth. There is an onboard file manager as well, along with built-in audio/video elements.

Google has sent me several versions of these systems and I really like them and see where they can serve a special purpose. For one thing they boot in 1 second. And I'm especially fond of their high-end Pixel Chromebook, which has an incredible display and probably the best touchpad I've ever used (called glass touchpad). A browser-based OS is an interesting concept and one that we'll have to see if the consumer market likes in the end.

To access a command prompt (or terminal) on a Chromebook you press Ctrl + Alt + T
And if you want a shell prompt just type "shell" at the command prompt.

File Systems and Drivers

Without going too deep into some of the inner workings of an OS, it is worth discussing file systems and drivers. File systems help you organize your data and have been around since the beginning, in different forms.

I can remember learning about the FAT (file allocation tables) file system, which was used with DOS. There was FAT12 and then FAT16, as it evolved. Then we had FAT32, which allowed for

larger file names. We were so limited back in the day to 8 letter file names with a 3 letter extension, the 8.3 limits. With FAT32 those limits were removed and the size of the disk was allowed to be larger.

With NT came NTFS, which allowed for greater security because you could establish more than just share level permissions but system level file permissions through Access Control Lists (ACLs). Encryption and compression along with a host of other features of NTFS gave server administrators greater control over the files than what we had with FAT.

A new file system being supported with Windows 2012 and Windows 8 is the Resilient File System (aka ReFS). It maintains backward compatibility with NTFS but includes a variety of new features including improved data verification and error correction (hence the name Resilient). It also surpassed NTFS limits on maximum sizes for files, directories, volumes and more.

In addition there are other files systems like Unix file system (UFS) for Unix and Unix variants. Mac OS X uses a file system that came with the original Mac called hierarchical file system (HFS) Plus, aka Mac OS Extended. These are just a few of the many hosts of file systems. Sometimes the operating system has the ability to read and work with multiple file systems and in other cases there is a need for help to accomplish that task.

As for drivers, pretty much everything extra that you want to plug into your computer; either literally through an expansion slot inside or externally, requires a driver. A driver is a tiny piece of software that tells the hardware what to do. Imagine attaching an extra arm to your body. You might be able to wire it up with power from your body and attach nerves and such (well…. maybe if this were the year 2100). Unless your brain has the driver - the knowledge about how to use the extra arm, it won't know how to use it. The same is true of anything you plug into your computer.

Now we mentioned that over time OS developed more of a 'plug and play' feel. That means when you plugged in a new card or device, if the device was PnP (plug and play), the system could

see it and would reach for a driver. Sometime it might already have the driver. If not, it will ask you for a disk or the location of that driver. This is all still true today.

When you install a new OS, using Windows as an example, you have to make sure you have the latest drivers that will work with your existing hardware. Sometimes hardware vendors haven't updated their drivers and you can research workarounds using older drivers. In other cases the device won't work without the updated driver on the new operating system. Often times the OS vendor (usually Microsoft) is blamed for this but it is really the fault of the hardware manufacturer. Microsoft gives them plenty of time to update their drivers, if they choose.

Going to the Next Level

There are two ways to become OS gurus. First, you have to work with them. You don't need to be awesome with all three, but whether it is a Mac OS X or a Windows or a Linux flavor you need to get into the details of the OS. Not just the desktop stuff but the file management side, the administrative tools and performance tools, the little quirky elements and shortcut keys.

Personally I'm a Windows guy and I have books and videos that take you deeper into the Windows desktop and server OS. Visit ClipTraining.com (the company I co-founded), to learn more about Windows and Office. With Mac and Linux, you'll have to find some alternative training materials to help you learn more.

Nothing beats installing an OS for yourself. The thrill of installing Windows for the first time on your own will empower you. You might need some help and either a spare system or a virtual machine to load it on. Clicking through the wizard that helps you install it and learning a bit more about things like formatting and/or partitioning the hard drive, installing drivers and more… this will really take you to the next level.

Chapter 5: Mobile Phones and Tablets

Can I have my iPad back?
Are you still using it for work?

Daddy, can I play
Angry Birds Star Wars
too?

The fact is there are plenty of non-geeks who know just as much (if not more) about mobile devices as geeks. These new phones and tablets make it part of pop culture, not just geek culture. We're going to look at it from a 100,000 foot overview and try and find the geeky elements that even the most avid mobile device user may not be in-the-know about. Plus we'll fill in some details for those who haven't upgraded their basic phone to one of these smart phones just yet and who are still afraid of the idea of an eReader or tablet.

A New Vision for the Future

We didn't mention this in the last chapter but Microsoft's original vision set out by Paul Allen and Bill Gates was "a computer on every desk and in every home" (something like that). However, not too long ago that vision changed. Considering the fact that the first vision has pretty much been achieved, the new vision is a clear indication that mobility has brought with it a new future.

Apparently the new vision is, "Create experiences that combine the magic of software with the power of Internet services across a world of devices." Some have said that last part is actually, "any time, any place and on any device".

Obviously Microsoft isn't the only one looking to accomplish this goal. A combination of innovative technology from Apple, Samsung, Amazon and others will lead us into the next generation of computing and we are really in the infancy stages of this now.

A Brief History of Mobile Computing

We say brief because in the world of mobile computing if you look backwards for too long you'll miss out on what's coming out in front of you. Obviously as the concept of computers on desks became more feasible throughout the early 70's, the idea to have one that could be carried was also in development. IBM offered up the first commercially available solution called the IBM 5100. The thing was like 50 pounds!!! Not too portable. Had a cute little five-inch screen though, but we're looking at a suitcase to carry this thing.

Obviously, laptops have improved since that point and we currently have a system like the MacBook Air which is literally under 3 pounds with more computing power than you can imagine compared to the IBM 5100.

Now laptops typically have all the bells and whistles, like optical drives, but a new breed of laptop came on the scene in 2007 called the Netbook. The idea was to offer smaller screen sizes and fewer features. To do this some features had to be left out and the operating system was either Linux or Windows XP compact editions. Microsoft also has a Windows 7 Starter edition that is used on newer netbooks.

Personally, I considered a netbook at one point but I have this little red Dell Latitude E4300 notebook with 4GB of RAM, now running Windows 8, with an optical DVD burner. It weighs about 5 lbs and I couldn't see going any smaller for myself. Brien Posey, one of our technical reviewers says "Some laptops are still really big and bulky. I bought a new Asus laptop a week ago and seriously, the thing weighs 20 pounds! I can't complain about the weight though. It has an Intel Core i7 CPU, a NVIDIA GTX560M video card with 3 GB of video RAM, 16 GB of system RAM, 1.5 TB of disk space, and a 3D monitor."

Okay, so laptops and now netbooks enabled mobile computing. At the same time pagers and then cell phones became all the rage and at some point, like a cereal commercial where two things collide into one… the smartphone was invented.

Well, before that happened there were several cool devices to play with that were not smartphones. These were called Personal Digital Assistants (PDA's). Now I know some of you reading this are smacking your head and going 'oh yeah… PDAs!!!' There were many on the market and many knock-offs of front runners on the market but certainly Palm hit the mark with the PalmPilot.

The term PDA was first used by John Sculley at the Consumer Electronics Show in 1992 in Vegas. Sculley was the Apple CEO if you recall from chapter 4 on operating systems.

I had a PalmPilot and it was small and sleek and I could take it on a plane, snap a keyboard into it and write. I wrote parts of two books back in 2000 using a PalmPilot while traveling excessively teaching an enterprise storage solution class for CommVault Systems.

PDA's initially didn't have the ability to connect you to the Internet or make calls. The first ones were made by a company called Psion with the Organizer I and II. These were made in mid-1980. They also had the Psion Series in 1991. The Apple Newton was released in 1987 and had a good run until 1998. It was replaced by iOS, which is the operating system for iPhones, iPads and modern Apple devices. I had a friend back in the early 1990's who went to M.I.T. and even though he was only 19 he created all sorts of cool things for the Newton.

Palm was really a front-runner in the PDA world. It would continue to develop new products but ultimately HP purchased Palm for $1.2 billion in April 2010 and ended the Palm device line. Even though Palm was cutting edge, it is actually Nokia that gets credit for the first mobile phone/PDA with the 9000 Communicator.

In the movie, "The Saint" (1997), Val Kilmer used a Nokia 9000 Communicator, which at the time was really cool, because I remember watching the movie and thinking, 'yeah, like that's real.'

Now some might disagree and say that the 1992 IBM Simon is the first real 'smartphone.' Simon was impressive in that it was a mobile phone with a calculator, notepad, email client and could even send and receive faxes. Perhaps that is true. The Nokia followed and then came the Erickson GS88, which is the first time the term 'smartphone' was used. The 2000 touchscreen Erickson R380 Smartphone was the first time the word 'smartphone' was used in the marketing name of a phone itself. It used the Symbian OS. Nokia also used the Symbian OS until the year 2011, when Nokia said it would switch to Windows Phone 7, the latest mobile OS from Microsoft.

It was during the 1990's and early 2000's that we would see devices from Microsoft running Windows CE, (Microsoft's OS for embedded systems at that time) and the Pocket PC. In 2003 I had a Dell Axim that my brother-in-law bought for me; I just loved it for playing Chess and golf on it. It also had a wireless card that allowed me to access the Internet. I still have it in a box for the sake of nostalgia and for my museum one day.

Then, in 2002 a new company would emerge and it would explode onto the mobile device scene with BlackBerry. BlackBerry was designed and developed by Research In Motion (RIM) and used the BlackBerry OS, with the latest flavor being the OS 7 at the completion of this book. Millions of people fell in love with their BlackBerry's and even with modern smartphones coming out there are still about 70 million subscribers worldwide. It has lost some traction even though it has evolved to be more like the modern touchscreen devices. The first versions had the cool keyboard attached that people loved.

Back in the day, the big thing about BlackBerry was that it could offer instant email because you would implement a BlackBerry Enterprise Server (BES) into your environment which would pull the email from the server and immediately push it down to the person. People would get their email's immediately as opposed to waiting for the client on the mobile device to check in with the server and poll for new email, which might delay you receiving it for 10 to 15 minutes depending on the polling interval. Now push email is available by all manufacturers.

While the various devices were evolving and the providers were as well, there was also a revolutionary change in the processors used for these devices. Let's discuss this amazing newcomer before going on to discuss mobile phones in greater detail.

The ARM Processor: A New Processor War Underway

We know the major desktop players are Intel and AMD. It's been that way for years. Well, in these smaller devices there are processors being developed, not only by the big boys of processing but by ARM Holdings. Founded in 1990, ARM Holdings was a joint venture of Acorn Computers, Apple and VLSI Technology. ARM stands for Advanced RISC Machine and they have developed a processor that is perfect for low power mobile and embedded electronics. Currently, they rule the market with over 90% of all PDA's, eReaders, smartphones, MP3 players, hand-held games and so on. All being controlled with an ARM processor.

Both Intel and AMD have been sitting back and hoping ARM doesn't jump into their prime space; but that is obviously their next step as they look to the netbook and notebook market. Thus, Intel and AMD have to work on battling to keep their position in the mobile space.

The difference is one of focus. Intel has focused over the last few years on increasing the clock speed of the CPUs. It was developing to improve performance, but giving little thought to the power consumption these processors need. ARM has focused on producing processors that are not as powerful as their desktop counterparts, but reduce the amount of power required to run them. Once the power issue was managed, they focused on improving performance. Even though ARM has a larger share of the mobile market I wouldn't count Intel out. They are currently getting great reviews on newer mobile-oriented Atom processors.

Since the big focus these days is on reducing energy, going "green" and saving money in the process, energy efficient processing is not only great for mobile devices and eReaders that work off a battery, but also for desktop and server systems as well. AMD and Intel have to scale down power consumption to remain relevant. ARM has to scale up performance to become relevant in the desktop and server world. This will be a fun one to watch; as we will all have to wait and see how this plays out.

Smartphones

There are so many different smartphones on the market these days. Seriously just walk into any Verizon, AT&T, Sprint or T-Mobile store (apparently there are many providers too, huh?) and you will see the walls lined with them. How do you choose? There are many models from so many different manufacturers.

Well, you might first look at the base operating system to see which one you want. Or you might consider the vendor. You might look to the services offered by your provider since not all vendors offer the same service, like a 3G or 4G network.

For some it is religious in nature. They love BlackBerry, have always used a BlackBerry and will always buy a BlackBerry. "I

was born a BlackBerry user and I'll die a BlackBerry user!" they shout (although there are fewer and fewer of these folks each day). The younger generation is no less religious about their Apple iPhone. Even when problems were discovered with the antenna for the iPhone 4 if you held it by the antenna band, many users held their ground in support. They might say "no device is perfect, so if I have to hold my phone differently I'll adjust, I'll take yoga - I don't care!"

In May of 2013 Samsung announced they have the world's first 5G system. It boasts high-speed Gbps throughput.

Well, let's look at the front-runners to the mobile world: iPhone Android and Windows Phone. Yes, we know BlackBerry is in the top 5 too, but all the talk these days is iPhone and Android.

As of 2013, according to market research firm IDC, Windows Phone marketshare has exceeded that of BlackBerry, in-spite of the new BlackBerry Z10 smartphone. At this time, iPhone and Android make up the huge part of the marketshare with Windows Phone and Blackberry in the single digit percentage category.

Now the only problem with the discussion is the words we are using. It's like saying let's discuss the differences between the iMac and Windows. One is a system with an operating system. The other is just the operating system. Again, because Apple controls both the hardware and software, the iPhone is not the OS; it is the phone which includes an OS. Whereas Android is the OS and it goes on a bevy of different phone manufacturers devices.

The iPhone

First released in 2007 this thing knocked people off their feet. Even with a recession beginning and a huge price-tag people just inhaled these things. The original iPhone had a multi-touch interface, with a beautiful screen that didn't need a keypad or a stylus (which is a little plastic pokey thing for touching your PDAs) because there was an easy to use virtual keyboard.

With the second release in 2008 Apple also created the App Store, which made it easy for you to find apps for your phone or iPod Touch. An iPod Touch is another mobile device but one that doesn't have a phone. There are both free apps and apps for purchase.

> The iPhone uses the iOS as its operating system, which is a variant of the Mac OS X, which you might recall is based on Unix. So, the iOS is another Unix variant that is used for the iPhone, iPod Touch and iPad.

Initially the original iPhone was only available exclusively with AT&T and the good, the bad and the ugly that came with that. But it has since expanded to Verizon and Sprint. Keep in mind there are different plans and different models depending on your provider so choose carefully if you want 3G or 4G. Also, keep in mind you can connect using Wi-Fi.

> One application released on the iPhone 4S, has a cool application called Siri, which is like a personal assistant that you can talk to and ask information from. The responses are great but oftentimes quite funny depending on the question. There is a whole website dedicated to it at www.sirifunny.com Just ask Siri what the meaning of life is.

With each new version comes new features and improvements including increasing the battery life for the device, adding cameras to the front as well as the back of the device, improving performance, storage and screen resolution.

At the time of this writing the current version of iPhone is iPhone 5. Newer versions will include the new iOS7 system. At this time we don't have new specs for the hardware but the new iOS is quite a revamp from legacy versions. Jony Ives (mentioned in Chapter 4 on operating systems) worked on this graphical overhaul that is receiving both praise and criticism.

Android Phones

The Android OS is built off of Linux so it is also a Unix variant for mobile devices. In 2005 Google purchased Android Inc. and they released the code as open source. It was released for devices in 2008 and the first phone using it was the HTC Dream. Also in 2008, Google opened the Android Market which is the equivalent to the App Store from Apple.

Third party smartphone manufacturers like Samsung sell many of their phones using Android as the underlying OS. At the completion of this book, they have version 4.0 of the OS and its nickname is ice-cream.

All Android OS nicknames are named after sweet foods or desserts like: 2.3 Gingerbread, 3.0 Honeycomb, 4.0 Ice-Cream Sandwich and 4.1/4.2 Jelly Bean. Hey some folks like to use big cats for their OS nicknames and others like desserts!

The OS obviously continues to improve to provide a more robust mobile experience but the hardware improves too and so you have to be sure you are getting what you want such as the screen resolution and size, the amount of storage, 3G/4G speeds, etc., and again that requires a conversation with your providers.

Windows Phone

Microsoft certainly hasn't sat on its hands through the mobile OS development process. Microsoft has been in the mobile OS game for a while. Windows Mobile was used on PDA devices (without phone capabilities) and smartphones (with phone capabilities). The Windows Mobile OS evolved from Pocket PC flavors through to the Mobile 5 and 6 flavors (with various version numbers). Microsoft had a solid piece of the market through hardware vendors that used the OS on their phones. However, in 2010 Microsoft released the successor to Windows Mobile, called Windows Phone 7 (and then 7.5). It was a whole new focus on the consumer market rather than the enterprise, to match the same focus Apple has with the iPhone.

In October of 2012 Microsoft released its latest mobile phone OS, Windows Phone 8. Much like the Windows 8 OS, this phone uses live tiles that update (for things like weather, calendar items and so forth). Like Apple and Google, Microsoft also has a Store for apps to be downloaded to the phone. And in case you're wondering, this is the phone I personally use (and I love it!)

Other Mobile OS's

Of course there are other mobile OS's. For example, Bada. Millions of people have Samsung phones running Bada. I've never heard of it, but it's out there. In early 2013 Samsung announced they will be moving away from Bada and going with Tizen, yet another mobile OS you probably haven't heard of. (I hadn't either… look it up!)

eReaders

eReaders were developed with the sole purpose of reading digital books and periodicals (magazines, newspapers, etc…) These have changed or morphed from their original versions that really focused on books-only, into tablets. The drive for an all-in-one device that can do it all has led to that evolution for the eReader market. There are, however, devices that still serve as eReaders only but that market is declining.

Two head-to-head front runners in the eReader space are Amazon (with the Kindle) and Barnes & Nobel (with the Nook).

The Amazon Kindle lets you connect to Amazon.com and download directly from the Amazons 3G Whispernet network. What's cool about the original Kindle is that it uses a special solution called E Ink electronic paper. It doesn't use a backlight but rather tries to mimic real paper. That makes it easier to read in the sunlight by the pool or ocean; which is what Amazon points out in their commercials when trying to help you see why you want a Kindle.

Since the first Kindle there have been a variety of different versions. The Kindle Touch doesn't have a keyboard below it. The latest family of Amazon tablets are called Kindle Fire, and these are actually Android tablets with a LCD that doesn't use the E Ink display.

One of the smartest things Amazon has done with the eReader space is release a Kindle app that can be downloaded and used on all devices (iOS, Android and Windows). It's one of the first apps I install on a tablet and probably the one I use most.

The B&N Nook started off as an Android based eReader that used E Ink; but then in 2010 they released a color version called the Nook Color. They currently have various Nook Simple Touch versions and Nook HD tablets.

Tablets

Tablets are like giant smartphones, but without the phone part (although most include some kind of soft-phone like Skype). They have different form factors and you'll hear that term sometimes in reference to the size and positioning of the screen.

You'll hear tablets referred to as slates, which means they have no dedicated keyboard, just the screen; or pads, in the case of the iPad. There is plenty of debate over what they should be called and who has the right to name them. One reason is because Microsoft first used the term in selling their XP Tablet PC Edition which didn't quite take off in comparison to the success of the iPad and other modern tablets.

Over the years various attempts have been made to provide a different portable form factor that had the power of the laptop, but was flatter and able to be carried like a book. I remember seeing a running XP Tablet PC Edition and not even getting excited about it, even though it had a pen for note-taking and a removable keyboard.

In April 2010 Apple released the iPad and again the crowds went wild. The iPad 2 was released in March 2011, iPad 3 in March 2012 and iPad 4 released November 2012. With a smaller form factor of 7.9 inches the iPad Mini was released in November of 2012 as well.

And then it happened… I didn't see it coming. After years of being an all Microsoft home (and proud of it), my wife wanted an iPad! So, I bought her one; and she loves it. I admire it from afar and refuse to play with it but I have to say, the sleek design is so appealing. As for me? I recently picked up a Surface RT running Windows 8. It has a kickstand and a cool touch cover. I love it! And that is why it is on the cover of this book! My wife wants the next version iPad though. <sigh>

There are different ways to purchase an iPad but I found the experience with the Apple Store online to be extraordinary. Easy to find the one I wanted and order it. When I had a question I got some of the best customer service I've ever received, and a free magnetic cover!

I've said this before and it is probably obvious to you the reader, but I'm a Microsoft guy. Nevertheless there is one thing I have to say with regard to the iPad and the Apple TV. They are literally awesome. If you get an iPad you should go pick up one of these little Apple TV boxes. It was $99 and the remote is absolutely futuristic and the interface for working with things like Netflix and iTunes is crisp. But the best part is that I can mirror my wife's iPad and perform AirPlay up to my TV with one tap of my finger.

Android tablets use the Android OS, just like their phone counterparts and also offer different options depending on the manufacturer in terms of camera quality and onboard applications. Personally, I've had a chance to play with the Samsung Galaxy Tab and the Motorola Xoom and both are sweet tablets. Can I say they are as sweet as my wife's iPad? Sure I can say that. I can say whatever I like, it's my book. ;-)

By the way, that's an emoticon. We haven't discussed those but emoticons are cutesy ways of expressing a feeling in texting and email. That is important because oftentimes a joke might be mistaken, so you use an emoticon to let the person know you're happy… which means you are just joking. Then they reply: LOL, which means 'laugh out loud'. This isn't necessarily 'geek culture' but it's good to know.). A full list of text emoticons can be found here: http://www.cool-smileys.com/text-emoticons

Last up are the Windows 8 tablets. These were a little late to the tablet game. You might not think 2 years is too late but by the time Windows 8 was released the iPad and Android market share was off the charts. Nevertheless Microsoft released the Surface RT (an ARM-based tablet) and a Surface Pro (an Intel-based tablet). They both have USB ports (missing from iPads, which is annoying) and they have cool magnetic snap in touch/type covers.

From an IT administration perspective the Surface Pro is the better device for your end-users if you want/need to enforce Group Policy over devices. The RT cannot connect to the domain but the Pro can. As a result you can enforce policies easily.

In addition to the Microsoft sponsored Surface tablets there are also versions offered by all of their Partners like Dell, Asus, HP and others. Much like the Android market where the OS remains the same but the devices differ in size, features and price, we see that same model for Windows 8 tablets. And yet by having their own Surface tablets to offer Microsoft also mimics the Apple model of having control (in this one case) over both hardware and software.

Going to the Next Level

It's fun to play with everything and see how everything works. But you can't buy every device on the market. You have to decide what is best for you today.

And maybe you just aren't a tablet person at heart. I keep trying with different versions but I'm more of a clam-shell laptop person. In my case I do a lot of typing so I prefer to have full keyboards beneath my fingers. And I like big ol' monitors. But I keep trying to adapt.

You know you're a geek when you are sitting in a room with other techies and you have your laptop (running Chrome OS) your Surface tablet (running Windows 8 RT) your iPhone (running iOS 7) with a Kindle Fire in your laptop bag (just in case!)

With your mobile providers you need to work out a data plan. Your phones may have a basic plan but if you want to be on the Internet you'll need to pay extra for a monthly plan. With tablets you don't HAVE to pay extra, you could go with all Wi-Fi and just connect to the Internet when you are at home, at the local Starbucks or anywhere with Wi-Fi. However, if you want the 3G or 4G service you'll need a data plan for your tablet.

Remember one thing my friends… buy what you need and buy what you can afford, but don't put too much emphasis on wanting to buy the latest and greatest of any of these devices. Why? Because within months they come out with a newer model and yours is already out of date. Buy the device that will make you happy over the long haul, even if the next version comes out the next day.

Chapter 6: Applications, Apps and Social Network Sites

"*Aren't you a little young to be doing tech and app support?*"

"*Yes… yes I am.*"

We put this chapter together not because it was thought that we could cover every application or app in existence, for those mobile and tablet users. Nor would we want to take a walk down memory lane like we have done in the past chapters. Perhaps we'll just take a short walk. It just felt wrong to have a whole bunch of computer stuff but never talk about the actual applications that run on them. Plus, we needed a spot to cover social networking so we stuck it here because it seemed a good fit. How's that for an honest introduction?

Applications

I can remember the first serious application I ever worked on. It was 1992 and I was working in Manhattan as a temp for all sorts of different companies. My typing speed wasn't awesome but the temp agency I worked for pulled me in and taught me WordPerfect, one of the best known word processing applications of all time. Typing speed didn't matter because I was a whiz kid with this thing. Seriously, I could do stuff with WordPerfect that pushed the boundaries of the application to its edge. Sounds ridiculous, I know, but it was cool at the time.

You know you're a geek when the technical support or IT folks at your company are coming to YOU for help.

WYSIWYG (pronounced wiz-ee-wig) stands for 'What You See Is What You Get'. The expression WYSIWYG was first used by Larry Sinclair to explain that what a user sees on the screen is what is going to come out of the printer.

One thing that stood out with WordPerfect 5.1 was that you could see the underlying code with a feature called Reveal Codes. This was essential in the days before WYSIWYG document processing was common.

With the release of WordPerfect 6.0 for DOS you could switch between the traditional version and the WYSIWYG version. However, WYSIWIG document processing solutions weren't new with WordPerfect 6.0. The first WYSIWYG application was supposedly Bravo and it was created at Xerox PARC for the Alto in 1974. Do you see how often in this book we refer to Xerox PARC? Those folks were true innovators back in the day.

WordPerfect was locked in, but an up and coming application was going to take its place. You might have heard of it, it's called Microsoft Word. It was initially developed from 1981 to 1983 by Charles Simonyi, who was the key developer for Bravo. Microsoft announced it was available for Xenix and DOS in 1983 and free copies were given away with PC World.

The free copies of Microsoft Word that were given away in the 1983 PC World mark the first time that software was bundled with a magazine. Since that occasion it is common to get software included with computer magazines, especially free game demos.

Microsoft Word didn't take the world by storm. It had a variety of different releases and enhancements through the 1980's but it wasn't a front-runner yet. With Windows 3.0 operating system becoming more popular, Word for Windows was first released. Word 6.0 was released in 1993.

It was sometime in 1994 that I first started seeing Microsoft Word enter the working world. As a temp I had to know the latest software so I went for extensive training in Word. Then in 1995, with Windows 95 we saw Word 95 (the first 32-bit flavor of Word) and then Word 97, which introduced many more new features. By this point Microsoft Word had overtaken WordPerfect in the market; although till this day there are still WordPerfect users in the world, especially in the legal fields. Corel currently owns WordPerfect and they released version X5 in 2010.

Word 97 to 2003 would use menu headings at the top to help you find options you are looking for; but with the release of Word 2007, 2010 and 2013, a new Ribbon interface was introduced. The ribbon interface has tabs and within those tabs are groups. This interface allows you to select a tab and see all your options spread out on the ribbon; each option is then separated by its relevant group.
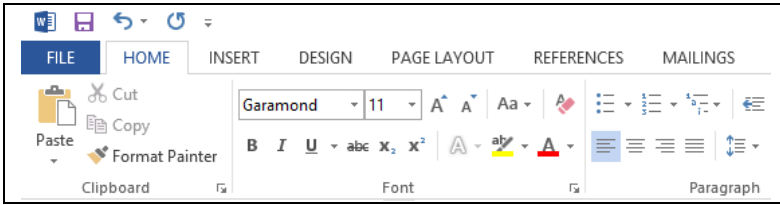
Word 2013 Ribbon Interface

When the Ribbon interface was first introduced in Office 2007 it was trashed immediately by critics. Microsoft was undeterred and with the 2010 release of Office the ribbon interface was integrated into the whole suite. Whereas initially it was only included in Word, Excel, PowerPoint and in the message side to Outlook. Personally, I love the ribbon interface; with over 1500 options it was time for change from the old menu headings of the past.

Microsoft Office

Microsoft Office was first released in 1990 as a suite of three applications: Word for Windows 1.1, Excel for Windows 2.0 and PowerPoint for Windows 2.0. Personally, I didn't start working with it until it was Office 4.0, which had Word 6.0, Excel 4.0 and PowerPoint 3.0. It wasn't till Office 95 that the numbers incremented and synchronized so that all applications were at 7.0.

You know you're a geek if you remember fondly getting and using the tricks to find an Easter Egg in your software or operating system. If you don't know what an Easter Egg is just check out the next note.

I mentioned this at some other point in the book, but it's good to mention again that prior to Office 95 we were working with 16-bit flavors of the applications and they were cooperatively multi-tasking. These meant when one crashed, they all crashed together. The key for those of us in the document processing world was SAVE OFTEN. Now of course we have preemptive multitasking so that if one application crashes it doesn't take out the others. We also have auto saving features so that hopefully if an application does crash we don't lose too much data even if we did forget to hit the save button.

One of the coolest things in software applications (and operating systems) for a geek was the inclusion of Easter Eggs. These were little gifts that were sometimes just weird things like a photo of the development team for the application and, in the case of Excel 97, sometimes a Flight Simulator game. You had to know how to find these because they didn't just pop up on their own. To see the tricks for many software applications you use or used in the past check out www.eeggs.com

Office continues to evolve and add new applications to the suite. The current lineup with the 2013 suite, includes the following applications (note: they may not all be sold together, you have to know what comes with the suite you are buying):

Word 2013 (for document processing)

Excel 2013 (for spreadsheet, charts, pivot tables and analytics)

PowerPoint 2013 (for slide presentations)

OneNote 2013 (for note taking, capturing text, images, video and audio notes)

Outlook 2013 (for managing email, calendar, contacts and tasks)

Publisher 2013 (to publish newsletters and other documents in a professional looking way)

Access 2013 (a desktop database application for managing data)

InfoPath 2013 (for creating online digital forms)

Lync 2013 (for instant messaging and presence information within your company and video conferencing)

And then there are two additional applications that you can purchase separately to add on to your Office and these include:

Project 2013 (for managing projects, including budgets and timelines)

Visio 2013 (for advanced diagram and layout creation)

There are alternative platform versions of Office like Office for Mac 2011 and Mobile Office, which is for your Windows Mobile 6.5 and higher devices.

Office Web Apps

In addition to the applications that you can install on your system, Microsoft also offers applications that are available online. There is a noticeable difference with regard to functionality between the online and the on-system versions but with each release there are improvements made. The current version of Office Web Apps include: Word, Excel, PowerPoint and OneNote. There is an Outlook Web App which is a client access options for Exchange Server 2013.

Google Docs

Google hit the market before Microsoft with an online suite of applications for working with documents and it has really captured the hearts of many. Google Docs is a very simple office suite with storage offered for files; and it allows you the ability to work on documents, spreadsheets and presentations. It supports

all the main file formats including Microsoft formats for Word, Excel, PowerPoint and more.

One of the great aspects of this kind of offering of "software as a service" (SaaS or on-demand software) is that, if supported by the browser (and most big name browsers like Internet Explorer, Firefox, Chrome and Safari support the features) it is a cross-platform in the sense that you can be on any OS and work with your documents in the same way.

Office 365

Many people approach me and ask, what is Office 365? They are confused in thinking that it is a new and different flavor of the Office suite. In fact, it is the name given to represent the hosted, online services for Exchange, SharePoint and Lync that can be had by individuals or companies if they purchase Microsoft's hosted solution. For every license purchased you also get a leased copy of Office Professional Plus. However, this is a month to month service for folks to use, it's "cloud based".

Office 365 is not a new offering from Microsoft. It was originally called BPOS (Business Productivity Online Suite) and offered Exchange 2007, SharePoint 2007 and Office Communications Server. The new O365 solution brings the server side up to 2013. It's not the only hosted suite of online server services; you should shop around for the best price, reputation and overall solution if you are looking for a cloud-based service. In my case, ClipTraining uses Office 365 because it made sense for us; but it isn't the right solution for everyone. In some cases on-premises, where you have the servers local and have your own IT staff handle it, is better or provides an added feeling of security for your company.

Cloud Computing

There are currently three different iterations of cloud computing: SaaS, IaaS and PaaS. I'll explain:

Software as a Service has applications in the cloud that you can utilize. If you have a Yahoo account or a Gmail account and you

log in to a web browser to view your mail rather than going through an installed application like Outlook, then you are quite familiar with SaaS. You are using software through the browser as a service. In some cases you might pay for those services whereas other times it is free.

You know you're a geek if you get annoyed at the excessive use of the word 'cloud' in techie marketing when referring to the Internet. You especially get annoyed because you know the 'cloud' means more than just the Internet but the marketing folks really have no idea what it is and just like to insert the word into everything. Just the other day I bought a pair of heterogeneous, ubiquitous, cloud-based sneakers that promised a lower TCO (total cost of ownership) and greater ROI (return on investment). I just wanted a pair of geek sneaks…Converse High Tops!

Platform as a Service offers more than an application in the cloud, but a specific platform that you need. As opposed to providing full access to an online server that you can log into or remote into and work with, you are given access to the platform service through other tools.

Infrastructure as a Service is a bit different. Here you are provided with computer infrastructure that might include servers and specific software running on it, as well as storage space. The burden of worrying about the availability and backup/recovery of these servers is out of your hands.

Some of this may be more than you want to know. It is important to note that SaaS is becoming more popular and you will see more applications running through your browsers in the

future. The only negative at this time is, it's not the same experience as what you get from an installed application and until it is we'll have both in play.

Note: Another popular term you might hear from online companies that provide training, like ClipTraining, is EaaS. Education as a Service.

Apache OpenOffice

I'll be honest, Microsoft Office is expensive. Even though I work with it daily, there are some who simply cannot afford it but still need to get their work done. For those folks I recommend OpenOffice, which can be downloaded from OpenOffice.org.

StarOffice was the original name and it was a much cheaper solution but still had to be purchased. It was then made free by Oracle as OpenOffice. OpenOffice includes a word processor, spreadsheet application, presentation application and more.

In June of 2011 Oracle turned over the code base to the Apache Software Foundation.

There are so many alternatives to Microsoft Office, you are welcome to search for and play with all options. Currently, however Microsoft holds the main percentage of market share and user base with Microsoft Office.

Top 10's of Applications

You know, every year there is a new Top 10 list of applications. Now, we also have apps (for mobile devices) which may or may not have a PC/Mac counterpart to them. Too much information to consider.

The best place for all your top freeware and shareware applications is Download.com which is run by CNET

CNET.com did a cool review of its top 10 downloads in the past 10 years and some of these still remain in the top 10 today. They include the following: ICQ, Winamp, Napster (no longer available), Firefox, WinZip, iTunes, Ad-aware, Skype, RealPlayer, and Adobe Acrobat Reader.

If you look at the site today (http://download.cnet.com) for different platforms (Windows, Mac, Mobile and Web Apps) you will see some amazing applications that are available and mostly free to download and use.

You know you're a geek if you know the instrument used for the original Star Trek theme song. It's called a Theremin.

With Windows we see lots of downloads for free anti-virus solutions like Avast and AVG, along with anti-malware, CCleaner and Hotspot Shield. There are also media players like Virtual DJ, and VLC along with other applications (go take a look at what is popular for Windows today!).

The Mac list of popular downloads, as of this moment, has but one anti-virus solutions on it (I guess because nobody worries about getting a virus on a Mac, although you should… you should). We see media players like VLC, Virtual DJ, RealPlayer and Skype, Firefox, Chrome and other applications.

It is good to know what other people like to download and install. Knowing what is popular may help give you some ideas on trying new applications. I personally have a top 10 list of applications that I install and it may not be the same as other geeks, each is different. Because of my work with video editing, webinars, social networking (not engineering), interactive lab content and so forth, my list includes solutions you may never have heard of:

Top 10 List of Applications J. Installs on a New System

The Microsoft Office Suite

TechSmith's Camtasia Studio (for creating professional screencasts)

Articulate Storyline (great tool for creating interactive labs, quizzes and more)

Adobe Air and TweetDeck (for managing Twitter)

Core FTP (for easy file transfer)

JustCloud (it's my cloud-based backup solution)

Stardock Start8 (restores my Start button on a Windows 8 system)

Google Chrome (I like having an alternate browser and Chrome is fast).

Windows Essentials (has a bunch of free solutions that I like to have on my system like Movie Maker and Photo Gallery (which are the only programs I install from the suite). These used to be installed with the OS but now they are a separate download).

Adobe Reader (even though Windows 8 has a built in reader app, I like using the Adobe version)
http://get.adobe.com/reader/

Keep in mind, by the 3rd Edition of this book we will possibly be looking at a new Office Suite and some of these applications will have to be updated. That's the beauty of the computer world, it all changes so fast. Some folks hate that! If you do, you aren't cut out for a career in tech because it is ever changing.

Apps

I wish I could say there are fewer apps than applications because after all 'apps' were not invented for modern devices until the iPhone's App Store and later the Android Market (renamed Google Play) and Microsoft Store. The Apple Apps store says, "With hundreds of thousands of apps, there's an app for almost anything." Over 800,000 apps! And that is just for the iPhone, the iPad also has apps (300,000 at this time). Yikes… so there is no way to review them all here.

Apps are oftentimes free and if you have ever downloaded some of these, you understand why they are free. Other times they are worth the price tag, usually a few bucks, just for the professionalism of the tool or game.

You know you're a geek if your favorite comic strip is Dilbert. And even more so if you laugh at some of the jokes and get angry at others. Scott Adams hits a raw nerve sometimes.

One of the best ways to find apps is to talk to your friends and see what apps they are using and then try those out. Games are pretty popular and two of the more widely known games right now are Angry Birds (which is available for just about any and every platform), Bad Piggies, Doodle God, Fruit Ninja and Words with Friends. We'll discuss these a bit more in the next chapter.

Like I said, there are so many apps and a gazillion "Top 10" lists for apps that it almost doesn't make sense to try and list any of these; plus, this book is meant to be read in seven days. There are a few that I personally install on my mobile systems (phone or tablet) because I need them. Here is my list; some are specific, some are general ideas:

Evernote: This is a great note taking application and I have it on my desktop and on my mobile devices.

An eReader App: Some phones have these already but if not you might try the Amazon Kindle app.

Netflix: Best way to keep my kids busy with 1970's cartoons.

A News App: I download both CNN and Fox News.

Again, these are just a few of the fun ones I like. You're welcome to email in and tell me some of the ones you like.

Social Network Sites

Mention the word Social Networking and people immediately think of Facebook or Twitter. A few years back and everyone would have also said MySpace. There are actually tons of social network sites. You just may not think of them in that category. Let's define the space and fill it.

A social network site is a way of creating or building upon social relations between people who have shared interests or shared experiences (for example if you went to school together, even if you don't remember one another you have a shared experience), have shared working interests. Online dating sites are not quite social network sites because the goal is different. We see many of these types of sites and some are used globally whereas others are country specific in scope.

You know you're a geek if you post false information about your being wildly successful on your Classmates profile with a picture of iStock eye-candy rather than your true self to show your former classmates (and bullies) that you turned out awesome.

There is a large list but I'm only going to mention the ones that come to mind personally:

Facebook: "Friend" people who are friends and family or even acquaintances and then share thoughts, photos and video online

Twitter: Gives you a 140 character limit to 'tweet' your thoughts about what you are doing or interesting things that you have come across with the ability to post links to pictures.

Classmates.com: Meet up with folks you went to school with.

Flickr: Share photos with others.

Foursquare: Let's you share your location with others while collecting points and unlocking specials from businesses that will give you discounts or sometimes free products.

Google+: Similar to Facebook this allows you to add friends to your 'circle' to enable sharing of thoughts, photos and videos.

LinkedIn: Let's you connect with others from a business standpoint.

MySpace: Similar to Facebook (actually preceded Facebook) with a younger twist. (This feels like it's on the way out though)

Pinterest: Allows users to create and manage theme-based image collections where you can post your own images and/or re-pin other person's images.

Vine: For uploading videos with a maximum length of 6 seconds.

Reddit: A social news site.

Instagram: An online photo sharing site (that also does 15 second video clips)

Tumblr: A microblogging platform with over 100 million blogs.

These are just a few of the ones that exist. There are many more. Sites for sharing photos like Picasa, Shutterfly, and Snapfish. Sites for setting up blogs like Blogger and WordPress. The Internet is a big place and there are many methods for sharing information and being more 'social'.

Going to the Next Level

Like anything else, the only way to take your application and app skills to the next level is to work with them. Don't be afraid to try out new applications or apps. Try not to be too ridged in your views; what you already have might not be the pinnacle. Experiment with other options and stay open minded to change. Certainly from the first applications to now we have seen quite a bit with regard to changes.

You know you're a geek if you know that the first use of a cordless phone in a feature film was in the movie Wall Street.

You know you're a geek if you can name that guy that started Napster and helped get Facebook off the ground, serving as first president. (Look it up… and no, it isn't Justin Timberlake).

You know you're a geek when all your friends live 100+ miles from you, possibly in other countries, but you still communicate every day through Facebook or Twitter and you've never met but you can tell from their 'avatar' that they are cool.

Chapter 7: Geek Entertainment

"Are you dressed up
for Comic-Con?"

"No. Why do
you ask?"

Let me just be absolutely clear… there is no list of geek
entertainment that we have hidden somewhere and only those
who can say the password in Klingon can see it. If there were a
password it may very well be "matlh! jol yIchu'!" which is
Klingon for Maltz! Activate Beam! (From Star Trek III Search for
Spock). What there is, however, is an interwoven set of geeky
concepts that draw us together combined with a modicum of
respect for differences in opinion (unless it is something
important like Apple vs. Microsoft vs. Linux or ATI vs. nVidia,
etc.) Geeks may not all love comic books but we respect the fact
that it is a part of our culture. Sci-fi may not be your forte, you
may love fantasy more and that is okay. At Comic-Con geeks all
come together in cosplay to enjoy our differences as geeks. This

chapter is not all inclusive any more than the others could be with regard to hardware, software and history. It's a taste… a buffet if you will of geek entertainment. We hope you find it enlightening.

Disclaimer: While I may mention and explain the various entertainment elements of the geek world, that is not an endorsement or encouragement to anyone to view, read, play or attend anything referenced within this chapter.

Movies and TV Shows

They say a picture is worth a thousand words. I promise if you watch some of these geek favorites you will have a much better understanding of your geek husband, child, friend or IT person. Remember, these are just my favorites and the favorites of a host of other geeks, but the list is by no means exhaustive. And look… to all my geek friends reading this book… I know you are going to think, 'But what about Back to the Future, maybe some Godzilla flicks, every Star Wars and Star Trek, the entire LOTR series, and every comic book hero made into a movie?' But let's be honest, millions of people liked those movies. We're trying to narrow the selection here.

WarGames (1983)

If you are going to watch one of the movies on this list, make it this one. This was a movie that inspired a generation of kids to be computer focused and afraid of global thermonuclear war. A quick synopsis: a young kid named David Lightman (Matthew Broderick) is looking to play the new games coming out and starts his computer dialing numbers. The computer dials into a Pentagon computer called the WOPR (War Operation Plan Response) which was designed to play war games to learn from itself. David accidentally gets the game to play but it isn't a game… it's for real. The WOPR, aka Joshua, thinks it must launch nuclear warheads! In a race against time David and Jennifer Mack (young Ally Sheedy, pre-Breakfast Club) have to find the maker and convince him to help them save the world. I won't give you the ending but let me tell you this, you'll never hear the words, "Would you like to play a game?" the same again.

For those of you geeks who do know the movie all I have to say is CPE 1704 TKS

In 2008 they made a second WarGames that went straight to video. It was called "The Dead Code." While an absolute necessity for geeks to watch simply out of respect for the first film, non-geeks do not have to subject yourselves to it.

Sneakers (1992)

A great movie with an all-star cast including Robert Redford, Sidney Poitier, River Phoenix and others. The story revolves around Martin Bishop and his team of geeks who test security systems. The movie talks about encryption systems and has signals bouncing off satellites and social engineering. It has plenty of tech and a good plot to top it off. Two of the writers (Lawrence Lasker and Walter F. Parkes) wrote "WarGames" so you would expect it to be interesting.

Hackers (1995)

It revolves around a kid who is caught after writing a virus and banned from working on computers until he is 18. It has an interesting cast with a young Angelina Jolie playing a hacker girl who helps our hero to track down the maker of a new virus. They rollerblade and skateboard, talk about hacking into systems with common passwords and form a global online flash mob before the advent of Twitter.

The Net (1995)

I know I'm going to take some heat for this one from my geek friends. But look, this movie is about Angela Bennett (played by Sandra Bullock), a software expert who works from home and

orders pizza online in 1995!!! It was cutting edge in some ways and had a crazy plot of a woman whose identity is stolen and she has to use all her hacker abilities to get her life back. There are some factual errors of course but overall it was fun and techie.

You should know that there is a "Net 2" that I haven't seen but it does exist.

Pirates of Silicon Valley (1999)

This TV movie was mentioned in Chapter 4 and it tells the story of Steve Jobs and Bill Gates, mostly focusing on Jobs. It stars Noah Wiley and Anthony Michael Hall and it is the Hollywood style version of the story so it is a bit more sensational than historical. Now that you have already read the backstory you'll know all the characters!

If a more serious and PBS-like version is your forte you want to look for "Triumph of the Nerds: The Rise of Accidental Empires" (1996) which tells the story of Jobs, Gates and Larry Ellison (of Oracle). It was hosted by Robert X. Cringely and really goes in-depth on the story we only touch upon in Chapter 4 (we gave the bullet points here, this documentary fleshes out the content). In 1998 a sequel entitled "Nerds 2.0.1 a Brief History of the Internet" was also put on PBS and hosted by Cringely.

The Matrix (1999)

I'm going out on a limb here by saying that watching the first "Matrix" is all that is required to understand geek entertainment in this regard. While geeks have to subject themselves to the

other two movies just to play out the storyline, I don't think anything extra comes of it in terms of acquiring geek insight. Although there is a really cool scene in The Matrix Reloaded where Neo, Smith and scores of clones of Smith battle it out... that is worth watching. The basic story though is that humanity is being fed on by computers for power while they make them think they are living a real life. Neo is contacted and not only breaks free of the Matrix, which is not a pleasant experience by any means, but learns how to re-enter and manipulate the false world of the Matrix. That's because he (Keanu Reeves) is the "One". Something that Morpheus already knew and something the Oracle predicted. If the story makes you curious and you haven't seen it, not to worry, it's on TNT all the time.

You know you're a geek if your screensaver has ever been the Matrix code.

Antitrust (2001)

This is about a young computer programmer working the dream job who finds out his boss (played by Tim Robbins and modeled after Bill Gates) is doing some evil software things.

The Social Network (2010)

This movie explains how Facebook was started and it gives a lot of the modern history that surrounds how companies of this sort come out of nowhere; but thanks to the proliferation of the Internet it can spread quickly (or "go viral"). It has a great cast, with Jesse Eisenberg who does an amazing job playing Mark Zuckerberg (Facebook founder). The writing is smart and interesting as it weaves you through the story of Facebook and some of the problems with ideas... Concepts are easily taken by others, or enhanced upon and it is really who gets to market first that counts. In this world being the geek the one who can create the product may get you a lawsuit in the end by rich twin rowing guys, but it will also make you a billionaire.

TRON (1982) and TRON: Legacy (2010)

No one is going to promise that either one of these films is going to WOW you in terms of storyline. The whole focus is Kevin Flynn, an arcade owner who gets converted into digital and pulled into a computer where there are light cycles and disc gladiatorial games. In the second one Kevin is stuck in the system for years until his son finds his old secret office and finds a way into the machine. The graphics are enhanced and the soundtrack is cool. Even if you don't feel like getting the original, the latest flavor of "TRON" is on Netflix streaming.

There are certainly other movies that fit within the geek space. But again, they may be loved by many more than tech geeks. Like the Monty Python series. Or even Napoleon Dynamite.

You know you're a geek if you think this song might be a good one to sing at your wedding to your new bride: "Why do you love me? Why do you need me? Always and forever... We met in a chat room, now our love can fully bloom... Sure the world wide web is great, but you, you make me "salvivate"... Yes, I love technology, but not as much as you, you see... But I still love technology... Always and forever." Kip (Napoleon Dynamite)

A Geek's Love of Sci Fi and Fantasy

Anything that involves technology that doesn't exist because it is either from the future or from a galaxy far, far away is going to capture a tech geeks attention. Fantasy is usually all tied into that concept. Now we are looking at "Star Trek," "Star Wars," "Dune," in the TV space "Battlestar Galactica" (new and old, but mostly the new ones), "Dr. Who," "Avatar," the Terminator franchise, including the Sarah Conner Chronicles, "Back to the Future" films and all movies based on comic books. Within those films we often come across some questions that geeks understand but non geeks may need some clarification on. Just

because you have seen the movies doesn't mean you understand the concepts anywhere near the way a geek would.

In the discussion on which is better, "Star Trek" vs. "Star Wars" you might point out that there are conventions every year for Star Trek fans (aka Trekies). But this is a loaded trick comment because guess what, there are Star Wars conventions too!!! (Don't call them StarWarsies though.)

Most geeks might appreciate both "Star Trek" and "Star Wars" although they may favor one or the other depending on their age or memories. For example, which movie they remember being taken out of school by their parents to see in the middle of the day. But when thinking you know anything about "Star Trek" or "Star Wars" it would be good for you to know that both have extensive lines of books that have been written to explain all the answers to all the questions.

For example, didn't Kirk die at the end of the movie Generations? Answer: Not if you have read "The Return" where James T. Kirk is resurrected by alien science. This book is considered part of the "Shatnerverse" in that it doesn't really pay much attention to the timelines established in the Star Trek universe according to other novels. But he is Shatner; he can do what he wants. The sequel to the book is, "Avenger," but the prequel is," Ashes of Eden." All three are well written.

The original Star Trek (with Kirk, Spock, et al) was rebooted for a whole new generation by having a future Spock accidentally open a hole back to the past and altering key events. J.J. Abrams helmed two reboot movies and will soon be putting together the new Disney-owned Star Wars continuation (with Episode VII)

See how that is just one piece of information you may not know. Now obviously you don't have time to read scores of books written about the "Star Wars" or "Star Trek" universe so my advice is to play it cool in a discussion about these matters. Reserve commentary. As the saying goes "better to be thought a fool than to speak and remove all doubt". Some say that was said by Abraham Lincoln, others say Mark Twain, but Chekov on Star Trek would claim it was of Russian origin.

My wife says the difference between geeks and non-geeks with regard to Star Trek and Star Wars is not so much that we debate which one is better but that in both cases we actually believe it's real. So silly, shows what she knows. "Star Wars" WAS real in the past (a long time ago) and "Star Trek" WILL BE real in the future. Neither one of them IS real in the 'happening right now' sense at all.

You know you're a geek if someone says 'I'll try' and you just can't help but say 'Do or do not… there is no try' in your best Yoda voice.

Another good example would relate to "Star Wars" and the events that occurred after the final movie (and no, not the prequel special effects extravaganza but the original three where they had a good plot, a good script and likeable characters). If you have read the books than you know that Leia and Han have twins (Jacen and Jaina Solo) and a third child Anakin, who were all very strong with the force. Luke marries Mara Jade (who you won't know either without reading the books) and has a son Ben Skywalker. The Jedi Academy is reestablished by Luke on the moon of Endor. A race from an entirely different galaxy invades called the Yuuzhan Vong and a horrible war breaks out to expel the invaders.

I believe it would be wrong to say any more about the happenings in the Star Wars universe because it would be filled with spoilers that are better left in the books themselves.

However, there is no guarantee that movies made in the future will follow the storyline of the books released.

If you wish to gain a full knowledge of all things Star Wars, did you know there is a wiki site called Wookieepedia you can use? It's located here: http://starwars.wikia.com

In late 2012 it was announced that Disney would purchase Lucasfilm and the Star Wars franchise for $4 billion. The end result will be many movies in the Star Wars Universe in the years ahead. Hopefully, with Disney at the helm, they'll be able to deliver a true story with characters you care about. After all, if they can do it with cartoon cars, fish, dolls, dogs, futuristic clean-up droids, bugs and more, they can hopefully do it with Jedi.

You know you're a geek if you find out about a lightsaber fencing school in San Francisco (aka Golden Gate Knights http://goldengateknights.com/) and cannot WAIT until you make it back out there! I'll let you know how it goes in the 3rd Edition!!!

TV Shows with Geeks (not just for geeks)

There simply aren't enough TV shows that cater to geek culture. They've tried in the past with shows like Whiz Kids (back in 1983/1984). It lasted a single season and featured Matthew Laborteaux (Albert from Little House on the Prairie. What? So I watched the show… don't judge me!) These were computer expert detectives.

One very popular show for 50 years has been Dr. Who. There were two films in 1965 and 1966 but for the most part this show has been produced by the BBC. It's about a Time Lord (a time traveling humanoid alien known as the Doctor) who travels in a time machine that looks like an old British phone booth (a blue one) called the TARDIS.. There have been 11 actors who have played the Dr. since 1963's William Hartnell first held the role.
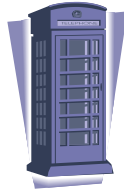
Usually geeks watch TV shows, they aren't in TV shows. Well, you might have a token geek in a show to add some comical elements as he/she interacts with the cool kids. More recently an entire show has been devoted to a collection of geek scientists called the, "Big Bang Theory." That it has lasted multiple seasons is a miracle. That it has won awards and one of the characters Jim Parsons has won two consecutive Emmy's for Outstanding Lead Actor in a Comedy is unbelievable.

The show is well written and literally has people LOLing all over the place. Penny (played by Kaley Cuoco) helps to balance out the crew because she is the non-geek who lives across the hall from the two main characters Sheldon (played by Jim Parsons) and Leonard (played by Johnny Galecki). No less important mind you are Howard (played by Simon Helberg) and Rajesh (played by Kunal Nayyar). More recently we see two new female characters enter the BBT world including Bernadette (played by Melissa Rauch) and Amy Farrah Fowler, I just had to say her whole name (played by Mayim Bialik).

BBT is one of the main reasons for the creation of this book. In every episode things are said that are not being understood by viewers. They may chuckle with the laugh track just to be a part of the 'joke' but a geek in the room is literally on the floor with tears in their eyes. This book will hopefully bridge the gap a bit so that non-geeks might get the joke also.

Let me say I would not be surprised in the least if I were to see this book on the show one day… maybe Penny reading it?

Comics

Personally, I've never been a fan of comics. I had a collection of Silver Surfer magazines that I started gathering later on in life (20 or so). I think that is one of the things that helps identify a geek. One who purchases comics beyond the teenage years; but this is not the only qualifier because there are many adults who purchase comics.

The archetypes that we see in movies like "Star Wars" revolve around the views of Joseph Campbell. Campbell explains the Hero Cycle in "Hero with a Thousand Faces" and George Lucas (who read the book) runs with the concept in Star Wars with good vs. evil clearly defined and the struggle to rise and become a hero.

One form of cartoon animation is called Anime, which is the Japanese abbreviated way to say animation. The Japanese word for "comics" is Manga. There is a huge following of both anime and manga. While there are many examples of this, perhaps one that might stand out to a non-geek would be Pokemon. You can see in the animation style and cartoon styles the Japanese look and feel. Pokemon is quite tame in comparison to other aspects of anime and manga, which often times are excessively violent, sexual and spiritistic in nature.

While I don't have a great love for comics I do understand why others do. The connection to youth, the characters are heroes, it's similar to the same archetypes that we see in movies like Star Wars and Matrix where there is good vs. evil and the lines are easily defined.

DC vs. Marvel

I mentioned earlier that it is probably best to step aside on some debates because you will never have enough information to battle effectively. Comics are another one of those subjects - especially in the battle of DC vs. Marvel.

Haven't you wondered why an Avengers movie would have Iron Man and the Hulk but not Batman and Superman? Well guess what, those are characters (relax fellow geeks, WE know they are real, I'm just talking politely to the naysayers) from two different worlds commercially. There is the DC world and there is the Marvel world.

Note: There are other comic book publishers but those are the most widely known.

On your DC side you have Superman, Batman, Wonder Woman, the Flash, Green Lantern and so on. On the Marvel side you have Silver Surfer (a personal favorite), Spiderman, Captain America, X-Men, Hulk, She-Hulk, Iron Man and Thor. Those are just the good guys. Obviously each universe has their own bad guys as well.

In truth, they all face the same problems. That of being different, of having powers that must be used for good but being riddled with imperfect thoughts and desires; other than Superman, he's always good. They are all damaged in one way or another; and in many cases overly attached to spandex costume-wear. (Or no costume wear in some cases, seriously these people are half naked all the time… personally when I go out to fight the evils of this world I like to cover up a bit. Not these folks and certainly not the female heroines, which must mean these are drawn by men with the minds of teenage boys most likely). But for the final time… I digress…

As for the Marvel vs. DC discussion… who would win in a fight? Well, if the fight was at the box office that is easy, Marvel. Marvel has been cranking out one blockbuster after another of the past 10 years. DC had a good run back in the day with Christopher Reeve as Superman but the Brandon Routh version was awkward to say the least. The 2013 "Man of Steel" is a whole new opportunity for the franchise.

There hasn't been a decent Wonder Woman movie put in the works and the only redeeming films are the new Batman movies, which even I find so dark that I didn't even see the second one. The Smallville series ran for 10 years, which was a win for DC in that regard, but film wise it seems Marvel is winning the battle. Except for that first Hulk movie with Eric Bana, Yikes, that was bad. The second one was better but Ed Norton as the Bruce Banner? Who's casting these things?

As for who would win in a fight? Here is one of those discussions you need to slip out of the conversation. You are in no way prepared to match powers and weaknesses of different characters with a geek. But if you are backed in a corner… if you must give an opinion… just say Superman could pretty much take on the entire Marvel cast all by himself and then run like the wind!!!

You know you're a geek if you went to the last Star Trek/Superhero/Star-Wars movie wearing fake pointy ears, a geek shirt (ie. one with a big S on the front or something like that), a cape or a plastic lightsaber.

Comic-Con, Dragon*Con and Cosplay

Both Comic-Con and Dragon*Con are conferences that promote the sci-fi, fantasy, and all-around-geek oriented entertainment. Some ask, what is the difference between the two? Well, Comic-Con is the bigger of the two conferences, but that may be because it is industry-driven and has more backing from the

studios and those looking to plug their movie, show, game and so on. Dragon*Con is smaller and more fan-driven.

The official Comic-Con is held in San Diego, although there are smaller ones held in other locations and it is a more commercially driven show with big names coming out to promote their stuff. So if that appeals to you Comic-Con is what you are looking for. It is also very focused on what is NEW in the industry and it becomes one 'giant press junket' according to die hard attendees of both SDCC and D*C.

Dragon*Con has a focus on everything old and new; and is driven by what the fans love. It's more party oriented and has things like fan-run panels, a better opportunity to speak to those in the industry (maybe not the big names like SDCC but smaller named guests who appreciate that you recognize them) and more cosplay oriented gatherings and contests.

BOTH feature cosplay. Cosplay is short for "costume play" which for adults can be funny, weird, sexual in nature, or all three. Manga and anime are sometimes the source for many cosplay characters that are seen at Comic-Con and Dragon*Con. Other times the characters come from comics or movies. It is not unusual to see a Princess Leia (from Return of the Jedi), a Stormtrooper, Superman, Mr. Incredible, Mr. Spock… well, you get the point.

Gaming

Arcade Games like Galaga, Pac-Man, Donkey Kong, Centipede, Missile Command and others started a whole new generation that

spent their time growing up in Arcades, like me. Game systems came home as well, like Pong. Then we had Atari, Activision, ColecoVision, Nintendo, PlayStation and enhancements to all those. Finally the Xbox, Xbox 360 with the cool Kinect device for hands free gaming, and Xbox One.

For an Atari blast from the past you can play your favorite games (with a new twist) here:
http://atari.com/arcade#!/arcade/atari-promo

Gaming systems aside, there were old games we had on our computers as well. Games like Oregon Trail. This thing was created in 1971 and it was torture to play. There was a version for Apple II, Macintosh, DOS, and so on. And would you believe the most recent iterations of it are for Facebook. The game is STILL ALIVE!!! I say it was torturous to play because as a kid I had no idea how to tell it what to do and I was always dying (usually from dysentery). Do a quick search for "You have died of dysentery" t-shirts and you'll see how popular this thing was and is. It's part of geek culture.

Play Oregon Trail once again… online!
http://www.virtualapple.org/oregontraildisk.html

Another game you might remember is the "Hitchhikers Guide to the Galaxy" (after the popular Douglas Adams books). It was one of the best-selling games of 1985, selling over 250,000 copies that year. Much like the original Oregon Trail there were no major graphics. It was all a story that you had to control by typing in text. If you want to feel the frustration of a classic computer game you can go to the Douglas Adams website here: http://www.douglasadams.com/creations/infocom.php   You'll be asked to put in the serial number that is found in the graphic on the screen. And you'll be able to play the actual game!!! Being able to say you played this will add tremendously to your geek-cred (like street cred but for geeks).

There are so many books that geeks would recommend and these vary with each person. One that I personally think most geeks know is the "Hitchhikers Guide to the Galaxy" by Douglas Adams, which is incredibly funny (please don't judge the book by the movie they made in 2005… some things are best left as a book, they just don't translate well otherwise). I'd love to recommend other books here in this chapter but after a thorough search online I found that geeks are divided over their choice of reading material. They all seem to agree on the Hitchhikers Guide. Some recommend "Flatland" (a good choice). Others think "Programming in C" is a good recommendation (it isn't). Some recommend books about string theory by Brian Green (his work is an acquired taste but incredibly enlightening I thought).

Computer games were (and are) a big part in the life of computer geeks, especially when you start talking about games like Descent and Doom. They certainly evolved over the years to include different types of games like first-person shooter (FPS) games where you literally are the shooter and walk around shooting, stabbing, grenading (I know that's not a word but essentially blowing up-ing) anything in site. Most of the modern games that are Top 10 sellers right now are first-person shooters like Call of Duty: Modern Warfare, Resident Evil, Rage, Battlefield 3 and so on.

You know you're a geek if someone mentions the answer to life and you cannot help but say "the answer to life, the universe, and everything… is 42"

Games that allowed you to play in real-time strategy or RTS (like Civilization) became really fun to play as opposed to turn-based games. The Internet helped to put people together to play these games. While I enjoyed playing a good round of Chess through the MSN Game Zone, others were playing Age of Empires or other multi-player games. Online games became more popular with the advent of Flash and Java so that the games interactions could be more graphical in nature. Once again you could play old arcade classics like SpyHunter, it's an 80's game that was awesome and I played it in the bowling alley for hours.

With all of these different game styles and the combination of increased bandwidth available through home based Internet connections; new acronyms have begun popping up that geeks know and so should you. There are RPGs, which stand for role playing games; and then there are MMORPG which stands for massively multiplayer online role-playing game. From that you can figure out what MMORTS and MMOFPS stands for.

Role Playing Games are not linked to the computer gaming world only. In fact, one of the most popular fantasy RPG in existence is a board game. Its name? Dungeons and Dragons. Released in 1974 (the original D&D) it would later be separated into two flavors, a basic set for the general public and an advanced version for true D&D players.

In modern times, one of the most popular MMORPG is World of Warcraft. Players control an 'avatar' within the game that they themselves can create. The avatars gain more power and abilities the more they play. Players can simply fight against monsters or against other players. Or they can go on quests together either on their own or as part of a group or guild. I focus in on one game because it is pretty obvious why people play first person shooter war-like games or games like Grand Theft Auto, which is noted to be extremely violent. Both geeks and non-geeks play those games, but World of Warcraft is right up a geek's alley so to speak. They can be "so much cooler online" in games like World

of Warcraft where they can spend the time building up their characters. They can be heroes on quests and they love the fantasy elements of it all.

In addition to games, there are really interesting online worlds that you can become a part of and they mimic some of the same elements of a MMORPG. Like Second Life. This is an online 3-D chat room of sorts. You create an avatar and then can move through the various worlds that are created and pretty much do anything. Drive a racecar, fly, hold a business meeting, attend a conference, go shopping for clothes for your avatar or a whole new skin, study to become a Jedi Knight at the Jedi Academy, go dancing, visit places set up by NASA, Microsoft, Apple, IBM and many others. And you have the ability to create your own world. Some people spend hours and hours in their virtual world.

Obviously games are always evolving. Both PC-based and console-based games improve with the graphics of the system and the ability to provide a realistic experience.

From a PC perspective systems like Alienware are considered great for gaming. Another company called Razer (www.razerone.com) has gaming laptops (aka Razer Blade) and tablets (aka Razer Edge) which comes with a cool gamepad controller to allow you to easily play all sorts of video games off it.

Games, like movies and music, are going fully to digital downloads. Soon it will be rare to buy a game you hold in your hand. They will all be either online or accessible through your devices. The negative here is that there are times when you don't have an Internet connection.

App Games and Social Network Games

Two games worth mentioning here for mobile devices are Angry Birds and Words with Friends. These are incredibly fun and addictive.

At this point Angry Birds is everywhere so I probably don't even have to tell you what it is. But it was developed by Rovio Mobile, a Finnish computer game developer and released first for the Apple iOS in 2009. The idea is to use a slingshot to launch birds into pigs that are sitting in different structures. The birds have different abilities to break down the structures and get rid of the pigs. It sounds absolutely ridiculous when I describe it this way but it is quite addictive. Games of this sort challenge a persons ability to understand trajectory, while other games like Bad Piggies, Cut the Rope, "Where's My Water" etc… require understanding of physics, engineering and more. It may sound like a made up explanation on why it's ok to play these for hours but it's true.

Another game that is quite addictive is Words with Friends which is similar to Scrabble where you each take turns (it's a turn-based game just like the board game) trying to come up with the highest scoring word combinations.

In addition, Facebook has had a string of well-known games that have held peoples interests like Farmville by Zynga. Zynga is the same company that brings us CastleVille, CityVille, Mafia Wars and Mafia Wars 2, Words with Friends, Pioneer Trail and more. Some of these games have been discontinued. Other popular Facebook games include SongPop, Bubble Island (and other Bubble adventures) Bejeweled Blitz and more.

You're At the Next Level!

Look, that's all you need to know at this point. If you're reading this it's either because you finished reading it (congrats!) or you flipped to the back of the book, in which case you haven't reached the next level, you're just a page flipper.

> You know you're a geek if you have read this whole book!
>
> Welcome to the Club!!! ;-)

If you did read through the other seven chapters then I want to congratulate you for coming this far. There isn't much more we can teach you here but obviously the possibilities are endless. You can use this book as a primer toward a more detailed education into the more serious side to technology. You might consider it a door you have walked through toward understanding an alternate culture of people with some of those people possibly living right in your own home!

And if you want to learn more geeky stuff from me, just check back on the Conversational Geek website: **www.conversationalgeek.com**

Additional 2nd Edition Appendix Chapters

These three chapters to follow are mostly personal musings and an opportunity to add a few new cartoons. We're going to look at ways to increase your "geek"-iness in the workplace. Future tech that we hope to see in the years ahead. And, a top 10 list of cool things to buy a geek.

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Appendix A: Geek in the Enterprise
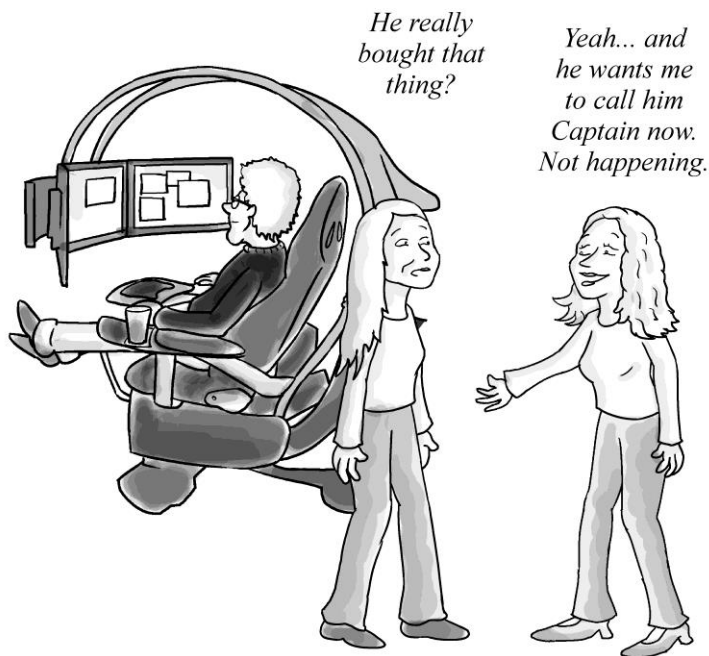
For several years I've been the Enterprise Windows columnist for InfoWorld and it has been an awesome experience. Although my primary focus from an IT perspective is Microsoft's Exchange Server for messaging solutions (ie. email, contact, calendaring and so forth) I love being able to write about anything and everything in the enterprise space. By "enterprise" we mean business. Home, small, large… global.

All businesses, large and small, have end-users. Those end-users, especially those who work on computers, have the ability to grow their geek-side a bit but often times aren't sure how to do it. Let's see if we can help with that without going too deep into "Fluency Geek (in 7 days!)", a book I may one day write.

Understanding Passwords and Social Engineering

What's the first thing you do when you sit down at a computer? You probably put in a username and password. If you are at home and don't have one of these that is pretty dangerous because, if stolen, you may have all sorts of important information on that system or passwords and such that are now obtainable. You might think 'would someone really do that?' Um… a thief? They might. It's kind of part of their whole job description.

So whether at home or work you need a password. You really want to come up with complex passwords. Ensure the password is long enough (at least 8 characters) with uppercase, lowercase, special characters (@#%$) and numbers.

> Microsoft has a password checker to see if your passwords are strong enough (or you can search online for a password checker):
>
> https://www.microsoft.com/en-gb/security/pc-security/password-checker.aspx

Now, some folks like to use one password for everything. In some cases that isn't possible though because your company may enforce a password change policy every 90 days (give or take). Or some sites you visit may not like special characters in the password so you have to take a different approach. How can you manage so many passwords? Well, some think "I'll just put together a document to manage those (note the point above about the thief getting into your computer). Or "I'll just write them on a sticky note and stick them under my mouse pad." Nobody will EVER look there. Seriously folks, you might consider doing a quick search for a "password manager" solution. You have the ability to store your passwords securely, encrypted, so you don't have to worry. And even in the event of your untimely demise you can make sure your Executor has the info to access that password "vault".

Obviously if work asks you to change your password on a regular basis you might see if you can come up with a pattern password that makes sense for you.

But no matter how secure your password is, a person can get it from you if you are susceptible to social engineering. Social engineering is the 'art of deception'. A social engineer can deceive a person by playing out a con. Some cons are run through email and these are called phishing scams (discussed earlier in the book). But social engineers capitalize on the fact that end-users are often not aware they are giving anything useful or harmful away.

One of the most notorious convicted hackers turned security professional of our time is Kevin Mitnick. He has written several security books – "The Art of Deception" and the "Art of Intrusion", as well as his autobiography "Ghost in the Wires".

Within a company there should be training on how to avoid being taken in by social engineering, and there should be a policy in place to help ensure the right steps are taken in the event you are asked for your password by someone who supposedly works in your IT department (NEVER give out your password). Or what if you find a USB drive in your parking lot, should you plug it in when you get inside? Not if you aren't sure where it came from. And don't ever let someone stand behind you (shoulder surfing) so they can memorize your access codes or passwords. We are WAY too trusting sometimes and we need to be more guarded with our information.

Kevin Mitnick partnered up with Stu Sjouwerman and KnowBe4 to provide "Kevin Mitnick Security Awareness Training". In addition, KnowBe4 provides an email exposure check to help your organization see where the human vulnerabilities to phishing are within your organization.

So seriously, to improve your geek credit in the office help your IT folks by not being ignorant of the dangers of social engineering. The weakest link really is the end-user.

And if someone calls and says they need your password… that is never true. Ever. On the server side to things administrators don't even have the ability or right to see your passwords. All they see are asterisks ************** or circles or something else.

The Network around You

What an amazing thing if you work for a company that has a network with cables, routers, switches and more. Do you even realize what a tremendous learning experience is right in front of you? Too often though people go to work, sit down, log in, work, and log out at the end of the day. Never wondering what makes it all happen.

If you take what you learned in Chapter 2 and consider that you have an amazing opportunity to take that knowledge to the next level you would start looking BEHIND your computer. See the cables? Where do they go? Do you have a false floor that allows cables to be hidden? Or are they all just out in the open?

Ask a few questions without annoying IT. Show them this book. Explain that it helps build an appreciation for all they do. They'll like that.

How many servers does your company have? Why not ask your IT admin or network team about that. You probably log in and connect to servers for file saving purposes right? And your computer connects to a printer, to email services and more. Are your email services on-premise (located somewhere in the building) or are they hosted or cloud-based?

Servers Make the World Go Round

In a network you have client desktops, laptops devices and you have servers that provide services. Servers sound scary when the reality is that they are literally there to "serve" you, so don't be too worried about them.

It's good to have an idea of what different types of servers there are and what they do. I'm going to list out a few (not all) and you'll note that I have a Microsoft slant here, not necessarily because I'm partial but because these are the ones I work with.

Server Type	Description
Active Directory	Provides a way for workstations (desktop systems) to log in. It maintains username/passwords for the people in your organization and provides your system a security access token when you log in. It also maintains directory information about persons (if you input that into the system, like address/phone/etc.) and offers a variety of tools for management of your network
DNS/DHCP	These are services provided within a network and could be included with other server services (like your AD server). As you recall, DNS provides name services (although in this case we mean internally on your network) and DHCP provides IP address leases for your client systems.
File (services)	These servers are designed to allow client connectivity so that persons can save their files to the network server. This is good for two reasons: It's easier to back up the one file server rather than 100 clients, and it's easier for collaboration when documents are on a network share.

Server Type	Description
Print (services)	Allows you to connect one or more printers up to a server and allow users to print through it. All the processing work is done on the server and the documents go into a print queue and are printed in the order received unless you tweak priority settings.
Exchange	An Exchange Server is used to provide email services. Users get a "mailbox" that allows them to send/receive email, keep track of their calendar and contacts, even receive voicemail (if configured properly).
SharePoint	SharePoint allows for easier collaboration within an organization. You access it through your browser and you can have web pages that have document libraries (with workflows, versioning and so forth), personal web pages, lists, and much more.
SQL	Provides database services, which are necessary when working with other server-types like SharePoint.
Lync	Provides a software based communications server system, that provides IM (instant messaging), Presence, VoIP (voice over IP) and conferencing capabilities (audio/voice and web conferencing).
Hyper-V	Virtualization services (discussed in a moment).
IIS (Web Server)	Internet Information Services allow that server to host web pages and web-based content.

There are so many other server types for monitoring and managing (System Center tools), etc… and other options beyond Microsoft too.

Where is the Cloud?

I'm out to dinner one night with a good friend. He proceeds to tell me that he has moved all his music "to the cloud" (and even though he swears he didn't do this I believe he literally lifted his eyes heavenward). To the cloud? I ask. "Yep". He's an Apple lover so I assume he means iCloud. So I say "you mean North Carolina?" Huh?

Where is the cloud? Well, when referring to a cloud-based storage solution like iCloud, or something like Google Drive or Microsoft's SkyDrive, or Dropbox or any other kind of data solution we're talking about a datacenter. Apple has a massive datacenter in North Carolina (and in other locations). Microsoft has them in Redmond WA, other parts of the US, Asia, and Europe. Google has datacenters around the globe as well.

Now you might be wondering 'what's a datacenter'? A datacenter is really just a fancy name for a place with lots and lots of servers (computers) with lots and lots of storage (big hard drives and many of them) lots and lots of redundancy (power, cables, etc…) and lots of air conditioning (hey, you have to keep a place like that cold right?

Wanna see one???!!! Check out the link here where you can take a walk through a Google datacenter (the video might be better than trying to navigate around the center).

http://www.google.com/about/datacenters/inside/streetview/

> Whether for your own personal edification or that of your children you might do a quick search to see if there are any datacenters near your home that you can go an actually tour.

Now, whether you are storing files in "the cloud" or using cloud services or hosted services in the cloud, the point is that none of your data or services are literally coming from… a cloud. So

whatever you do, when you say "cloud", do not lift your eyes heavenward.

Virtualization

Virtualization is a big buzz word these days. It's more than a marketing term though. In short, if you think about your computer (remember Chapter 1?) and all that hardware running, and then you think about your Operating System and how you have to install that on top of your hardware (on the bare metal so to speak) what are you really doing? You install the OS program on the hard drive right? Well when your computer boots up and looks at your hard drive it finds out where the OS is located and begins booting up your system. That OS is installed on the "bare metal". But you know what? That makes life so much harder when you want to install an OS because you have to worry about the type of hardware, do you have all the drivers, what if the server out-grows the hardware, can you move it…? And that is where virtualization comes in.

Virtualized systems have a hypervisor. The hypervisor is a thin layer that sits between the hardware and the OS itself. So now you can install things much easier because it's not directly on the bare metal.

Now initially we had what are called Type-2 hypervisors. These you installed right on your desktop and they allowed you to install another OS on top of your existing OS. So I remember running Windows Vista with VMWare's Workstation (a Type 2 hypervisor) running Server 2003 R2. I could perform testing and do demonstrations with the virtualized server I had. To the server itself it thought it was running right on bare metal. But in reality it was running on top of an OS with a hypervisor in-between. The negative here is that this made for such a huge performance hit. The better approach was to go with a Type 1 hypervisor.

A Type 1 hypervisor (like VMWare's ESX or Microsoft's Hyper-V) sits right on top of the bare metal. And the virtual machines (or VMs) sit on top of that. Each VM requires processor power and memory but most modern systems are so powerful that they

are being underutilized these days. So how great that you can utilize them more fully by running different server types (ones that have solutions that cannot be installed on the same server so you need multiple servers anyway).

Now the hypervisor itself is not the cool part anymore. The cool part is the management solutions that are used on the back end to keep track of all your VMs and also assist with backing up the data and being prepared to help move VMs when necessary, or have them be redundant and fail over to another system if necessary (if one server crashes). These are features that modern virtualization management solutions provide.

VDI and IDV

In some of your workplace environments you may have a need for VDI (or IDV). Virtual desktop infrastructure basically allows you to use your system as a client (fat client, thin client, zero client) that attaches back to a virtual desktop running in your on-premise datacenter. So the actual system you connect to (running Windows 7 or 8 most likely) is a VM.

Now, if you are thinking "Why? I have a system right in front of me." then you probably don't have one of those circumstances that require a virtual system. But let's say you have an old XP system that doesn't have the hardware power to run Windows 8 but you want to work with Windows 8 to stay progressive. Well, your company could buy you a new computer. Or they could give you a virtual Windows 8 and you can connect up to it using a remote desktop tool.

Another good reason for VDI is when you want to bring your own device to work (BYOD) and it is an iPad, which doesn't conform to company security policies because you cannot enforce Group Policy on it. Well, you could remote desktop to it and now your IT person is happy, and you have your iPad at work.

The reason I said earlier fat, thin, zero client is because a Windows XP system running as a whole OS would be a fat client. A thin client would be a small box running a small OS (or a no

software zero client) with no storage and it connects to your monitor, mouse, keyboard and network. It makes a connection back to your VDI desktop.

Now the other acronym for this portion of the chapter is IDV. Intelligent desktop virtualization is a much more cost effective option compared to VDI. You basically have a regular computer and you install a small client on it. The client connects back to a server that keeps track of your system, inventories it for software and hardware, allows management of it… all of it in much the same way you have with VDI. The one plus over VDI (other than the cost savings)? You don't need a network connection to get to your desktop. You take your desktop wherever you go (which is what we normally do now).

My opinion is that VDI is the future. When we have ever-constant connectivity in a network or the Internet and never fear losing that connection (and when that connection is faster than what we have now) VDI will be the norm. For now, due to the expense, complexity of setup and existing limitations, I believe IDV is a better option in many cases.

Going to the Next Level

It's really hard not to go into so much more in this chapter. I fear I have already lost many of you with my VDI/IDV rant. It's a personal pet peeve so I added it in, forgive me. I wanted this to be interesting and fun for you. You may be considering a career in IT and hopefully this is just the start. Where do you go from here?

Reading is key. And staying up on the latest releases and such. But it is so hard to do without help. I recommend you have a few sites to visit for information, including:

- InfoWorld (www.infoworld.com): You can read my column (Enterprise Windows) or other articles.
- CNET: (www.cnet.com): Tons of great geek stuff here.
- Paul Thurrott's Supersite for Windows (winsupersite.com)

Appendix B: A Geek's Dream Future

Holographic Manipulation: What Geeks Dream About

A dream future? Imagine part Jetsons (flying cars), part Iron Man (the A.I. assistant), part "Back to the Future" (hover boards), part Minority Report (interactive UI), part Star Trek (transporters), and the list goes on. Note: We're not focusing on militaristic items like lasers, exoskeleton suits and so forth.

Technology is improving. As that happens we will see all sorts of new inventions that currently exist only in the movies. Here are a few things coming up on the near horizon (1 to 2 years) and distant horizon (5-10 years).

Obviously, some things are impossible. You'll never be able to scramble your molecules and send them across the galaxy to the

Klingon home world of Kronos. BUT… that doesn't mean you won't be able to do something similar with objects.

3D Fax Transporter

3D faxing is not new. In fact many have worked on it and accomplished varying degrees of success with it.

> In 1991 UT Austin engineers attempted to manufacture a solid object through long-distance laser sintering. http://tinyurl.com/dfhtyo

The exciting thing about today is that we have these 3D printers that can scan objects and reproduce them using "additive manufacturing". Using a similar concept, you could scan an object on one side of the globe and have it 3D print elsewhere.

> The first 3D printer was actually created by Chuck Hull of 3D Systems Corp in 1984

Imagine being in space (in a shuttle or space station) and you need a part. With a 3D printer you could make the part you need! Obviously not all parts can be done this way (electronics for example).

Flatter (Paper Thin) Tablets

Some are calling it the Paper-Tab. A screen as thin as a sheet of paper; and this is something that has already reached prototype stage. Here is a quick link to an article: http://tinyurl.com/a5onglg

Wearable Tech

Wrist TV's were something promised when I was a kid. Nowadays we see wearable technology in the form of bracelets

with chips in them (identity chips, payment chips, etc.). We see cool new watches on the market (or in development) with eInk displays (like the Pebble, getpebble.com), Bluetooth pairing to your mobile devices, GPS, MP3 players, activity trackers for running or cycling and much more. Weather alerts, twitter, email, calendar, etc…

There are all sorts of other wearable devices in development. Everything from a re-timer jetlag light to a glove for doctors to use that acts like a tricorder (called, logically, the Glove Tricorder) (http://www.augmilabs.com/)

Very few technologies are being given the attention of Google Glass though. We even paid homage to it on our new 2nd Edition cover (that's what the geek is wearing in case you weren't sure). Essentially Google Glass is a headset worn like glasses that has a projector for beaming images into your right eye. It makes it look like you are viewing a 25 inch HD screen that is 8 feet away. It has a camera for photos and video capture. It has audio, microphone, WiFi, Bluetooth and so forth. Currently developers are making all sorts of different apps to work with it, including weather apps and such.

Applications for Google Glass are called "glassware" (a funny take on software huh?). Some of these apps include news updates, reminders, facial recognition, social network sharing, maps and so forth.

Electric Cars

We are already aware that hybrid cars (like the Prius or Kia Optima Hybrid, and others) save money on gas by switching to electricity when possible. But what about all-electric cars? Well, this exists now and the cars are very cool. Go visit Telsa's website (http://www.teslamotors.com/models). Not only are the cars cool looking on the outside, but the interior console is all geeked out with full monitor consoles.

Tesla isn't the only one with an all-electric car. There is the Nissan Leaf, the Mitsubishi I-MIEV, and others. We'll, no doubt, see more of these with time.

Autonomous Cars

Another thing to look for is self-driving cars, aka robotic cars. Google has a driverless car (notice how often we refer to Google and innovative tech). But these have been in the works for a long time. Some cars have parts of their ability that are autonomous, like self-parking, accident avoidance, driver fatigue detection and so forth.

So some of these are semi-autonomous and we'll see more of this in the next few years but within 10 years we'll see

Hoverbikes and Flying Cars

These are already being designed. They remind me of the crafts flown in Return of the Jedi on Endor. Imagine two propellers (face down) that allow you to get off the ground and begin moving in different directions.

One example is from Aerofex (http://www.aerofex.com/). They have cool videos: http://www.youtube.com/user/aerofexcorp

Here is another private inventor's vision of the hoverbike. Watch the videos. It's not ready yet… but soon!!! http://www.hover-bike.com/

Flying cars and bikes have been in the works for a long time. Look up the Avro Canada VZ-9 Avrocar, a Cold War experimental craft being worked on from 1958 to 1961. Another example is the Piasecki VZ-8 Airgeep.

As for flying cars, these are nothing new. In fact the very first flying car on record was developed 15 years after the Wright Brothers plane took off in Kitty Hawk NC in 1903. In 1917

Glenn Curtiss showed off his Autoplane. It didn't fly so much as hop a few times. Other attempts at a car that flies and drives are on the record and worth researching. In modern times one effort stands out to me. Terrafugia. Just going to their website will make you excited because the first aircraft they have is real… not science fiction. http://www.terrafugia.com/

The Transition is a car that spreads its wings and becomes a plane. It has approval to be on the road too! The next-gen aircraft is the TF-X and this is super exciting. It can take off or land vertically and can then fly forward using propellers with a range of 500 miles. It will be some time before we see this go from design to prototype but the possibilities are exciting.

Holographs

I used to joke with the daughter of one of our dear friends that her new step-mother was a hologram. Mildly immature of me, yes… but a fun way to tease. When the step-mom had a baby it became impossible to continue to accuse her of being holographic. When asked by the little girl what I thought about her new sister and the fact that she was not a hologram I calmly replied "we knew it would eventually happen… they invented robots that could mimic human behavior and so no longer need the holograms". I explained that they would trade up models when they went to the doctors for "inoculations". This is a fun game that I still play with the now teenage little girl. I don't think she believes me anymore.

Ever since Princess Leia asked Obi-Wan for help as her "only hope" and Chewbacca played R2-D2 at space chess the idea of holographic communication and game play have been a hoped for reality. It's in the works.

Interacting with 3D floating images is not difficult with technology like the Kinect already available. Companies are working on ways to make working with holographic display technology. One such company worth keeping an eye on is Holoxica. (http://www.holoxica.com/)

Remote Presence

We all like Skype or Facetime and other apps for face-to-face chat with family, friends, colleagues, business meetings, etc… but sometimes you need a little more than that. Sometimes you need a movable version of that. There are remote presence robots that have a screen and can be controlled. Perfect for working with telecommuters or a person from another location like a doctor who may need to see patients. These can certainly evolve to be more interactive with the ability to perform tasks remotely.

One example of this is the Texai Remote Presence System (from Suitable Technologies) https://www.suitabletech.com/

Other Cool Possibilities

The possibilities are endless really. Imagine cars you can alter the design on daily (like changing socks). They are already working on this! Imagine a cool new type of unicycle vehicle that feels like something out of Tron. Research Noah, the motorized unicycle for conceptual art available. You can see other design concepts of this as well by searching for Uno or Tango and electric unicycle. Imagine human transporter options beyond the Segway. Research Bombardier for some cool design concepts.

What about that hoverboard? Any chance we'll see one of those? Well, what about an Airboard? It's a hovercraft/hoverboard. Or perhaps the "Mag surf" which uses magnetics. This guy Ben is in the know on hover ideas: http://www.hoverage.com/

You know you're a geek if you are reading this chapter but still thinking "does that chair from the cartoon in the last chapter really exist"? It does. There are two versions. The $6000 Emperor 1510 and the $50,000 (yes, you read correctly) Emperor 200.
www.mwelab.com

Appendix C: Gifts for Geeks
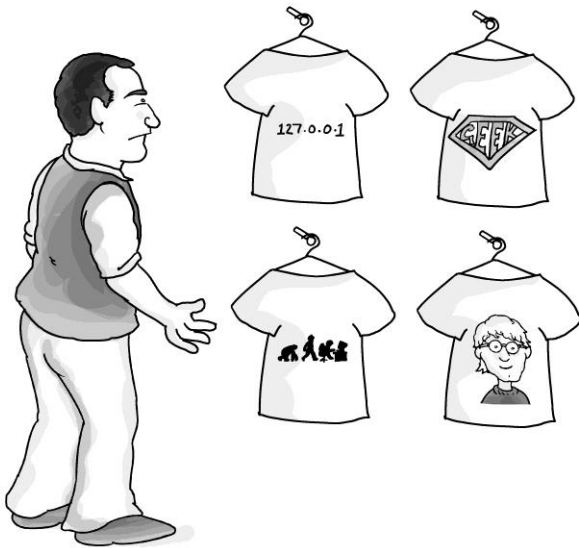
People THINK they know what a geek wants as a gift. And top 10 lists of "gifts for geeks" abound at different times of the year. Are we really that predictable?!

Ok, ok… we are. But you would be wise to know your geek before you go buying something for him or her. Don't come home with an Iron Man t-shirt for the guy who loves Batman. That's like coming home with some football jersey from some team (insert team name here, I have no idea) when they love some other team (seriously no idea on this… San Francisco Dolphins? Fedoras? Right… San Francisco Fedora's). You just don't do that. Know your geek. And know where to go to find the best geek toy/shirt/tech for your geek.

Once you have an idea of what your geek likes, it's time to find things that will make them happy.

T-shirts: Yes, we know geeks love t-shirts. Superheroes, funny code shirts (if they are developers, not if they are IT admins typically), favorite sci-fi characters and so forth. It's also cool to get shirts that have logos from the best software and stuff that your geek likes. So if your geek likes something like TrainSignal Training to learn IT training stuff all you have to do is call them and ask if they have any shirts with their logo on it. Companies love stuff like that.

And don't be afraid to get yourself a t-shirt too. Nothing says "I've embraced your geekiness" like a geek t-shirt.

So I personally have a ton of geek shirts from conferences and such. I also have a Hulk shirt and a Silver Surfer shirt. A Star Trek shirt that explains why Kirk is better than Picard (hint: Kirk never drinks tea, ever!) And I have an Iron Man Tony Stark shirt from thinkgeek.com that has a glowing center that is attached to a battery pack to light it up. Now that is cool!

Subscriptions: Again this depends on what your geek is into. Macs have their own magazines, and many journals are online and some are free.

My personal favorite magazine for computer hardware information and other fun tidbits is Maximum PC (www.maxiumumpc.com). Another cool magazine is "geek" which you can find at geekexchange.com. Try buying your geek an annual subscription.

But even if you don't get a subscription, think about how nice it would be for you to pick up the latest magazine when swinging through an airport or newsstand. For a geek, that's like buying them flowers.

Gadgets: Beyond tablets, music players and such, there are many different types of practical gadgets out there (and some not so practical ones). Here are a few sites where you might be able to find something interesting:

- ThinkGeek.com

- Jinx.com

- CoolThings.com

You might want to purchase some kind of hardware for your geek. Maybe a cool keyboard, mouse, whatever… Here are some places to look:

- NewEgg.com

- TigerDirect.com

- Xoxide.com

So I personally have a pizza cutter that is in the shape of the Enterprise (from thinkgeek.com). And my wife just picked up a very cool ST:TOS (Star Trek, the Original Series) electronic door chime (which is pretty awesome, she knows me so well).

Events: Not everybody can go to Comic-Con, and that is ok. Got anything geeky going on in your city? We had an exhibit at the nearby science center where you could see original Star Wars ships, outfits, etc. That was pretty fun. Maybe look for something like that. Or some other geeky event. Maybe it's just a new movie coming out and you make the effort to pick up a couple of appropriate t-shirts (remember to stick to the proper theme and genre) and some tickets.

Figures: Note, these are "Figures" (aka action figures) not "Dolls". There is a difference. There are also statues. And not all geeks are into these so be judicious in your purchase in this

case. What you might try is finding something from your geeks childhood through a site like eBay. Maybe talk to parents and see if their little geek had a toy they were fond of. Some of these things are quite pricey, but not always.

A friend of mine bought some real Star Trek original series uniform tunics (and a Klingon Bird of Prey from Wrath of Khan with working lights). We stayed at his home with his family one time when he was away and I emailed and joked with him that I had forgotten my pajamas and had to wear one of the tunics. He didn't find my joke to be funny.

There are a few things you don't want to buy your geek. At least not without their input. Like comics, video games and movies. Much of this involves personal taste (and depending on the age of your geek you parents may want to make sure you have some input on those kinds of tastes and purchases). One example of this is if you see the movie Superman IV: Quest for Peace available at the grocery store and think "oh… this is perfect", IT IS NOT. Put it right back down next to the copy of Daredevil, Catwoman (didn't even see it), and the first Fantastic Four movie (seriously, Jessica Alba as Susan Storm… did you even read the comics Tim Story (director)???)

You know you're a geek if when writing a chapter on Geek Gifts you cannot help but get distracted with a list of gifts for yourself.

Geeks love their geek paraphernalia. A t-shirt, an action figure, anything that glows… watch their eyes light up.

Index

Conversational Geek is a fun and easy to read journey through all the main aspects of a tech geeks life from computers to the Internet to "geek" entertainment. The goal here is to bridge the gap between geeks and non-geeks. Learn to communicate better with your spouse, child, friend or IT personnel by reading Conversational Geek (in 7 days!).

J. Peter Bruzzese (one of the Co-Founders of ClipTraining.com) is an internationally published technical author with over a dozen titles to his credit. In addition, he is a Microsoft MVP, a Microsoft Certified Trainer, and a Triple-MCSE (Microsoft Certified Systems Engineer). He has been a technical journalist for 10+ years and is the Enterprise Windows columnist for InfoWorld.

ClipTraining, founded in 2006 by Tim Duggan and J. Peter Bruzzese, provides online, task-based training on Microsoft Windows and Office along with a host of other enterprise oriented training courses through a proprietary, cloud-based Learning Management System that offers private corporate portals for organizations of all sizes. Helping persons become more proficient with their career is ClipTraining's prime objective. Learn more about how ClipTraining can help you as an individual or assist your entire company to increase in knowledge by visiting us online at: www.cliptraining.com

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