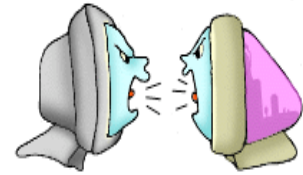




Chapter 2

Nothing But Net: Get Connected!



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Schools created their networks over the past decade, but now many are struggling with the increased demands on their systems. The use (some say overuse) of e-mail, the use of file sharing and networked comment reporting, increased use of Web 2.0 and social networking for educational purposes, and the onslaught of video uploads and downloads -- all have contributed to the network concerns of schools.

Networking issues might become an ongoing dilemma for technology directors; how can schools address the increased need for bandwidth?

So what is bandwidth? In computer networks, bandwidth is the data transfer rate, usually expressed in bits per second. When a website takes forever to download or a YouTube video appears choppy, the problem lies with the bandwidth of the connection between your computer and the Internet Service Provider. The bandwidth issue is, actually, the last mile of the connection, so to speak; consider driving on highway, happily cruising along at 70 miles per hour, when suddenly you have to merge from four lanes to one. Congestion and headaches ensue. That is the bandwidth issue schools are now facing.

A Short History of the Net

permission requested from info.isoc.org/guest/zakon/Internet/History/HIT.html
for an e-mail copy, send a blank message to timeline@hobbes.mitre.org

- 1969 ARPANET commissioned by Department of Defense for research into networking
- 1979 USENET established using UUCP between Duke and UNC
- 1981 BITNET started as a cooperative network at the City University of New York with the first connection to Yale; BITNET stood for Because It's Time Network
- 1981 Minitel (Teletel) is deployed across France by France Telecom
- 1983 Berkeley releases software incorporating TCP/IP
- 1984 Domain Name System (DNS) introduced; number of hosts (sites) breaks 1000
- 1986 Network News Transfer Protocol (NNTP) designed/enhances Usenet performance over TCP/IP; number of hosts breaks 10,000
- 1988 NSFNET backbone upgraded to T1 (1.544Mbps)
- 1989 Number of hosts breaks 100,000
- 1991 Gopher released at the Univ of Minnesota
- 1991 World Wide Web released by CERN
- 1992 Number of hosts (now called websites) breaks 1,000,000
The term "Surfing the Internet" is coined by Jean Armour Polly
- 1993 InterNIC created by NSF to provide specific Internet services (e.g. names)
Mosaic takes the Internet by storm
- 1995 Popular dial-up systems (CompuServe, AOL, Prodigy) begin to provide Web access
- 1997 71,618 mailing lists registered at Liszt, a mailing list directory
- 1998 Number of hosts (now called websites) breaks 29,000,000
- 1999 Teachingcompany.com and Summercore.com
- 2000 Airport Technology and wireless networks
- 2001 Google indexes 1,346,966,000 Web pages
- 2002 Google indexes 2,073,418,204 Web pages
- 2003 Google indexes 3,083,324,652 Web pages
- 2004 Wireless technology hits big time
- 2005 Dial-up modems go the way of dial phones
- 2006 Web 2.0 is the way to go
- 2007 The Read/Write Web takes over
- 2008 The YouTube Generation
- 2009 The Facebook Generation
- 2010 Twitter Nation
- 2011 Social Media rules the Web

Listservs and Newsgroups

A Listserv is an electronic magazine that comes to your individual e-mail box and tends to resemble the “Letters to the Editor” section of a magazine. A Newsgroup is a public conference bulletin board. In contrast to a Listserv which goes to individual e-mailboxes, a Newsgroup generally shows up as a conference on a bulletin board. To look for a list, send e-mail to listserv@listserv.net (subject blank) with the phrase List Global Red Sox using your own topic of course. You will get informative e-mail back (perhaps within 33 seconds) that gives you listserv choices on that topic. Or you can search for LISTSERV lists via the Web isoft.com/lists/listref.html; once you find a desired listserv, it is time to subscribe!

To subscribe, send e-mail to LISTSERV@LISTSERV.NET, leave the subject blank and type SUBSCRIBE listname with the list you want to join, e.g. SUBSCRIBE BOSOX

The Wizards ListServ at thayer.org

Mark Nelson (mnelson@thayer.org), Director of Information Technology at Thayer Academy in Braintree, MA runs a wonderful listserv for computer coordinators and computer teachers. To subscribe, create a google account and email wizards-list@googlegroups.com to request membership. Mark asks that you introduce yourself to the relatively small group with a short note about your position and your school.

ISED-L: Independent School Educators On Line

This wonderful listserv for independent school educators, founded by Ellen Berne of Winsor School in 1994, is equally valuable to tech people and administrators. To subscribe, send to listserv@listserv.syr.edu, leaving the subject blank. In the body of the message, type SUBSCRIBE ISED-L Larry Bird, using your name of course.

- To send a note to your ISED colleagues, send your note to ISED-L@listserv.syr.edu and you will get confirmation within a few minutes. Ed Siegfried formerly from Milton Academy and Marti Weston from Georgetown Day School run ISED-L and estimate that there are usually 600-700 copies and perhaps 2000 readers of any given posting.

NYCIST ListServ

A fantastic tech listserv (nycist.net) of some of the “niceist” tech people around -- New York City Independent School Technologists. Create a google account and then email nycist@googlegroups.com to request membership.

File extensions

Quiz? Identify the software for each Red Sox file:

- varitek.doc __ • lester.txt __ • ortiz.docx __ • youkilis.mpg __ • pedroia.ppt __
- lowell.isf __ • cameron.xls __ • ellsbury.kml __ • beckett.pdf __ • wakefield.jpg __

Sending files via e-mail

- 1) When sending a Word document that does not need to be edited by anyone, first save the document as a pdf, thus ensuring that all can read it
- 2) It might be necessary to add the 3 letter extension of .doc or .xls or .jpg onto the filename so a PC user can read the file. If you are sending a docx file, it is sometimes safer to save it as a doc file since not all users have the newer versions of MS Word
- 3) if the file does not easily open or does not work via double-click, then open the application first (back door) and then navigate to the location and open the file from within the application or drag the file onto the application's icon on the dock, taskbar, or desktop shortcut.

Mac users usually had no idea that files have built-in tags indicating the file type, while PC users see these tags regularly. Metaphorically, this 3 letter code is like the tag on a piece of clothing at a store or like a bar code. With the advent of OS X, Mac users now frequently deal with file extensions.

common: .doc or .docx (MS Word) • .rtf (rich text format) • .txt (text)
.xls or .xlsl (Excel) • .pages (iWorks) • .psd (photoshop)
.pdf (adobe acrobat) • .ppt or .pptx (Powerpoint) • .isf (inspiration)

audio: mp3 (music) .wav (PC) .aif (quality audio) .mid (midi)
.rm (real player files) .ra (real audio) .aac (iTunes)

PC-specific: .exe (executable) .drv (drivers) .bat (batch files)

Transfers: .hqx (binhex/stuffit) .zip (pc compressed file)
.bin (mac-binary).sit (stuffed file) .dmg (Mac OSX disc image)

graphics/video: .jpg .gif .pict (mac) .bmp (pc, usually created with Paint)
.png (portable network graphic) .qt (quicktime) .tif (graphic)
.avi (movies) .mpg (MPEG movies) .mov (quicktime movie)

- by the way, JPEG stands for Joint Photographic Expert Group, the group that created the standard. This type is best for photos with many colors or shades of gray.
- GIF are graphic files; GIF stands for Graphic Interchange Format, created by CompuServ. GIF files are useful for color pictures drawn with a graphics program, since the file compression works best with a finite number (e.g. 256) of colors. Animated GIF files containing motion!

Wireless Networks

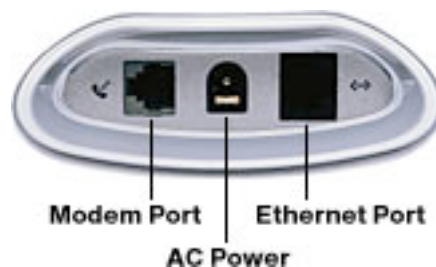
Wireless Networks are nearly a godsend, allowing for classroom laptop use with ease, laptop access throughout the campus, and tremendous flexibility. Wireless networking gives a school the benefits of a traditional network with e-mail and Internet access, plus file sharing, printing, and device sharing. Plus wireless networking reduces the need to drill through walls.

How Wireless LANs Work

A wireless network allows computers to share network and Internet connections without any wires between them. Wireless networks use electromagnetic airwaves (radio or infrared) to communicate information from one point to another without relying on any physical connection. Wireless networks use different kinds of wireless media, including microwaves, cellular systems, radio frequencies, and infrared light. Radio frequencies are becoming accepted as the network of choice. The wireless network can act in conjunction with a traditional wired Ethernet LAN. In a typical configuration, a transmitter/receiver (transceiver) device -- an **access point** -- connects to the wired network using standard cabling. Each computer has a wireless network card (airport card). A typical access point supports between 10 and 15 computer users at one time.

Wireless LANs can be simple or complex. At its most basic, two PCs equipped with wireless adapter cards can set up an independent network whenever they are within range of one another. Or they can be as complex as extending wireless LAN in one building to another building on campus. One solution might be to install a directional antenna on each building, each antenna targeting the other. The antenna on A is connected to your wired network via an access point. The antenna on B is similarly connected to an access point in that building, which enables wireless LAN connectivity in that other building.

- The Airport is a base station that wirelessly lets Macs and PCs connect to a network. Each Airport supports up to 10 users within a range of 150 feet.



Like the base station of a cordless phone, the Airport Base Station uses a physical connection to access the Internet and wireless connections to communicate with Airport-enabled computers. The base station has an RJ-11 connector for the built-in 56-Kbps V.90 modem. There's also an RJ-45 connector for the built-in 10BASE-T Ethernet connection that allows a connection via Ethernet. Apple also offers the Airport express, a small device that plugs into an outlet and extends your wireless connectivity.

Cookies and Privacy Issues

Too many Cookies?

A cookie is a piece of text, a small data file, that a Web server stores on a user's hard disk and that allows a website to store information on a user's machine and later retrieve it. For example, a website might generate a unique ID number for each visitor and store the ID number on each user's machine using a cookie file. Cookies, then, let websites recognize you on a return visit.

Cookies allow Amazon.com to greet you with your name and a suggested reading list.

- When you type the URL of a website into your browser, your browser sends a request to the website for the page, say for instance amazon.com
- When the browser does this, it will look on your machine for a cookie file that Amazon has set. If it finds an Amazon cookie file, (which usually contains an ID number assigned to you previously by Amazon) your browser will send the data in the file to Amazon's server along with the URL. If it finds no cookie file, it will send no cookie data.
- Amazon's Web server receives the cookie data and the request for a page. If data is received, Amazon can use it to send you personalized information on its Web page because every time you request a page or order an item from the store, the server connects that request to your unique ID number, giving Amazon an exact record of your info.
- If no data is received, Amazon knows that you have not visited before. The server creates a new ID for you in Amazon's database and then sends data to your machine in the header for the Web page it sends. Your machine stores the data on your hard disk as a cookie.

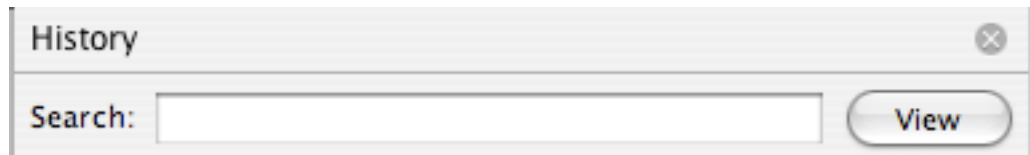
Strategies for dealing with Cookies?

- If you completely disable cookies, some sites won't work correctly; tracking your orders for instance could be a problem.
- You can download cookie blocker software that lets you set cookie rules.
- Clear your cookie file. If you use Netscape, search for a file named cookies.txt and delete it. If you use Explorer, go to Windows Directory, Temporary Internet Files and Windows Directory, Cookies and delete the contents of both folders. On the Macintosh version of Explorer, Go to Edit menu, then Preferences, under Receiving Files, click Cookies. Click the cookies you want to delete, then click delete.

Deleting Your History

If you are surfing the Web on a public computer, say in your school's computer lab, others can retrace your steps by checking History on your browser.

How to purge your history? On a PC using Explorer, Go to Tools menu, then Internet Options, and in the General Tab, click the Clear History button. In Netscape, go to Edit menu, Preferences, choose Navigator in the Category Window and click Clear History. For the Mac user of Explorer, go to Explorer Menu, Preferences, Web Browser in the Category Menu, then Advanced, then click Clear History. Or you can click the History Tab on the side of the browser, draw a selection rectangle to select all the sites you have visited and press the delete key on your keyboard. On Safari, go to History Menu and choose Clear History. On Firefox, go to History Menu, then choose Show in Sidebar; there you will see you browsing history. To delete, control-click on each folder and choose delete. To close the History side bar, click the X on the top right side of the bar.



What is all this talk about WiFi?

Everywhere we go these days, we will find ourselves right in the middle of a WiFi network--airports, coffee shops, hotels. EZ Lube Service Centers offer free WiFi for customers waiting for their cars to be serviced. Entire cities are going--or planning to go-- wireless. In the not-too-distant future, we will be able to access the Internet almost anywhere and at anytime.

So, how do WiFi work? Basically a wireless network will let information travel over the air, with hotspots available for laptop or other devices to connect to the Internet. Similar to cellphones and televisions, a wireless network uses radio waves. A router receives information from the Internet, translates it into a radio signal, and then sends it to the computer's wireless adapter. Wireless adapters can plug into a computer's PC card slot or USB port. Google the term "wifi free spots" to view the many hotspots available. One caveat: WiFi networks are usually not secure, so do not send any confidential information while using a public hotspot.

What is a Firewall?

A firewall is either a program or a device that protects your home (or school network) from the crazy people of the world. In other words, a firewall blocks out malicious hackers and offensive websites. A firewall filters information and flags packets of data to prevent them from coming through. Firewalls protect your home computer from remote logins (someone who has gained access to your computer through spyware and can then view or access files on your hard drive), e-mail bombs (someone sending you thousands of e-mails), viruses, spam, and more. You can set the desired level of security. Even if you have a firewall, you should still install anti-virus software.

What is a Spam Filter?

There are many different kinds of filters that deal with spam. User-defined filters are included in most e-mail clients. With these filters you can forward e-mail to different mailboxes depending on headers or contents. For example, you would put e-mail from each of your friends into a designated folder. You can also use these same filters to forward e-mail to the trash if the origin or contents are suspicious. Header filters are more sophisticated. They scan the e-mail headers to see if they are forged. E-mail headers contain information in addition to the recipient, sender and subject fields displayed on your screen; they contain information about the servers that were used in delivering your e-mail. Because many spammers do not want to be traced, they enter false information in the e-mail headers to prevent people from contacting them directly. Some anti-spam programs can detect these forged headers. Not all spam has forged headers though, so this filter by itself does not do the whole job. Language filters work by filtering out any e-mail that is not in your desired language. If you do not expect to get e-mails in another language, this may eliminate some portion of spam. Content filters scan the text of an e-mail by using fuzzy logic to give a weighted opinion as to whether the e-mail is spam. They can be highly effective, but can also occasionally filter out bulk e-mail that may only appear to be spam. This can usually be overridden by explicitly authorizing email from domains you subscribe to. Finally, permission filters block all e-mail that does not come from an authorized source.