All about how the Internet works

1. Packets explained (3:21)
   https://www.youtube.com/watch?v=Gfoc3Cxgnpk
2. What is the Internet - Vint Cerf – History (3 :44)
   https://www.youtube.com/watch?v=Dxcc6ycZ73M
3. Wires, Cables, WiFi (6:40)
   https://www.youtube.com/watch?v=ZhEf7e4kopM
4. DNS (6:44)
   https://www.youtube.com/watch?v=5o8CwafCxnU
5. How Search Works (5:12)
   https://www.youtube.com/watch?v=LVV_93mBfSU

Some hints for Internet searching

1. Keep it short: The fewer words you use, the more accurate your search will be. Every time you add a new word to the mix, you limit your results.

2. Use quotes: Double quotes around a set of words tells Google to consider the exact words in that exact order without any change.

3. Search a web site: Google allows you to specify that your search results must come from a given website. For example, try **search term site:websitename**

4. Search a domain extension: Use the "site" operator above to search a whole class of sites. Try **search term site:.edu** to find online learning tools provided by an educational institution.

5. Tell it what you don't want: Use a minus sign (-) to signify words you do not want to appear in your results. The minus sign should appear immediately before the word and should be preceded with a space (so it's not confused with a hyphen). Chocolates labrador –dog –puppy -retriever

6. Remove what you don't want: You can exclude as many words as you want by using the minus sign in front of each one. You can also exclude more than just words. For example, place a hyphen before the "site" operator to exclude a specific site from your search results.

7. Use Boolean operators (AND, OR): Use OR between words (in all CAPS) or the pipe symbol (|) to allow either one of several words. Example: "dining hall" OR "cafeteria" AND "students" -"university"

8. Limit by file type. Example: To limit to a pdf type filetype:pdf https://www.sitepoint.com/10-tips-for-conducting-a-more-effective-google-search/

TECHNOLOGY IN ACTION, COMPLETE, 12E, EVANS / MARTIN / POATSY, CH 13: BEHIND THE SCENES: HOW THE INTERNET WORKS

The Management of the Internet

1. Who owns, manages, and pays for the Internet?

- Management of the Internet is carried out by several nonprofit organizations and user groups such as the Internet Society, the Internet Engineering Task Force (IETF), the Internet Architecture Board (IAB), the Internet Corporation for Assigned Names and Numbers (ICANN), and the World Wide Web Consortium (W3C). Each group has different responsibilities and tasks.
- Currently, the U.S. government funds a majority of the Internet's costs. Other countries also pay for Internet infrastructure and development.

Internet Networking, Data Transmission, and Protocols

2. How do the Internet's networking components interact?

- Computing devices or networks connect to the Internet using Internet service providers (ISPs). These providers vary in size and work like the physical highway system.
- The largest paths of the Internet, along which data travels the most efficiently and quickly, make up the Internet backbone. Homes and all but the largest businesses connect to the Internet through regional or local connections, which then connect to the Internet through the entities that make up the Internet backbone. The largest businesses, educational centers, and some government agencies make up the Internet backbone.
- Optical carrier (OC) lines are high throughput and are used to connect large corporations to their ISPs.
- Service providers use an Internet exchange point (IXP) to connect directly to each other, reducing cost and latency time.
- Individual users enter their ISP through a point of presence (POP), a bank of routers and switches through which many users can connect simultaneously.

3. What data transmissions and protocols does the Internet use?

- Data is transmitted along the Internet using packet switching. Data is broken up into discrete units known as packets, which can take independent routes to the destination before being reassembled.
- A computer protocol is a set of rules for exchanging electronic information. Although many protocols are available on the Internet, the main suite of protocols used to move information over the Internet is TCP/IP. The suite is named after the original two protocols that were developed for the Internet: the Transmission Control Protocol (TCP) and the Internet Protocol (IP).
- TCP is responsible for preparing data for transmission, but IP actually sends data between computers on the Internet.

Internet Identity: IP Addresses and Domain Names

4. Why are IP addresses and domain names important for Internet communications?

- An IP address is a unique number assigned to all computers connected to the Internet. The IP address is necessary so that packets of data can be sent to a particular location (computer) on the Internet.
- A domain name is merely a name that stands for a certain IP address and that makes it easier for people to remember it.

- DNS servers act as the phone books of the Internet. They enable your computer to find out the IP address of a domain by looking up its corresponding domain name.

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HTML, XML, and Other Web Building Blocks

5. What web technologies are used to develop web applications?

- The Hypertext Transfer Protocol (HTTP) is the protocol used on the Internet to display web pages in your browser.
- The Hypertext Markup Language (HTML) is a set of rules for marking up blocks of text so that a browser knows how to display them. Most web pages are generated with at least some HTML code.
- Blocks of text in HTML documents are surrounded by a pair of tags. These tags and the text between them are referred to as elements. By examining the elements, your browser determines how to display the text on your computer screen.
- The current HTML standard is HTML5, which offers much better support for media like audio and video.
- Because HTML wasn't designed for information exchange, eXtensible Markup Language (XML) was created. Instead of locking users into standard tags and formats for data, XML enables users to create their own markup languages to accommodate particular data formats and needs. JSON is another standard supporting the exchange of information between web services.
- Software is developed on both the server and on the client side to make web pages more responsive and interactive. Server-side programming includes CGI and ASP.NET. Clientside programs can run faster because they don't need to wait for information exchanges with the server. Embedded JavaScript and Java applets are two common approaches for writing client-side programs.

Communications Over the Internet

6. How do e-mail and instant messaging work, and how is information using these technologies kept secure?

- Simple Mail Transfer Protocol (SMTP) is the protocol responsible for sending e-mail over the Internet.
- E-mail is a client/server application. E-mail passes through e-mail servers, whose functions are to store, process, and send e-mail to its ultimate destination. ISPs and portals such as Gmail maintain e-mail servers to provide e-mail functionality to their customers.
- Your ISP's e-mail server uses DNS servers to locate the IP addresses for the recipients of the e-mail you send.
- Encryption software, such as Pretty Good Privacy (PGP), is used to code messages so that they can be decoded only by authorized recipients.
- Instant messaging (IM) software communicates with a chat server to quickly deliver communications to your friends who are online. It's not secure and can be vulnerable to eavesdropping.