Learning\_Activity\_1: What do you understand from your listening about How the internet works. Discuss it in class and upload your note on d2l engagement activity

**How the internet works?**

What is the Internet?

Internet is an open and public system. It is a distributed packet-switched network (it is a network of networks). It is made up of many independently operated networks. It links billions of devices together all around the globe.

Internet ships binary (binary code) information.

* 8 bits together = 1 byte.
* 1024 bytes = 1 kilobyte.
* 1024 kilo byte = 1 megabyte;

It doesn’t matter if it’s a picture, a video or a song, everything on the internet is represented and send around as bits. They are sent by electricity, light and radio waves.

Those messages are sent by cable:

* Ethernet wire (find home,office,scholl) - + cheap ; - signal loss
* Fiber optic cable (is a thread of glass engineered to reflect light)- + fast, no loss signal; - expensive, hard to work with.
* Radio waves – wireless has made our internet mobile- + totally mobile, - short range (the bits are sent through the wireless at your location and then transferred to the physical wire to travel the long distance of the Internet.

The internet – IP (internet protocol) addresses & DNS

IP addresses: that’s a unique number (32 bites long) to each computer or device.

8 first numbers – country/network

Followed by: - region/network

-subnetwork

-device

Transitioning to IPV6 – 128 bytes per address

DNS – domain name system – the computer uses the DNS to look up domain names and get the associated IP address which is used to connect your computer to the destination on the internet.

DNS servers are connected in a distributed hierarchy and are divided into zones.

DNS spoofing – that’s when a hacker taps into a DNS server and changes it to match a domain name with the wrong IP address.

Safe websites prevent snooping ad tampering by communicating on a secure channel (Secure Sockets Layer & Transport Layer Security)

HTTP and HTML

WEB browser: URL – Uniform Resource Locator.

Computer –> Server

Server -> Computer in a language called HTTP (Hyper Text Transfer Protocol)

* Request pages with get request
* Send information like when fill out a form or search a query.

HTML (Hyper Text Markup Language): the language that you use to tell a web browser how to make a page look.

Packets, Routing & Reliability

Packets travels is the way the information on the internet goes from one computer to another through. It packets has the information from where it came and where it is going.

Every router keeps track of multiple paths for sending packets and it chooses the cheapest (time, non -technical factors – politics and relationship between companies) available path for each piece of data. That’s options make the network fault tolerant, which means the network can keep sending packets even if something goes wrong (reliability).

TCP – Transmission Control Protocol

TCP manages the sending and receiving of all your data as packets.

\*The little locker or https mean the computer is using public key encryption to exchange data securely with the website you are on.

Encryption & Public Keys

Encryption – scramble or changing a message to hide an information.

Public Key – asymmetric encryption. A public key can be exchanged with anybody and a private key that is not shared. The public key is used to encrypt data, shared with everyone, but the secret one can only be decrypted by a computer with access to the private key.

Cybersecurity & Crime

* Fake install
* Vulnerability on software
* Spam email (a phishing scam)

DDOS (Distributed Denial of Service): attacks come from many computers all at once.

Avoid getting hacked

* Use strong passwords
* Check for authentic web addresses
* Install system security updates often
* Don’t install software you don’t trust

How search Works

Request -> result: search engines are constantly scanning the web in advance that’s why the search engine has what is needed to give you an answer in real time.

Spider: a program that collects information about websites

Search index: a database of information used for doing a research -> determine the best matches to show first.

An algorism chooses the most relevant results for a search by considering how many other web pages linked to a given page. If a lot of web site think that a web page interesting, then it’s probably the one you are looking for (page rank).