\*\*Dito natin lagay mga notes natin :)\*\*

**Internet** - global network of networks(google)

- hierarcy, infrastructure

INTER NETWORKING

**inter** - outside

**intra** - within the border

**Network** - interconnected devices ('nodes')

- share data

**Interconnected technologies** – Wired /Wireless.

**Protocols** –rules to interact to each other.

**Store and Forward (S &F)-**  send message without establishing connection.

characterized by

1**.Hardware**

a. nodes - the actual devices i.e computers

IoT - Internet of Things

b.Interconnected Technologies - Wired - utp, fiber; Wireless - infrared,bluetooth

2.**software**

a.protocols

b.device drivers -software that run active (something missing here)

computer to computer - serial communication

- one cable, send data with 1s and 0s

Problems of wired and wireless - susceptible to noise

**LAN** - Local Area Network

interconnection of networks with the use of ISPs

different ISPs can connect with each other

connection between countries - underwater(preferred)/ satellite

**1969 - modern internet was born**

circuit switch network -- used by old telephones

store and forward - cellphones (texting)

**IPv4 - 32-bit**

**IPv6 - 64-bit**

**Early 1960's -->** DARPA (Defense Advanced Research Project Agency) --> packet switch

circuit switch - relaying and keeping the connection

packet switching

send and forward --> send-->store-->send-->...until it reaches the destination

**ARPANET** (Advanced Research Project Agency NETwork) --> 4 computers communicate

**First popular app --> email - 1972**

**World Wide Web** - information system that uses Hypertext links

- information system on the internet

- allows documents to be connected to other documents by hyperlinks

- was created for researchers and scientist to share their findings and research

- back then it is more textual

**Wide Area Information Service (WAIS)** - multiple server locations

- early information service

**Gopher (protocol)** - application layer protocol

- similar to WAIS

- hierarchical in nature

- distibuting, seraching, retrieving

- a TCP/IP application layer protocol designed for distributing searches and retrieving documents over the internet

**USETNET** - worldwide distributed discussion system

- similar to discussion groups

**Semantic Web** – analyzes the meaning of the searches.

**1989 (Sir Tim Berners-Lee) --> HTTP, HTML, URL**

HTML – HyperText Markup Languge

URL – Uniform Resource Locator

**HTTP FUNDAMENTALS**

HTTP - jointly developed by the 23c and the IETF

- standard way of communicating

ITCF – Internet Engineering Task Force

Version history

HTTP 0.9 (1991)

HTTP 1.0 (RFC 1945, edited may 1996)

HTTP 1.1 (RFC 2068 Rewritten specifications on Jan 1997)

HTTP 2 (RFC 7540 May 2015)

* Patterned by SPDY
* Backwards compatible with HTTP 1.1

-HTTP runs on top of TCP/IP, port 80 by default. Port 443 for HTTPS (HTTP over SSL/TLS)

-Socket is the combination of IP address and a port

-Port numbers range from 0-1024

-IANA

-HTTP is based on client-server architecture

* Clients AKA user agents

-web browsers, web crawlers/spiders (google bot), other end user tools

* Servers

-engine servers, proxy servers, gateways, tunnels

-HTTP uses a request-response standard protocol

* The client sends an HTTP request message to the server
* The server processes the request and replies with an HTTP response message
* Pull push poll

-HTTP is a stateless communications protocol

* Servers do not keep info about clients in between requests

-HTTP provides support for other functionalities such as

* Cache control
* Content media type (MIME – multipurpose internet mail extension) specification
* Language and character specification
* Context/transfer codings
* Content negotiation
* Client server protocol negotiations
* Persistent connection
* Request pipelining
* Authentication/autorization

web Server

Web Client

Semantic web - next step

- uses natural language

**HTTP RESOURCE ADDRESSING**

Http resources are identified doing URI’s (RFC 3986) or more specifically HTTP URIs

* Scheme (http/https)
* Authority
  + User information or authentication credentials (deprecated).
* host
* domain name (resolved to an IP address using DNS) of the server where the resource resides (or will be created).
* Port number
* Path – path to resource (resolved relative to the document root on the server)
  + May refer to a static/dynamic resource
* Query
  + Typically provided as key value pair with (&) separators between key/value pairs
  + May be URL – encoded.
* Fragment identifier (bookmark) - #

**HTTP REQUEST MESSAGE**

* Request Line
  + Method
  + Request URI
  + HTTP Protocol Version
* Message Headers (general, request, and/or entity headers)
  + HTTP 1.1 requres at least the host request header to be provided
* Empty line (CRLF)
* Message Body

**HTTP RESPONSE MESSAGE**

* Status Line
  + HTTP Protocol Version
  + Status Code
  + Reason Phrase
* Message Headers (general, request, and/or entity headers)
* Empty Line
* Message Body

Status Code:

* Informational (1xx) – 100(Continue), 101(Switching protocol)
* Success (2xx) -
* Redirection (3xx) -304(Not modified)
* Client Error (4xx)- 400(Bad Request), 401(Client Error)
* Server Error (5xx)

**HTTP REQUEST METHODS**

* Put
  + Store the enclosed entity in the message body under the specified request URI
* Delete
  + Delete a data in a server
* Options
  + To know what the option request type that is allowed to the client
* Trace
  + Request a loopback of the request (request the server to echo back to the client the received request message)
* Connect
  + Request the establishment of a tunnel
* Safe methods
  + Not affecting any data
* Idempoted methods
  + Repeatedf execution, same result
* Cacheable methods
* Extension Methods
  + WEBDAV RFC 4918
  + Propfind, proppicthc,mkcol,copy,move,lock,unlock.

**HTTP Message Headers**

**General Header fields**

Cache-Control no cache

| Connection-keep alive

| Date tue, nov 1, 1001

| Pragma

| Trailer

| Transfer-Encoding

| Upgrade switch protocols

| Via

| Warning

**Request Header Fields**

* Accept text/plain
* Accept-charset Unicode-8859
* Accept encoding gzip
* Accept language en,fil
* Authorization basic [hash]
* Proxy-authorization credentials
* If match etag
* If non-match
* If range etag+date
* If modified since http-date
* If unmodified since
* Referrer http://www.tutorialspoint.org/http/index.htm

**Response Header Fields**

* + - Used by servers
    - Response messages
* Accept Ranges bytes
* Age delta-seconds
* Etag
* Location http://www.tutorialspoint.org/http/index.htm
  + used for redirection
* Proxy Authenticate challenge
* Retry-after HTTP-date | delta-seconds
* Server
* Vary(depende sa request) Accept-Language, Accept-Enconding
* WWW Authenticate challenge

**Entity Header Fields**

* Allow HTTP METHOD
* Content Encoding gzip
* Content Language fil, en
* Content Length bytes
* Content Location URI
* Content-MD5(checking the integrity of the message) parang etag yung syntax
* Content Range(depende sa gusto mong range) first 500 bytes(0-499)
* Content Type text/html
* Expires date
* Last Modifier date

**HTTP STATUS CODE**

Informational

* 100 continue
* 101 switching protocols

Success

* 200 OK
* 201 Created
* 202 Accepted
* 203 Non-Authorized Info
* 204 No Content
* 205 Reset Content
* 206 Partial Content

Redirection

* 300 Multiple Choices
* 301 Moved Permanently
* 302 Found
* 303 See Other
* 304 Not Modified
* 305 Use Proxy
* 306 Switch Proxy
* 307 Temporary Redirect

Client Error

* 400 Bad Request
* 401 Unauthorized
* 402 Payment Required
* 403 Forbidden
* 404 Not Found
* 405 Method not Allowed
* 406 Not Acceptable
* 407 Proxy Authentication Required
* 408 Request Timeout
* 409 Conflict
* 410 Gone
* 411 Length Required
* 412 Precondition failed
* 413 Request Entity Too Large
* 414 Request-URI too large
* 415 Unsupported Media Type
* 416 Request Range not satisfied
* 417 Expectation Failed
* 426 Upgrade Required

Server Error

* 500 Internal Server Error
* 502 Bad Gateway
* 503 Service Unavailable
* 504 Gateway Time-out
* 505 Http Variation not supported

The Internet

Internet is global network of networks, means it is a global network that millions or billions of computers are connecting to each other to exchange data, information and many more. Internet is decentralized or it’s independent, because each computer or host that is linked to the network is independently working as its own. It operates specific local services that will be available globally and others may connect to it.

There are many theories and claims about the origin of the internet. One of the theories said that the very first packet switching exchange was on October 29, 1969 of the ARPANET which led by professor Leonard Kleinrock. It was said that there are 4 computers that were linked together in different places. The Second theory was creation of the TCP/IP which is a backbone protocol that was developed by Vinton Cerf and other members of a networking group in 1970’s in California. It was developed to solve problems of ARPANET on the linking of computers. This theory states that the beginning of the internet was the meeting and development of the TCP and the discussion of the problems about the interconnecting multiple packet networks. The third theory was originated to the origins of Telco. Kim Veltman said that the very first digital transmission and switching was made by the AT&T Bell Labs in 1962 (nethistory.info, 2004). There are many more claims of theories on the origin of the Internet and it is still on examination.

Reference: http://www.nethistory.info/History%20of%20the%20Internet/origins.html

The World Wide Web

The World Wide Web is a global information medium on the internet that allows documents to be connected to the other documents by linking hyperlinks and identified using Uniform Resource Locator. Hypertext was influenced by the Memex of Vannevar Bush, Markup Language of IBM and the Project Xanadu of Ted Nelson. The World Wide Web uses protocols; Hypertext Markup Language (HTML), Hypertext Transfer Protocol (HTTP) and Uniform Resource Locator (URL). The Web is unidirectional which making someone link to another sources without action by the source.

Tim Berners Lee was working in CERN with the project named ‘Enrique.’ It was him who created the WWW on 1989 in Switzerland. Availability of web server software and browser on 1991. CERN declared on April 30, 1993 that the web is free to everyone. World Wide Web Consortium was founded by Tim Berners Lee to administer the improvement of the web. Another mentionable man, Robert Cailliau makes a great impact on the creation of the web. It was very popular for billions people and access it for fact-finding. Many search engines such as Yahoo and Google takes in action, as well as commercial sites like Amazon.

Many misunderstood and mistakenly think that the Internet and the World Wide Web are the same. Internet is a larger scale which is a global system of network of networks while the Web is just a part of the internet and one of the global information medium that is a global collection of documents that uses hyperlinks, URL and HTTP.

Reference: http://www.nethistory.info/History%20of%20the%20Internet/web.html