Internet - global network of networks

Inter– outside the boundary

Network – interconnection of devices

Nodes – actual devices

Interconnection technology – coaxial, fiber, UTP, infrared

Protocols - a set of technical rules for the transmission and receipt of information between computers

Device drivers - a program that controls a particular type of device that is attached to your computer.

IP – Internet Protocol

IPv6 - is the sixth revision to the Internet Protocol and the successor to IPv4. It tilizes 128-bit addresses.

IPv4 - Internet Protocol version 4. It is the underlying technology that makes it possible for us to connect our devices to the web. It utilizes 32-bit addresses.

DARPA - Defense Advanced Research Project Agency

IoT- Internet of things

Email – electronic mail

Circuit Switch Connection - Establish circuit and maintain it to communicate; Not scalable

Store and Forward - Send messages to the next hub until destination is reached

Wide Area Information Services (WAIS) - Connected to servers from different locations to get data from each server periodically and index these data

Gopher Protocol - Distributing, searching and retrieving documents over the internet; Hierarchy is involved with the index having sub-indexes

Usenet - Similar to an online discussion group

Hypertext Markup Language

Universal Resource Locator –

Universal Resource Identifier

World Wide Web (WWW) - Information system that allows documents to be connected to other documents; an arrangement of web servers that boost particularly designed records

Web Server - Hosts web resources; Listens for requests

Web Client - Example is web browser; Gives requests to web servers; Follows HTTP to communicate with the server

Semantic Web - Next step in the evolution of the web; Makes use of artificial intelligence to understand the question given by user

Hypertext Transfer Protocol (HTTP) - Application layer communications protocol used to access resources; Standard way of communicating through applications

W3C (World Wide Web Consortium) –

IETF (internet Engineering Task Force) -

IANA – allocates certain ports to certain applications

Socket - IP Address and Port number

SSL/TLS – takes HTTP traffic and transmits it in an encrypted form

Clients - user agent; Web browsers, web crawlers/spiders, other end user tools and applications; any application that communicates with HTTP protocol

Origin server – where original resources are actually stored

Proxy server – checks authentication; forwards requests and gives back requests

Gateway tunnel - blind relay between two points; forwards communication without knowing what it does; can be used for authentication

Uses request-response protocol – Client sends an HTTP request message to server (pull protocol); Server volunteers new information via notifications (push protocol); Checks server at regular intervals (polling); Server processes the request and replies with HTTP response message; In HTTP 2, server can push resources to client without client requesting.

Stateless communication – A communication where it does not keep information about clients in between requests

Cache control – storage for easy and fast access

Content media type – (MIME: Multipurpose Internet Mail Extension) specification;

Language and character set specification -

Content/ transfer coding -

Content negotiation – talk to tell what the recipient can handle

Client-server protocol negotiation – asking server if it can handle higher version and if yes, the server will upgrade

Persistent connections – telling the server to not close the connection for further requests

Request pipelining – sending requests one after another

Authentication/ authorization -

HTTP Resource Accessing - HTTP resources are identified using URIs (Uniform Resource Identifier), which tells what the resource is, or more, specifically HTTP URL (Uniform Resource Locator), which tells where the resource is.

Scheme (http or https) –

Authority - User information/ information credentials

Host - domain name (resolved to an IP address using DNS) of the server where the resource resides, or will be created

Port number (HTTP) – default is 80

Path to resource (resolved relative to the document root) – may refer to a static or dynamic resource

Query – typically provided as key = value pairs, with ampersand separators between key/ value pairs, and may be URL-encoded

Fragment identifier – “bookmark”

Absolute URL - Scheme and domain name are always required

Relative URL - Scheme, user info, and domain name can be omitted

GET - Transfer a current selected representation of the resource identified by the request URI; Requests data from a specified resource; Most commonly used method; Must be supported by all compliant general-purpose servers; Can be stored; Can be bookmarked; Must never be utilized when managing delicate information; Are ought to be utilized just to recover information; Asks for have length limitations; Remains in the browser history

HEAD - Same as GET but the entity is not sent; Used to retrieve metadata about the entity; Must also be supported by all

POST - Performing resource-specific processing of entities enclosed in the message body; Submits data to be processed to a specified resource; Has a payload; Are never cached; Cannot be bookmarked; Do not remain in the browser history; No restrictions on the data length

PUT - Store the enclosed entity in the message body under a specified URI; By default, the method is not allowed; When allowed, authentication must be provided; Uploads a representation of the specified URI

DELETE - Remove the resource associated with the specified URI; Like PUT, the method is not allowed by default

OPTIONS - Request information on what can be done with the resource specified; Returns the HTTP methods that the server supports

TRACE - Perform or request a loopback of the requested message (echo back); Typically used for testing/diagnosis of the request/response chain; Allows the customer to perceive what is being gotten at the flip side of the demand chain and use the data for testing

CONNECT - Establishment of an encryption tunnel to communicate with https; Converts the request connection to a transparent TCP/IP tunnel

Extension Methods

WebDAV

PROPFIND - method recovers properties characterized on the asset recognized by the Request-URI

PROPPATCH – method forms guidelines indicated in the demand body to set and additionally or expel properties characterized on the asset recognized by the Demand URI

MKCOL – make collection (new folder)

COPY – creates a duplicate of the source resource

MOVE – does not guarantee the ability to move a resource to a particular destination

LOCK - lock resources

UNLOCK – unlock resources

Safe Methods- Doesn’t change the resources

Idempotent Methods - Repeated request result to the same response

Cacheable Methods - Requests that generate cache

Request Line (CRLF – terminated line consisting of three spaced-separated items)

Request URI – location of the requested resource

HTTP protocol version – shows what HTTP version of the Client uses

Request Header Fields – information about the request and the client

* Accept-Charset
* Accept-Encoding
* Accept-Language
* Authorization
* Expect
* From
* Host
* If-Match
* If-none-match
* Range
* If-range
* If-modified-since
* If-unmodified-since
* Max-forwards
* Proxy-authorization
* Referer
* TE
* User-agent
* Message headers
* HTTP 1.1 requires at least the host request header to be provided
* Empty line (CRLF)
* Message body a.k.a. payload – optional

HTTP Response Message

* Request and response have the same structure
* Response Header Fields
* Accept-Ranges - you can give specific bytes
* Age - how long the response from fetching in the origin server or in the cache
* ETag -an identifier
* Location-for redirection
* Proxy authentication- authentication to access a proxy
* Retry-After – when maintenance of a web server; timeouts
* - indicate to a client that the server is currently not available
* -503 Service not Available
* Server – displays what server .
* -Example Apache, Amazon s3 , sffe
* Vary – changing header values. Used in content negotiations.
* www-Authentication - authentication to access a site
* Status line (CRLF)
* HTTP protocol version
* Status code – 3-digit code that designates the status
* Reason phrase – descriptive meaning of the status code
* 1xx (informational ), 2xx (success), 3xx (redirection), 4xx (client error), 5xx (server error)
* Message headers (general, response and / or entity headers)
* Empty line
* Message body – optional

HTTP Request Methods

* Standard
* GET
* Transfer a current selected representation of the resource identified by the request URI
* Most commonly used method
* Must be supported by all compliant general-purpose servers
* HEAD
* Same as GET but the entity is not sent
* Used to retrieve metadata about the entity
* Must also be supported by all
* POST
* Performing resource-specific processing of entities enclosed in the message body
* Has a payload
* PUT
* Store the enclosed entity in the message body under a specified URI
* By default, the method is not allowed
* When allowed, authentication must be provided
* DELETE
* Remove the resource associated with the specified URI
* Like PUT, the method is not allowed by default
* OPTIONS
* Request information on what can be done with the resource specified
* TRACE
* Perform or request a loopback of the requested message (echo back)
* Typically used for testing/diagnosis of the request/response chain
* CONNECT
* Establishment of an encryption tunnel to communicate with https
* Extension Methods
* WebDAV (Web Distributed Authoring and Versioning)
* PROPFIND
* PROPPATCH
* MKCOL – make collection (new folder)
* COPY
* MOVE
* LOCK – lock resources
* UNLOCK – unlock resources
* Safe Methods
* Doesn’t change the resources
* GET, HEAD, OPTIONS, TRACE
* Idempotent Methods
* Repeated request result to the same response
* GET, HEAD, OPTIONS, TRACE, PUT, DELETE
* Cacheable Methods
* Requests that generate cache

HTTP Message Headers

* General Header Fields(client & server)
* Cache-control – used for controlling cache and telling whether a resource needs to be cached or not
* Connection – Control whether connection is persistent or not and allows the sender to specify options that are desired for that particular connection
* Date – represents the date and time at which the request was generated
* Pragma – from older version, generic directive, indicates that something is cacheable
* Used to include implementation specific directives that might apply to any recipient along the request/response chain.
* Trailer – indicates that a header is present at the end of the data to supply metadata that might be dynamically generated while the message body is sent.
* Transfer-encoding – indicates what type of transformation has been applied to the message body to safely transfer it between the sender and the recipient.
* Upgrade – used for protocol negotiation \*
* Allows the client to upgrade or change to a different protocol on the same connection.
* Via – indicate where the request passed through
* Used for tracking message forwards, avoiding request loops, and identifying the protocol capabilities of senders along the request/response chain.
* Warning – carry additional information about the status or transformation of a message error in the message \*
* Request Header Fields (client)
* Accept – specifying acceptable file type; server responds with negotiation, accept if other type can be delivered.
* Accept-Charset – indicates which character sets are acceptable for the response
* Accept-Encoding –restricts the content-codings that are acceptable in the response.
* Accept-Language – restricts the set of natural languages that are preferred as a response to the request.
* Authorization
* Ensure protection from unauthorized access
* When proper credentials are entered, another request will be sent with authorization
* Without authorization, www-authenticate challenge will be sent and a pop-up authorization will appear
* Proxy Authorization – allows the client to identify itself (or its user) to a proxy which requires authentication
* Consists of credentials containing the authentication information of the user agent for the proxy and/or realm of the resource being requested.
* Expect – for two-face connection
* Indicates that particular server behaviors are required by the client.
* If any of the expectations cannot be met the server must respond with a 417 (Expectation Failed).
* From – contains contact credentials of sender – an internet e-mail address
* May be used for logging purposes and as a means for identifying the source of invalid or unwanted requests.
* Host – required in HTTP 1.1
* Specifies the internet host and port number of the resource being requested. This enables the origin server to distinguish among resources while servicing requests for multiple host names on a single IP address
* If-Match – comparing the file in the cache and server to check if file is unmodified to avoid state entity.
* If-None-Match – requests the server to perform the requested method only if one of the given value in a tag matches the given entity tags represented by the Etag
* Used to update caches or to prevent to upload a new resource when one is already existing
* If-Range – “is what I have a portion of what you have”
* Can be used with a conditional GET to request only the portion of the entity that is missing
* Allows the client to “short circuit” the second request
* If-Unmodified-Since – used with a method to make it conditional
* Expects the entity to be transmitted only if it has not been modified after the given date
* Ranges – Specifying portions of the resource the client wants to receive
* Max-Forwards – for tracing and limiting a trace.
* Limit the number of proxies or gateways that can forward the request to the next inbound server
* Contains a decimal integer indicating the remaining number of times a request message may be forwarded
* Referer – specify the address (URI) where the request was originated; to check where traffic is coming from
* TE – trailer encoding
* Specifies the transfer encodings the user agent is willing to accepts
* User-Agent – contains additional information about the clients, identity
* Response Header Fields (server)
* Accept-Ranges – allows partial resources
* Age – how long ago the response has been generated
* ETag (entity tag)
* Location – for redirection. If present, the server will fetch the latest resource from location
* Proxy-Authenticate
* Retry-After – amount of time the client has to wait before trying again
* Server – information about the server
* Vary – for content negotiation
* Entity Header Fields
* Allow – methods that can be called
* Content-Encoding – when server changed form of entity
* Content-Language – language characteristics; for accessibility purposes
* Content-Length – size of payload
* Content-Location – when content is from somewhere else; actual location of the resource
* Content-MD5 (deprecated header)
* Content-Range – when doing range request
* Content-Type – MIME type
* Expires – for controlling cache access; cache-control; (e.g. max-age = ??)
* Last-Modified – possible reference value to check if resource is fresh

HTTP Status Codes

-return values and its corresponding description

* Server Responses
* Informational (1xx)
* 100 – continue
* 101 – switching protocol. When the client request a switch to different protocol using upgrade header
* Success (2xx)
* 200 – OK. Request is successful
* 201 – Created. New resources has been created.
* 202 – Accepted; request is accepted but not yet generated
* 203 – Non-Authoritative Information; some are not from the origin server. Something has been added while going through a proxy
* 204 – No Content; successful but not returning anything.
* 205 – Reset Content; client can reset forms and data entries
* 206 – Partial Content; in other words, this is not the whole resource.
* Redirection (3xx)
* 300 – Multiple Choices; when resource is available in different forms
* 301 – moved Permanently; resource is no longer here and location must be changed. Example pdf, java, html, text file, etc..
* 302 – Found; when a new resource is generated and can be found somewhere
* 303 – See Other; same as 302. can be found somewhere.
* 304 – Not Modified; cache and server resource are the same
* 305 – Use Proxy; access through proxy. Not directly accessing origin, it is either for validation, filtering or authorization.
* 306 – n/a (unused status code). Used by earlier version.
* 307 – Temporary Redirect; like 301 but location must not be changed. Possibility in using when the site is in maintenance or crashed.
* Client Error (4xx)
* 400 – Bad Request; malformed request
* 401 – Unauthorized; accessing protected resource
* 402 – Payment Required; for online payments
* 403 – Forbidden; resource must not be accessed
* 404 – Not Found; resource might be there but the client made a mistake in typing
* 405 – Method Not allowed; a request was made of a resource using a request method not supported by that resource.
* 406 – not Acceptable; server won’t do it
* 407 – Proxy Authentication required; the client must first authenticate itself with the proxy.
* 408 – Request Time-out; request taking too long to process the request
* 409 – Conflict; request can’t be done because state of resources can be compromised
* 410 – Gone; no forwarding address, no longer there, purposely removed
* 411 – Length Required; specify content length
* 412 – Precondition Failed; condition has failed
* 413 – Request Entity Too Large; payload is too big
* 414 – Request-URI Too Large; URI is too long
* 415 – Unsupported Media Type; the server is refusing to service the request because the entity of the request is in a format not supported by the requested resource for the requested method.
* 416 – Request Range not Satisfiable; The client has asked for a portion of the file, but the server cannot supply that portion.
* 417 – Expectation Failed; server cannot honor request; the server cannot meet the requirements of the Expect request-header field.
* 426 – Upgraded Required (recently introduced status code); the client should switch to a different protocol.
* Server Error (5xx)
* 500 – Internal Server error; server’s fault, misconfiguration; a generic error message, given when no more specific message is suitable.
* 501 – Not Implemented; method can’t be handled; The server does not support the functionality required to fulfill the request.
* 502 – Bad Gateway; gateway machine is having problem; the server, while acting as a gateway or proxy, received an invalid response from the upstream server it accessed in attempting to fulfill the request.
* 503 – Service Unavailable; when server is under maintenance or temporary overloaded.
* 504 – Gateway Timeout; the server was acting as a gateway or proxy and did not receive a timely response from the upstream server.
* 505 – HTTP Version not found; the server does not support the HTTP protocol version used in the request.

If ever need ng definition sa mga header field terms, pwede dito :D :)

HTTP 1.1 RFC 2616 : Header Field Definitions

<https://www.w3.org/Protocols/rfc2616/rfc2616-sec14.html>

<https://developer.mozilla.org/en-US/docs/Web/HTTP/Headers>

https://tools.ietf.org/html/rfc7230#section-6.7

http://www.restapitutorial.com/httpstatuscodes.html