HTTP

* Application layer (highest layer) communication protocol used to access resources
* Invented by Tim Berners-Lee – father of Internet
* Jointly developed by W3C and IETF [1991 Protocol – original HTTP]
* By default:
  + TCP port is 80 for TCP
  + TCP port 443 for HTTPS (HTTPS – encrypted communication; for security)
* Port number must be unique
* Can be accessed in plain text (for those connected in the same wire)

Encryption (SSL/ TLS)

* Based in a client-server architecture
  + Client/ User agent – to make request from a server
    - Ex: Web browser, Web Crawlers/ Spider
  + Server – listens to web request
    - Ex: origin server (physically stored)
    - Proxy server, gateway, tunnels

Computer -> Proxy -> Gateway -> … -> Computer

* Where clients initiate request
* User request – response standard protocol (“pull”); client sends request, serves processes and replies
  + Real time – “pulling”
  + HTTP2 – “push”

A stateless communication protocol

* Doesn’t save information about client
* Serve and forget

Supports:

* + Cache Control
  + Content Media type (MIME – Multipurpose Internet Mail Extensions)
  + Language and Char
  + Content/ Transfer Coding’s
  + CP protocol negotiation
  + Persistent Connections
  + Request Pipelining
  + Authentication/ Authorization

HTTP Resource Addressing

* Identified using URI’s (RFC 3986)
  + Scheme (HTTP or HTTPS)
  + Authority
    - Domain name (transfers the name to an IPAddress)
  + Port number
* Resource can be static or dynamic

Request Line

* Method
* Request URI
* HTTP Protocol Version

Message Headers

* General Headers – can be used by clients and servers
* Request Headers – can be used by clients
* Respond Headers – can be used by servers
* Entity Headers – describes the payload

Status Line

* Status Code (3XX DIGIT)
  + Information (1xx)
  + Success (2xx)
  + Redirection (3xx)
  + Error (4xx)

HTTP Request Methods

* Standard Methods
  + Get - retrieve resource, return responses as entity
  + Head – not return body but returns headers; metadata info; general purpose
  + Post –form data
  + Put – to put data
  + Delete – to delele/ remove data
  + Options – what to do
  + Trace – diagnostic purposes
  + Connect – establishes tunnel; blind relay