**Internet**

-A global system of interconnected computer networks that use the standard Internet Protocol Suite (TCP/IP) to serve billions of users worldwide.

-It is a network of networks that consists of millions of private, public, academic, business, and government networks, of local to global scope, that are linked by a broad array of electronic, wireless and optical networking technologies.

-Internet is at once a world-wide broadcasting capability, a mechanism for information dissemination, and a medium for collaboration and interaction between individuals and their computers without regard for geographic location.

**Vinton Cerf** - Father of the internet

**Internetwork**

**Inter** – crosses boundaries

**Network** – set of devices connected to each other

**LAN (Local Area Network)** -small network limited to an area

**ISP (Internet Service Provider)** -a company that provides individuals and other companies access to the Internet

**Cables & Satellites** – connection of LAN’S

**Protocol -**Set of rules need to be followed(standard way)

* HTTP typically runs on top of **TCP/IP**, using **TCP port 80 by default (TCP port 443 for HTTPS).** HTTP over SSL (Secure Socket Layer) / TLS (Transfer Layer Security)

**Interconnection Technology Types**

**1. Wired** – physical meet to connect devices

**2. Wireless** – there’s no physical connection (infrared, wifi, Bluetooth, satellite, etc)

**World Wide Web**

-A global information medium which users can read and write via computers connected to the Internet. The term is often mistakenly used as a synonym for the Internet itself, but the Web is a service that operates over the Internet, as e-mail does.

-In September 1994, Berners-Lee founded the World Wide Web Consortium (W3C) at the Massachusetts Institute of Technology with support from the Defense Advanced Research Projects Agency (DARPA) and the European Commission. It comprised various companies that were willing to create standards and recommendations to improve the quality of the Web.

-World Wide Web was introduced in 1969 and established in 1989

**Tim-Berners Lee** - Father of the web

**ARPANET (Advanced Research Project Agency)** – concept of pocket switched vs circuit switched

**WAIS (Wide Area Information Servers)**

-An internet system in which specialized subject databases are created at multiple server locations, kept track of by a directory of servers at one location, and made accessible for searching by users with WAIS client programs.

**Gopher (protocol)**

-A TCP/IP application layer protocol designed for distributing, searching, and retrieving documents over the internet.

**Usenet** -A worldwide distributed discussion system available on computer.

**HTTP – Hypertext Transfer Protocol (hypermedia)**

-Application layer used primarily to retrieve hypertext (on hypermedia) documents and resources on the World Wide Web. Jointly developed by the W3C and the IETF

**Version History**

HTTP 0.9 (1991)

HTTP 1.0 (RFC 1945), May 1996

HTTP 1.1

HTTP 2

**HTTP resources are identified using URIs (specifically, HTTP URLs)**

* **Scheme** (http: or https:)
* (optional) **authentication information**
* **Host** and (optional) **port number**

-resolved to an IP address using Domain Name System

* **Path** (resolved to the document root on the server) to the resource
* (optional) **scheme-specific parameters**
* (optional) **URL-encoded query**
* (optional) **bookmark** (or fragment identifier)

**2 Types:**

**Absolute Form** - complete

**Relative Form** – scheme and host only

* **HTTP is based on client-server architecture**

**Clients, aka user agents (UA):**

* Web browsers
* web crawlers – Google search engine
* email clients
* other end user tools and applications

**Servers (any application that waits for request of HTTP):**

* Origin servers – where the resources hosted
* proxy servers
* gateways – connect to ISP
* tunnels – for HTTP’s; blind relay
* **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

* **HTTP is a stateless communications protocol**

-Servers do not keep information about clients in between requests

-Web applications effect session tracking using mechanism such as cookies on URL-encoded session information to keep track of related client requests

* **HTTP provides support for other functionalities:**
* cache control
* content media type (MIME) specification
* language and character set specification
* content/transfer coding
* client-server protocol negotiations
* persistent connections
* request pipelining

**Cache**

-Local storage/copy of resource that is fetched from a server