INTERNET AND WWW

SUBJECT: BASICS OF WEB DESIGN (09CE2102)

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➢Internet and WWW

➢Web Pages and Web Server

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Introduction to Internet

➢ Internet is a global computer communication system that has made all the services possible.

➢ Internet is a network of networks.

➢ A network is defined as a group of two or more computers / electronic devices which are linked together.

➢ It is made to move the information and Can be used through wired or wireless media.

Introduction to Internet

WWW

- WWW - World Wide Web
- A service of internet that consists of web pages.
- The development of the World Wide Web was begun in 1989.
- The Web gives users access to a vast array of documents that are connected to each other by means of hypertext or hypermedia links— i.e., hyperlinks.
- WWW was made available publicly in 1991 and In 1993, it was made free globally.

Web pages

➤ Web pages may contain information like text, audio, video etc..
➤ A web page is a hypertext document on the World Wide Web.
➤ Web pages are delivered by a web server to the user and displayed in a web browser.

Website

➢ Website is a collection of web pages / page.

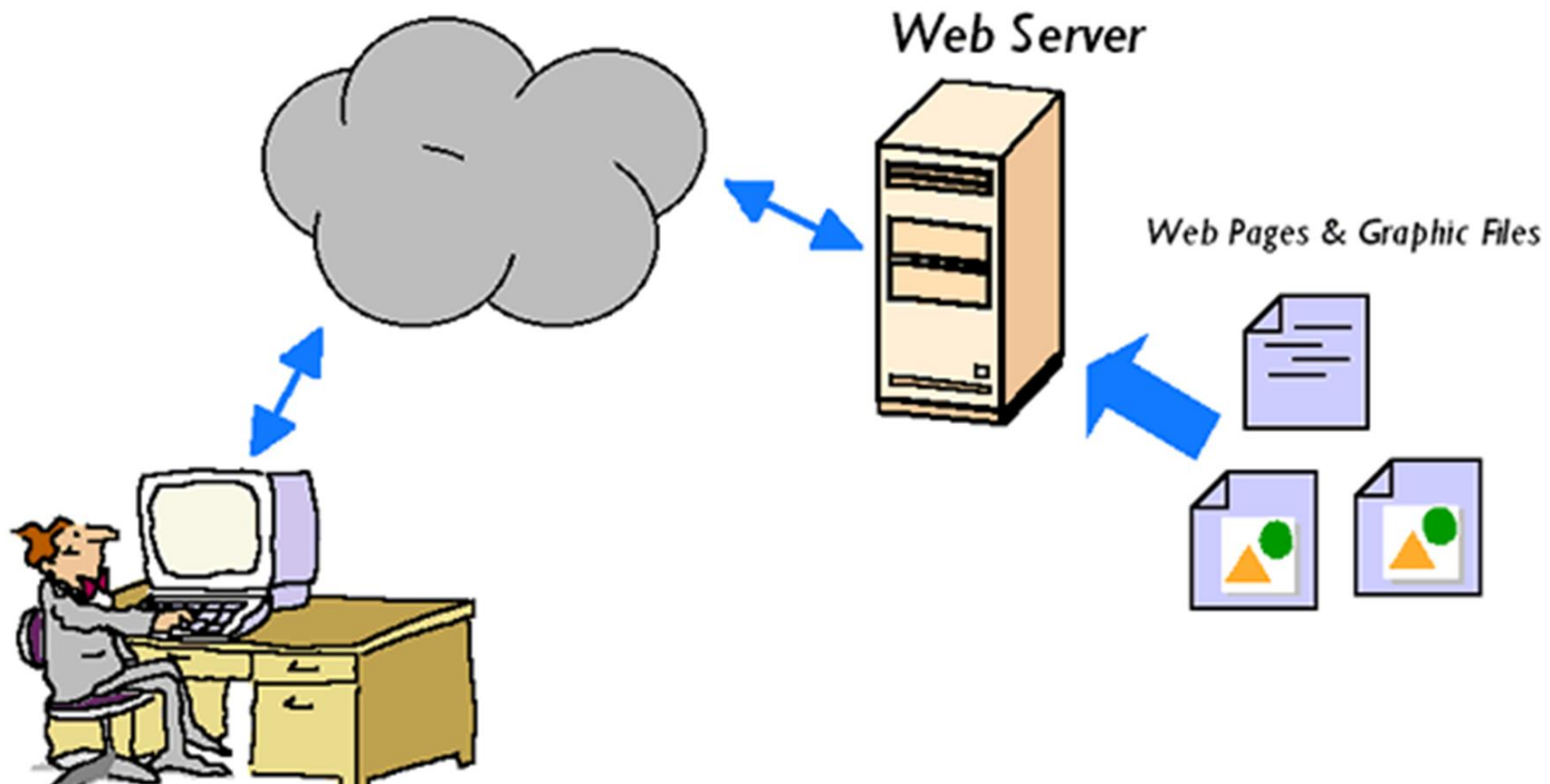Website have 2 main elements.

Domain name

Web server

Web Server

➢ The primary function of a web server is to store, process and deliver web pages to clients and Satisfies Web client requests.
➢ A web server can contain one or more websites.
➢ A web server is computer software and underlying hardware that
➢ accepts requests via HTTP.

Web Server

Web Server

Web Pages & Graphic Files

Domain

the address of your website

http://www.example.com

name

extension

prefix

sub-domain

domain name

Domain

- ➢ A domain name is essential for website. (name and extension).
- ➢ It is like a physical address (we type in browser).
- ➢ A web browser needs a domain name to direct you to a website.
- ➢ An organization called ICANN (Internet Corporation for Assigned Names and Numbers) specifies which domain name extensions are available and keeps a database of where the domain names point to.
- ➢ Without a domain name, anyone who wanted to visit your website would have to enter the full IP address.

Domain

➢ But the problem is that an IP address is difficult for people to memorize.

➢ Different domains - .com .org .net .edu .in .gov .co.in

Domain Name

https://www.site24x7.com/find-ip-address-of-web-site.html

Find IP Address

Find IP Address of your website. Sign up for a Site24x7 Free Account to monitor up to 5 websites for free continuously and be alerted when it goes down!

Domain Name

gseb.org

Find IP

Domain Name

Find IP Address

Test results : - gseb.org

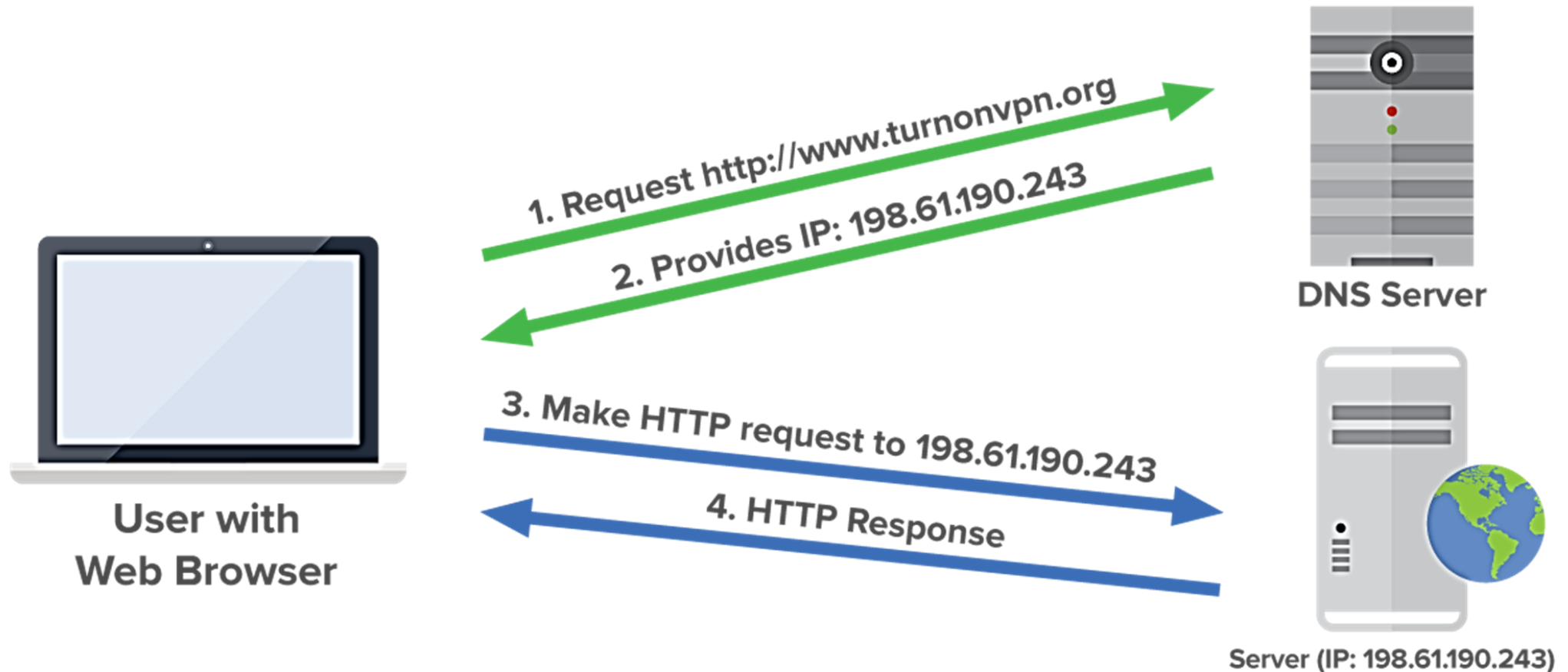| |
|---|
| Result URL: gseb.org |
| Load Time: 2 sec(s) |
| Tested on: 11 Nov 2020 10:01:25 AM |

Check Website Availability | Ping Website | DNS Analysis | Find

Find IP Results: 11 Nov 2020 10:01:25 AM

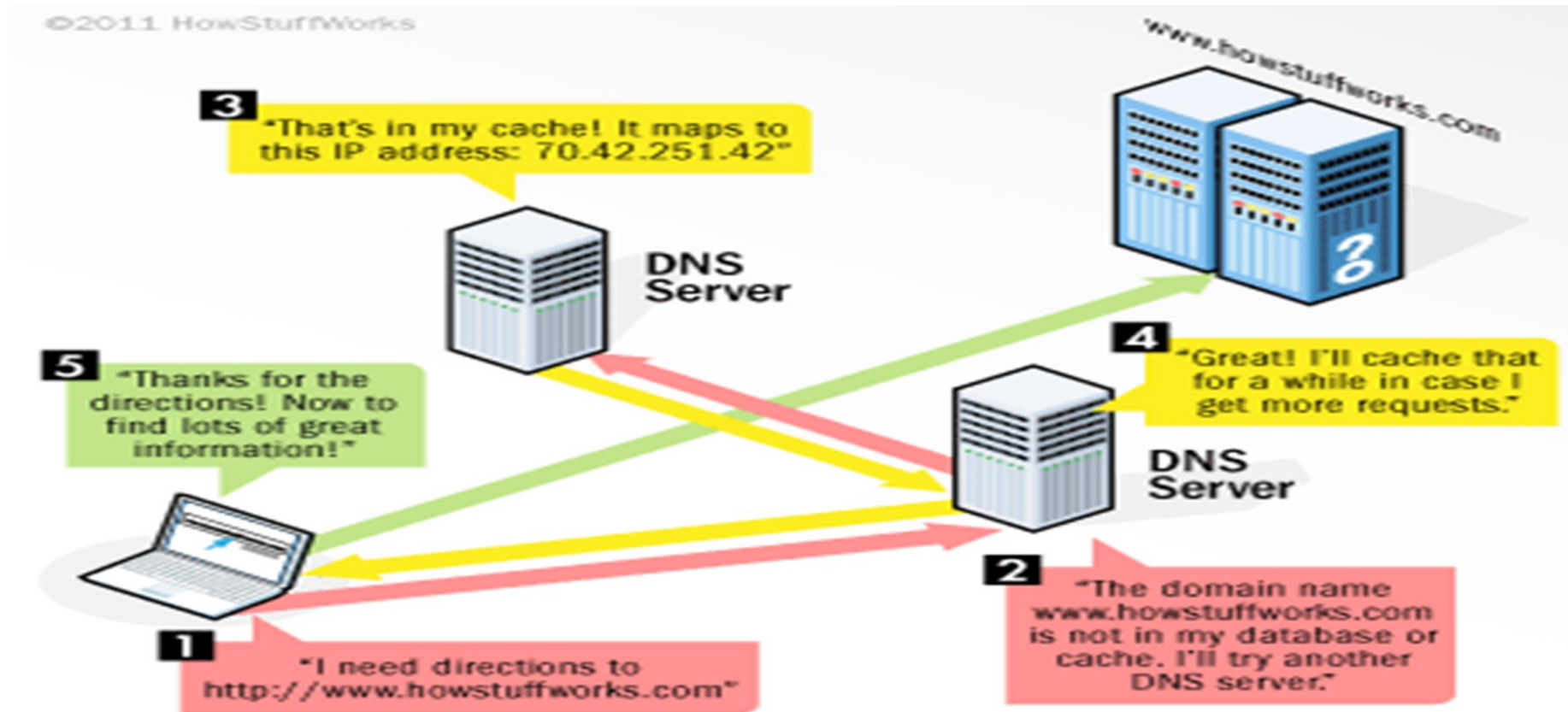| S. No.	Domain Name	IP Address
1	gseb.org	seb.org./203.77.192.241

Domain Name

Domain Name

Domain Name

Top-Level Domain Names (TLDs) :
➢ Country Code Top-Level Domain Names

Two-character country codes have also been assigned as top-level domain names.

These were originally intended to be meaningful and relate the domain name country code to the geographical location of the individual or organization that registered the name.

Country Code TLD	Country
.au	Australia
.de	Germany
.in	India
.jp	Japan
.nl	The Netherlands
.us	United States
.eu	European Union (a group of countries rather than a single country)

Domain Name

The DNS associates domain names with IP addresses. The following happens each time a new URL is typed into a Web browser:

1. The DNS is accessed.
2. The corresponding IP address is obtained and returned to the Web browser.
3. The Web browser sends an HTTP request to the destination computer with the corresponding IP address.
4. The HTTP request is received by the Web server.
5. The necessary files are located and sent by HTTP responses to the Web browser.
6. The Web browser renders and displays the Web page and associated files.

Search Engines

- ➤ A search engine is a software program that helps people find the information they are looking for online using keywords or phrases.
- ➤ List of Search Engines:
  - ✓ Google
  - ✓ Bing
  - ✓ Yahoo
  - ✓ Ask.com
  - ✓ AOL.com
  - ✓ Baidu
  - ✓ DuckDuckGo
  - ✓ Yandex.ru

Search Engines

Web Browser

- The Web operates within the Internet's basic client server format.
- Browser software allows users to view the retrieved documents.
- List of Web Browser:
  - Mozilla Firefox
  - Google Chrome
  - Opera
  - Microsoft Edge / Internet explorer
  - Vivaldi
  - Tor Browser
  - Safari

Web Browser

Chrome   Firefox   Internet Explorer

Konqueror   Opera   Safari

Ip Address

- ➢ Every computer on the Internet has a unique address, called an IP address, that distinguishes it from other computers on the Internet.
- ➢ Currently, two versions of IP addresses exist: IPv4 (Internet Protocol Version 4) and IPv6 (Internet Protocol Version 6).
- ➢ IPv4 has 5 classes (1 reserved {5th class})

IPv4

➢IPv4 is an IP version widely used to identify devices on a network using an addressing system.

➢It uses a 32-bit address scheme to store 2^{32} addresses which is more than 4 billion addresses.

➢It is considered the primary Internet Protocol and carries 94% of Internet traffic.

➢IPv4 address has two parts that identify a specific computer.

➢One part to identify the network where that computer resides and a second part to pinpoint the specific computer or host within that network.

IPv4 Address class range

| Class	Range of IP address	Range used
A	**1.0.0.1 TO 126.255.255.254**	It Assigned to contain Large Number of Host.
B	**128.1.0.1 TO 191.255.255.254**	It Assigned to Network that ranges from medium-sized to large-sized
C	**192.0.1.1 TO 223.255.254.254**	It Assigned to Network that range small-sized
D	**224.0.0.0 TO 239.255.255.255**	It Reserved for Multicasting
E	**240.0.0.0 TO 254.255.255.254**	It Reserved for Experimental and Research purpose

IPv4 Addressing Scheme
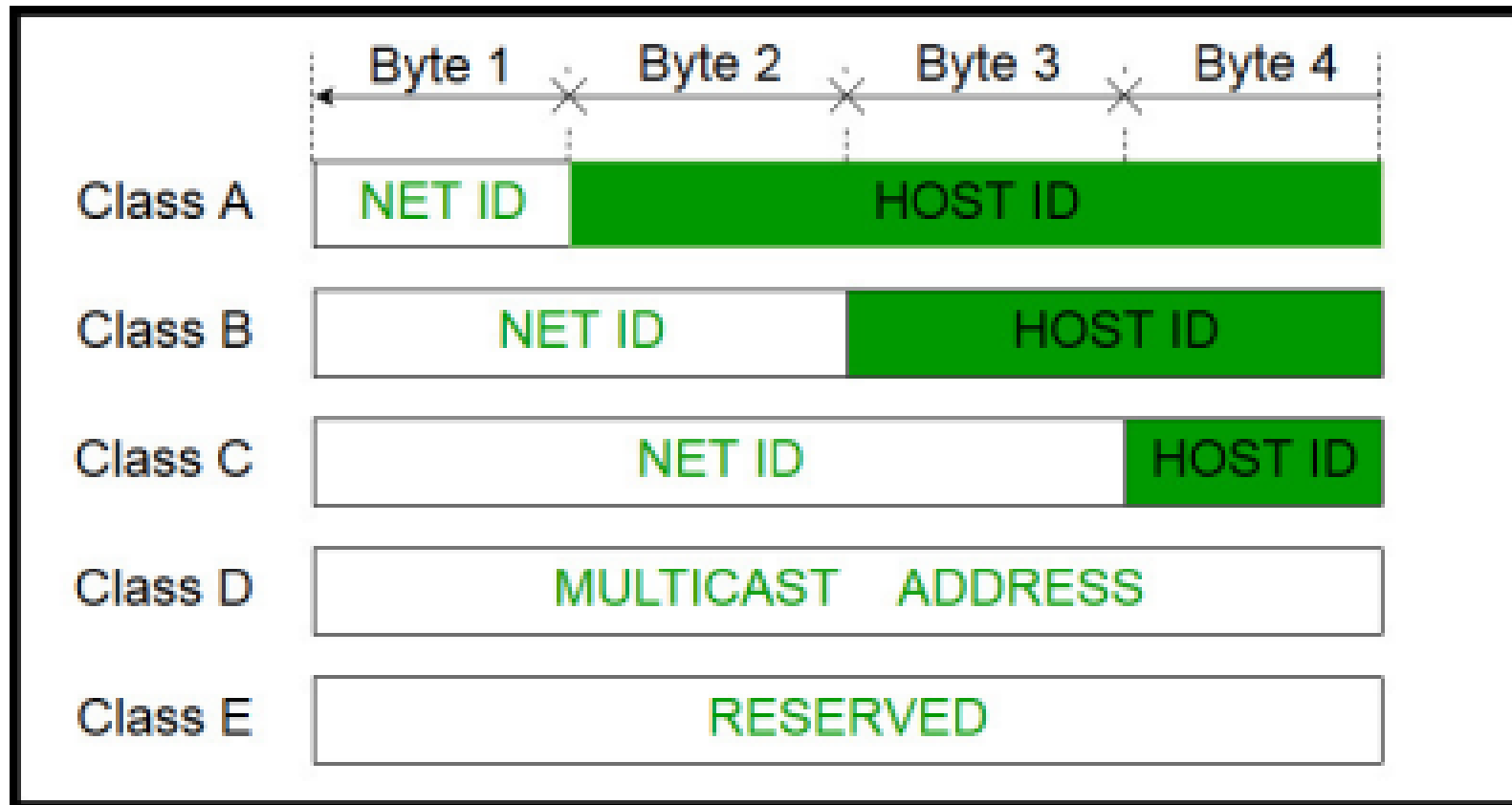
IPv6

➢ This new IP address version is being deployed to fulfil the need for more Internet addresses.
➢ IPv6 also called IPng (Internet Protocol next generation).
➢ An IPv6 address has three parts.
➢ A global prefix to identify the network, a subnet to identify the location within the network, and the interface ID to identify the specific computer or host

IPv6 Addressing Scheme
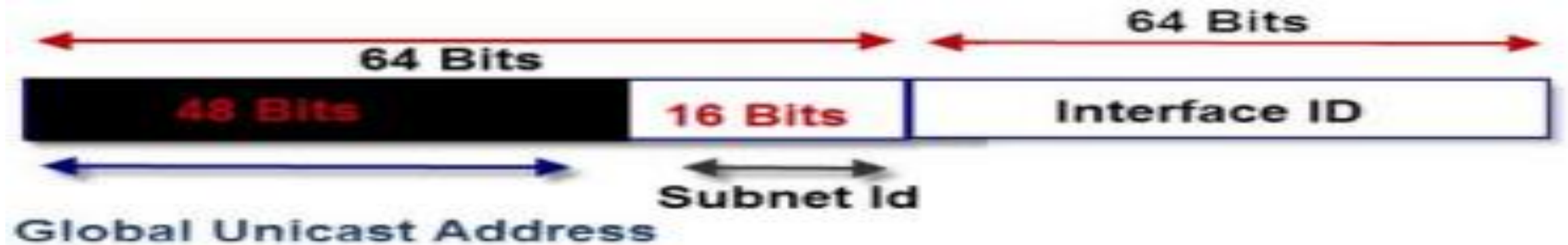
> The lower 16 bits are used for subnets on an internal networks, and are controlled by a network administrator.
> The upper 48 bits are used for the global network addresses and are for routing over the interne

IPv4 vs IPv6

IPv4	IPv6
IPv4 has a 32-bit address length	IPv6 has a 128-bit address length
Address representation of IPv4 is in decimal	Address Representation of IPv6 is in hexadecimal
In IPv4 Encryption and Authentication facility not provided	In IPv6 Encryption and Authentication are provided
IPv4 has a header of 20-60 bytes	IPv6 has header of 40 bytes fixed
IPv4 consist of 4 fields which are separated by dot (.)	IPv6 consist of 8 fields, which are separated by colon (:)
IPv4's IP addresses are divided into five different classes. Class A , Class B, Class C , Class D , Class E.	IPv6 does not have any classes of IP address.
Example of IPv4: 66.94.29.13	Example of IPv6: 2001:0000:3238:DFE1:0063:0000:0000:FEFB

TCP/IP

➢ TCP/IP stands for Transmission Control Protocol/Internet Protocol and is a suite of communication protocols used to interconnect network devices on the internet.
➢ TCP/IP is also used as a communications protocol in a private computer network.
➢ TCP checks packets for errors and submits requests for re-transmissions if any are found.
➢ TCP is the component that collects and reassembles the packets of data, while IP is responsible for making sure the packets are sent to the right destination.

TCP/IP

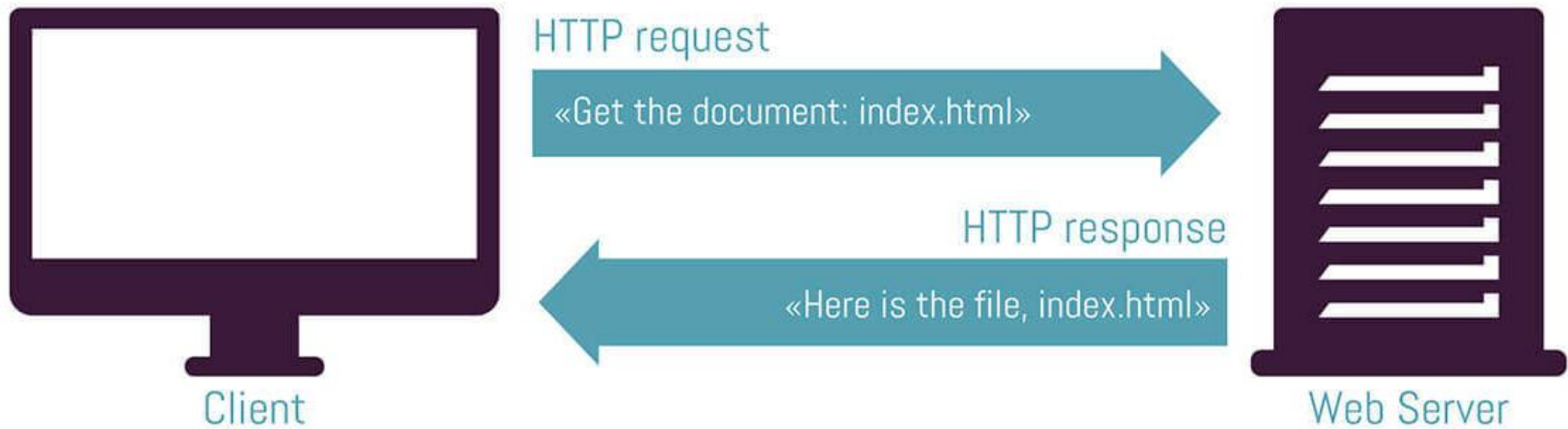|	
Application	• To allow access to network resources
Transport	• To provide reliable process to process message delivery and error delivery
Internet	• To move packets from source to destination • To provide internetworking
Network Interface	Responsible for the transmission for the between two device on the same network.

HTTP and HTTPS

➢ HTTP stands for Hypertext Transfer Protocol.
➢ HTTP is a set of rules for exchanging files such as text, graphic images, sound, video, and other multimedia files on the Web.
➢ A web client (i.e., Internet browser on a computer) sends a request to a web server to view a web page.
➢ The web server receives that request and sends the web page information back to the web client.
➢ HTTPS stands for Hypertext Transfer Protocol Secure.
➢ Often used for sending credit card transaction data or private data from a web client (i.e., Internet browser on a computer) to a web server.

HTTP

How HTTP Works

Client — HTTP request «Get the document: index.html» → Web Server

Web Server — HTTP response «Here is the file, index.html» → Client

HTTP VS HTTPS

HTTP VS HTTPS

https://www.example.com

password: abc123

Carol

HTTPS

With password encryption
Hacker see "xyaerXzabc"

HTTP VS HTTPS

HTTP	HTTPS
HTTP stands for Hyper Text Transfer Protocol	HTTPS stands for Hyper Text Transfer Protocol Secure
In HTTP, URL begins with "http://"	In HTTPS, URL starts with "https://"
HTTP is considered to be insecure	HTTPS is considered to be secure
HTTP Works at Application Layer	HTTPS works at Transport Layer
HTTP does not require any certificates	HTTPS needs SSL Certificates
HTTP speed is faster than HTTPS	HTTPS speed is slower than HTTP

FTP

➢ FTP stands for File Transfer Protocol .
➢ It is a way of transferring files between computers.
➢ We can use FTP to access a remote computer on the network to get or receive files, or to put or send files.
➢ A computer on the Internet that offers FTP access is said to be an FTP host or FTP server.
➢ We require username and password to access an FTP server.
➢ Various public FTP servers don't require you to have an account for access.
➢ Windows comes with a text-based version of the FTP program, similar to the one originally found on the old Unix computers.

ADVANTAGES OF FTP

➢ One of the biggest advantages of FTP is speed.
➢ It is more efficient as we do not need to complete all the operations to get the entire file.
➢ To access the FTP server, we need to login with the username and password. Therefore, we can say that FTP is more secure.
➢ FTP allows us to transfer the files back and forth.

DISADVANTAGES OF FTP

➢ However, not all the FTP providers are equal and not all the providers offer encryption.

➢ FTP serves two operations, i.e., to send and receive large files on a network. However, the size limit has a limit.

➢ Passwords and file contents are sent in clear text that allows unwanted eavesdropping.