

Basics of Web

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DISCLAIMER

- The data in the tutorials is supposed to be one for reference.
- We have made sure that maximum errors have been rectified. In spite of that, we (ECTI and the authors) take no responsibility in any errors in the data.
- The notes are theoretical concepts only.
- These are pre-requisites for any Web Development Courses.

What is Internet?

- In simple terms, Internet is a Network of Networks.
- The internet is a network of computers linking many different types of computers all over the world using TCP/IP protocol.
- The internet is made up of millions of computers from all around the world, linked to each other by a network of telephone lines, cables and satellite connections.



Client

- A client is an application that runs on a personal computer or workstation.
- They rely on servers for:
 - Files
 - Devices
 - Some operations to perform
- There are many different types of clients. For example:
 - **E-mail client** - an e-mail client is an application that enables you to send and receive e-mail.
 - **Web Browser** - runs on a user's local computer or workstation and connects to a server as necessary.

Server

- A computer or device on a network that manages network resources.
- There are many different types of servers. For example:
 - **File server:** a computer and storage device dedicated to storing files. Any user on the network can store files on the server.
 - **Database server:** a computer system that processes database queries.
 - **Application server:** an application server is a program that handles all application operations between users and business applications or databases.

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- When we say a server is a computer, in simple terms, it is a computer with huge amount of data held on it and connected in a network (read, Internet).
- Each of these SERVERS has a unique ID called as the IP address.
- The IP address is in the form of X.X.X.X where each X may range from 0 – 255.
- Each website we try to access is present on such servers. Thus upon request, the IP address is called and a connection with that server is successfully established.

Web Browser

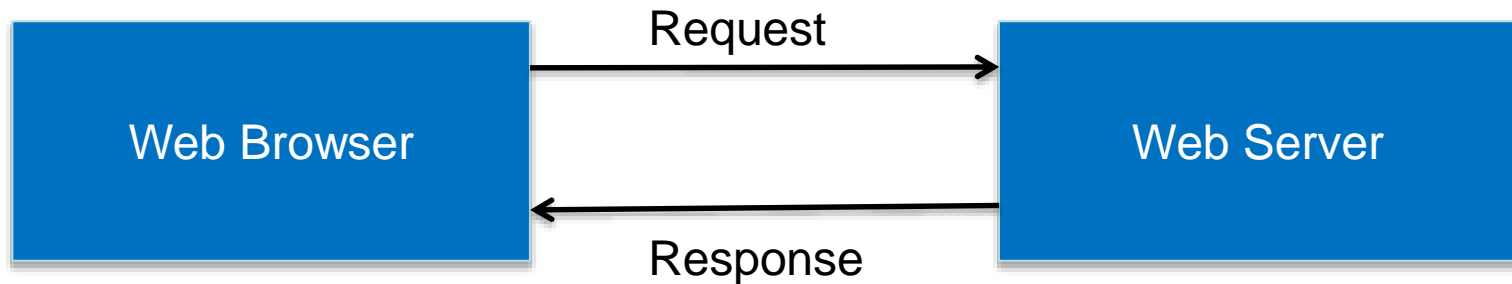
- A browser is a software application used to locate, retrieve and display content on the World Wide Web, including Web pages, images, video and other files.
- The most popular web browsers that are used today are **Mozilla Firefox, Google Chrome, Microsoft Internet Explorer, Apple Safari** and **Opera browser**.
- Windows additionally has a new browser in Windows 10 in the name of **EDGE**.

Web Server

- A web server is a system that sends content, such as web pages, using HTTP (HyperText Transfer Protocol), or files using FTP (File Transfer Protocol), over WWW.
- The server handles all the requests from the clients and is manages the request in a very sophisticated manner.
- Server architectures are a huge domain to look into.
- We will be looking into the basics of how the client and server communicate with each other and what exactly happens when a client system sends a request to the server.
- The most popular web servers that are used today are Apache, Microsoft's IIS.

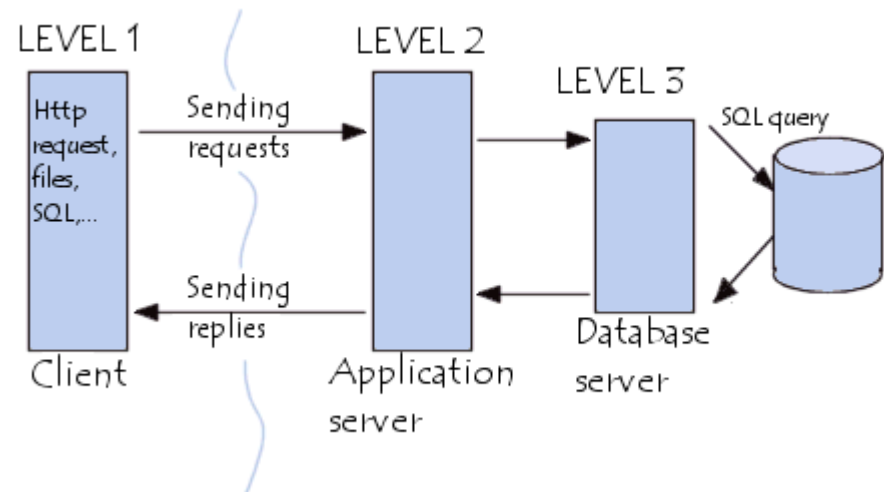
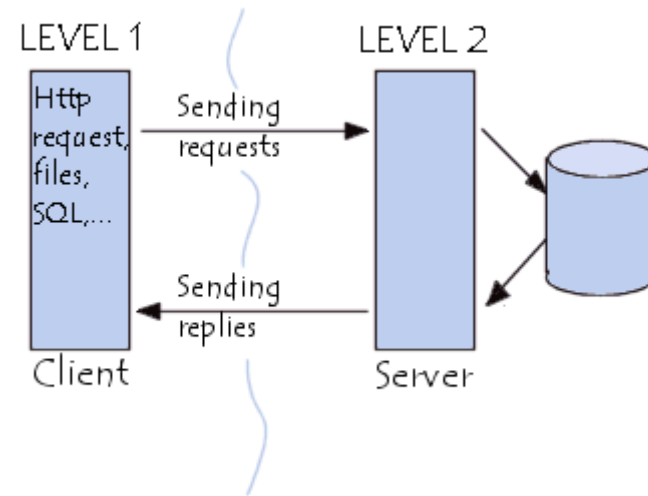
Client – Server Architecture

- Clients and servers exchange messages in a request–response messaging pattern i.e. The client sends a request, and the server returns a response.



Client - Server Architecture

- A Client – Server Architecture works in multiple ways.
- There is either a 2-tier or a 3-tier architecture method in application of Client – Server Communication.
- The image above shows a 2-tier Client – Server Architecture
- Whereas the image below shows a 3-tier Architecture.



Request – Response Cycle

- The client – server communication happens in form of a cycle. This cycle is called as the Request – Response Cycle.
- There are multiple ways in which this cycle can be implemented.
- The multiple ways are:
 - Synchronous Messaging
 - Asynchronous Messaging

What is Request – Response?

Request

- It is a request of data or web page from the web browser to the server.
- It can be in any form.
- e.g.:

When we type in www.facebook.com in our web browser, the browser first decodes the IP address linked to the URL facebook.com and then sends a request to that server to send the page linked.

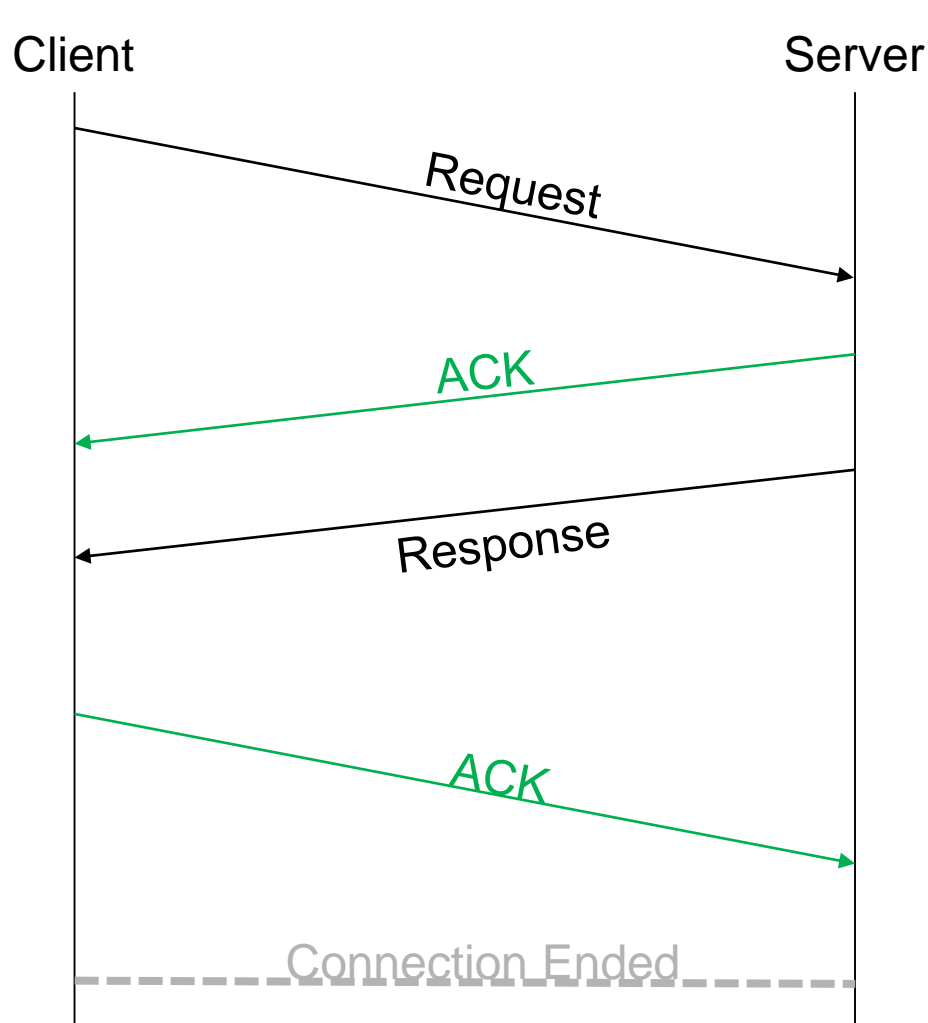
Response

- It is the response that the server sends back to the client in the form of data or web page.
- e.g.:

When a request of www.facebook.com is received, the server IP for facebook would respond with the facebook.com page.

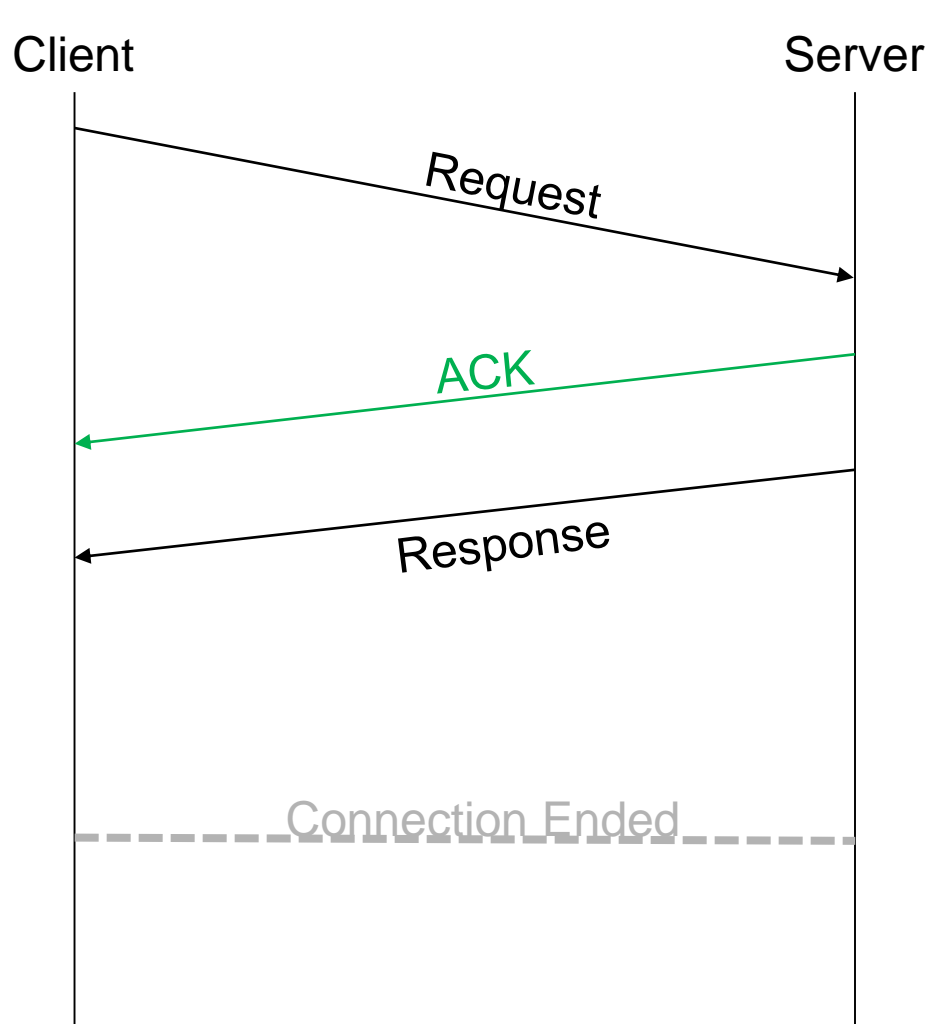
NOTE: The IP Address for facebook is 69.63.176.11

4 – phase RR Cycle



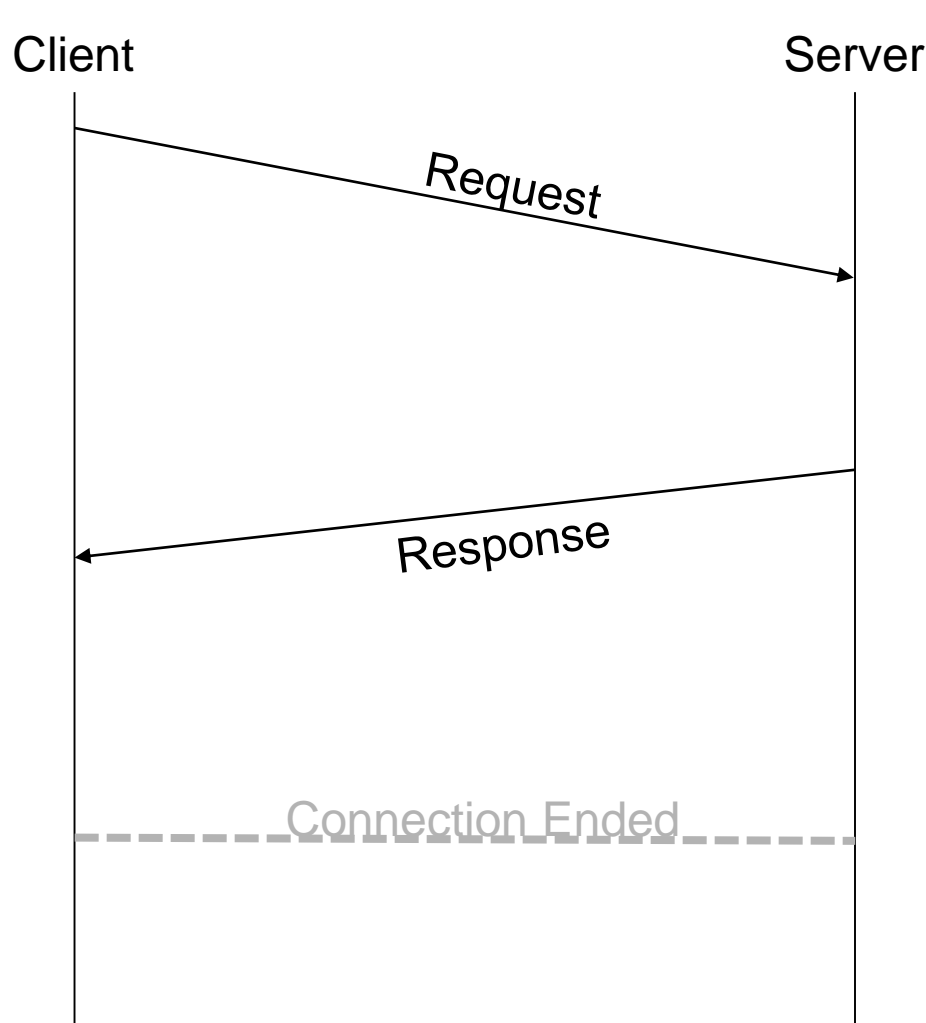
- In this type, when the client sends a request, the server sends an acknowledgement once it receives it. If the client does not get an ACK in a stipulated time, it assumes that the request did not reach the server and thus it is sent again. Thus making sure that the request is executed for sure.
- The same happens when the server sends back the response.

3 – phase RR Cycle



- In this type, the first two stages remain the same.
- At the 3rd stage, the server sends back the response. **The only difference is that the server does not wait for an ACK from the client.**

2 – phase RR Cycle



- In this type, the client sends requests and the server sends back the responses.
- At any given point, if a request or response is lost in transmission, there is **NO WAY of recovery**.
- There are no ACK messages in this type of RR Cycle.

Contents of a WEBSITE

- A website predominantly consists of any or all of the following components:
 - HTML / HTML5
 - CSS / CSS3
 - JavaScript
 - jQuery
 - Bootstrap / Foundation
 - WordPress / Joomla
 - PHP / Java / .NET
 - MySQL / Oracle DBMS etc.
- All of these components are responsible for different characteristics of the website. Let us look into each of these individually.

HTML / HTML5

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Apps dev news localhost

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- The elements highlighted in red in the above screenshot are the results of HTML / HTML5 codes.
- There are tags in HTML which help us write various text in various different ways.
- HTML is not responsible for any of the styling content to any of the text.
- e.g.:
- In the box highlighted above, the text looks white and the font size too is big, all of this is not possible in HTML but only through CSS.

CSS / CSS3

- CSS stands for Cascaded Styling Sheet.
- All the styling part of any website or web content is taken care of, by CSS.
- Font styling, background styling, window styling, etc are all written in CSS.
- CSS can be written in three ways:
 - Inline styling
 - On-page styling
 - External styling

JavaScript & jQuery

- JavaScript is a scripting language which is used to add some amount of dynamicity to our web page.
- JavaScript is an amazing tool through which we can create animations to the images etc. with the help of few line.
- jQuery is a library of JavaScript.
- Many a times, we need to add same animations to multiple websites or at multiple locations.
- Using jQuery, we can do this by simply calling a function.

Framework just gives us a structural idea of things whereas a Library defines how the things are to be done

Bootstrap / Foundation

- Responsive websites are websites which respond to the screen size on which they are being viewed.
- There is a single code written in HTML and CSS but handles layouts for different screen sizes which decide the web layout at the time of rendering.
- Responsive websites are thus created through media queries in CSS etc.
- These can be easily designed with the help of certain frameworks.
- Bootstrap and Foundation are these such frameworks which can be used to design a responsive website.
- They are not mandatory but are suggested for a simplified responsive code.
- We see the use of Bootstrap more than Foundation in the market*

*as of August 2015

Content Management System (CMS)

- A content management system (CMS) is a computer application that allows publishing, editing and modifying content, organizing, deleting as well as maintenance from a central interface. Such systems of content management provide procedures to manage workflow in a collaborative environment.
- In simple terms, a CMS is an application which is used to manage the entire web content without the help of coding.

WordPress / Joomla

- WordPress and Joomla are examples of such types of CMSs'.
- WordPress is the most commonly used CMS in the world with approximately 23.3% of the websites using a CMS, use WordPress.
- It is free and open-source written in PHP-MySQL.
- Joomla is another free and open-source CMS written in CMS.
- Additionally Joomla is built on the MVC (Model-View-Controller) architecture.

PHP / Java / .NET

- A website may have back-end application as well.
- This includes a CMS as well.
- Simply to explain, websites like Flipkart.com, Snapdeal.com etc. have a front-end and a back-end system through which the entire database is managed.
- This back-end is a code written in either PHP / Java or .NET technologies.
- Simple example of a CMS system is WordPress and Joomla

Database Management Systems (DBMS)

- A DBMS is used to store data collected either from the client or the server itself.
- A different system is used to store the DB in order to keep the system flow smooth.
- There are numerous DBMS / Relational DBMS (RDBMS)
- There are structured and non-structured DBs available
- The ones used most commonly are:
 - Oracle
 - MySQL
 - Hadoop
 - MongoDB

END OF BASICS IN WEB

- Thus, the basics of Web ends here.
- We hope you are satisfied with the theory provided.
- Feel free to share, distribute or use it in any form you wish to.
IT IS FOR YOU. 😊

END OF BASICS IN WEB

For advance courses or for any doubts in this tutorial, please contact us on any of the following details:

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