

LAMP STACK ASSIGNMENT

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1. HTML/CSS

HyperText Markup Language is used to render webpages by embracing document in between tags which define how the document(text, image) will be represented or viewed in the web page and to specify its format. The HTML elements include headings, paragraphs, line breaks, forms, lists etc to define the location of appearance of text in the document and its format. The HTML tags are predefined and have specific functionality. HTML attributes modify the default behaviour of an HTML element by the value specified by name-value pairs, name being the attribute and is defined within the element's braces. HTML documents start with a DTD to enable parsing of the document by the interpreter. HTML is transported through the protocol HTTP across the network.

CSS or Cascading Style Sheets is used to add styles like fonts, color etc. to the original web page(HTML). CSS can thus change how text will be displayed on screen and provides flexibility in design and viewability of the document. It helps in providing styles to multiple pages by a single specification in a CSS file and reduces the overhead of specifying styles in every HTML tag.

2. PHP

PHP : Hypertext preprocessor is an server side interpreted language which helps generate dynamic hypertext pages and provide it to the client where the logic behind the web page generated is abstracted from the client. PHP is embedded in normal HTML page which is then interpreted by the web server to generate dynamic HTML content. A PHP block of code starts with `<?php` and ends with a `?>` and is compiled by the Zend Engine on run-time. There can multiple blocks like such and the interpreter ignores any other HTML document outside the PHP tag and jumps in and out of the PHP tags while executing. It can be used for I/O to read/write files and also access databases, provide forms besides arithmetic, logical and conditional branching operations, objects, functions etc.

3. MySQL

MySQL is a relational database which follows the standards of structured querying using clauses, expressions, predicates and queries. It supports usage of stored procedures, triggers and cursors. It can be accessed from several programming languages like C, C++, Java etc to read/store/modify data by language specific database connector drivers. MySQL Workbench allows users to create, use and query databases run a server to connect to the database. It is used widely in industry where large databases are required as it is highly scalable and is also faster than other databases in terms of performance. Complies with ACID properties in cases of clusters and provides full transactional support and referential integrity.

4. I/O

Input output functionalities involve reading a writing files in a system or peripheral devices or through a network. It is generally provided by libraries of the various programming languages which uses the os level system library to make system calls to access the devices.

5. JSON

JavaScript Object Notation is a open format for exchanging of data amongst systems and is language independent. JSON is a text format and uses the stringify function in javascript to convert data into string which can then be transferred easily. Data is stored in the name-value pair format or ordered list of values or objects. The types in JSON are objects, arrays, values, strings and numbers. Here again values can be an object or an array and thus these structures can be nested for heirarchical storage. JSON.parse() is used to convert JSON data back into javascript object.

6. XML

eXtensible Markup Language is used to transfer data in a structured format between applications or web. XML uses the tag-like structure to store data like HTML, but the tags in XML are user given and are not predefined, hence XML can be used to describe the schema / structure of the data and is thus self-describing. It can be used to share structured data amongst applications or across the network. It follows a document type definition and is well-formed i.e checked for open and closed tags “ < “ and for proper nesting of tags.

7. Sessions

Sessions are an instance of interaction of a client with an application or a server. Generally sessions refer to the time period where the application the client is interacting with, goes through different states or needs to remember the action of the client. Sessions are generally used to record a specific instance of interaction with a client in a multi-client environment. It is also widely used in the case of authorization where a client has to be authorized every time it performs an operation; thus a session can be created where the client authorises itself at the start and the server temporarily allows the client to perform authorizations without requiring credentials as long as the client interacts with the unique session id generated.

8. Javascript

Javascript is a dynamically typed, event-driven, imperative interpreted language that provides client-side execution, interactivity, dynamic content generation while being lightweight and removing the burden from the server side. It is capable of data object modification , like modification of HTML documents. JavaScript also has server side versions such as Node.js to run applications with I/O, networking etc which are not allowed in client-side execution.

- Syntax overview – Javascript is dynamically typed and is object oriented. Javascript can be introduced in a webpage within <script> .. </script> tags which lets the interpreter know from where to execute the script. Syntax consists of values, variables, literals, operators, expressions. Javascript is case sensitive and uses the unicode character set.
- DOM manipulation – Document object manipulation refers to the ability to modify documents like HTML, where it can modify data stored in tags or its style. It acceses the document by the document object and by the id provided in the element that is to be accessed or modified.
- eval – It is a function that evaluates javascript code expressed in string format. It allows execution of dynamically created code which can be of string format. Misuse can lead to XSS exploits as malicious code can be injected.

- closures – closures are inner functions that still has access to the outer function scope variables and parameters in which it was defined even after the outer function has returned and thus has a sort of “private” variable.
- Objects – Objects are collection of properties where each property is a key-value pair and can be values, strings or functions and follows encapsulation, inheritance, polymorphism properties of object oriented design.
- AJAX – Asynchronous Javascript and XML is a form of asynchronous communication on client side where a web page can be asynchronously updated without requiring the full page to reload and changing other content. It uses XMLHttpRequest objects to request data from the server and fetch the data in XML format. So every content request is generated separately and fetched in the background by asynchronous calls.

9. jQuery

jQuery is a javascript library that allows creating ajax applications, animations, effects and DOM element selection and manipulation and utilities. It is lightweight and allows callback features for asynchronous updating of web page.

10. ZEND framework

It is a framework for rapid development of web applications built on PHP and other professional packages and based on model-view-controller architecture easily. It provides an object oriented web application development framework, helps developing RESTful web services with multiple-database support, easier session management, easily deployable encryption technologies and also unit testing.

11. Other PHP frameworks

- Laravel
- Phalcon
- Codeigniter
- Symfony
- Fuel PHP
- Slim
- Cakephp

12. Server Administration

Server administration duties involves ensuring computer servers of an institution working smoothly, which incorporates checking whether all systems are working properly, installing and upgrading required softwares, logging instances and monitoring activity and performance, securing networks, detecting intrusion and malicious activity, protecting from exploits and attacks.

13. Virtual Host Setup

It refers to running multiple web domains on a single machine. It is of three types name based, IP based and port based. Name based virtual hosting allows multiple domain names to use the same IP address and reduces the need of assigning an IP for each domain as done by IP based virtual hosting which turns out to be costly. Name based hosting requires the client to mention the

hostname in HTTP header so then the HTTP server can be configured to identify the hosts based on the hostname in header data.

14. Eclipse IDE

Eclipse is a widely used open source Java integrated development environment. It has a small run-time kernel with other functionalities being included as plug-ins. It is based on Equinox which is built on OSGi framework which is an architecture for modular application development. Eclipse provides rich client, server, web tools and data modeling platforms and could also be extended to use for other languages via plug-ins.

15. XAMPP

It stands for (X) cross platform (A) Apache (M) MariaDB or MySQL (P) PHP (P) Perl. It includes all the technologies needed to set up a web server and also works across platforms and can be installed easily with all the necessary features of a web server available by default. It is mainly developed to reduce the difficulties in installing and configuring separately a web server, database and interpreters for PHP, Perl etc along with FTP and mail servers. It makes development and testing of a web application easier and hassle free.

16. Linux

Linux is a free, open source operating system but mainly the kernel developed with inspiration from UNIX. Linux is widely used in personal computers, servers, high performance systems, mobile devices, embedded systems etc. Linux is a monolithic kernel with kernel modules that can be loaded and unloaded at runtime ex. device drivers. The kernel in conjunction with GNU software is generally known as GNU Linux. The kernel being monolithic handles all system calls, scheduling (completely fair scheduler), I/O, networking and peripherals along with virtual filesystem management and drivers. The kernel combined with graphical interface and GNU utilities have evolved into various customized distributions designed for specific purposes and use cases.

17. Web 2.0

Web 2.0 refers to the era of web applications which included dynamic web pages, user interaction, server side storage of client data, social applications, content sharing, peer-to-peer applications, user account creation functionality, cloud computing etc. backed by client-side interpretation of web documents and dynamic webpage generation enabled by Perl, PHP, Ruby, Python etc. It helped emerge providing software as a service, user content hosting and other interactive services.