

Utilización y Administración avanzada de sistemas GNU/Linux y aplicaciones Software Libre para estudiantes universitarios

Configuración de plataforma LAMP - Teoría

David Vaquero Santiago

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por David Vaquero Santiago

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Capítulo 1. Introducción a la plataforma LAMP

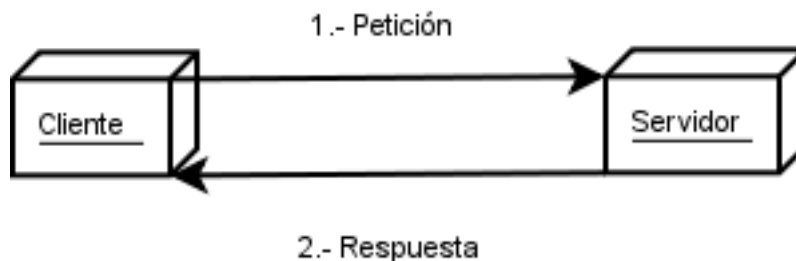
Bienvenidos a esta documentación sobre La Teoría de funcionamiento de la plataforma LAMP. Espero que os sea grata y que os ayude a entender mejor el desarrollo de aplicaciones mediante los ordenadores con GNU/Linux.

1.1. Principios de la arquitectura cliente servidor.

A fin de poder entender correctamente el comportamiento de la arquitectura LAMP es importante describir el funcionamiento de la arquitectura de aplicaciones Cliente-Servidor. En Dicha arquitectura disponemos de dos tipos de agentes:

- Cliente: Ordenador o programa informático que solicita información.
- Servidor: Ordenador o programa informático que dispone de información.

Figura 1-1. Arquitectura Cliente Servidor Básica



Dentro de este tipo de arquitectura podemos definir distintos tipos de Agentes dependiendo del tratamiento que se realice con la información:

- Activo: El Agente realiza un procesamiento activo de la información. Cálculo intensivo, cálculo de la presentación gráfica de la información, acceso a datos son algunas de las tareas típicas de un Agente Activo.
- Pasivo: El agente se limita a manejar información en bruto o preprocesada.

1.2. Tipos de Arquitectura Cliente Servidor

A continuación se detallan los distintos tipos de Arquitecturas de Cliente - Servidor:

- Cliente Activo, Servidor Pasivo: El cliente realiza la practica totalidad del trabajo de procesado de la información. Ejemplo: Google Earth.
- Cliente Pasivo, Servidor Pasivo: Tanto el cliente como el Servidor simplemente pasan información. Ejemplo: Gateways de comunicaciones VoIP.
- Cliente Pasivo, Servidor Activo: El Servidor realiza todo el trabajo de procesado y el cliente simplemente presenta los datos. Ejemplo: Servidores de terminales.
- Cliente Activo, Servidor Activo: Tanto el Servidor como el Cliente procesan la información. Ejemplo: Servicios de Correo Electrónico.

Capítulo 2. La Arquitectura LAMP

2.1. Introducción a LAMP

Dependiendo de la aplicación LAMP que el tipo de arquitectura puede variar, pero por simplicidad en el presente manual sólo va a tratarse del Tipo Cliente Activo - Servidor Activo.

2.2. Glosario LAMP

A continuación se detallan un glosario de términos que permiten entender mejor la arquitectura LAMP:

- **HTML:** Hyper Text Markup Language. Lenguaje que permite definir el contenido y su presentación para que el cliente web permita visualizar la información que contiene. Dicho lenguaje permite la inclusión de medios (gráficos, sonidos, vídeos, etc.).
- **Etiqueta o TAG:** Unidad mínima de representación en el Lenguaje HTML. Permite definir: párrafos, tablas, enlaces, imágenes, etc...
- **CSS:** (Cascading Style Sheets) Hojas de Estilo en Cascada . Permiten generar clases de estilo que se pueden aplicar a etiquetas HTML. Dichas hojas de estilo se pueden definir dentro de los ficheros HTML o incluso referenciarlos. Los TAG permiten agrupar cambios en las propiedades de un determinando TAG.
- **Java Script (JS):** Lenguaje de programación que permite en la parte cliente procesar y realizar cambios en la presentación. Dichos Scripts suelen estar referenciados desde el fichero HTML.
- **Página Web:** Unidad de contenido de un servidor web. Normalmente está compuesta de un fichero formateado en HTML y sus referencias.
- **Sitio Web:** Conjunto de reglas del Servidor Web y las páginas Web que lo componen.
- **Servicio DNS:** Servidor que entre otras funciones permite traducir nombres de máquinas en Internet a direcciones IP.
- **Navegador Web:** Cliente que permite consultar a Servidores Web y presentar la información HTML. Ejemplos: Firefox, Konqueror, Opera, Internet Explorer, etc.
- **Plugin Web:** Extensión de un navegador web que permite añadir una funcionalidad a un navegador web, por ejemplo la visualización de elementos no estándar. Ejemplos: Flash Player, JVM, etc.
- **Apache:** Servidor Web Libre. Dicho servidor es altamente flexible y actualmente el 60% de los sitios web funcionan con Apache.
- **Módulo de Apache:** Conjunto de funcionalidades agrupadas que permiten extender el tratamiento de la información por parte del servidor Web Apache.
- **URL:** Uniform Resource Locator. Definición del acceso a un recurso. El concepto de URL ha sido incorporado dentro del más general de URI (Uniform Resource Identifier - Identificador Uniforme de Recurso), pero el término URL aún se utiliza ampliamente. La URL está dividida en tres partes: Nombre del Servidor Web, Recurso a acceder y Parámetros GET.

- Método GET: Forma de paso de parámetros mediante URL.
- Método POST: Forma de paso de parámetros mediante formulario (normalmente).
- PHP: PHP Hypertext Pre-processor. es un lenguaje de programación usado generalmente para la creación de contenido para sitios web. PHP está preparado para funcionar como un módulo de Apache (y otros servidores Web).
- Dirección IP: Identificativo único de un interfaz de red basado en el Protocolo IP.
- SGBD: Sistema de Gestión de Bases de Datos. Son un tipo de software muy específico, dedicado a servir de interfaz entre la base de datos, el usuario y las aplicaciones que la utilizan. Se compone de un lenguaje de definición de datos, de un lenguaje de manipulación de datos y de un lenguaje de consulta. En los textos que tratan este tema, o temas relacionados, se mencionan los términos SGBD y DBMS, siendo ambos equivalentes, y acrónimos, respectivamente, de Sistema Gestor de Bases de Datos y DataBase Management System, su expresión inglesa.
- SQL: Lenguaje de Consulta Estructurado (Structured Query Language). Es un lenguaje declarativo de acceso a bases de datos relacionales que permite especificar diversos tipos de operaciones sobre las mismas. Auna características del álgebra y el cálculo relacional permitiendo lanzar consultas con el fin de recuperar información de interés de una base de datos, de una forma sencilla.

2.3. Elementos de la Arquitectura LAMP

A continuación se detallarán los elementos de una arquitectura LAMP:

- Cliente Web/DNS: Navegador Web. Por ejemplo: Firefox.
- Servidor DNS: Conversor de nombres a IP's. Por ejemplo: BIND.
- Servidor Web: Almacén y procesador de la Información Web. Apache en nuestro caso.
- Módulo de PHP: Módulo para apache que permite procesar ficheros escritos en el Lenguaje PHP. Por ejemplo: PHP5
- Aplicación LAMP: Conjunto de ficheros PHP que componen una Aplicación Web. Por ejemplo: PhpMyAdmin
- SGBD: Sistema de gestión de bases de datos que permitirá almacenar la información dinámicamente. En nuestro caso Mysql.

2.4. Proceso de una Petición LAMP

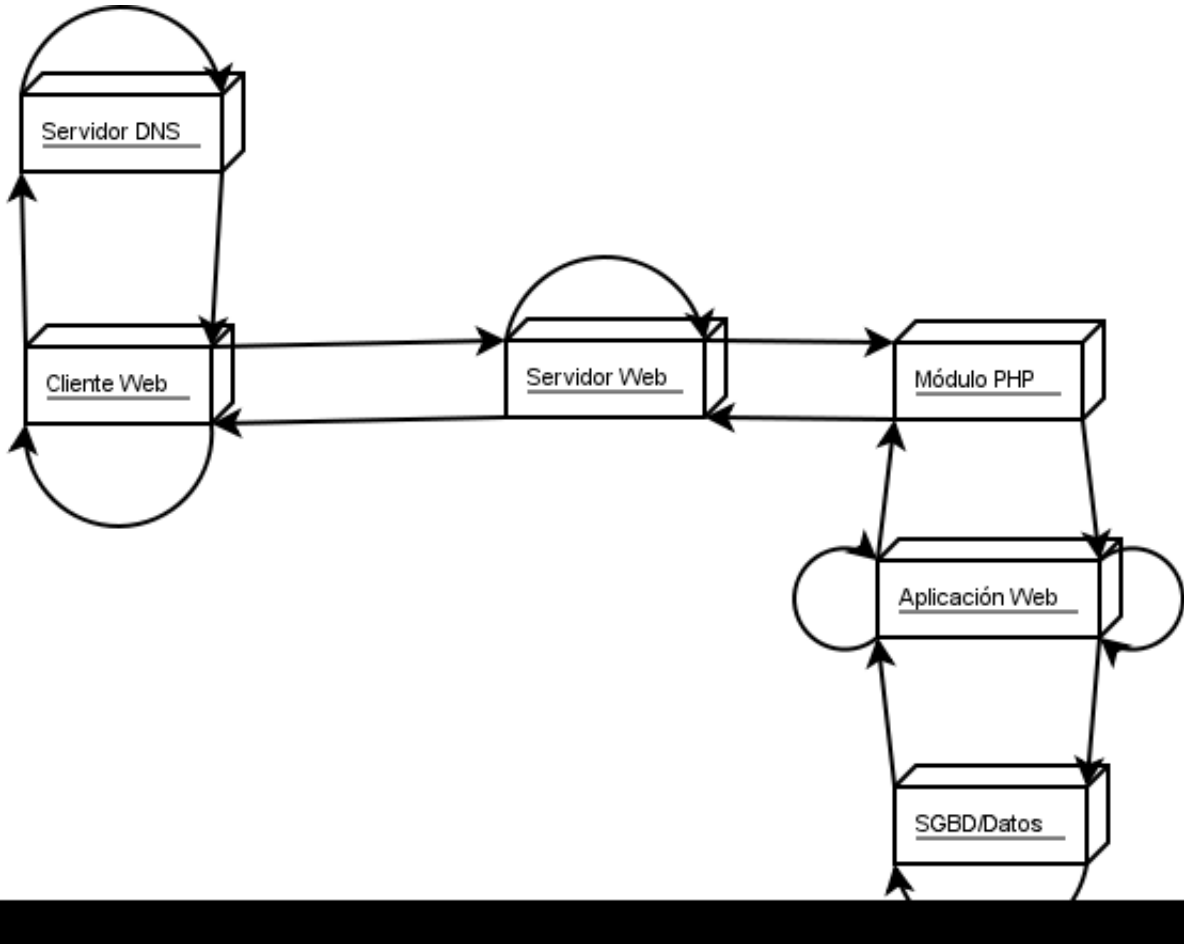
A continuación se detallarán los pasos que realizan el cliente y el servidor de una arquitectura LAMP

- Cliente Web: Solicitud de conversión del nombre de una máquina al Servidor DNS. Por ejemplo: www.google.es
- Servidor DNS: Recepción y tratamiento de la solicitud. Una vez recibida la petición realiza las consultas necesarias para resolver y obtener la dirección IP.

- Servidor DNS: Devuelve la dirección IP que corresponde al Servidor Web al navegador Web.
- Cliente Web: Realiza la solicitud de información mediante una URL(Método GET) o un formulario (Método POST). Dicha solicitud incluye: la dirección IP del servidor web, el puerto del servidor web, URL y parámetros POST(esta sólo en el caso de formularios normalmente).
- Servidor Web: Control de Acceso, Análisis de la petición y localización del recurso.
- Servidor Web: Selección del módulo de PHP para interpretar el fichero PHP elegido.
- Módulo de PHP: Ejecución del programa PHP elegido.
- Aplicación PHP: Procesado de los parámetros GET o POST.
- Aplicación PHP: Realización de las llamadas SQL al Servidor de SGBD.
- SGBD: Recogida y procesado de la petición SQL.
- SGBD: Retorno de los datos solicitados.
- Aplicación PHP: Procesado de los datos devueltos por el SGBD y Generación del HTML resultante.
- Modulo PHP: Paso del HTML resultante a Apache.
- Apache: Devuelve el HTML al cliente Web.
- Cliente Web: Presentación del HTML resultante, CSS y elementos relacionados y ejecución del Javascript.

A continuación se puede visualizar un gráfico que resume dichos pasos:

Figura 2-1. Procesado de una petición LAMP



Capítulo 3. Pasos de la Instalación de un Entorno LAMP

3.1. Instalación y configuración o acceso a un Servidor DNS.

Debido a que la instalación y configuración específicas dependen del sistema operativo y la versión escogida, se van a enumerar los pasos necesarios para su configuración, que son los siguientes:

- Alta de un dominio. Ejemplo: midominio.com
- Alta de las máquinas que pertenecen al dominio. Ejemplo: servidor.midominio.com. en este paso se relaciona la dirección IP de la máquina con el nombre dentro del dominio.
- Alta de los Alias necesarios: www, ftp, correo, etc. Se relacionan los nombre reales de las máquinas con un alias o apodo de la máquina.
- Esperar de 24 a 48h a que se replique la información entre los Servidores DNS de todo el mundo.
- Realizar una consulta de DNS para ver si ha funcionado correctamente la operación para cada una de las máquinas y alias creados.

3.2. Instalación y configuración de Apache.

Debido a que la instalación y configuración específicas dependen del sistema operativo y la versión escogida, se van a enumerar los pasos necesarios para su configuración, que son los siguientes:

- Configuración de los parámetros básicos: Directorio principal de directorio, reglas de acceso por defecto, numero de hijos, memoria ram, número máximo de peticiones, etc...
- Alta y Configuración de los módulos básicos necesarios: redirección, proxy, configuración, etc...
- Prueba de funcionamiento del servidor web con un fichero HTML de ejemplo.
- Instalación y Configuración del módulo de PHP: inclusión del módulo, asociación del tipo de fichero al módulo, configuración de tamaño máximo de upload, memoria por hilo php, acceso a datos, etc...
- Alta de un sitio web virtual que permita manejar el sitio principal del dominio. Ejemplo: www.midominio.com relacionado con el directorio /var/www/midominio.com/
- Configuración de las reglas especiales para el sitio principal del dominio: control de acceso, etc.
- Prueba de funcionamiento de PHP con un fichero de ejemplo.

3.3. Instalación y configuración de un Sistema de Gestión de Bases de Datos: Mysql.

Debido a que la instalación y configuración específicas dependen del sistema operativo y la versión escogida, se van a enumerar los pasos necesarios para su configuración, que son los siguientes:

- Configuración básica del servidor Mysql: memoria principal disponible, tipos de tabla disponibles, memoria destinada a cache, etc...
- Inserción de usuarios básicos.
- Creación de una base de datos de ejemplo.
- Creación de una tabla de ejemplo.
- Modificación de un usuario para tener acceso a la base de datos creada.
- Prueba de funcionamiento con un cliente de Mysql.

3.4. Instalación y configuración de una aplicación LAMP.

Debido a que la instalación y configuración específicas dependen del sistema operativo y la versión escogida, se van a enumerar los pasos necesarios para su configuración, que son los siguientes:

- Creación de una base de datos en el servidor para la aplicación.
- Colocación de las tablas principales necesarias para el funcionamiento de la aplicación LAMP.
- Instalación de la aplicación web en el sitio web principal.
- Configuración de la aplicación web.
- Prueba de la aplicación web.

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