

UNIT – V
OPEN SOURCE TOOLS AND TECHNOLOGIES

1. Explain Apache Web Server and its working principle

Apache Web Server is open-source web server creation, deployment and management software. Initially developed by a group of software programmers, it is now maintained by the Apache Software Foundation.

Apache Web Server is designed to create web servers that have the ability to host one or more HTTP-based websites. Notable features include the ability to support multiple programming languages, server-side scripting, an authentication mechanism and database support.

It is also widely used by web hosting companies for the purpose of providing shared/virtual hosting.

Working principle

- These servers must run server software to handle user requests.
- Apache Web server offers a free server solution for developers to host Web pages.
- The Apache server works by handling URL requests to the server through specific communication protocols.

URLs and HTTP Protocol

- Apache is web server software, and as such handles primarily Hypertext Transfer Protocol requests through Universal Resource Locator address requests.
- When a user makes a URL request to an Apache server, the Apache server will handle the HTTP request and return the requested Web pages.

Multitasking/Multithreading

- An Apache server will handle numerous HTTP requests at a single time. In order to do this, the server has to run on multiple "threads" of execution.
- This allows Apache to serve Web pages to multiple users at the same time.

Apache Packages

- The Apache server comes as a standalone package, as part of larger web serving programs and complete with modules to enhance its performance.
- A popular implementation of the Apache server is the "LAMP" (Linux, Apache, MySQL and PHP/Perl/Python) stack.

2. Explain the Configuring and using apache web server

Downloading Apache for Windows

on the latest versions of Apache can be found on the web site of the Apache web server at <http://httpd.apache.org/download.cgi>.

There is a separate .zip file, which contains only the source code. You can compile Apache yourself with the Microsoft Visual C++ (Visual Studio) tools.

Installing and configuring a Apache web server

The installation will ask you for these things:

1. **Network Domain.** Enter the DNS domain in which your server is or will be registered in. For example, if your server's full DNS name is server.mydomain.net, you would type mydomain.net here.
2. **Server Name.** Your server's full DNS name. From the example above, you would type server.mydomain.net here.
3. **Administrator's Email Address.** Enter the server administrator's or webmaster's email address here. This address will be displayed along with error messages to the client by default.

4. **For whom to install Apache** Select for All Users, on Port 80, as a Service - Recommended if you'd like your new Apache to listen at port 80 for incoming traffic.
5. **The installation type.** Select Typical for everything except the source code and libraries for module development.
6. **Where to install.** The default path is C:\Program Files\Apache Group under which a directory called Apache2 will be created by default.

Starting and Stopping Apache

The installer installs Apache as a windows service. You can start and stop the apache server by starting or stopping the windows service. Once in the services control panel, look for the service named Apache2_2. The right-click menu will display options such as start, stop, and restart.

Making changes to the apache configuration

The configuration settings for apache are included in a file called **httpd.conf**. This file is located under the **conf** directory under the apache installation directory. Use your favorite editor such as EditRocket to modify the file.

3. Explain Open Source Software tools

Open-source tools are software tools that are freely available without a commercial license. Many different kinds of open-source tools allow developers and others to do certain things in programming, maintaining technologies or other types of technology tasks. The following are the examples of open source software tools

➤ Scribus

[Scribus](#) is a powerful desktop publishing and page layout tool. Scribus enables you to create a document including newsletters, books, and magazines, as well as other print pieces.

Scribus has color management tools that can handle spot colors for files that are ready for reliable reproduction at print shops.

➤ Krita

[Krita](#) is a digital drawing application with a deep set of capabilities. The application is geared toward illustrators, concept artists, and comic artists and is fully loaded with extras, such as brushes, palettes, patterns, and templates.

➤ Shotcut

[Shotcut](#) is a free, open source, cross-platform video editor. It supports

- 4K resolution support
- video editing effects

4. What does Eclipse Platform mean?

The Eclipse platform is a generic open source tool and integrated development environment (IDE) foundation without a specific programming language. The platform's primary function is to provide mechanisms and rules to software vendors, allowing smooth software integration between different vendors.

The design and structure of the platform has the following functions:

- Construction of varied application development tools
 - Manipulation of content types, such as HyperText Markup Language (HTML), Java, C, JavaServer Pages (JSP), Enterprise JavaBeans (EJB), Extensible Markup Language (XML) and graphics interchange format (GIF)
 - Support of development environments for graphical user interface (GUI) and non-GUI applications
 - Execution within varied operating systems, including Windows, Linux™, Mac OS X, Solaris, AIX and HP-UX
 - Use of Java programming language
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5. Write notes on Open Source Processors or Open SPARC project

The term “Open Source” today refers to “Free or Open Source Software”. It is not a perfect term in the hardware field. But now a days, open source hardware is becoming popular. Few organizations are providing free and open tools that are essential components for developing a new chip. Until now, chip design and development is closely guarded and proprietary one (e.g. Intel Corporation).

OpenSPARC project

SPARC (Scalable Processor Architecture) is a RISC instruction set architecture (ISA) originally designed in 1985 by Sun Microsystems.

SPARC is a registered trademark of **SPARC International, Inc.**, an organization established in 1989 to licensed to several manufacture.

Implementations of the SPARC architecture were initially designed and used for Sun’s Sun-4 workstation and server systems which was based on the Motorola 68000 family of processors. Later, SPARC processors were used in SMP servers produced by Sun Microsystems, Solbourne and Fujitsu, among others.

6. Write notes on open source Compilers:

A **Compiler** is a computer program (or set of programs) that transforms source code written in a computer language (the *source language*) into another computer language (the *target language*, often having a binary form known as *object code*).

GNU Compiler Collection

The **GNU Compiler Collection** (usually shortened to **GCC**) is a compiler system produced by the GNC Project. It provides support to various programming languages. GCC has been accepted as the standard compiler by several modern operating systems like Unix, Linux, Mac OS etc.. GCC has been supported by a wide variety of processor architectures.

GCC is also available for most embedded platforms, for example Symbian OS which is used by 2G and 3G mobile phones.

7. Explain about Model –driven architecture:

Model –driven architecture (MDA) is a software design approach for the development of software systems. It provides a set of guidelines for the structuring of specifications, which are called as **models**.

MDA tools:

MDA tool is a tool used to develop, interpret , compare, align, measure, verify, transform, etc. Models or meta models. In the following section “model” is interpreted as meaning any kind of model (e.g. a UML (unified modelling language model). In any MDA approach we have essentially two kinds of models.

- (i) Initial models are created manually by human agents. For example an analyst may create a UML initial model from his observation of a business situation.
- (ii) Derived models are created automatically by programs. For example a Java model may be automatically derived from this UML model by a Model transformation operation.

Different types of MDA tools:

Creation Tool: A tool used to draw initial models or edit existing models.

Analysis Tool: A tool used to check models for completeness, inconsistencies, or error

Transformation Tool: A tool used to transform models into other models or into code and documentation.

Composition Tool: A tool used to compose (merge) several source models.

Test Tool: A tool used to “test” models.

Simulation Tool: A tool used to simulate the execution of a system represented by a given model. This is related to the subject of model execution.

Reverse Engineering Tool: A tool intended to transform particular legacy or information.

8. Explain about E- Governance:

The emergence of Information and Communications Technology (ICT) has provided following benefits.

- (i) Faster and better communication.
- (ii) Efficient storage and retrieval.
- (iii) Efficient processing of data.
- (iv) Providing information to individuals, groups, businesses, organizations or governments.

Objectives

- To provide a policy framework for rapid and effective adoption of OSS
- To ensure strategic control in e-Governance applications and systems from a long-term perspective.
- To reduce the Total Cost of Ownership (TCO) of projects

E- Governance or Electronic Governance is basically the application of Information and Communications Technology. If a Government uses above mentioned technology, then it will become “Simple, Moral, Accountable, Responsive and Transparent” (**SMART**) governance.

10. Briefly explain the types of interactions in e- Governance:

e- Governance supports the following types of interaction. :

(i) G2G (Government to Government)

This kind of interaction is only possible within government agencies. For example communication between central government and state government will happen through this interaction. The primary objective is to increase efficiency and performance.

(ii) G2C (Government to Citizens)

In this case, an interface is created between the government and citizens. It helps the citizens to benefit from efficient delivery of large range of public services.

Citizen can interact with government at any time (e.g. 24 hours a day, 7 days a week). The main purpose is to make friendly relationship between government and citizen.

(iii) 2B (Government to Business)

E- Governance is used to help the business community – providers of goods and services. Business people can interact with government easily. The objective is to save time, reduce operational costs and create a transparent business environment when dealing with government.

(iv) G2E (Government to Employees)

Government is the biggest employer in a country. It has to interact with its employees on a regular basis. Use of ICT tools help in making these interactions fast and efficient. Similarly it increases the satisfaction level of employees

12. Describe Wikipedia as a open source project.

- Wikipedia is a multilingual, web-based, free-content encyclopaedia project supported by the Wikimedia Foundation
- It is based on an openly editable model. Wikipedia's articles provide links designed to guide the user to related pages with additional information.
- Wikipedia uses a simple yet powerful page layout to allow editors to concentrate on adding material rather than page design. These include automatic sections and subsections, automatic references and cross-references, image and table inclusion, as well as usual formatting elements and common symbols.
- Most of these have simple formats that are deliberately very easy and intuitive.

The page layout consists of tabs along the beginning. These are:

- *Article*. Shows the main Wikipedia article.
 - *Talk*. Shows a user discussion about the article's topic and possible revisions, controversies, etc.
 - *Edit*. This tab allows users to edit the article.
 - *View history*. This tab allows readers to view the editors of the article and the changes that have been made.
 - *Star*. ("Watch") If you are logged in to your account, clicking on the star icon will cause any changes made to the article to be displayed on the watchlist.
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