12. What are denial of services attacks?
13. How can you prevent/ counter threats of network security?
14. When do you think, ring topology becomes the best choice for a network?
15. Write the two advantages and two disadvantages of star topology in network.
16. Write the disadvantages if twisted pair cables.
17. Define Hub.
18. Define switch.

Chapter 2

FREE AND OPEN SOURCE SOFTWARE

Brief Summary of the Chapter:

In this chapter we are going to discuss about various open source software and how they are different from software which are not open source.

Key Points:

Free Software: It means software is freely accessible, free to use, changed, improved, copied, and distributed without any payments.
Four kinds of freedom:

- ► Freedom to run the program for any purpose
- ► Freedom to redistribute copies.
- ► Freedom to study how the program works
- ► Freedom to improve the program and release your improvements to the public

Open Source Software:

Definition: The categories of software / programs whose Licenses do not impose many conditions.

Features:

1. Freedom to run and use the software
2. Modify the program
3. Redistribute copies of either original or modified program (without paying royalties to previous developers).

It can be freely used for modifications, but it does not have to be free of charge. Its source code is available.

Criteria for the distribution of open source software

1. Free distribution
2. Source code
3. Derived works
4. Integrity of the Author's Source code
5. No discrimination against fields of endeavor.
6. Distribution of License
7. License must not be specific to a product
8. License must not restrict other software.

FOSS (free and open software): Free software- no payments

Open source software- for technical progress

OSS and FLOSS

- ► OSS- Source code is available

(Open source modified and redistributed software) free of cost or with nominal charge.

► FLOSS- (free libre and open source software)

FSF (free software foundation)

- Founded by Richard Stallman in 1985 to support GNU project.
- Non-profit organization created for the purpose of supporting free software movement

GNU (free and open source)

- Objective: To create a system compatible to UNIX but not identical with it.
- Now it offers a wide range of software, including applications apart from operating system.

Proprietary software (neither open nor freely available)

- Definition- Its use is regulated and further distribution and modification is either forbidden or requires special permission by the supplier
- Source code is not available.

Freeware

- Free of cost
- Copying and further distribution but not modification.
- Source code is not available

  Example Internet Explorer

Shareware

- Right to redistribute copies
- After a certain period of time license fee should be paid.
- Source code is not available.
- Modifications are not possible.
- Objective- to increase user's will to pay for the software. Limits functionality after a trial period of 1-3 months.

Important Software's

LINUX

- Linux: - free and open source software.
- It can be downloaded from www.linux.org
- Linux is a part of popular web server program LAMP (Linux, apache, MySql, PHP).

Mozilla

- Freeware
- No source code available
- free internet software

  It can be downloaded from www.mozilla.org

Apache Server

- The most common web server (or HTTP server) software on the Internet.
- Apache is designed as a set of modules, enabling administrators to choose which features they wish to use and making it easy to add features to meet specific needs including handling protocols other than the web-standard HTTP.
- Apache HTTP server is an open source web server.
- It is component of LAMP.

Denial-of-services attacks:

DOS are those attacks that prevent the legal users of System from accessing or using the resources, information or capabilities of the system. It may be of following types:

- Denial of Access to Information: Such attacks cause deletion or changing of important information to non-readable format.
- Denial of Access to Applications: Such attacks make the applications unusable or unavailable for legal user of the system.
- Denial of Access to Communications: Such attacks includes cutting of communication wire, jamming radio communications, flooding a system with junk mail.

Threats to network security: It may be of following types:

- **Snooping:** It refers to unauthorized access to someone else's data, email or computer activity.
- **Eavesdropping:** It refers to unauthorized listening / intercepting someone else's private communication / data/ information.

Standards:

Standards refers to an established set of rules or requirements which are approved by recognized body or widely used across various software platforms. For ex.: PDF (Portable documents format) is a technical standard widely used by the industry.

They are of two types: Proprietary Standards and Open Standards.

Proprietary standards are those for which users have to buy license to use them. For e.g. MS Office format .doc, .ppt, .xls etc

Open Standards are internationally accepted technical standards that guarantee that data can be exchanged across platforms and for any applications. Open is feely open to all.

Advantages of Open Standards:

- Making the data accessible to all.
- It ensures data is application and platform independence.
- Diversity and Interoperability in the Industry i.e. it enables business and people to go for any technology of their choice as per their needs and budget.

E.g.: ASCII Characters, HTML file, Joint Photographic Expert Group, Portable Network Graphic etc.

Ogg Vorbis:

- It is a new audio compression which is open format developed by Xiph.org. It is roughly comparable to mp3, mpeg-4 formats and is completely free, open and unpatented. Hence it imposes no restrictions on its usage, types of usage, distributions, redistribution etc.

Indian Language Computing:

- Indian Language computing refers to ability to interact in diverse Indian language on electronic system.

How to represent character in Memory?

- ASCII: American Standard Code for Information Interchange is widely used alphanumeric code in most microcomputers and minicomputers and in many mainframes. It is 7 bit code hence it can represent standard 27 =128 characters.

ISCII:

- Indian Standard Code for Information Interchange (ISCII) is an eight bit code capable of coding 256 characters. It retains all ASCII characters and also offers coding for Indian Scripts.

Transliteration:

- When we type Indian Language words phonetically in English script and tool will automatically convert them into corresponding language words called as transliteration.

Unicode

- Unicode provides a unique number for every character, no mater what the platforms, no matter what the program, no matter what the language. Unicode can represent 94140 characters. Unicode standard has incorporated Indian Scripts under the group named Asian scripts. Indian

scripts included as Devnagari, Bengali, Gurumukhi, Gujarati, Oriya, Tamil, Telgu, kannada, and Malayalam.

Fonts:

- A Font refers to a set of displayable text characters called glyphs, having specific style and size. There are two categories of font: **True Type Font** and **Open Type Font**.
- **True Type Font**: It is developed by Apple and licensed to Microsoft. It is 8 bit font which is compatible with Microsoft Windows and MAC OS.
- **Open Type Font**: It is the extension of the True Type Font Format which is 16 bits font and support 65536 characters (Unicode characters).

Indian Language Text Entry:

Many Tools / software have been developed to facilitate the typing of Indian Language text. There are two types text entries:

- **Phonetic Text Entry**: Words typed as per their pronunciation in English script and later on converted to Corresponding (Hindi/Gujarati) language work is known as phonetic text entry.
- **Key map based text entry:** When you type text from a keyboard having key mapping of Indian language characters, is known as key map based text entry.

Questions and Answer

Q1. What is OSS?

Ans Open Source Software is a software available with source code and free to change/edit / redistribute and imposed no further restrictions on product or its usage.

Q2. Expand the terms: OSI, FLOSS, FSF, GNU, W3C, and PHP.

Ans: **OSI:** Open source Initiative

FLOSS: Free Libre and Open Source Software.

FSF: Free software Foundation created for the purpose of supporting free Movement.

GNU : GNU's Not Unix Project established with an objective to create a system Compatible to UNIX but not identical with it.

W3C: World Wide WEB consortium is responsible for producing the software standards for World Wide Web.

PHP: Hypertext Pre-processor is a widely used open source programming language primarily for server side applications and developing dynamic web content.

Q3. What is free software?

Ans : Free Software means the software is freely accessible and can be freely used, changed, improved, copies and distributed to others.

Q4. Define freeware and shareware.

Ans The freeware is the software available free of cost and allows copying and further distribution but does not allows modification as its source code is not available.

Shareware is as software which is available for redistribution for stipulated time but after some time some license fee is required to be paid.

Q5. What is openoffice.org?

Ans It is Office an application suite which is free software and directly competes with Microsoft Office. It is compatible with MS Operating System, UNIX, MAC OS.

Q6. What is font? What is OTF?

Ans : A font is a set of displayable or printable text characters having specific style and size. Open Type Font: It is the extension of the True Type Font Format which is 16 bits font and support 65536 characters (Unicode characters).

Q7. What are different font categories?

Ans : There are two categories of font: True Type Font and Open Type Font.

True Type Font: It is developed by Apple and licensed to Microsoft. It is 8 bit font which is compatible with Microsoft Windows and MAC OS.

Open Type Font: It is the extension of the True Type Font Format which is 16 bits fon and support 65536 characters (Unicode characters).

Q8. Define ODF.

Ans : ODF is an Open Document file Format used for exchanging office documents such as memos, reports, spreadsheets, database, charts and presentations. Open document is open, XML based file format used for exchanging office documents such as memos, reports, spreadsheets, database, charts and presentations.

Q9. What is key map based text entry?

Ans: When you type text from a keyboard having key mapping of Indian Languages characters is known as key map based text entry.

Q10. What is Unicode?

Ans10: Unicode provides a unique number for every character, no mater what the platforms, no matter what the program, no matter what the language. Unicode can represent 94140 characters.

Q11. What is ISCII?

Ans : Indian Standard Code for Information Interchange (ISCII) is a coding scheme for representing various writing systems of India. It encodes the main Indic scripts and a Roman transliteration. When we type Indian Language words phonetically in English script and tool will automatically convert them into corresponding language words called as transliteration.

Q12. What is Indian Script key map known as?

Ans : **Key map based text entry:** When you type text from a keyboard having key mapping of Indian language characters, is known as key map based text entry.

Unsolved Questions

1. What is open source software?
2. Compare Free software and open source software.
3. Compare OSS and floss.
4. Compare Proprietary software and free software.
5. Compare Free ware and shareware.
6. Compare Freeware and free software
7. Write Short notes on GNU.
8. Write short notes on LINUX.
9. Write Short notes on MOZILLA.
10. Write short notes on APACHE.
11. Write short notes on POSTGRE SQL.
12. Write short notes on PHP.
13. Write short notes on Open Office.
14. What are technological standard and its various categories?
15. Mention some advantages of open standards.
16. What is the significance of Unicode in terms of Indian Language Computing?
17. How phonetic text entry is different from key map based text entry?
18. What is Ogg Vorbis? Why?
19. How to represent character in Memory?
20. What is font and its types?