



Chapter I — General Introduction to Free and Open-Source Software

1. Definitions and History of Free and Open-Source Software (FOSS)

Free software refers to software that gives users freedom, not necessarily zero cost.

The concept was formalized by Richard Stallman in the 1980s through the GNU Project and the Free Software Foundation (FSF).

Free software is based on four essential freedoms:

- The freedom to run the program for any purpose.
- The freedom to study how the program works.
- The freedom to modify the program.
- The freedom to redistribute copies.

Access to the source code is necessary for these freedoms.

Open-source software (OSS) is software whose source code is publicly available and can be used, modified, and shared. The term became popular in 1998 with the creation of the Open-Source Initiative (OSI). While free software emphasizes ethics and user freedom, open-source focuses more on collaboration and development efficiency.

Examples of FOSS: Linux, Firefox, LibreOffice, Python.

Brief history timeline:

- 1970s: Software mostly shared freely among researchers.
- 1983: GNU Project launched.
- 1985: Free Software Foundation created.
- 1991: Linux kernel released by Linus Torvalds.
- 1998: Open-Source Initiative founded.
- 2000s–today: FOSS becomes central to the internet and cloud computing.

2. Differences Between Free Software, Open-Source Software, and Proprietary Software

| Aspect | Free Software | Open-Source Software | Proprietary Software |
|----------------------|---------------|----------------------|----------------------|
| Source code access | Yes | Yes | No |
| Modification allowed | Yes | Yes | Usually not |
| Redistribution | Allowed | Allowed | Restricted |
| Main focus | User freedom | Collaboration | Commercial control |
| Examples | GNU tools | Linux, Git | Windows, Photoshop |

Free Software: Source code access allowed, modification allowed, redistribution allowed, focus on user freedom.

Open-Source Software: Source code access allowed, modification allowed, redistribution allowed, focus on collaboration.

Proprietary Software: Source code not accessible, modification usually not allowed, redistribution restricted.

Examples of proprietary software: Microsoft Windows, Microsoft Office, Adobe Photoshop.

Advantages of proprietary software:

- Professional support
- Polished user experience

Disadvantages:

- Limited control
- Licensing costs
- Vendor dependency

3. Philosophy and Ethical Challenges of Free Software

Free software is connected to digital ethics and user rights.

Key ideas:

- Knowledge should be shared
- Users should control their technology
- Software should encourage cooperation

Ethical challenges include:

- Funding free software projects
- Balancing openness with security
- Compatibility with commercial models
- Intellectual property debate

4. Types of Licenses

GPL (General Public License): A strong copyleft license where modified versions must remain open-source.

Example: Linux kernel.

LGPL (Lesser GPL): Allows linking with proprietary software.

MIT License: A permissive license allowing reuse in proprietary software.

Apache License: A permissive license that includes patent protection.

BSD License: A simple permissive license similar to MIT.

Creative Commons (CC): Used mainly for documents, media, and educational content rather than software.

Chapter II — Adapting to MX Linux

1. Overview of MX Linux: Origins, Features, and Advantages

MX Linux is a Linux distribution developed through collaboration between the **antiX** and **MX Linux communities**.

It is based on **Debian Stable**, which makes it reliable and secure.

MX Linux is designed to be:

- Lightweight
- Stable
- Easy to use
- Highly customizable

Key features

- Uses the **Xfce desktop environment**
- Includes many **built-in system tools (MX Tools)**
- Works well on **older or low-performance computers**
- Simple software installation system

Advantages

- Fast performance
- Strong community support
- Stable Debian base
- Beginner-friendly interface
- Low hardware requirements

2. Comparison with Other Linux Distributions

| Distribution | Base | Strength | Typical Users |
|--------------|-------------|------------------------------|----------------------------------|
| Ubuntu | Debian | Ease of use, large community | Beginners |
| Debian | Independent | Stability and security | Advanced users |
| Fedora | Red Hat | Latest technologies | Developers |
| MX Linux | Debian | Lightweight + stable + tools | Beginners and intermediate users |

Main difference:

MX Linux focuses on **simplicity, performance, and system tools**, while distributions like Fedora focus on innovation and Ubuntu on accessibility.

3. The Xfce Desktop Environment in MX Linux

Xfce is a lightweight desktop environment that provides:

- A panel (taskbar)
- Application menu
- Desktop icons
- File manager (Thunar)

Why MX Linux uses Xfce:

- Fast and responsive
- Uses little memory
- Easy to customize
- Stable interface

Users can change:

- Panels
- Themes
- Icons
- Workspace layout

4. Package Management in MX Linux

A **package manager** installs and updates software.

MX Linux includes three main tools:

MX Package Installer

A graphical tool to:

- Install popular applications
- Access Debian repositories
- Install flatpak software

Synaptic Package Manager

Advanced graphical package manager used to:

- Search packages
- Install libraries
- Manage dependencies

APT (Advanced Package Tool)

Command-line package manager.

Examples:

```
sudo apt update           sudo apt upgrade           sudo apt install program_name
```

5. Installing, Removing, and Updating Software

Install software

Using GUI or terminal:

```
sudo apt install vlc
```

Remove software

```
sudo apt remove vlc
```

Update system

```
sudo apt update
sudo apt upgrade
```

Updating keeps the system:

- Secure
- Stable
- Optimized

6. MX Tools: Introduction and Usage

MX Linux includes a collection of utilities called **MX Tools**.

MX Snapshot

Creates a **backup image of the system** that can be restored later.

Use cases:

- Backup configuration

- Create a custom MX Linux version

MX Tweak

Allows interface customization:

- Theme selection
- Panel configuration
- Window behavior

MX Boot Options

Controls system startup settings:

- Kernel options
- Boot modes
- Hardware compatibility

7. System Customization

MX Linux allows users to personalize their environment.

Themes

Change the appearance of:

- Windows
- Buttons
- Colors
- Icons

Panels

Users can:

- Move panels
- Add launchers
- Resize panels

Keyboard shortcuts

Examples:

- Open terminal
- Switch windows
- Lock screen

Customization improves productivity and comfort.

8. Introduction to the Linux Terminal

The **terminal** allows users to interact with the system using commands.

It is powerful for:

- File management
- System control
- Software installation

9. Basic Linux Commands

Navigation

`pwd` → show current directory

`ls` → list files

`cd` → change directory

Example:

`Cd Documents`

File and Folder Management

`mkdir test` → create folder

`rm file.txt` → delete file

`cp file1 file2` → copy file

`mv file1 file2` → move/Rename

Editing Files

Simple editor:

`nano file.txt`

Save: **Ctrl + O**

Exit: **Ctrl + X**

Conclusion

MX Linux is a **stable, lightweight, and customizable Linux distribution** built on Debian.

Its combination of:

- Xfce desktop
- MX Tools
- Simple package management
- Terminal control

makes it suitable for both beginners and intermediate users.

Chapter III — Adapting to LibreOffice

1. Overview of LibreOffice (History, Features, Advantages)

LibreOffice is a free and open-source office suite developed by **The Document Foundation**. It was created in **2010** as a continuation of **OpenOffice**.

LibreOffice is used for:

- Writing documents
- Creating spreadsheets
- Making presentations
- Managing databases
- Drawing diagrams

Main features

- Free and open source
- Compatible with Microsoft Office formats
- Multi-platform (Linux, Windows, macOS)
- Regular updates
- Offline use

Advantages

- No license cost
- Lightweight and reliable
- Strong community support
- Open document format (ODF)

2. Integrated LibreOffice Applications

LibreOffice includes several applications:

| Application | Function |
|-------------|---------------------|
| Writer | Word processing |
| Calc | Spreadsheets |
| Impress | Presentations |
| Draw | Vector graphics |
| Base | Database management |

Together, they form a complete office productivity suite.

3. Word Processing with LibreOffice Writer

LibreOffice Writer is used to create text documents

such as:

- Letters
- Reports
- CVs
- Assignments

Basic tasks in Writer

- Typing and editing text
- Formatting text (font, size, color)
- Aligning paragraphs
- Adding images
- Creating tables
- Saving documents

Common formats:

- .odt (OpenDocument Text)
- .docx (Microsoft Word)
- .pdf

Example workflow:

1. Open Writer
2. Type text
3. Format content
4. Save document

4. Spreadsheets with LibreOffice Calc

LibreOffice Calc is used to organize and calculate data using tables.

It is useful for:

- Budgets
- Grades
- Data analysis
- Lists

Basic spreadsheet concepts

- Rows and columns
- Cells
- Formulas
- Functions

Example formulas:

=SUM(A1:A5)

=A1+B1

Calc can also create:

- Charts
- Tables
- Reports

File format:

.ods

5. Presentations with LibreOffice Impress

LibreOffice Impress is used to create slideshow presentations.

Common uses:

- Classroom presentations
- Business presentations
- Project demonstrations

Basic features

- Slides
- Text boxes
- Images
- Themes
- Animations

- Transitions

Typical presentation structure:

- Title slide
- Content slides
- Conclusion slide

File format: .odp

6. Introduction to LibreOffice Base

LibreOffice Base is a simple **database management tool**.

A database stores organized information such as:

- Student records
- Employee data
- Product lists

Database elements:

- Tables
- Forms
- Queries
- Reports

Base can connect to:

- MySQL
- PostgreSQL
- Embedded databases

7. Vector Drawing with LibreOffice Draw

LibreOffice Draw is used to create:

- Diagrams
- Flowcharts
- Posters
- Technical drawings

Features:

- Shapes
- Lines
- Text boxes
- Connectors
- Layers

Vector graphics can be resized without losing quality.

Draw can also open PDF files for editing.

File format: .odg

Conclusion

LibreOffice is a **complete office suite** that allows users to:

- Write documents (Writer)
- Work with data (Calc)
- Create presentations (Impress)
- Manage databases (Base)
- Design graphics (Draw)

Because it is **free, open-source, and compatible with many formats**, LibreOffice is widely used in **education, business, and personal computing**.