

Sun City Summerlin Computer Club

Seminar

A Tour of Linux Mint 22

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January 10, 2026

Where to Find the Materials

- Sun City Summer Computer Club Website:
 - <http://www.scscclub.com/smnr/TourofLinuxMint22>

Seminar Agenda

- **Introduction**
- **Linux Advantages**
- **Linux Disadvantages**
- **Where to get Linux Mint**
 - **Direct Boot from CD/DVD and then run the installer**
- **Install Linux Mint w Cinnamon into Virtual Box VM**
- **A Tour of Linux Mint – Applications, Tools and Settings**
- **Basic Linux Terminal Shell Commands**
- **Reference - Adding Network “Server” Components**
 - **Samba File and Print Server (demo)**
 - **Apache Web Server**
 - **MySQL Database Server**
 - **PHP 8 Scripting Language**

Introduction

- **Linux is an open-source operating system**
 - Originally written by Linus Torvalds
 - Looks and acts much like Bell Labs' Unix
 - Widely used today as a server operating system
- **Linux now has many derivative distributions (“distros”)**
 - There are now many versions of Linux for the desktop
 - <http://www.linux.com>
 - <http://www.linux.org>
 - <http://distrowatch.org/>
- **We'll look at one of the most popular desktop distros:
Linux Mint 22.2 (Zara) with the Cinnamon Desktop**
- **The Mint distros are available as “boot and run” DVDs (.ISOs)**
 - Usually, you can also *install* from the “boot and run” distros

Desktop Linux Mint Advantages

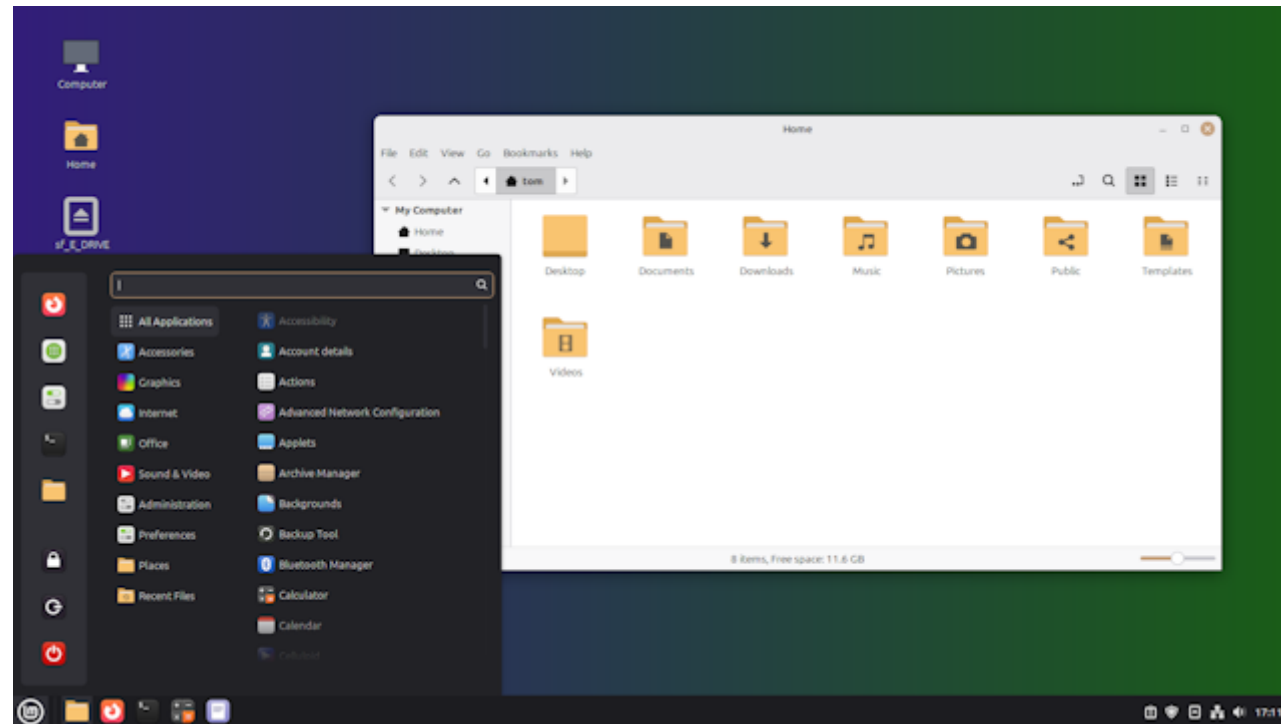
- **It's FREE (But donations are welcome!)**
- **Hardware requirements are generally less than for Windows 10/11 or Mac OS**
- **Includes a rich set of free bundled apps**
 - **Web browsers**
 - **E-mail**
 - **Office Suite**
 - **Image editor / Image Viewer**
 - **Multi-media Player**
- **Linux Mint distros are well-supported**
- **Linux is generally more secure**
 - **Small user base is not an attractive malware target**
 - **Linux system design is innately more secure**

Desktop Linux Mint Disadvantages

- **It's *not* Windows or Mac OS**
 - Windows apps don't run natively. (But there is a compatibility system called WINE.)
 - You will have to do some learning. (But the Mint distro looks and acts a lot like Windows 7.)
 - File system and security model are different.
- **If you need help or training, there's far less available**
 - Don't expect telephone support – especially from ISPs like Cox, CenturyLink or T-Mobile.
 - Most Linux distros DO have good online support forums.
 - There's a lot of tutorial material on YouTube.
 - However, plan on being much more self-reliant.
- **Getting updates or patches isn't as automatic as on Windows**
 - This may actually be a GOOD thing.

Linux Mint 22.2 Cinnamon Distro (1)

- Based on Ubuntu Linux 24.04 with newer kernel, other updates
 - <http://www.linuxmint.com/>
 - Versions only for 64-bit Intel and AMD processors.
 - Download the .iso, burn to a DVD or flash drive and then boot to run.



Desktop Linux Mint

Linux Mint 22 Cinnamon Distro (2)

- Looks and acts much like Windows 7.
- Our demo version uses the “Cinnamon” desktop (Alternatives are the Mate or XFCE desktops).
- Extensive set of applications and tools including:
 - Nemo file browser (like Windows File Explorer)
 - Firefox web browser
 - Thunderbird e-mail
 - LibreOffice office suite
 - Pix image viewer / organizer
 - Rhythmbox music player / organizer
 - Celluloid multi-media player
- Also, can access a huge library of free applications and games
 - GIMP image editor
 - VLC media player
 - Simple screen recorder
 - Calibre eBook reader / manager

Install Linux Mint on Native Hardware

- A dual Linux Mint / Windows boot setup is possible but can be challenging.
- Place the Linux Mint setup DVD in the DVD drive or the USB boot flash drive in a USB port.
- “Start / boot” the PC.
- If the PC BIOS doesn’t detect the DVD or flash drive, check the BIOS boot order. Make sure it’s first in the BIOS boot order.
- After Linux boots, double click the “Install” icon.
- Follow the step by step for the Linux Mint setup.
 - Let Linux Mint partition and format the entire virtual hard drive.
 - Answer a few setup questions.
 - Finish the setup.
- Finally reboot into Linux Mint.
- Set screen size, theme, background, colors

Install Linux Mint in a Virtual Machine

- Start Virtual Box (can get it from <https://www.virtualbox.org>)
- Create a new, empty virtual machine for Linux (2 or 4 GB RAM)
 - May need to disable 3D Acceleration (still buggy).
- Place the Linux Mint setup DVD in the drive or link the virtual DVD drive to an image (.iso) of the setup DVD.
- “Start / boot” the [empty] virtual machine just created.
- If the virtual BIOS doesn’t detect the DVD, check the menus at the top. Enable the DVD. Make sure it’s first in the boot order.
- Double click the “Install” icon.
- Follow the step by step for the Linux Mint setup.
 - Let Linux Mint partition and format the entire virtual hard drive.
 - Answer a few setup questions.
 - Finish the setup.
- Finally reboot into Linux Mint in the VM.
- Set screen size, theme, background, colors

Linux Mint Cinnamon Features

- **Let's look at Linux Mint Features:**
 - Desktop
 - Software Manager (install / uninstall Apps)
 - Synaptics Package Manager (Install System Components)
 - Let's Explore the Mint Start Menu and a Few Apps
 - File Explorer / Manager
 - Web Browser (FireFox)
 - E-mail (Thunderbird)
 - Libre Office Office Suite
 - Pix Image Viewer / Manager
- **Let's use Software Manager to install some Apps:**
 - VLC Media Player
 - GIMP Image Editor

Linux Mint Terminal Commands

- The Terminal displays a plain text window on a command shell to allow you to execute system utilities.
- Linux uses “/” as the folder delimiter.
- Linux file and folder names are *case sensitive*.
- A few common file management commands are:
 - **ls** (list files and directories)
 - **cd** (change to a different directory)
 - **cp** (copy files and directories)
 - **mv** (move / rename files and directories)
 - **mkdir** (create a new directory)
 - **chmod** (change permissions on a file or directory)
 - Note - these actions can also be done in Nemo, the GUI file manager.
- Super-user Do (sudo) command prefix:
 - To run commands that require “root” (administrator) privileges, enter **sudo <command>**. Sudo will prompt for your login password and then allow the command to run.
 - This eliminates needing to login as “root” for occasional system maintenance activities.

Linux Mint – Network Server Upgrade

- You may want to add some software components to turn desktop Linux Mint into a full-featured network server like Windows 10/11 Pro
 - Samba file and print server (a Samba client comes built-in)
 - Apache web server
 - MySQL database server (interfaces to LibreOffice Base)
 - PHP Scripting Language
- Once the installs are done, there may be some work to do on the settings files for each server component.
- Here's a link to a comprehensive article on installing a LAMP (Linux, Apache, MySQL, PHP) server ...
 - <https://forums.linuxmint.com/viewtopic.php?t=309843>
- Before starting, use the Update Manager to ensure your Linux Mint OS is up to date.
- See the following slides for further details.

Linux Mint – Samba Server

- Use the Synaptics Package Manager to Install Samba.
- Use the Nemo File Manager to make a backup copy of `/etc/samba/smb.conf` to your Documents folder.
- Edit the `/etc/samba/smb.conf` text file to modify the following lines in the “Browsing Identification” section:

```
workgroup = <your workgroup name>
```
- To specify shared folders, edit the `/etc/samba/smb.conf` text file to add the lines like the following in the Share Definitions section:

```
[<share name>]
comment = <Description of the share>
path = <folder path of the share>
browsable = yes
guest ok = yes
read only = no
create mask = 0755
```
- Alternatively, use the Nemo File Manager to create the share from the File menu.

Linux Mint – Apache Web Server

- You may want to have an in-house web server so you can run web apps on your LAN ...
- <https://linux4one.com/how-to-install-apache-on-linux-mint-19>
- Use the Synaptics Package Manager to install Apache 2.
- Use the Terminal to check status of the apache2 service:
 - `$ sudo systemctl status apache2`
- Use the Terminal to configure the fire wall and check status:
 - `$ sudo ufw allow 'Apache Full'`
 - `$ sudo ufw status`
- Use the web browser to check Apache status
 - `http://<your server's IP address>`
- Actual website folders and files are to be stored at: `/var/www/html`
- To use Apache's Virtual Hosts Facility (Multiple sites on one server) refer to this article:
 - <http://www.linuxandubuntu.com/home/how-to-create-virtual-hosts-on-apache-server-to-host-multiple-websites>

Linux Mint – MySQL Database Server (1)

- <https://atacomsian.com/blog/install-mysql-on-ubuntu>
- Use the Synaptics Package Manager to install MySQL
- Use Terminal to start and configure MySQL
 - `$ sudo systemctl start mysql`
 - `$ sudo service mysql status`
 - `$ sudo mysql_secure_installation`
 - Set root password? [Y/n] y
 - Remove anonymous users? [Y/n] y
 - Disallow root login remotely? [Y/n] y
 - Remove test database and access to it? [Y/n] y
 - Reload privilege tables now? [Y/n] y
- **You will also need to reconfigure the MySQL root user to use password authentication, rather than socket authentication (see the link above).**
- Install MySQL Workbench Community (a graphical UI front end) to MySQL
 - <https://linuxconfig.org/install-and-configure-mysql-workbench-on-ubuntu-linux>
 - *Sorry - at the moment, this doesn't work for Linux Mint.*

Linux Mint – MySQL Database Server (2)

- Terminal commands to stop, start and enable the MySQL service:
 - `$ sudo systemctl stop mysql`
 - `$ sudo systemctl start mysql`
 - `$ sudo systemctl enable mysql`
- MySQL databases can be accessed from another Linux or Windows PC using ODBC connections. A MySQL data connector must be installed on the client PC and then an ODBC dataset name (connection) must be created.
- To create and administer databases, you can either use the graphical MySQL Workbench from Linux Mint or any Windows PC on the same LAN.
- Alternatively, you can use the MySQL command line to enter SQL commands:
 - `$ mysql -u root -p <mysql root password>`
- MySQL databases are physically stored in ???.

Linux Mint – PHP 8.x Scripting Language

- Use the Synaptics Package Manager to Install PHP 8.3.
- Use Nemo (File Manager) to make a backup copy of `/etc/php/8.3/apache2/php.ini` into `Documents/php.ini`
- Edit `Documents/php.ini` settings to read as follows:

```
memory_limit = 256M
short_open_tag = On
post_max_size = 32M
upload_max_filesize = 32M
output_buffering = off
max_execution_time = 60
date.timezone = America/Los_Angeles
```
- Save the results into `Documents` as `phpnew.ini`
- Use Terminal to run the command: `$ sudo nemo`
 - Copy `phpnew.ini` from `Documents` to `/etc/php/8.3/apache2/`
 - In `/etc/php/8.3/apache2/` rename `php.ini` to `php_orig.ini` and `phpnew.ini` to `php.ini`
- Use Terminal to restart the Apache web server (or just restart Linux).
 - `$ sudo /etc/init.d/apache2 restart`
 - `$ sudo systemctl reload apache2`

Linux Mint – PHP 8.3 Scripting Language

```
Ubuntu (20.04, 22.04, and 24.04)
## Save existing php package list to packages.txt file
sudo dpkg -l | grep php | tee packages.txt

# Add Ondrej's PPA
sudo add-apt-repository ppa:ondrej/php # Press enter when prompted.
sudo apt update

# Install new PHP 8.3 packages
sudo apt install php8.3 php8.3-cli php8.3-{bz2,curl,mbstring,intl}

# Install FPM OR Apache module
sudo apt install php8.3-fpm
# OR
# sudo apt install libapache2-mod-php8.2

# On Apache: Enable PHP 8.3 FPM
sudo a2enconf php8.3-fpm
# When upgrading from an older PHP version:
sudo a2disconf php8.2-fpm

## Remove old packages
sudo apt purge php8.2*
```

Final Q and A

Final Questions and Answers