BCSE303L (OS) DA1

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- Type of the OS

Zorin OS is a free and open-source operating system based on Ubuntu, which is itself a Linux-based distribution. It is designed to be user-friendly and to provide a Windows-like interface for people who are transitioning from Windows to Linux. Zorin OS comes with a wide range of software pre-installed, including office software, media players, and web browsers. It also includes a custom desktop environment called "Zorin Desktop", which is based on the Gnome desktop environment and is designed to be highly customizable. The latest version of Zorin OS is based on Ubuntu 20.04 LTS (long-term support) and will receive updates and security patches until 2025.

The default desktop environment is GNOME 3 or XFCE 4, but it has been substantially altered to make it easier for users to switch from Windows and macOS.

- Structure or model of the os

The structure of Zorin OS is based on the Ubuntu Linux distribution, which follows a hierarchical file system structure. The file system starts with the root directory, represented by a forward slash '/', and branches out into various subdirectories that contain the operating system files, user data, and installed applications.

The main directories in the Zorin OS file system include:

'/': The root directory, which is the top-level directory in the file system hierarchy.

'/bin': Contains essential command-line utilities and programs that are required for the system to boot up and function properly.

'/boot': Contains the Linux kernel and other files needed to boot the system.

'/etc': Contains configuration files for the system and installed applications.

'/home': Contains the home directories for all users on the system.

'/lib': Contains libraries and modules that are used by the programs in the '/bin' and '/sbin' directories.

'/media': Mount point for removable media such as USB drives and CDs.

'/mnt': A directory that can be used for temporarily mounting file systems.

'/opt': Contains additional software that is not part of the default installation.

'/root': The home directory of the system's root user.

'/sbin': Contains system binaries, such as system administration and configuration utilities.

'/usr': Contains user-related files, such as applications and documentation.

'/var': Contains files that change frequently, such as log files and email messages.

This is a general structure of Zorin OS and based on the Ubuntu Linux distribution. It may have slight variation depending on the version of Zorin.

- Functionalities of OS.

Some of the key functionalities of Zorin OS include:

A Windows-like interface: Zorin OS includes a custom desktop environment called "Zorin Desktop" that is designed to look and feel similar to the Windows desktop. This makes it easy for people who are used to using Windows to navigate and use the operating system.

Pre-installed software: Zorin OS comes with a wide range of software pre-installed, including office software, media players, and web browsers. This makes it easy for users to get started with their work or entertainment without having to install additional software.

Customization options: Zorin OS allows users to customize the appearance and behavior of the operating system to their liking. Users can change the theme, icons, and other elements of the desktop, as well as adjust settings such as the location of the taskbar and the behavior of windows.

Multilingual support: Zorin OS supports a wide range of languages, allowing users to use the operating system in their native language.

Compatibility: Zorin OS is based on Ubuntu, which is one of the most widely used Linux distributions. This means that it is compatible with a wide range of hardware and software, and users can run most Linux programs and drivers on Zorin OS.

Security: Zorin OS is open-source and benefits from the security of the Linux community. It is less prone to viruses and malware compared to Windows and MacOS.

Reliable: The Zorin OS is based on Linux and Ubuntu. The same open source software that powers NASA, the US Department of Defense, etc. also powers the Zorin system.

Swift: The Zorin updates quickly and runs at a high speed. The Lite edition, in particular, functions properly on PCs as old as 15 years. As a result, Zorin OS allows you to give obsolete computers a fresh lease on life.

Flexible: We may install Zorin OS alongside Windows or macOS, but you must boot from a certain operating system.

- How the services provided by the OS are handled internally from the kernel point of view give an example with explanation.

In Zorin OS, like any other Linux-based operating system, the kernel is the core component that communicates directly with the computer's hardware and manages the system's resources. It is responsible for handling various system services and providing an interface for other software to interact with the hardware.

One example of how the kernel handles services in Zorin OS is the process management. When a user launches an application, the kernel creates a new process for that application, assigns it a unique process ID, and allocates memory and other resources for it. The kernel then schedules the process to run on the CPU and monitors its execution. When the process is finished, the kernel releases the resources that were allocated to it.

Threats that are communicated by people outside the control of the running device are neutralised by the security function.

- Os mode of operation without examples

Similar to other Linux-based operating systems, Zorin OS operates in a multi-user, multi-tasking mode. As a result, multiple users can log in to the system at once and operate numerous apps simultaneously.

In Zorin OS, the BIOS or UEFI firmware begins to operate when the machine is powered on. After running a few simple hardware checks, it loads the bootloader, which then loads the kernel. The init process, which kicks off all the other services and daemons required for the system to function, is started by the kernel, which also initialises the system's hardware.

The operating system controls running applications using a system of processes.The operating system establishes a new process for each programme when it is launched, gives it a distinct process ID, and allots memory and other resources to that process. The operating system then assigns the process to the CPU and keeps track of how it is being carried out. The operating system releases the resources assigned to the process after it is ended.

Access to system resources and files is also managed by the operating system via a privilege system. Each user is given a set of rights that define the tasks they are permitted to complete. Greater access to the system's resources is available to users with higher rights, such as the root user.

In order to make it more user-friendly, Zorin OS also includes a graphical user interface (GUI). This GUI offers a visual representation of the system's files and directories, as well as the active programmes and system processes, and it enables users to interact with the system using a mouse and keyboard.

- Design issues in the OS

The fact that Zorin OS could not be entirely compatible with all hardware is one possible problem. Even though Zorin OS is based on the Linux kernel, which is renowned for its strong hardware support, some devices might not function as well as they would under other operating systems.

Another potential problem is that certain users might not like how the user interface is designed or organised. Some Linux users could want a more conventional interface, whereas others might favour a more contemporary, touch-friendly interface.

In addition, flaws or compatibility difficulties could appear, just as with any new software, which would be problematic for consumers. If you're planning to use a new operating system for crucial work, it's always a good idea to investigate, test, and stay current with the most recent version before committing to it.

- Recent research work or innovation on the os.

Zorin OS depends on the contributions and research effort of its developers and community members because it is a community-driven open-source project. New features, bug fixes, and security updates are continuously added to the project to enhance it.

Updated software, better hardware support, and new features like Zorin Connect, which enables users to connect their Android phone to their computer and exchange files and notifications between devices, are all included in the most recent version of Zorin OS, which is based on Ubuntu 20.04 LTS.

The Zorin Grid, a new layout option for the Zorin Desktop that enables users to arrange their apps and files in a grid-like form to provide greater visual organisation and a new method to interact with the desktop environment, is one of the new features included in Zorin OS.

The Zorin OS team is also developing new features like the Zorin Web Browser Manager and Zorin Application Browser,

which will make it simple for users to search and instal new software.

It's important to note that the Zorin OS development team and community members constantly add new features and innovations to the operating system.

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