



AL-Mustaqbal University
College of science
Department of Smart Medical Systems

Lecture 1: Introduction of operating systems

AL-Mustaqbal University

Application development
Stage: 3rd

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Introduction to Operating Systems

Operating systems (OS) are critical software that manage computer hardware and software resources, providing essential services for computer programs. They act as an intermediary between users and the computer hardware, ensuring efficient execution of tasks.

Key functions of an operating system include:

- 1.Process Management:** Handling the execution of processes, including scheduling and multitasking.
- 2.Memory Management:** Allocating and managing system memory, ensuring optimal use and security.
- 3.File System Management:** Organizing and controlling data storage, retrieval, and access.
- 4.Device Management:** Managing input and output devices, facilitating communication between hardware and software.
- 5.User Interface:** Providing a means for users to interact with the computer, typically through graphical (GUI) or command-line interfaces (CLI).



Overview of Android OS

Open-source Platform

Android is an open-source mobile operating system based on the Linux kernel, allowing for customization and innovation.

Widespread Adoption

Android is the most widely used mobile OS, powering a vast ecosystem of smartphones, tablets, and other devices.

User-friendly Interface

Android offers an intuitive and customizable user interface, making it accessible for a wide range of users.

App Ecosystem

The Google Play Store provides access to millions of apps, catering to a diverse range of user needs and preferences.

Defining Operating Systems

Windows

Developed by Microsoft, Windows is the most widely used desktop operating system, known for its user-friendly interface and diverse software ecosystem.

iOS

Created by Apple, iOS powers the company's range of iPhones, iPads, and other devices, offering a highly integrated and seamless user experience.

Android, macOS, and Linux

Android is the dominant mobile OS, while macOS and Linux are popular desktop and server operating systems, each with their own unique features and user bases.

Key Features of Android OS

1 Customization

Android allows users to customize their device's home screen, app layout, and various settings to suit their preferences.

2 Multitasking

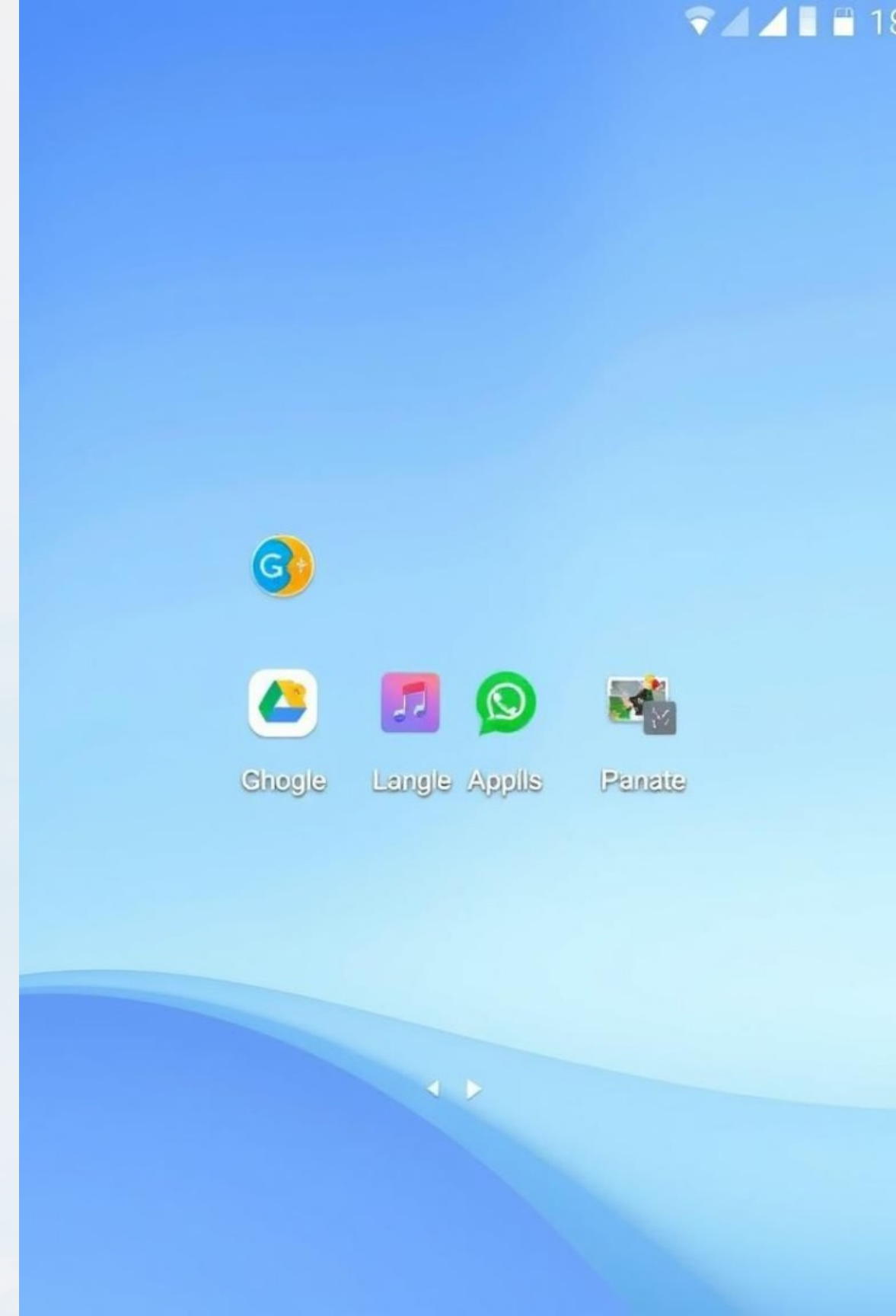
Android's robust multitasking capabilities enable users to seamlessly switch between and run multiple apps simultaneously.

3 Google Services

Android devices come with a range of Google services, including Gmail, Google Maps, Google Play Store, and more, providing a cohesive user experience.

4 Security

Android's security features, including regular updates and app permissions, help protect users' data and device integrity.



Android OS Architecture and Versions



1

Linux Kernel

Android is built on top of the Linux kernel, providing a stable and secure foundation for the operating system.

2

Android Runtime (ART)

ART is the runtime environment responsible for executing Android apps, offering improved performance and memory management.

3

System Libraries

Android includes a set of system libraries, such as C/C++ libraries and Android-specific libraries, that provide core functionality for the OS.

The Linux Kernel

Kernel

The Linux kernel is the core of the operating system, managing hardware resources, processes, and system services.

Open-source

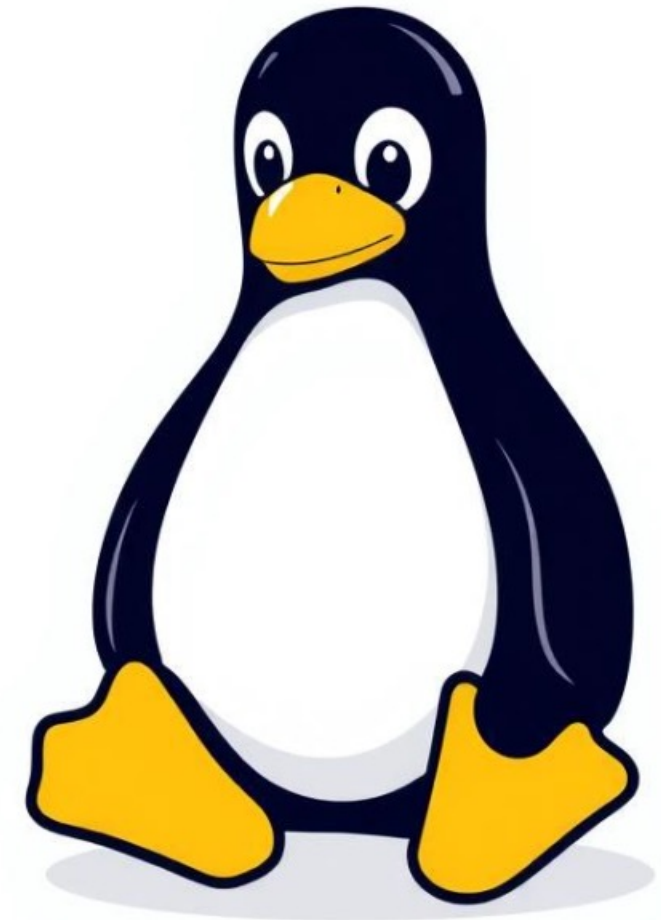
Linux is an open-source operating system, allowing for community contributions, customization, and continuous development.

Security

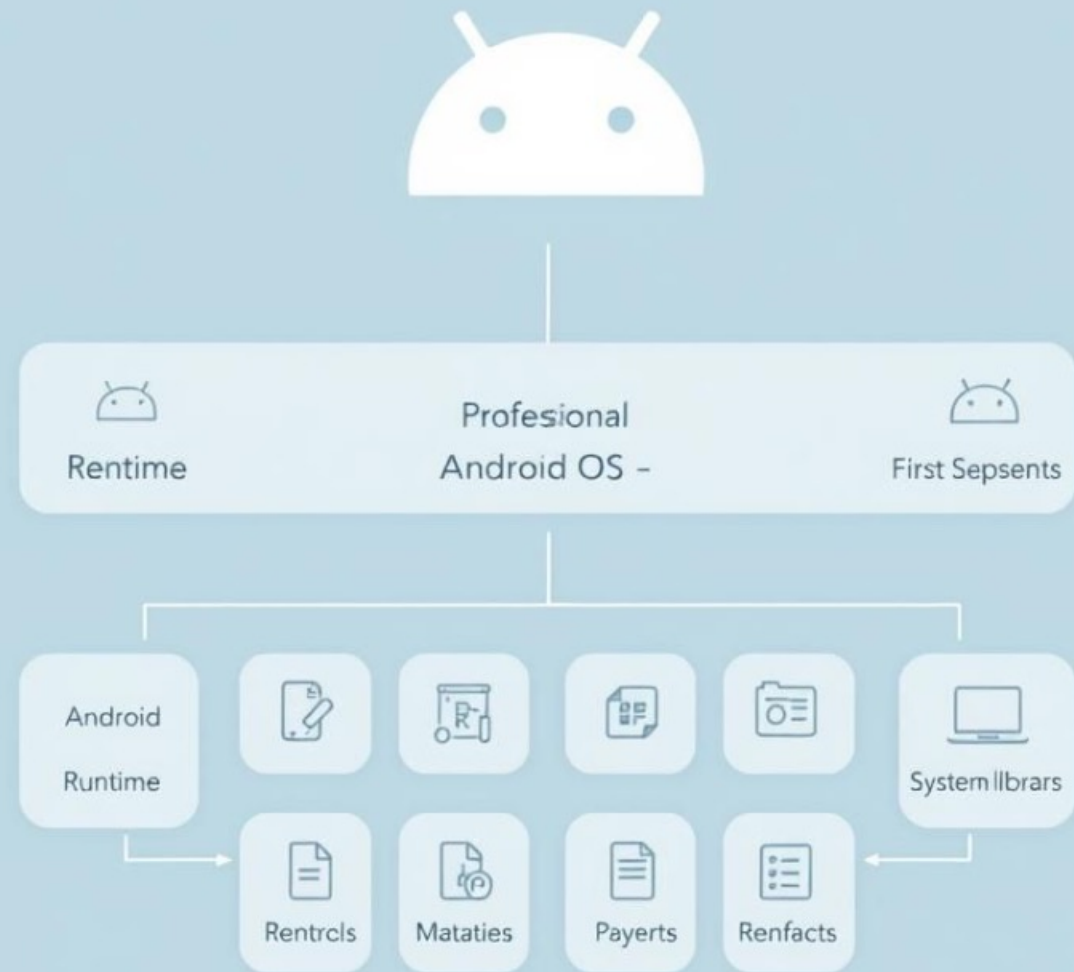
Linux's robust security features, including access controls and regular updates, make it a reliable and secure platform.

Versatility

Linux can be used on a wide range of devices, from desktops and servers to embedded systems and IoT devices.



Android Runtime and Libraries



1

Android Runtime (ART)

ART is the runtime environment responsible for executing Android apps, providing improved performance and memory management.

2

Android Libraries

Android includes a comprehensive set of libraries, including Java and C/C++ libraries, that provide core functionality for the OS.

3

Native C/C++ Libraries

Android also supports native C/C++ libraries, which can be used by developers to build high-performance applications.

Future Trends and Developments in Android OS

Artificial Intelligence

Android is embracing AI and machine learning to enhance user experiences, improve device performance, and enable smarter assistants.

Internet of Things (IoT)

Android is expanding its reach beyond smartphones to power a wide range of IoT devices, from smart home appliances to industrial equipment.

5G and Connectivity

With the advent of 5G technology, Android devices will offer faster, more reliable connectivity, enabling new use cases and applications.

Conclusion

Android has become a dominant force in the mobile operating system landscape, with its open-source architecture, user-friendly features, and robust app ecosystem. As technology continues to evolve, the future of Android looks bright, with exciting advancements in areas like AI, IoT, and 5G connectivity.



Thanks

