Unit 4: Generalized Mobile Operating System Architecture and comparison

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Unit Structure

4.1 LEARNING OBJECTIVE

To gain the knowledge regarding the architecture of mobile operating system as well as the management of different hardware parts

4.2 INTRODUCTION

Now days, mobile phone used to voice call as well as different verity of services such as video calls, 2D and 3D games, GPS service, file sharing, location tracking etc. mobile operating system is play the important role to manage the hardware parts of the mobile phones like different sensors. System kernel, file server, memory management and device drivers are located at the   base of the mobile operating system. The kernel manages the system resources and responsible for time slicing. Every operating system follows its own architecture. In the next section we will see the architecture of the most popular mobile operating system that is the Android mobile operating system running on different android smartphones as well as on different smart handheld devices.

4.3 GENERALIZE ARCHITECTURE OF MOBILE OPERATING SYSTEM

A mobile OS is a software platform on top of which other programs called application programs can run on mobile devices such as PDA, cellular phones, smartphone and etc.

- Low Level Hardware

  Mobile architecture is working on the basis of the RISC architecture. Processors are mainly two types such as ARM and MIPS. ARM is the 32-bit RISC processor architecture. ARM processor provides the low power consumption e.g.:-   Qualcomm Snapdragon Marvell's XScale Texas Instruments OMAP series. MIPS processor is used in mainly embedded systems. e.g.:-TiVo, Playstation1 & 2.

- Mobile Memory

  The better memory management is offered by mobile operating system. ROM (Read only Memory) used for operating system and preinstalled programs. RAM (Random Access Memory) is a short term digital storage.

- Types of RAM
    - DRAM (Dynamic RAM): cheapest, used in mobile devices
    - EDO (Enhanced Data Output): more expensive but offers a speed increase over DRAM
    - SDRAM (Synchronous Dynamic RAM): a further 50% speed (iPAQ)
    - DDR (Double Data Rate) SDRAM is twice as fast as SDRAM
    - OUM (Ovonics Unified Memory): experimental

- Kernel

  Kernel is responsible to manage the different services such as security management, memory management and process management.

- Libraries & Application Framework

  These Libraries are exposed to developers through the application framework.

4.4 A COMPARISON BETWEEN MOBILE OPERATING SYSTEMS

Feature	Android	iOS	Windows 10	BlackBerry 10
Company	Google	Apple Inc.	Microsoft	BlackBerry ltd.
Current version	9.0.0	12.1.3	10.0.	10.3
Current version release dates	December 11, 2018	January 22, 2019	February 12, 2019	April 4, 2018
License	Free and open-source	Proprietary except for open source components	Proprietary, Commercial software	Proprietary
OS family	Linux	Darwin	Microsoft Windows	QNX
Supported CPU architecture	ARM	64-bit ARMv8-A	32-bit ARMv7-A and 32-bit ARMv8-A	ARM
Programed in	C, C++, Java, Kotlin	C, C++, Objective-C, Swift	.NET, C#	C/ C++

Table-6 Comparison between Mobile Operating System

4.5 LET US SUM UP

Kernel is the low level system software which plays important role in the architecture of mobile operating system such as to manage the all resources with the responsible time slicing.

4.6 CHECK YOUR PROGRESS

1.   What is kernel?

2.   Explain working of kernel?

3.   What are resource managements?

4.   What is the use of RAM?

4.7 CHECK YOUR PROGRESS: POSSIBLE ANSWERS

1.   Kernel is low level system software which is responsible to manage the different services such as security management, memory management and process management.

2.   Kernel is used to manage the all resources with the responsible time slicing.

3.   Resource management is the proficient and effective development of an organization's resources when they are needed.

4.   Random access memory (RAM) is used to store running programs and data for the programs.

4.8 ASSIGNMENTS

1.   Explain the mobile memory?
2.   Which are the different types of the RAM?
3.   Differentiate between Android OS and iOS OS?
4.   Why Android mobile operating systems become so popular?
5.   What is the ROM?
6.   Differentiate between RISC architecture and ARM architecture?

4.9 ACTIVITIES

1. Make a case study on comparison between different types of mobile operating system.

4.10 FURTHER READING AND REFERENCES

1. https://www.webopedia.com/DidYouKnow/Hardware_Software/mobile-operating-systems-mobile-os-explained.html

2. https://en.wikipedia.org/wiki/Comparison_of_mobile_operating_systems