Lesson 02
Mobile Operating System
Mobile computing systems

- Specialized hardware
- GUIs
- VUIs
- Provision for mobile communication
- Many constraints, for example, the constraints of connectivity, CPU speed, memory, battery life, display, and size of input devices

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Mobile OS

• An OS which enables running of application tasks taking into account such constraints of hardware and network

• Enables a programmer to develop application without considering the specifications, drivers, and functionalities of the hardware of the system
Driver

- Software component which enables the use of a device, port, or network by configuring (for open, close, connect, or specifying a buffer size, mode, or control word) and sends output or receives input
Mobile OS

- Enables an application to run by simply abstracting the mobile system hardware.
- Enables the programmer to abstract the devices such that the application need not know full details of the font and font size of the mobile device display.
- Application need not know how the message will be displayed by the LCD hardware.
Mobile OS Examples

- PalmOS
- Windows CE
- Symbian
- Android—released in 2008 by Google [open-source code which powers mobile operating system]
Example of hardware abstraction by the OS

• Assume that keypad, LCD display, serial input, and serial output devices are abstracted by an application as the input and output devices with device numbers 1, 2, 3, and 4, respectively
Example of hardware abstraction by the OS

- `write (1, 'Welcome to ABC Telecom')` when a message Welcome to ABC Telecom is sent in the output for display
- The line can be `write ('Welcome to ABC Telecom')` when display device is taken as default output device
Mobile OS

- Facilitates execution of software components on diversified mobile device hardware
- Application need not be aware of the details of the LCD driver and memory at which the CPU will send the message for display
Mobile OS

- Provides interfaces for communication between processes, threads, and ISRs at the application and middleware layers
- Provides middleware for the system hardware
- Provides management functions (such as creation, activation, deletion, suspension, and delay) for tasks
Mobile OS

- Provides memory management
- Enables running of processes
- Helps the processes in obtaining access to system resources
Application

- Application tasks
- The OS provides the functions used for scheduling the multiple tasks in a system
- Synchronization of the tasks by using semaphores (tokens)
- A task may have multiple threads
Mobile OS

- Provides for synchronization of the threads and their priority allocation
- Accomplishes real-time execution of the application tasks and threads
Application

- Uses the system resources, for example, CPU, memory keypad, display unit, modem interface, USB or serial port, and battery
- Resources shared concurrently by the applications running on the system
User application

- GUIs (graphic user interfaces)
- VUI (voice user interface) components
- Phone API
- Mobile OS provides configurable libraries for the GUI in the device
- It provides for multi-channel and multi-modal user interfaces
Summary

- Mobile OS—An OS which enables running of application tasks taking into account mobile system constraints of hardware and network
- Enables a programmer to develop application without considering the specifications, drivers, and functionalities of the hardware of the system

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… Summary

- Device drivers
- GUILs
- VUILs
- Phone APIs
End of Lesson 02
Mobile Operating System