Special Constraints and Requirements of Mobile OS

Beulah A.
AP/CSE

Special Constraints

- A mobile device needs to function in the presence of many types of constraints which are not present in a traditional computer.
- Ex: Mobile device is powered by limited energy stored in tiny battery. Therefore complex computations should be avoided. Also enter into a low power sleep mode as soon as power gets drained. (Such constraint not in traditional OS)
- To handle such constraints, is an important reason why the MOS needs to differ significantly from a traditional OS.

Special Constraints

- Limited Memory
  - Mobile device's permanent and volatile memory is very less compared to laptop or desktop.
  - To handle this M OS should be small and it should provide rich functionalities to meet user demands.
  - Therefore size of kernel is an important feature to be considered.
- Limited Size Screen
  - Size of MD is small which limits the size of display screen.
  - M OS should provide easy interface to suit individual preferences, switching between menu and iconic interfaces, etc.

Special Constraints

- Miniature Keyboard
  - Small keypad or small sized display with touch screen mode.
  - Typing documents is difficult.
  - Therefore new facilities like word completion prompts, handwriting recognition, iconic commands etc.
- Limited Processing Power
  - ARM – Based processor.
  - Energy efficient, Powerful and cheaper when compared with laptop/desktop processors.
  - With the restricted processing power, memory, the M OS is made to provide only limited number of functionalities that are useful in the actual operation of the mobile device.

Special Constraints

- Limited Battery Power
  - Mobile device needs to be lightweight.
  - So have a small batter with recharging capacity.
  - Small battery should support long talk time without frequent recharge
- Limited and fluctuating bandwidth
  - Wireless medium – more noise – high bit error rate.
  - Variable bandwidth leads to fluctuation in speed of communication.
  - Movement of mobile device - handoff
  - Above leads to data loss.
  - Data caching, Pre fetching, Integration.
- Real time data streaming
  - Beyond 3G OS, real time data streaming such as mobile TV.

Special Service Requirements

- Support for Specific Communication Protocols
  - 1G, 2G 3G etc. Uses different communication protocol
  - Mobile device should support 2 or 3 generations.
  - To communicate with other devices (computers, printers etc) use specific protocols.(TCP/IP, Wireless LAN)
  - Other devices like headphones, USB drives etc.
- Support for Variety of Input Mechanism
  - Miniature keyboard, smart keyboard, stylus based input mechanism, touch screen.
  - Mobile OS needs to support these variety of input mechanism.

Special Service Requirements

- Compliance with Open Standards
  - Should provide open standard facility to develop innovative applications by third party developers.
- Extensive Library Support
  - Third party applications requires library support.
  - M OS should provide libraries to be called for email, SMS, MMS, Bluetooth, multimedia, user interface primitives, GSM/GPRS, etc.
- Support for Integrated Development Environment (IDE)
  - General purpose IDE such as Eclipse can be used to develop applications.
  - M OS can have their own IDE for effective Software development and good performance