Mobile Computing
Lecture 25
Palm OS 1

Contents

- Overview
- Architecture
- Features of kernel
- Memory organization
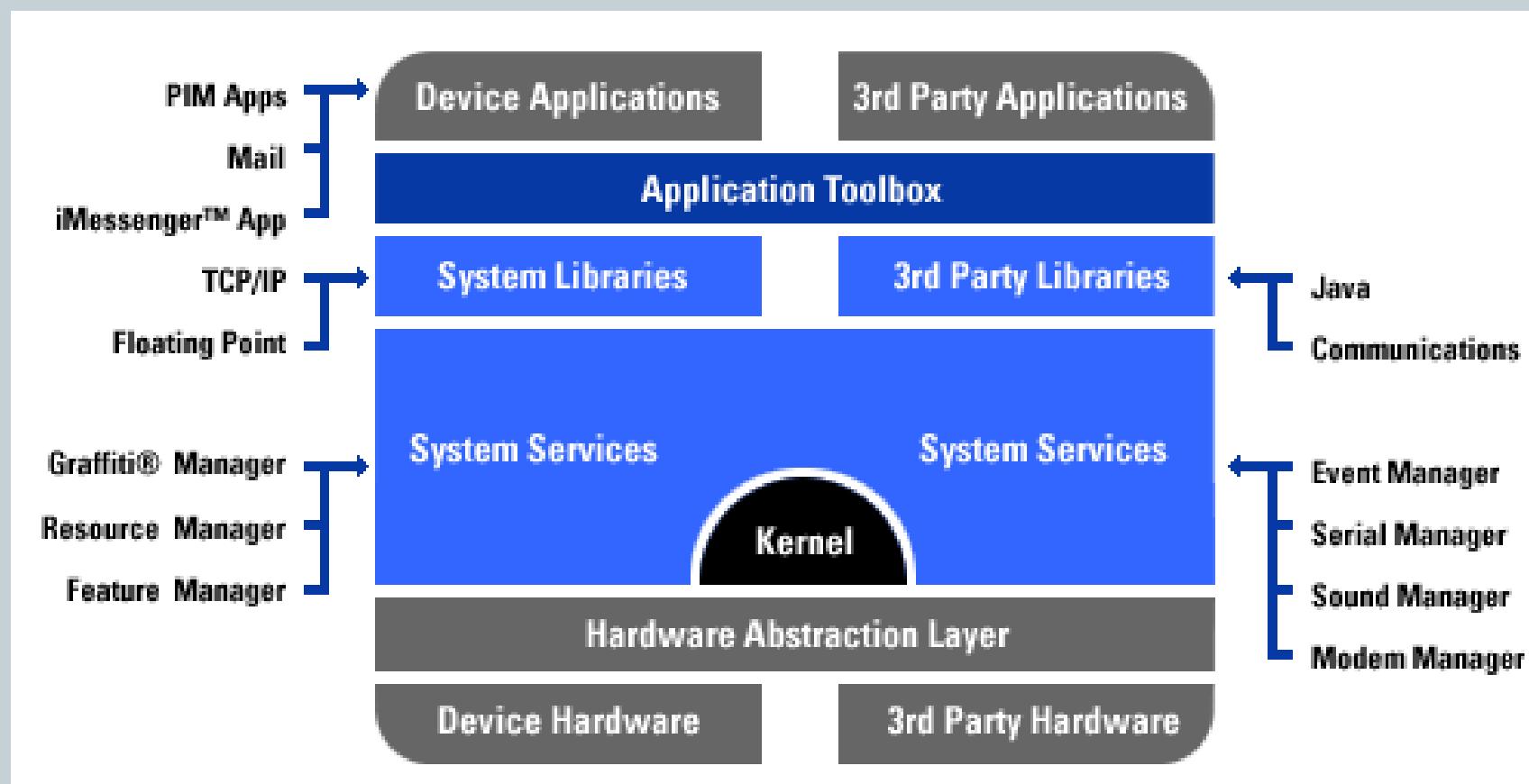
An Overview of Palm OS

- Designed for special hardware
  - small screen (160 x 160)
  - less processing power than desktop PCs
  - quick turnaround expected
  - limited memory (512k ~ 8MB)
  - no disk drive or PCMCIA disk

The Appearance of a PalmPilot

System Architecture

Memory Orgnization

- Motorola 68328 uses 32-bit addresses
- External data bus is only 16 bits wide
- ROM - stores the main suite of applications (the OS itself)
- RAM - stores additional and replacement applications & system extensions
- RAM - dynamic RAM & storage RAM

Dynamic RAM

- Served as temporary space for allocation
- Analogous to the RAM installed in a typical desktop system
- Is cleaned after reboot
- Implement a single heap that provides memory for dynamic allocations(TCP/IP, IrDA, …)

Storage RAM

- Holds nonvolatile user data (appointments, to do lists, memos, address lists, …)
- Is accessed via calling the database manager or the resource manager
- Analogous to the disk drive of a typical desktop system

Memory Chunks and Heaps

- A chunk - contiguous memory between 1byte ~ 64 KB that has been allocated by the Palm OS memory manager

- Each chunk resides in a heap

- Memory manager allocates memory in the dynamic heap

- Data manager allocates memory in the storage heap

Memory Heaps

- Each heap has a unique heap ID
- The heap with heap ID 0 is the dynamic heap
- Only the dynamic heap is reinitialized through soft reset cycles

Movable / Nonmovable Chunks

- Each chunk is referenced by a **local ID**

- The local ID of a **nonmovable** chunk : the offset of the chunk from the base address of the card

- The local ID of a **movable** chunk : the offset of the master pointer to the chunk from the base address of the card