Overview

Files & media	01-Overview.pdf
Mid-Review	☑
Name	Lecture 1
Review	☑
Status	Done

LECTURE 1 OVERVIEW

@September 7, 2023

What is Mobile Computing?

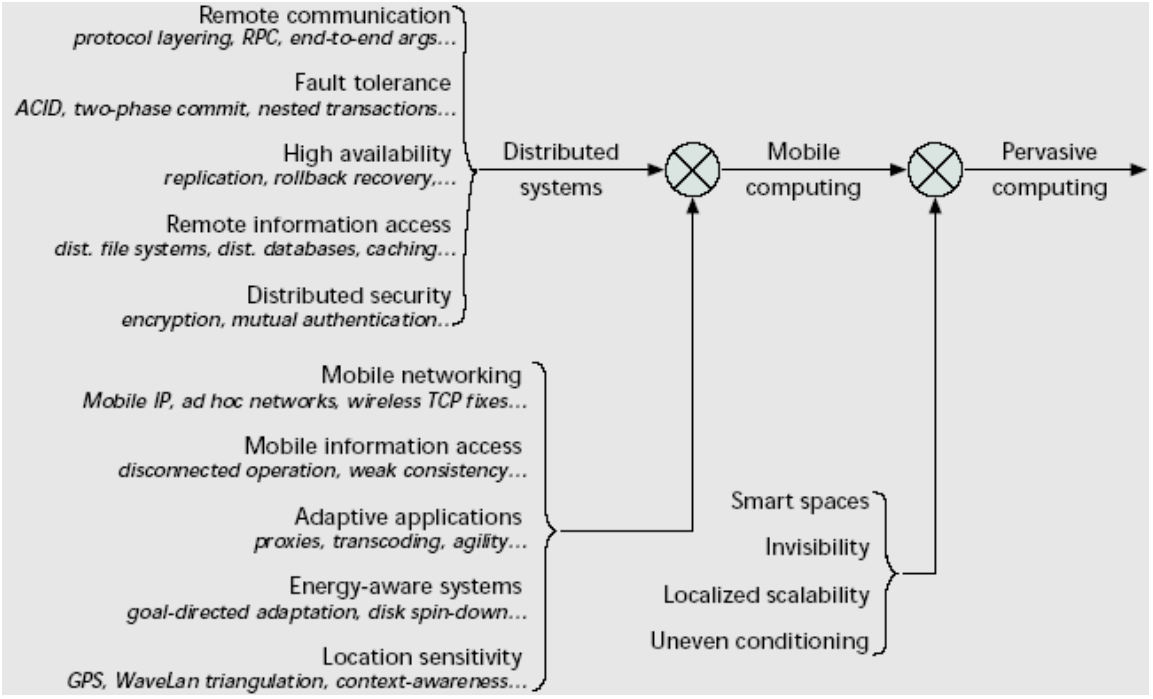
- computing - operation of computer
- mobile - position changes
- Mobile Computing = mobile + computing
  - operations of computers are moved from onw place to another place
- Mobile computing
  - different mobile entities
    - terminal, user, code
  - different computing modes
    - offline(small office), online(home office), moving(mobile office)

Why does Mobile Computing?

- Motivations
  - Nowadays, the access to info and computing services is necessary
  - increase demands on accessing to info, communication, cooperation

- Enabling factors
  - tech- use mobile device to run app/ access remote app
    - wireless widely available
    - handheld device increasing computing power, low cost
    - communication+ computing in 1 device
    - advanced techniques → new service & application

▼ **Mobile computing means:**



- wireless communication
- distributed computing: efficiently coordinate & utilize computing resource
- New feature
  - limited asymmetric bandwidth & high latency
  - weak connectivity & low reliability
  - low processing power & energy
  - mobility of device
  - low physical security
  - High degree of heterogeneity

- cloud computing: delivering host service over internet
    - access to shared pool of configurable computing resources
    - hide complexity & detail of underlying infrastructure from user & application
- edge computing: distributed computing paradigm
- pervasive computing: smart environment, without requiring users to know

Mobile Computing Application

▼ **Mobile Computing Applications**

- Corporation: M- business
- Consumers: M- commerce, mobile web services, entertainment
- Government/public services: M-healthcare, Publication transport, Tourism, Environment monitoring, emergencies
- militaries: battlefield communication

Future: device convergent, ubiquitous communication

Pervasive computing applications: smart life, internet of things

Challenges in mobile computing

▼ Wireless communication

- data
- signals
- transmission medium
    - wired transmission medium(guided) - easily engineered
    - wireless transmission medium(unguided)
        - hard
            - high background noises
            - signal strength fluctuates significantly
            - low data rate

        - high error rate
    - characteristics
        - low & asymetric bandwidth
        - high latency
        - high error rate
        - large variation in bandwidth
        - frequent disconnection
        - shared channel

▼ Mobile devices

- converged technology
    - smart phones…
    - advantages
        - always with the user
        - have internet access
        - typically GPS enabled
        - Typically have accelerometer & compass
        - have input/output methods
        - apps are low-cost

▼ Mobility

- different Mobility mode
    - Terminal mobility: continuing access
    - Personal mobility: reach mobile user using logical ID
    - Service mobility: service available to mobile user while user is moving/changing devices
- dynamic changes of physical location
- dynamic changes of logical addresses(different networks)
- frequent change of system configuration

- mobility management problem
  - location management
  - handoff management problem

Need new solution