

ITEC452

Midterm Exam Study Guide

Lecture 1 Smartphone Specifications

- big.LITTLE Technology
- Moore's Law
- 14nm Technology
- GPS (Global Positioning Systems) and A-GPS (Assisted GPS)
- Wireless Electricity Charging: Qi, Wireless Power Consortium (WPC), Power Matters Alliance (PMA)

Lecture 2 Smartphone Operating Systems

- iOS release year
- iOS Software Development Kit (SDK)
- Multitasking, iCloud, Siri
- Android release year and name
- What is the application programming interface (API) level?
- Auto-pairing and stereo support, A2DP (Advanced Audio Distribution Profile), AVRCP (Audio/Video Remote Control Profile)
- Android 3.0 Honeycomb: First Tablet only Android OS
- Android 4.3 Jelly Bean: BLE (Bluetooth Low Energy) support, AVRCP 1.3 support
- Android 4.4 KitKat: Wireless Printing
- Building and publishing Apps
 - Android apps are programmed in C, C++, and Java
 - iOS apps are programmed using Objective-C and Swift

Lecture 3 Bluetooth

- Bluetooth Protocol Stack
 - LMP (Link Management Protocol)
 - L2CAP (Logical Link Control and Adaptation Protocol)
 - SDP (Service Discovery Protocol)
- Bluetooth High Speed
- Transmission rate, Standard PAN Range for each Bluetooth version.
- Bluetooth Beacons

Lecture 4 Wi-Fi

- Mainly used ISM radio bands: 2.4 GHz UHF (Ultra High Frequency), 5 GHz SHF (Super High Frequency)
- AP (Access Point), BSS (Basic Service Set), IBSS (Independent Basic Service Set), ESS (Extended Service Set)
- Stream Data Rate of 802.11ac, 802.11ad, 802.11ay
- MIMO
- Devices operating in the 2.4 GHz range include: IEEE802.15.4 devices: ZigBee, 6LoWPAN, and ...
- Dual Band
- Wi-Fi Direct
- Tethering (Hotspot)

Lecture 5 Mobile Communication

- Hard Handover, Soft Handover
- What is Cellular?
- To overcome the limited frequency band
 - Cellular Technology
 - Multiple Access Technology
 - FDMA
 - TDMA
 - CDMA
- Mobile Phone Evolution
 - 1st Generation: AMPS
 - 2nd Generation: GSM, IS-95 (cdmaOne)
 - 3rd Generation: UMTS (WCDMA), CDMA2000
 - 3G Transitional: HSDPA, EV-DO Rev. A, HSPA+, EV-DO Rev. B,
 - 4th Generation: LTE-A

VLSM (Variable Length Subnet Masking)

- See the sample questions below:
For each subnet, please answer to the following questions below. Please make sure to give *both* the 32 binary number and the dotted decimal notation.

Given:

IP address 193.2.3.0/24

- AtlantaHQ: 58 hosts
- PerthHQ: 26 hosts
- SydneyHQ: 10 hosts
- CorpusHQ: 10 hosts
- WAN1: 2 IP addresses
- WAN2: 2 IP addresses
- WAN3: 2 IP addresses

Question 1. How many bits need to be used for a host id?

Question 2. How many bits need to be used for a subnet id?

Question 3. What is the subnet id?

Question 4. What is the IP address for the 1st usable host id in the subnet?

Question 5. What is the IP address of the last useable host id in the subnet?

Question 6. What is the broadcasting IP address for the subnet?

Question 7. What is the subnet mask for the subnet?

Configuring a Router

- See the router configuration in the Lab Guide of the project 1.