WELCOME
Mobile Applications Testing

❖ An acronym for **Long Term Evolution**

❖ **LTE** is a 4G wireless communications standard developed by the 3rd Generation Partnership Project (3GPP) that's designed to provide up to 10x the speeds of 3G **networks** for mobile devices such as SmartPhones, Tablets, NetBooks, Notebooks and Wireless Hotspots.

NETWORK: Satellite

❖ **SATTELITE** - artificial object which has been intentionally placed into orbit.

❖ Such objects are sometimes called **artificial satellites** to distinguish them from natural satellites such as Earth's Moon.

❖ The world's first artificial satellite, the Sputnik 1, was launched by the Soviet Union in 1957. Since then, thousands of satellites have been launched into orbit around the Earth.

❖ Common types include military and civilian Earth observation satellites, communications satellites, navigation satellites, weather satellites, and research satellites. Space stations and human spacecraft in orbit are also satellites.

❖ Satellite orbits vary greatly, depending on the purpose of the satellite, and are classified in a number of ways.

What is satellite navigation?

❖ Satellite navigation ("satnav") means using a portable [radio](#) receiver to pick up speed-of-light signals from orbiting [satellites](#) so you can figure out your position, speed, and local time

❖ The best-known satnav system, the **Navstar Global Positioning System (GPS)**, uses about 24 active satellites (including backups). Day and night, 365 days a year, they whiz round Earth once every 12 hours on orbital planes inclined at 55 degrees to the equator.

❖ GPS was kick-started by the US military in 1973 and its satellites are designed to last about 7.5 years, but the latest generation typically survive about 10–12 years.

NETWORK: GPS

❖ The Global Positioning System (GPS) is a satellite-based navigation system made up of a network of 24 satellites placed into orbit by the U.S. Department of Defense.

❖ The 24 satellites that make up the GPS space segment are orbiting the earth about 12,000 miles above us. They are constantly moving, making two complete orbits in less than 24 hours. These satellites are travelling at speeds of roughly 7,000 miles an hour.

❖ GPS satellites are powered by solar energy. They have backup batteries onboard to keep them running in the event of a solar eclipse, when there's no solar power. Small rocket boosters on each satellite keep them flying in the correct path.

NETWORK: WiFi

❖ **WiFi** is a technology that uses radio waves to provide network connectivity. WiFi- most widely accepted definition for the term in the tech community is **Wireless Fidelity**.

❖ Wireless technology has widely spread lately and you can get connected almost anywhere; at home, at work, in libraries, schools, airports, hotels and even in some restaurants.

❖ Like mobile phones, a **WiFi** network makes use of radio waves to transmit information across a network. The computer should include a wireless adapter that will translate data sent into a radio signal.

WiFi TM

PCI Desktop, Laptop PC Card, and USB Wi-Fi

EZ Networking
EZ Card 10/100
PC Card
SMC

http://www.computerhope.com

NETWORK: WiFi Frequencies

❖ Wireless networking is known as WiFi or 802.11 networking as it covers the IEEE 802.11 technologies. The major advantage of WiFi is that it is compatible with almost every operating system, game device, and advanced printer.

❖ A wireless network will transmit at a frequency level of 2.4 GHz or 5GHz to adapt to the amount of data that is being sent by the user. The 802.11 networking standards will somewhat vary depending mostly on the user's needs.

The **802.11a** will transmit data at a frequency level of 5GHz. The Orthogonal Frequency-Division Multiplexing (OFDM) used enhances reception by dividing the radio signals into smaller signals before reaching the router. You can transmit a maximum of 54 megabits of data per second.

The **802.11b** will transmit data at a frequency level of 2.4GHz, which is a relatively slow speed. You can transmit a maximum of 11 megabits of data per second.

The **802.11g** will transmit data at 2.4GHz but can transmit a maximum of 54 megabits of data per second as it also uses an OFDM coding.

The more advanced **802.11n** can transmit a maximum of 140 megabits of data per second and uses a frequency level of 5GHz.

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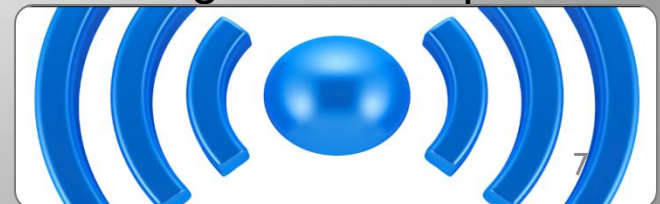
NETWORK: WiFi (Hotspots)

❖ A **HOTSPOT** is a physical location where people may obtain Internet access, typically using **Wi-Fi** technology, via a wireless local area network (WLAN) using a router connected to an internet service provider.

❖ A **WiFi connection** is established using a wireless adapter to create *HOTSPOTS* - areas in the vicinity of a wireless router that are connected to the network and allow users to access internet services.

❖ The term **HOTSPOT** is used to define an area where **WiFi** access is available. It can either be through a closed wireless network at home or in public places such as restaurants or airports.

Equipment is inexpensive (many newer computers have the needed hardware built in), and Wi-Fi hotspots remains free in some locales.
Availability can be a problem, specifically in most suburban and rural areas.

NETWORK: BLUETOOTH

❖ **Bluetooth** is a [wireless](#) technology standard for exchanging data over short distances

❖ You can use Bluetooth with cell phones, PDAs, laptops, palmtops, printers, baby monitors, garage openers and other external devices.

❖ Bluetooth networking transmits data via low-power radio waves. It communicates on a frequency of **2.45 gigahertz**

❖ This frequency band has been set aside by international agreement for the use of industrial, scientific and medical devices (ISM).

NETWORK: BLUETOOTH Facts

❖ The maximum distance for a Bluetooth network is about 30 feet

❖ Bluetooth requires very little power to use (befitting its design, which concentrates on battery-operated devices)

❖ Slow compared with the 802.11b network standard.

❖ No base station is required for Bluetooth communications between devices.

FUN FACT:

The **Bluetooth symbol** is a bind-rune, which means that it is formed from two runes that are merged together. Runes are the ancient Norse letters that, according to mythology, Odin discovered and gave to gods and humans. Runes have been used for over thousand years (probably a lot longer).

NETWORK: BROADBAND

❖ **MOBILE BROADBAND** is the marketing term for wireless Internet access through a portable modem, mobile phone, USB wireless modem, tablet or other mobile devices.

❖ A barrier to **MOBILE BROADBAND** use is the coverage provided by the mobile phone networks.

➢ *This may mean no mobile phone service or that service is limited to older and slower mobile broadband technologies.*

➢ *Customers will not always be able to achieve the speeds advertised due to mobile data coverage limitations including distance to the cell tower.*

➢ *In addition, there are issues with connectivity, network capacity, application quality, and mobile network operators' overall inexperience with data traffic.*

➢ *Peak speeds experienced by users are also often limited by the capabilities of their SmartPhone or other mobile device.*

NETWORK: 1G to 4G

EVOLUTION

1G 1981 · 2G 1992 · 3G 2004 · 4G and 4G LTE 2010 and 2011 · 5G 2020

NETWORK: 1G to 4G LTE Evolution

❖ **1G** *analog signal used by cellular towers*

❖ **2G** *technology upgraded the analog signal to digital and powered the inclusion of sending text messages across the network*

❖ **3G** *technology made use of electromagnetic wavelengths, known as spectrum, to broadcast a wireless broadband signal that allowed users to access the Internet and download applications using a 3G data card or a handheld mobile device*

❖ **4G** *called an "ultra-broadband" access for mobile devices. 4G networks are based on an all Internet protocol packet switching instead of circuit switching*

❖ **4G + LTE** *Long Term Evolution (LTE) is a 4G wireless broadband technology developed by the Third Generation Partnership Project (3GPP), an industry trade group. It's a type of 4G technology, and it delivers the best performance and speeds available today.*

NETWORK: is 5G around the corner ?

❖ Aug 28, 2013 – Huawei (Chinese company) intends to introduce commercial 5G networks by 2020, a service touted as "100 times faster" than current 4 G networks.

❖ May 15, 2013 - Samsung says it has successfully tested technology that will be at the core of 5G mobile connectivity.
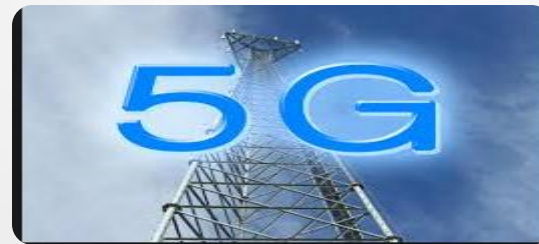
Mobile Ecosystem

Mobile World Statistics

Carriers/Service Providers

Network

Manufactures

Devices

Platforms/OS

Frameworks

API-Apps

Services

Devices

Devices

Handheld PC, Palm-size PC, Pocket PC, Pocket computer, Palmtop PC

PDA Electronic Organizer, Mobile Phone , Feature Phone, SmartPhone, Phablet

PMP, DAP

E-Reader

Handheld Game Console

Portable/Mobile Data Terminal

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Devices: Principals of Mobile Computing

Portability
Facilitates movement of device(s) within the mobile computing environment

Connectivity
Ability to continuously stay connected with minimal amount of lag/downtime, without being affected by movements of the device

Social Interactivity
Maintaining the connectivity to collaborate with other users, at least within the same environment

Individuality
Adapting the technology to suit individual needs.

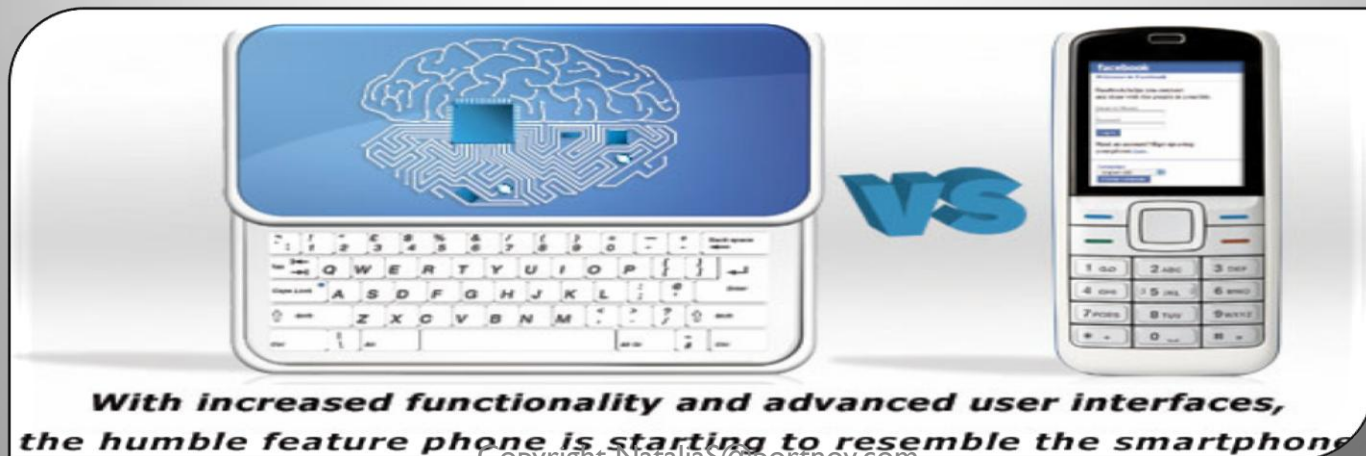# Devices : FeaturePhone vs SmartPhone

SmartPhones are those which have advanced computing capability than Feature phones

FeaturePhones are low-end device with lower-price

Devices : FeaturePhone vs SmartPhone

In short :
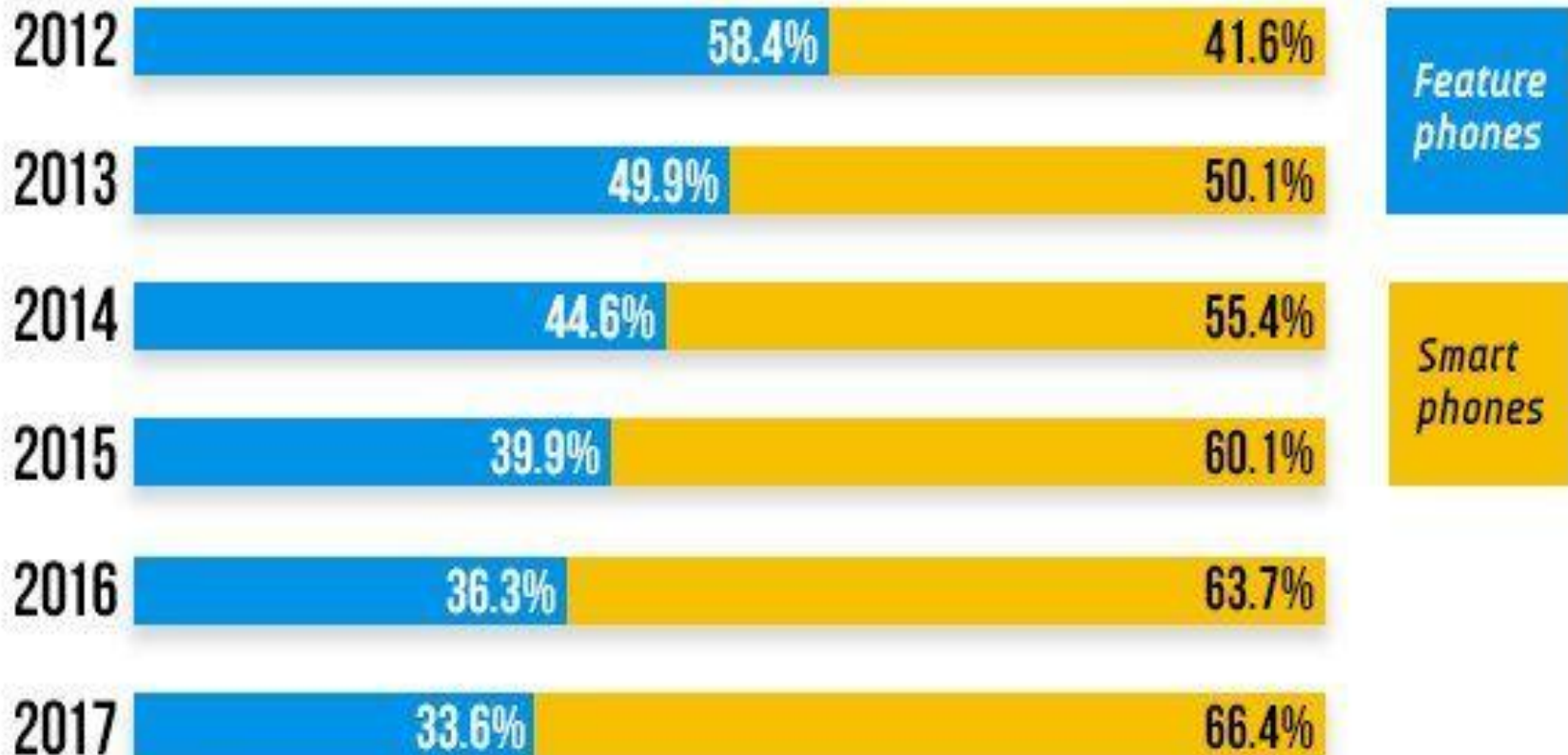
❖ *SmartPhones usually have a wider array of key features.*

❖ *These can include a full Web browser, 4G LTE network support, Flash player capability, GPS, higher-resolution camera, third-party application support , video conferencing and more*

With increased functionality and advanced user interfaces, the humble feature phone is starting to resemble the smartphone

Devices :
FeaturePhone vs SmartPhone Comparison Data

Predicted smartphone v feature phone shipments worldwide 2012-2017

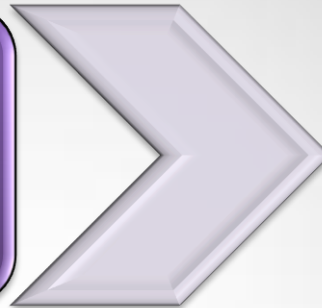| Year	Feature phones	Smart phones
2012	58.4%	41.6%
2013	49.9%	50.1%
2014	44.6%	55.4%
2015	39.9%	60.1%
2016	36.3%	63.7%
2017	33.6%	66.4%

Source: International Data Corporation (IDC), "Worldwide Quarterly Mobile Phone Tracker"
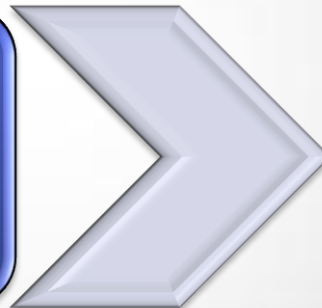
Devices :

JAILBREAKING : iOS

JAILBREAKING
process of modifying iOS system kernels to allow file system read and write access.

JAILBREAKING TOOLS
(and exploits) remove the limitations and security features built by the manufacturer Apple (the "jail")

JAILBREAKING TOOLS
allow users to run code not approved and signed by Apple.
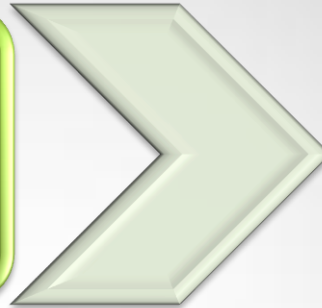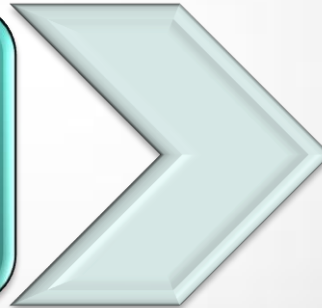
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Devices :
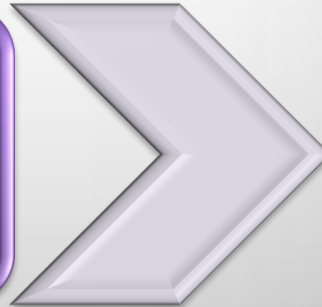## UNLOCKING : IPHONE

An **UNLOCKED** iPHONE

can be used with any carrier, not just those that have been approved by Apple.

many **UNLOCKING** solutions only work with certain iOS models

Factory IMEI **UNLOCKS** is a popular solution that works with all iPhone models.

Devices :
ROOTING : ANDROID OS

Rooting is the Android equivalent of jailbreaking, a means of unlocking the operating system

you can install unapproved apps, deleted unwanted bloatware,

update the OS, replace the firmware or customize anything

ROOT

Devices :
ROOTING : GLOSSARY

ROOT
- Rooting means you have root access to your device

ROM
- A ROM is a modified version of Android.

KERNEL
- A kernel is the component of your operating system that manages communications between your software and hardware.

RADIO
- Radios are part of your phone's firmware that controls your cellular data, GPS, Wi-Fi, and other things like that.

FLASH
- Flashing essentially means installing something on your device, whether it be a ROM, a Kernel, or a Recovery

Devices :
ROOTING : GLOSSARY

BOOTLOADER
- Lowest level of software on a device, running all the code that's necessary to start OS

RECOVERY
- Software on a device that allow user to make backups, flash ROMs, and perform other system-level tasks

NANDROID
- From most third-party recovery modules, user can make device backups called nandroid backups.

ADB
- ADB stands for Android Debug Bridge

BRICK
- Breaking device during flashing or other acts.

Devices :
TETHERING

TETHERING

connecting one device to another

In the context of **mobile phones** and **tablet computers**, tethering allows sharing the Internet connection of the phone or tablet with other devices such as laptops

Connection of the phone or tablet with other devices can be done over **wireless LAN** (**Wi-Fi**), over **Bluetooth** or by physical connection using a cable, for example through

TETHER

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Platforms / OS Licensed

Licensed platforms are sold to device makers for non-exclusive distribution on devices.

The major goal of Licensed Platforms was to create a common/standard platform of Application Programming Interfaces (APIs) development that work similarly across multiple devices with the minimum effort required to adapt the device differences.

Example: **Windows Mobile, JME - Sun Microsystems/Oracle; Brew MP – HTC Smart Phone or carrier's firmware, etc**

Platforms / OS Proprietary

A proprietary operating system is one which a particular company conceptualizes, designs, develops and sells. Examples of proprietary operating systems are Windows and Mac OS X

Pros

- ✓ **Simplified user experience making the overall user experience simpler and smoother.**
- ✓ **User multiplier effect based on increasing number of people already using it.**

Cons

- ✓ **Limited Customizability**
- ✓ **Interoperability Operating systems are often designed to work with a fixed set of hardware specifications**

Platforms / OS Open Source

Open source is a philosophy which suggests that the source code behind something should be freely available to the public.

Pros

- ✓ **The main advantage is that it allows end users to directly interact with the source, potentially modifying it to suit their wishes.**

- ✓ **Encourages constant development and innovation, while also creating a community of shared information.**

Cons

- ✓ **Vulnerable to malicious users**
- ✓ **Might not be as user-friendly as commercial versions**
- ✓ **Don't come with extensive support**

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Platforms / OS SUMMARY

Licensed
- JME
- BREW
- LiMo

Proprietary
- OS X
- BB QNX
- Windows Phone
- bada
- Symbian (Eclipse Lic.)
- webOS

Open Source
- Android-OHA
- Tizen
- Maemo
- MeeGo
- Linux
- Alternative

Open-Source Software can replace proprietary software

ubuntu for Windows 7 — Operating Systems

Open Office for Microsoft Office — Office applications

GIMP for Photoshop — Image editing

Mozilla Firefox for Internet Explorer — Internet browser

VLC for Windows Media Player — Video & audio playback

Calibre for Adobe Reader — Ebooks