

Future Generation' Mobile Protection and Security

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Abstract— the future of mobile wireless communication networks will be experiencing several generations. This kind of development will drive the researches of information technology in industrial area of continuous development and evolution. In this paper, we have explored future generations of mobile wireless communication networks including 4th, 5th, and so forth. If looking to past, wireless access technologies have been followed different evolutionary paths with aim at unified target related to performance and efficiency in high mobile environment. Android develops one of the most popular mobile operating system in the whole world, as a side effect of this popularity, Android becomes the most preferred destination of hackers with different aims, some of them looking for making money and others are just having fun by raid the privacy of the others without their authorization. Nowadays, Android security has become a major problem because of the free application provided and functionalities that make it very easy for anyone to progress it. However, various systems have been planned by a large number of scholars to address these problems.

Keywords—3G, 4G, 5G, Phones, Android, Hacking

I. INTRODUCTION

It is an assortment in 40 years of mobile phone and ascends of mobile internet communications, social networks and super-fast internet [1].

The contribution of this paper is to explore the future generations of mobile and their protection and security threats. Mobile phones that show just how much the world has altered since the early days of mobile communication [1]

- In 1983, the first mobile phones went on sale in the U.S. at almost \$4,000 each.
- Over 250 million Nokia 1100 were sold, making it the bestselling electrical gadget in history.
- More People in the world have mobile phones than toilets.
- Facebook photos and videos are uploaded via mobile that it takes up 27% of upstream web traffic.
- The expertise behind smartphones relies on up to 250,000 separate patents.

II. THE GENERATION OF PHONES

- **1G:** 1G refers to the first generation of wireless telephone technology. These are the analog telecommunications standards that were introduced in the 1970s and continued until being replaced by 2G digital telecommunications. The main difference between the two mobile telephone systems (1G and 2G), is that the radio signals used by 1G networks are analog, where as in 2G it is digital.
- **2G:** The 2G (second generation) systems premeditated in the 1980s were still used principally for voice applications but were based on digital technology, together with digital signal processing techniques. [3] These 2G systems provided circuit switched data communication services at a low speed [4]. The second generation of wireless mobile. These data services for mobile, starting with SMS (Short Message Service) plain text-based messages. The 2G technologies enable the various mobile phone networks to provide the services such as text messages, picture messages and MMS (Multimedia Message Service). Communication systems were a huge success. The second-generation standards are GSM, GPRS etc.

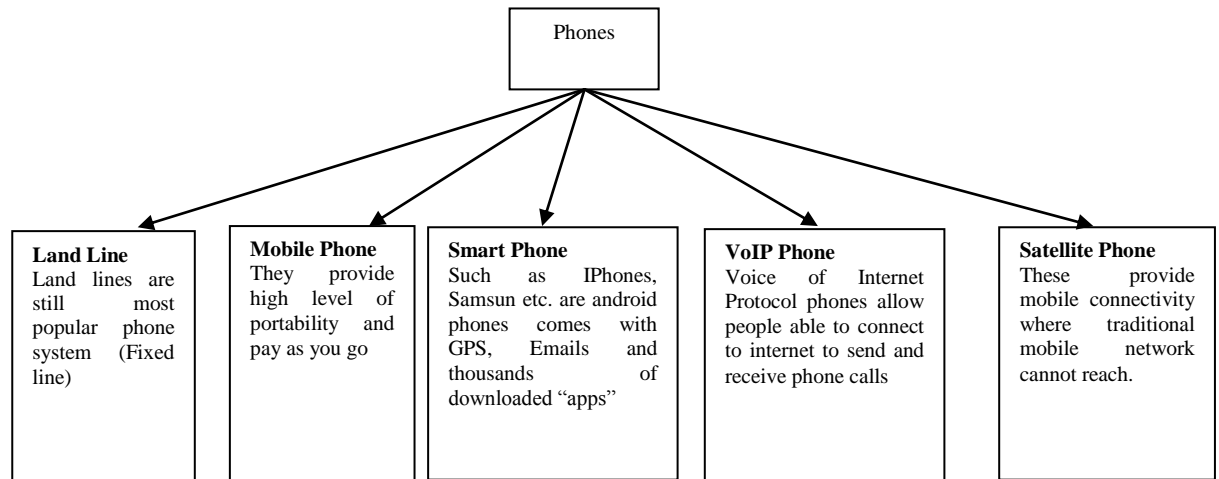


Figure 1. Different type of phones [2]

- 3G:** To meet the mounting demands in association capacity, rates required for high speed data transmit and multimedia applications, 3G standards started evolving. [3] The systems in this role are essentially a linear improvement of 2G systems. They are based on two equivalent backbone bases; one consisting of circuit switched nodes, and one of packet-oriented nodes. The third generation (3G) is not one regular; it is a family of principles which can all work together. An association called 3rd Generation Partnership Project (3GPP) has persisted the work by defining a mobile system that fulfils the IMT-2000 standard. [2PDF] Later 3G releases, often denoted 3.5G and 3.75G, also offer mobile broadband access of several Obit/s to smartphones and mobile modems in laptop computers. This certainty can be purposeful to wireless voice telephony, mobile Internet access, fixed wireless Internet access, video calls and mobile TV technologies. [3]
- 4G:** WiMAX (Worldwide Interoperability for Microwave Access) & LTE (Long Term Evolution) [5] are the major components. 4G technologies to distribute downlink speeds of 1Gbps when inactive and 100Mbps when mobile, regrettably, those spectacles are so destructive that no commercialized standard currently meets them. Provides, in accumulation to the usual voice and other services of 3G, mobile broadband Internet access, for example to laptops with wireless modems, to smartphones, and to other mobile devices. Impending and current applications include amended mobile web access, IP telephony, gaming services, video conferencing, 3D television, and cloud computing. [4]
- 5G:** The 5th generation mobile network is the proposed next telecommunications standards beyond the current 4G/IMT advanced standards. Underneath device-to-device, ultra-reliable, and massive machine connections. There is presently no standard for 5G. A 5G standard are [5,7,8]:

 - Data tariff of tens of megabits per succeeding for tens of thousands of users.
 - 1 GB per second concurrently to many workers on the same office floor.
 - Several hundreds of thousands of concurrent connections for wireless sensors.
 - Coverage enhanced.
 - Signalling competence superior.
 - Latency condensed extensively compared to LTE.

III. APPLICATIONS OF NEXT GENERATION

The next peer group applications are set to evolve in a multiplatform atmosphere. 4G submissions will be accessible across numerous wireless technologies like LTE, Wi-Fi, etc. and also in devices like cell phones, laptops, e-readers, digital cameras, printers and so on. 4G applications are very likely to be extended and improved versions of the existing 3G services. [6,7,8,9,10,11,12,13].

- Virtual Presence:** 4G and 5G will provide user amenities at all times, even if the user is off-site. 4G provides users with virtual triangulation completed which a user can admittance a database of the streets,

buildings etc. of large cities. This necessitates high speed data transmission.

passenger travel process. This is likely to play a role in re-ordering these phases over the next period.

Table 1: 1G,2G,3G,4G,5G Difference [1,2 ,3 4,5, 7 ,8 ,9]

Specification	1G	2G	3G	4G	5G
Name	1 st Generation Mobile N/T	2 nd Generation Mobile N/T	3 rd Generation Mobile N/T	4 th Generation Mobile N/T	5 th Generation Mobile N/T
Brought into Operation	1980	1993	2001	2009	2020 will be brought.
Commercialization Location	USA	Finland	Japan	South Korea	mostly in Europe, Japan, Korea and USA
Technology	Analog Technology	Digital Technology	CDMA2000	Wi-Max LTE Wi-Fi	WWWW (Coming soon)
Speed	2kbps	64kbps	2Mbps	1Gbps	10 times faster than 4G
Switching	Circuit	Circuit, Packet	Packet	All Packet	All Packet
Services	Voice Only	Voice & SMS	Voice/Data /Multimedia	IP Voice/Data/Mobile Internet	IP Voice & Data, TV (Broadcast, Multicast) D2D
Core Network	PSTN	PSTN	Packet N/T	Internet	Internet.
Bandwidth	Analog	25MHz	25MHz	100MHz	2GHz(Future)

- **Tele-Medicine:** 4G and 5G will sustenance remote health monitoring of patients. A user essential not go to the hospital in its place a user can get videoconference help for a doctor at anytime and anywhere.
- **Tele-geoprocessing applications:** This is a combination of GIS (Geographical Information System) and GPS (Global Positioning System) in which a user can get the location by querying.
- **Crisis management:** Usual disasters can cause breakdown in message systems. But in 4G it is expected to restore such crisis issues in a few hours.
- **Education:** 4G provides a good opportunity. People anywhere in the world can linger their education finished online in a cost-effective manner.
- **Artificial Intelligence:** More claims mutual with artificial intelligent (AI) as human life will be enclosed by artificial sensors, which could be interactive with mobile phones.
- **Travelling:** The use of Bluetooth & NFC technology integrated smartphones in the

- **Economic growth:** As technology changes economic growth also support it, as it allows consumers to get benefits from it.

IV. ANDROID ARCHITECTURE

- **Linux kernel:** The bottom of the layers is Linux 3.6 with roughly 115 covers. This contains all the vital hardware chauffeurs like camera, keypad, display etc. Also, the kernel handles all the things that Linux is actually good at such as schmoosing and a vast array of device drivers. [14]
- **Libraries:** On top of Linux kernel there is a set of libraries including open-source Web browser engine Web Kit, [15] well known library libc, SQLite database which is a useful source for storing and sharing of claim data, libraries are used to play and record audio and video, SSL libraries accountable for Internet security etc. [14].

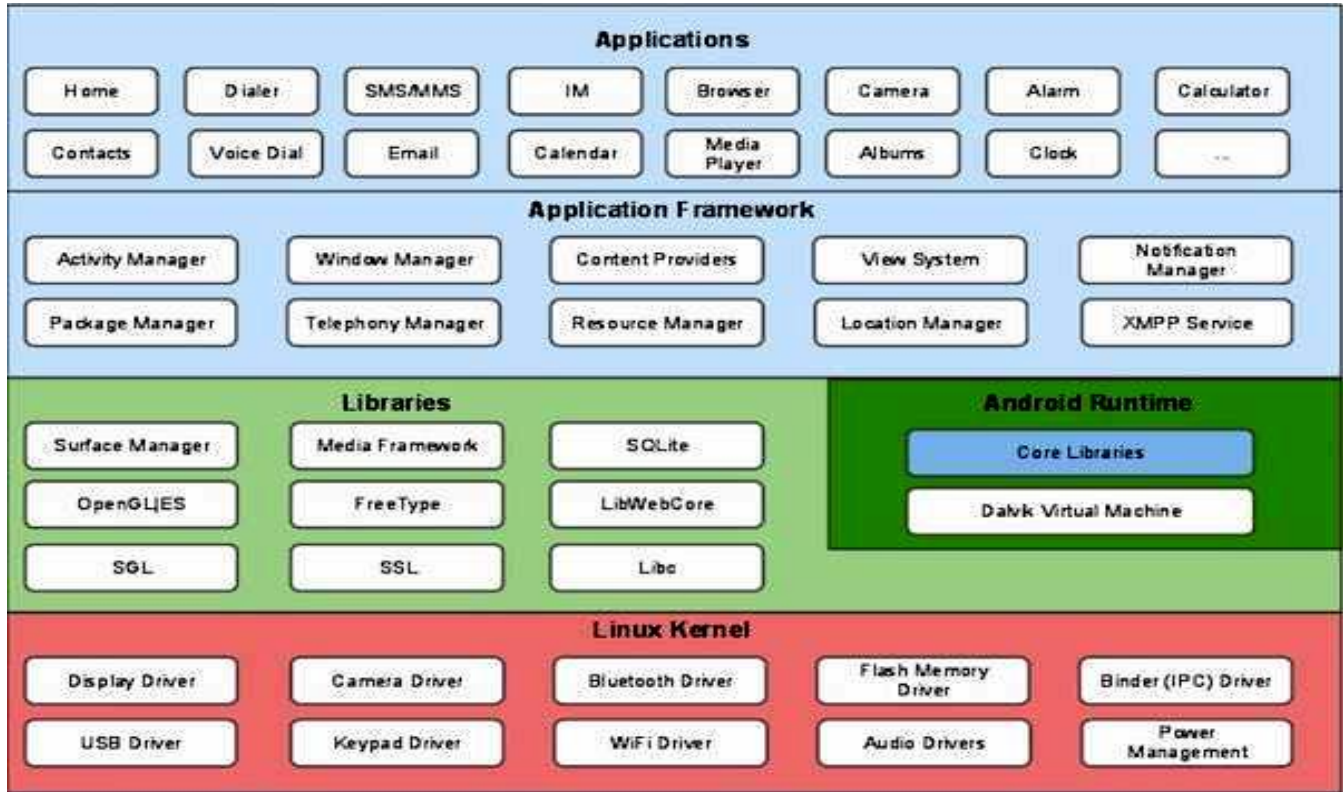


Figure 2:Android Architecture [14]

- **Android Libraries:** This group incorporates those Java-based libraries that are specific to Android development. [14,15]
- **Android.app-** Offers access to the application perfect and is the cornerstone of all Android applications.
- **android.content** – Expedite content access, issuing and messaging between applications and application components.
- **android.database** – Used to access data published by content providers and includes SQLite database management classes.
- **android.opengl** – A Java interface to the OpenGL ES 3D graphics rendering API.
- **android.os** – Provides requests with access to normal operating system services including
 - messages, system services and inter-process communication.
 - **android.text** – Used to condense and manipulate text on a device display.
 - **android.view** – The essential building blocks of application user interfaces.
 - **android.widget** – A amusing gathering of pre-built user interface components such as buttons, labels, list views, layout managers, radio buttons etc. [14]
 - **android.webkit** – A usual of classes envisioned to allow web-browsing capabilities to be built into applications. [15]
- **Android Runtime:** The third segment of the architecture and obtainable on the second layer from the bottom. This section provides a key component called Dalvik Virtual Machine [19] which is a kind of Java Virtual Machine specially designed and optimized for Android. The Dalvik VM types use of Linux core topographies like memory management and multi-threading.

- **Application Framework:** The Application Outline layer provides many higher-level facilities to applications in the form of Java classes. Application developers are allowed to make use of these services in their applications, which include
 - a) Activity Manager – Controls all features of the application lifecycle and activity stack.
 - b) Content Providers – Permits requests to publish and share data with other applications.
 - c) Resource Manager – Delivers access to non-code embedded resources such as strings, color settings and user interface layouts.
 - d) Notifications Manager – Permits requests to display alerts and notifications to the user.
 - e) View System – An extensible set of views used to create application user interfaces.
- **Applications:** This application will be at the top layer. You will inscribe your request to be installed on this layer only. Examples of such applications are Contacts Books, Browser, Games etc.

Different Hacking code for Android Phone [16]

CODES	Service Provided by Code
##7780##	Reset the rdata partition to factory state
*2767*3855#	Format device to factory state
##7764726	Hidden service menu for Motorola Droid
*#06#	IMEI number
#0#	Enter the service menu on newer phones
*#4636##	Phone information, usage statistics and battery
##34971539##	Detailed camera information
##34971539##	Detailed camera information
##273282*255*663282*##	Immediate backup of all media files
##197328640##	Enable test mode for service
##232339##	Wireless LAN tests
##0842##	Backlight/vibration test
##1111##	FTA software version (1234 in the same code will give PDA and firmware version)
#12580*369#	Software and hardware info
*9090#	Diagnostic configuration
#872564#	USB logging control
#9900#	System dump mode
#301279#	HSDPA/HSUPA Control Menu
*7465625#	View phone lock status
##7780##	Reset the /data partition to factory state
##0842##	Backlight/vibration test

Table 2: Android Phone Hacking code [16]

11 ways to protect your phone: [17,18]

Sr.	Hack-Proof	Explanation
1	<i>Keep up to data</i>	Always to install software updates as soon as they become available; that's as true on smartphones as it is on computers
2	<i>Careful of installation</i>	When we install a smartphone app, we are asked to grant various, but they're potentially open to abuse: think before you approve the request. Months on the Play Store before being spotted and taken down.
3	<i>Review what's you have on your phone.</i>	The apps on your phone seemed simple and safe when you installed them, but updates could have turned them into something more sinister. We will find lots of relevant information under Settings > Privacy.
4	<i>Get harder for intruders to get in</i>	Android and iOS can be set a six-digit passcode. Device offer other options too, like fingerprints or facial recognition.
5	<i>Track and Lock your phone</i>	Don't forget that both Apple and Google operate "find my device" services that can locate your phone on a map, and remotely lock or erase it
6	<i>Don't leave online services unlocked</i>	We shouldn't use auto-login features at all. If you must, use a password manager app that requires you to regularly re-enter a master password.
7	<i>Beware open wifi</i>	If doubtful about a wireless network, don't connect, stick with your phone's mobile internet
8	<i>Don't let lock screen to give notifications</i>	Lots of apps pop up messages and notifications on your phone's lock screen. Notifications may reveal It's safest to shut the feature off entirely.
9	<i>Lock individual apps</i>	A second line of defence, we can lock individual apps, so even if someone can get past your lock screen, they can't open ours email or banking app.
10	<i>Get a warning when your phone goes walkies</i>	Device will give cautionary if the device goes beyond 50 mts. So, the warning gives you a fortuitous to ring the phone right away, hopefully drawing consideration to the thief and prompting them to abandon it
11	<i>Keep an eye on things behind the scenes</i>	LogDog – available for both Android and iOS – is an app that monitors your identity on sites such as Gmail, Dropbox and Facebook. It alerts you to suspicious activity. Before serious harm can be done.

Table 3. 11 Ways to protect your phone [17,18]

V. CONCLUSION

Mobile Wireless Communication Technology is going to be a new revolution in mobile market. This paper provided an overview of different type of phones. The evolution and technologies form 1G to 5G which will certainly add apparent advantage to an ordinary person's life over 1G-5G. The 5G in real wireless world, it can be announced everywhere the year 2020. 6G integrates the 5G cellular networks and satellite networks to make global coverage. This can supply mobile internet to users at anyplace, anyhow and anytime. Here, we have given different code how to hack the mobile phone and also explain the architecture of Android. The paper has presented 11 ways to protect the smart phones from hacking; it also highlights the different codes and security methods with evolution mobile generations.

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