



# WIRELESS SYSTEMS

Presented By :-

**DANIEL GEORGE**

BSc Computer science

ST.Thomas college





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# INTRODUCTION

WHAT IS WIRELESS ?

**The word wireless in dictionary is defined “having no wires ” .**

**In networking terminology , wireless is the term used to describe any computer network where there is no physical wired connection between sender and receiver, but rather the network is connected by radio waves and or microwaves to maintain communications.**

**Wireless networking utilizes specific equipment such as NICs and Routers in place of wires (copper or optical fibre).**

- ★ **1G refers to the first generation of wireless telephone technology, mobile telecommunications which was first introduced in 1980s and completed in early 1990**
- ★ **It's Speed was upto 2.4kbps.**
- ★ **It allows the voice calls in 1 country.**
- ★ **1G network use Analog Signal.**
- ★ **AMPS was first launched in USA in 1G mobile systems.**



- ★ Poor Voice Quality
- ★ Poor Battery Life
- ★ Large Phone Size
- ★ No Security
- ★ Limited Capacity
- ★ Poor Handoff Reliability



1G Wireless System





# 2G TECHNOLOGY

- ❖ **2G technology refers to the 2<sup>nd</sup> generation which is based on GSM.**
- ❖ **It was launched in Finland in the year 1991.**
- ❖ **2G network use digital signals.**
- ❖ **It's data speed was upto 64kbps.**

## Features Includes:

- ✓ **It enables services such as text messages, picture messages and MMS (multi media message).**
- ✓ **It provides better quality and capacity .**





## DRAWBACKS OF 2G

- ❑ **2G requires strong digital signals to help mobile phones work. If there is no network coverage in any specific area , digital signals would weak.**
- ❑ **These systems are unable to handle complex data such as Videos.**



2G Wireless System



# WIRELESS MODELS OF 1G & 2G

## 1G WIRELESS SYSTEMS



## 2G WIRELESS SYSTEMS







## 2.5G TECHNOLOGY

- ❖ 2.5G is a technology between the second (2G) and third (3G) generation of mobile telephony.
- ❖ 2.5G is sometimes described as 2G Cellular Technology combined with *General Packet Radio Service (GPRS)*.

### Features Includes:

- ✓ Phone Calls
- ✓ Send/Receive E-mail Messages
- ✓ Web Browsing
- ✓ Speed : 64-144 kbps
- ✓ Camera Phones
- ✓ Take a time of 6-9 mins. to download a 3 mins. Mp3 song





# 3G TECHNOLOGY

- ◆ **3G technology refer to third generation which was introduced in year 2000s.**
- ◆ **Data Transmission speed increased from 144kbps- 2Mbps.**
- ◆ **Typically called Smart Phones and features increased its bandwidth and data transfer rates to accommodate web-based applications and audio and video files.**





# FEATURES OF 3G TECHNOLOGY

- ✓ Providing Faster Communication
- ✓ Send/Receive Large Email Messages
- ✓ High Speed Web / More Security
- Video Conferencing / 3D Gaming
- ✓ TV Streaming/ Mobile TV/ Phone Calls
- ✓ Large Capacities and Broadband Capabilities
- ✓ 11 sec – 1.5 min. time to download a 3 min Mp3 song.





# DRAWBACKS OF 3G TECHNOLOGY

- ◆ **Expensive fees for 3G Licenses Services**
- ◆ **It was challenge to build the infrastructure for 3G**
- ◆ **High Bandwidth Requirement**
- ◆ **Expensive 3G Phones.**
- ◆ **Large Cell Phones**





# 4G TECHNOLOGY

- ◆ **High-speed data access**
- ◆ **High quality streaming video**
- ◆ **Combination of wi-fi and wi-max**
- ◆ **Capable of providing 100Mbps – 1Gbps speed.**
- ◆ **One of the basic term used to describe 4G is **MAGIC**.**

**MAGIC:**

- ◆ **Mobile Multimedia**
- ◆ **Anytime Anywhere**
- ◆ **Global Mobility Support**
- ◆ **Integrated Wireless Solution**
- ◆ **Customized Personal Services**



**Also known as Mobile Broadband Everywhere.**





## 4G (Anytime, Anywhere)

- ◆ **The next generations of wireless technology that promises higher data rates and expanded multimedia services.**
- ◆ **Capable to provide speed 100Mbps-1Gbps.**
- ◆ **High QOS and High Security**
- ◆ **Provide any kind of service at any time as per user requirements, anywhere.**

### Features Include:

- **More Security**
- **High Speed**
- **High Capacity**
- **Low Cost Per-bit etc.**





## DRAWBACKS OF 4G

- ◆ **Battery uses is more**
- ◆ **Hard to implement**
- ◆ **Need complicated hardware**
- ◆ **Expensive equipment required to implement next generation network.**





## COMPARISON BETWEEN 3G Vs 4G

The basic difference between 3G and 4G is in data transfer and signal quality.

<b>Technology</b>	<b>3G</b>	<b>4G</b>
<b>Data Transfer Rate</b>	<b>3.1 MB/sec</b>	<b>100 MB/sec</b>
<b>Internet Services</b>	<b>Broadband</b>	<b>Ultra Broadband</b>
<b>Mobile - TV Resolution</b>	<b>Low</b>	<b>High</b>
<b>Bandwidth</b>	<b>5-20 MHz</b>	<b>100MHz</b>
<b>Frequency</b>	<b>1.6-2 GHz</b>	<b>2-8 GHz</b>
<b>Download and upload</b>	<b>5.8 Mbps</b>	<b>14 Mbps</b>



## Countries Have 4-G

**Except for the Scandinavian Countries (Northern Europe that includes Denmark and two of the nations of Scandinavian , Norway and Sweden. ), a few countries have started the 4G commercially.**

**In the US, Sprint Nextel and Others Germany , Spain, China , Japan and England are also using the 4G services and mobiles .**



# WIRELESS MODELS OF 3G & 4G

## ➤ 3G WIRELESS SYSTEM



## ➤ 4G WIRELESS SYSTEM







# 5G TECHNOLOGY





# 5G TECHNOLOGY

More **Reliable**

Better **Speed**

Better **Range**





**HUAWEI**

**Huawei Likely to Develop 5G  
Technology by 2020**



- ◆ **5G technology refer to short name of fifth Generation which was started from late 2010s.**
- ◆ **Complete wireless communication with almost no limitations.**
- ◆ **It is highly supportable to WWW (Wireless World Wide Web).**



- ◆ **High Speed, High Capacity**
- ◆ **5G technology providing large broadcasting of data in Gbps .**
- ◆ **Multi - Media Newspapers, watch T.V programs with the clarity as to that of an HD Quality.**
- ◆ **Faster data transmission that of the previous generations.**
- ◆ **Large Phone Memory, Dialing Speed, clarity in Audio/Video.**
- ◆ **Support interactive multimedia , voice, streaming video, Internet and other**
- ◆ **5G is More Effective and More Attractiv**





The following basic differences between 4G and 5G are:

<i>Technology</i>	<i>4G(2000-10)</i>	<i>5G(2010-20)</i>
<i>Switching</i>	<i>Circuit/Packet</i>	<i>Circuit/Packet</i>
<i>Data Rate</i>	<i>Upto 20Mbps</i>	<i>Upto 1 Gbps</i>
<i>Technology</i>	<i>Combination of broadband LAN/WAN/PAN</i>	<i>Combination of broadband LAN/WAN/PAN</i>



# EVOLUTION OF 1G TO 5G TECHNOLOGY



**1G**  
1981



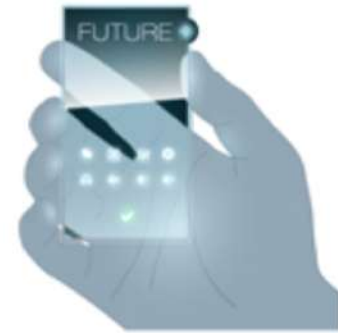
**2G**  
1992



**3G**  
2001



**4G**  
2011



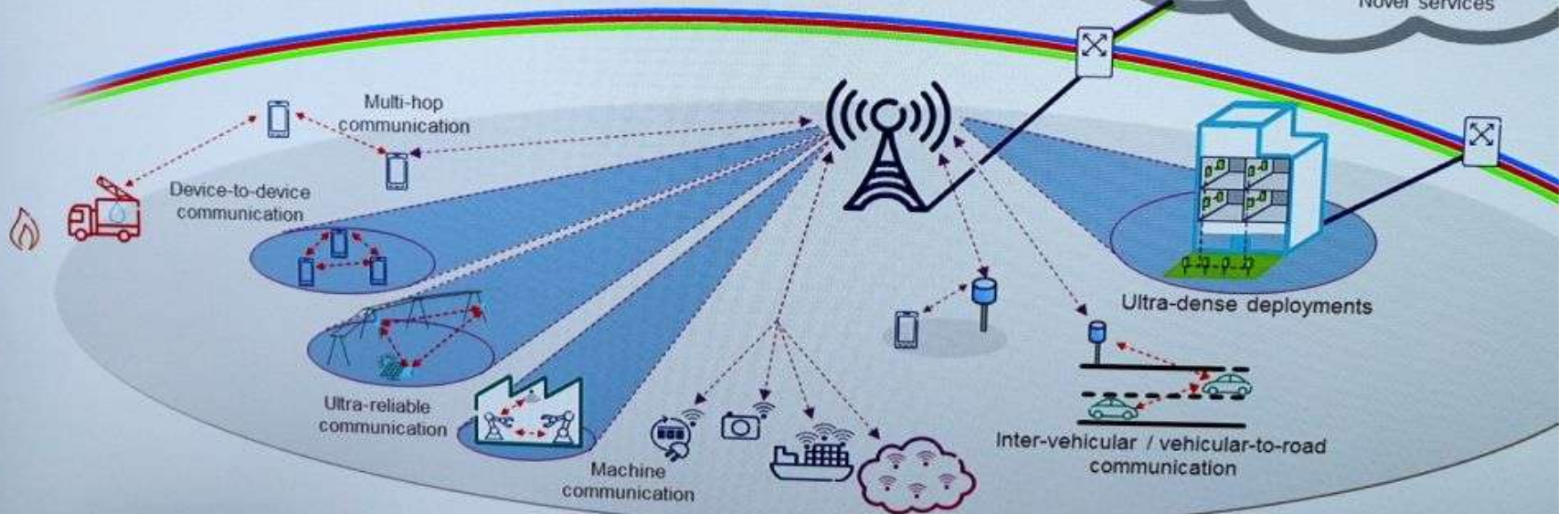
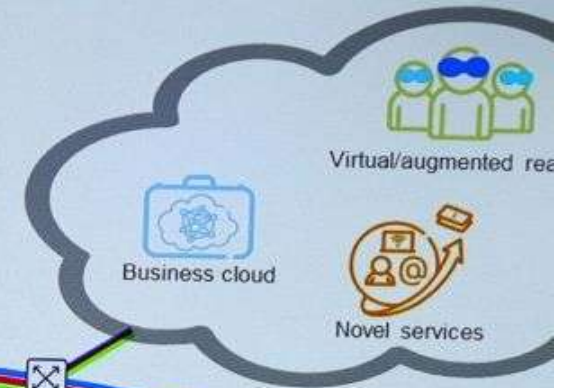
**5G**  
2020



# 5G WIRELESS ACCESS

## 5G WIRELESS ACCESS

[ Multiple Integrated Wireless/Access Solutions  
enabling the long-term Networked Society ]







# FEATURE OF WIRELESS TECHNOLOGY

**Feature of Wireless Technology**

Better Coverage

Consume Low Battery

Cheap Rates

upto 40 MHz

Strong Bandwidth

Multi User MIMO

Radio Telephone

1G

Analog Telephone

2G

SMS Service

3G

Video Call

4G

LTE High Speed

5G

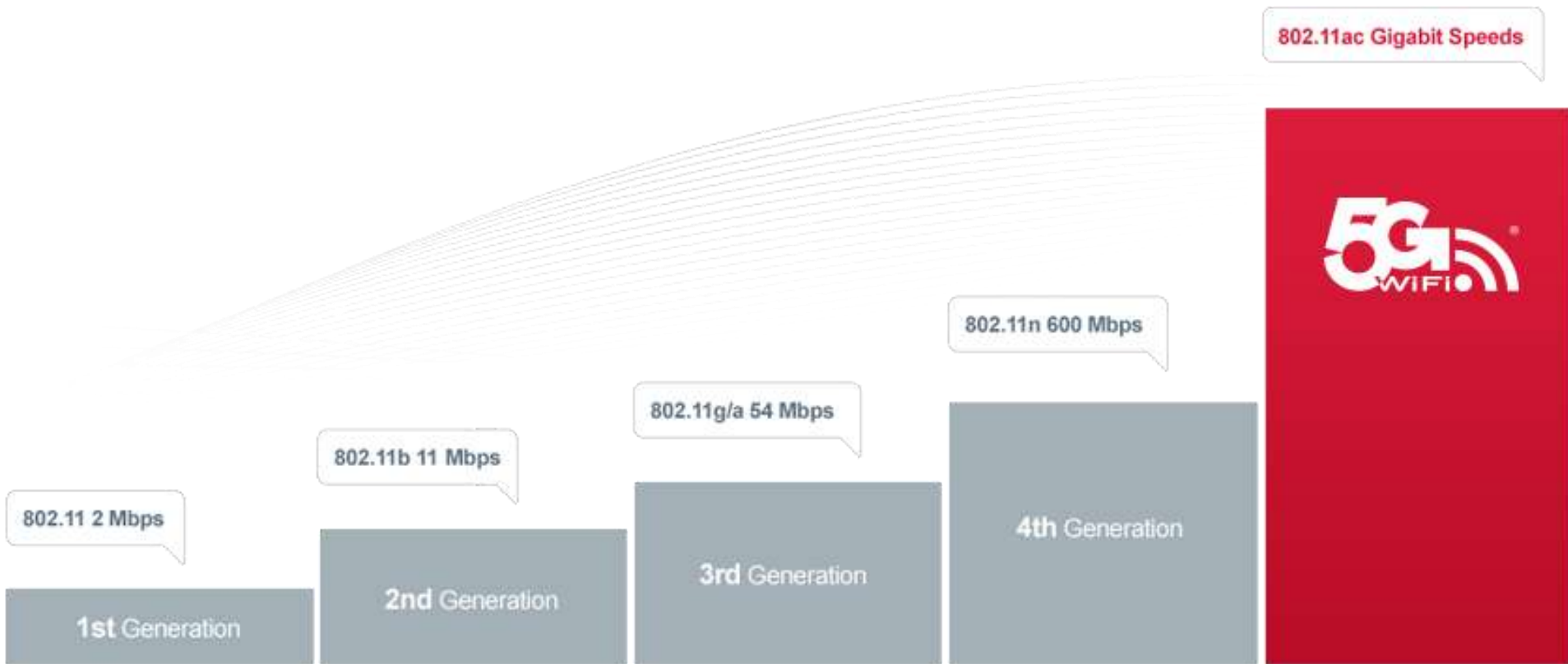






# COMPARISON OF 1G TO 5G TECHNOLOGIES

Technology	1G	2G/2.5G	3G	4G	5G
Deployment	1970/1984	1980/1999	1990/2002	2000/2010	2014/2015
Bandwidth	2kbps	14-64kbps	2mbps	200mbps	>1gbps
Technology	Analog cellular	Digital cellular	Broadbandwidth/ cdma/ip technology	Unified ip &seamless combo of LAN/WAN/WLAN/PA N	4G+WWWW
Service	Mobile telephony	Digital voice,short messaging	Integrated high quality audio, video & data	Dynamic information access, variable devices	Dynamic information access, variable devices with AI capabilities
Multiplexing	FDMA	TDMA/CDMA	CDMA	CDMA	CDMA
Switching	Circuit	Circuit/circuit for access network&air interface	Packet except for air interface	All packet	All packet
Core network	PSTN	PSTN	Packet network	Internet	Internet
Handoff	Horizontal	Horizontal	Horizontal	Horizontal&V ertical	Horizontal&V ertical





# WIRELESS APPLICATIONS

◆ **Wireless applications are those which we use free space as the transmission medium & do not involve cabling like fibre or copper cables.**





# WIRELESS SERVICES

**Wireless solution for:**

❖ **Business and Industry**

❖ **Schools , Colleges**

❖ **Doctors , Pilots**

❖ **Police and Vehicles etc**





- **All totally the best way to help all users is to use 5G as the next wireless system and in totally it is safety and secure for public, this the need that demands the solution.**
- **Today's wired society is going wireless and if it has problem, 5G is answer.**
- **5G technology is going to give tough competition to Computers and Laptops.**
- **It will be available in the market 2020 at affordable cost with more reliability than previous mobiles.**

THANK  
YOU



