

Assignment No 9

Title: Case study of cellular Network

Problem Statement: Case Study: Evolution of cellular Networks all the way upto 7G

Theory-

Wireless Communication: In transfer of information over a distance without use of physical conductors or wires. The distance may be short (a few meter: TV remote control) or long (thousands or millions of kilometers for radio communication).

There are several generations ~~so~~. Key Benefits are:

1. Require minimal bandwidth & enhance customer satisfaction
2. Wireless networks are cheaper to install & setup as compared to wired Networks.
3. Duplexing allowing users to send & ~~also~~ receive info. at the same time, through a single radio link.

- Zero Generation Technology (0G - 0.5G)

In pre-call days, mobile operator setup calls & there were only handful of channel available. mobile radio telephone systems preceded modern cellular mobile telephony technology.

→ 1st Generation Technology or 1G (1-G)

It is first generation wireless telephony technology.

These were analog cell phone technologies that were introduced in the 1980s. A voice call gets modulated to higher frequency of about 150 MHz & is transmitted between radio towers with the help of 1G.

Features of 1st generation :-

Generation	1G (1970 - 84)
Frequency	800 - 900 MHz
Data Capacity	2 KBPs
Technology	Analog wireless

3. 2nd generation Technology :-

2G was first introduced by end of 1980s. This generation uses completely digital multiple access of technology, TDMA (Time Division Multiple Access) & CDMA (Code Division Multiple Access).

Features of 2G, 2.5G & 2.75G.

4. 3rd generation Technology (3G - 3.75G)

3G is third generation of mobile phone standards & technology, superseding 2G & preceding 4G. It is based on ITU family of standard under IMT-2000.

Features of 3G, 3.5G & 3.75G.

	3G	3.5G	3.75G
→ Generation	3G	3.5G	3.75G
→ Starts from	2001	2003	2003
→ Frequency	1.6 - 2.5 GHz	1.6 - 2.5 GHz	1.6 - 2.5
→ Data Capacity	284 KBps	2 Mbps	30 Mbps
→ Technology	Broadband	45M / 3 app.	

5. Fourth Generation Technology (4G)

It is successor to 3G. It is network that combines internet technology with Wifi & Wi-Max.

Features of 4G

Generation	4G
starts from	2010
Frequency	2-8 GHz
Data Capacity	200 MBps - 1 Gbps
Technology	Wi-Max
Standard	IP-Broadband
Multiplexing	
Switching	
Main W/W	
Hands off	

6. Fifth generation

5G (fifth generation Mobile & wireless network) can be complete wireless communication without limitation. It succeeds 4G, 3G & 2G for high level of performance. Data rate of 20 Mbps & freq band of 2-8 GHz.

7. Sixth generation

6G uses an air filter technology with transceiver. It will be best to broadcast secured info. 6G integrates satellite to get global coverage. It is developed by 4 countries GPS by USA, COMPASS by China, Galileo system by EU & glonass system by Russia.

RUSSTA⑧ Seventh generation:

7G is like 6G for global coverage. It is more advanced generation in mobile communication but there will be some researches on demanding issues like use of mobile phone during moving condition from one country to another because satellite is also moving in constant speed & in specific orbit.

Conclusion:

Thus in this assignment, I have learnt evolution of cellular networks from zero generation to seventh generation.