

AUS Repository

5G Networks

Item Type	Project
Authors	Al-Nasla, Fahed;Almeadat, Haneen;Fernandes, Sheehan;Chehimi, Alaa
Download date	2024-12-03 10:51:07
Link to Item	http://hdl.handle.net/11073/7715

5G Networks

Fahed Al-Nasla (MCE)

Haneen Almeadat (CVE)

Sheehan Fernandes (ELE)

Alaa Chehimi (CHE)

Situation

. Importance of Mobile Networks in the 21st Century

. Development of Mobile Networks

1G<2G<3G<4G<5G

. What are 5G Networks?

The are the next generation of mobile networks based on MiMo (Multiple input Multiple output) Technology.[2]

. 5G networks:

High Speeds (up to 100 Gb/s)

Large Capacities (100 times greater than 4G)

Evaluation

. 5G aims in providing flexible fast and low latency services in modern cities

. Influences the economy

. Aims to enhance the person-machine interaction

. Highly secured

. Users can be better and faster solutions through remote management [1]

. Establishes smart cities

Problem

. Keep up with the needs of the suppliers and demanders

. Issues occurring due to 4G:

- Speed
- Capacity
- Appearance
- Range
- Latency Rate
- Limitations
- Security

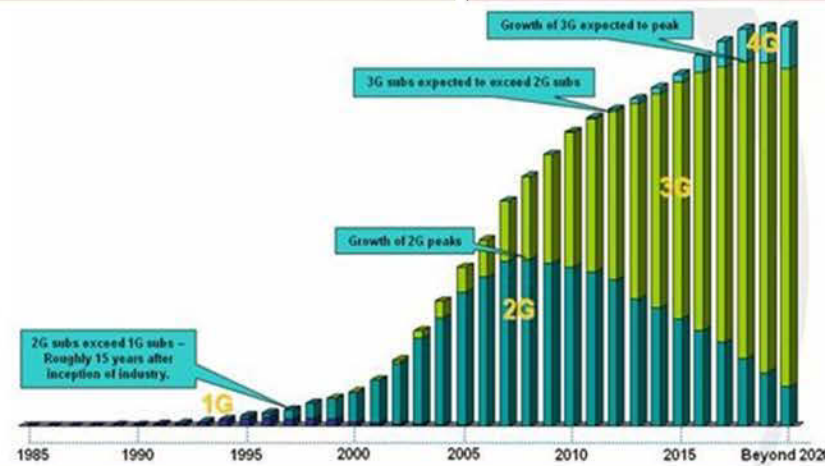


Figure [3] - Cellular Generations

References

- [1]Slanina, M.; Klozar, L.; Hanus, S. "Practical measurement of data throughput in LTE network depending on physical layer parameters", Radioelektronika (RADIOELEKTRONIKA), 2014 24th International Conference, On page(s): 1 - 4
- [2]Hossain, E.; Rasti, M.; Tabassum, H.; Abdelnasser, A., "Evolution toward 5G multi-tier cellular wireless networks: An interference management perspective," Wireless Communications, IEEE , vol.21, no.3, pp.118,127, June 2014
doi: 10.1109/WMC.2014.6845056
- [3] Sling Broadband December 19th, 2011 "5g.png(figure 1)" [online]. Sling Broadband: <http://slingbroadband.com/wp/the-operators-dilemma-3g-4g-5g-what-to-deploy-and-when> (December 4,2014).

Solutions

- . Faster download and upload speed using cloud storage services
- . Low end to end latency rate (2ms to 5ms) which is extremely beneficial in algorithm trading [2]
- . Flexibility and high speeds make ultra high definition visual communications possible (4K resolution)
- . As large number of devices can be connected to the network it will provide a basis towards building a smart city. Fitting a GSM and GPS modules, traffic and speed of vehicles can be monitored through network. Lights, A/C thermostat can be controlled through applications on mobile devices.

- EASY TO IMPLEMENT
- 90% ENERGY SAVING PER PROVIDED SERVICE
- 10% LONGER BATTERY LIFE
- 5X LOWER END-TO-END LATENCY
- 100 BILLION OF CONNECTIONS
- TRUE IMMERSIVE EXPERIENCE

Figure [2] - 5G Solutions



Figure [1] - Smart City