

A Study of the 3g, 4g and 5g Mobile Networks Speed and Coverage

Abstract

The Individual Project paper discusses and tests mobile networks, the aim of the project is to research 3g, 4g and 5g mobile networks to show how the networks operate in ranging environments.

The network parameters that are being tested are download speed, upload speed, jitter, and latency. These parameters were chosen as they can show the speed and coverage capabilities of the different networks in different environments.

Objectives

To complete the aim of the project these objectives were made for the researcher to follow.

- The first objective of the Individual Project is to provide background information on 3g, 4g and 5g mobile networks.
- The second objective will be an investigation, the coverage speed and distance of each of the mobile networks will be tested in different areas of Wales
- The third objective is to test the 3g, 4g and 5g mobile networks using a mobile phone in a real-life scenario. The test will include testing download speed, upload speed, jitter, and latency on each network
- The fourth objective of the Individual Project is to outline which mobile network performed the best in the location where it was tested. Figures generated from the experiment will be shown to determine the differences in the speed and coverage.

Research Review

To summarise the findings from the research that was completed as part of the literature. The Research outlined the background information on the networks along with explanations on the features and functions on the networks operations.

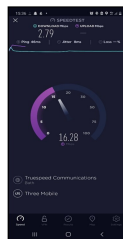
A couple of research papers carried out research tests into the speed capabilities of the networks in question. These tests were then used to compare with the findings from this experiment and they agreed with the findings from this experiment.

Experiment Design

The network technologies to be analysed are 3g, 4g and 5g mobile networks. The experiment required travelling to specific locations in the South Wales area and testing the networks. The parameters of the network that are tested are Upload Speed, Download Speed, Jitter and Latency. These parameters will be tested by the two applications OpenSignal and Speed Test.



On the left is a screenshot of the OpenSignal app in use.



On the left is a screenshot of the SpeedTest app in use.

The three areas that were chosen to complete the experiment were the IQ building car park, Swansea Uplands and Morfa shopping park. These specific locations were chosen as they show a range of different size networks from large to small.

Experiment Findings

The averages for all network parameters in each location were calculated to show the differences between the network speed and coverage capabilities. Red Bar represents 5g, Yellow bar for 4g and Green bar for 3g.



These graphs clearly show the differences between the networks speed capabilities and how well each network can handle delay of traffic that is travelling through the network.

Conclusion

In conclusion from the graphs shown in the experiment findings section above we can see that the 5g has much higher speed capacity compared to the 4g and 3g as well as being able to handle traffic delay better.

Recommendations that can be made using this research is as long as the user of the network has the capability to use the 5g network this should be done as it will provide the user with much quicker access to online resources such as social media and video streaming.