EFFECTED VOIP SERVICE BY MEANS SUBJECTIVE METHOD USING MOS IN LTE NETWORK

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Background

With exponential increase in the volumes of video traffic in cellular net-works, there is an increasing need for optimizing the quality of voice delivery. **4G networks** (Long Term Evolution – Advanced or LTE-A) are being introduced in many countries worldwide, which allow a downlink speed of upto 1 Gbps and uplink of 100 Mbps over a single base station. This makes a strong push towards voice broadcasting over LTE networks, characterizing its performance and developing metrics which can be deployed to provide user feedback of voice quality and feed-back them to network operators to fine-tune the network.

Aim of the work

Characterize the performance of voice transmission over LTE-network and study user perceived quality of service for mobile VOIP in term mean opinion score (MOS) using effected codec for different bandwidth.

Simulations And Result

To directly monitor/assess voice quality → **Non-intrusive Techniques**

Such techniques either use → **Degraded Signal (E-model)**

→ **Network parameters (delay, jitter, packet loss, codec ...etc).**

The mean rating, averaged over all test participants and stimuli reflecting the same circuit condition, is then called a mean opinion score (MOS).and an average S-shaped relationship is defined between the *R*-scale (range [0;100]) and MOS ratings (range [1;4.5]) collected from "average" test participants in an "average" experimental setting

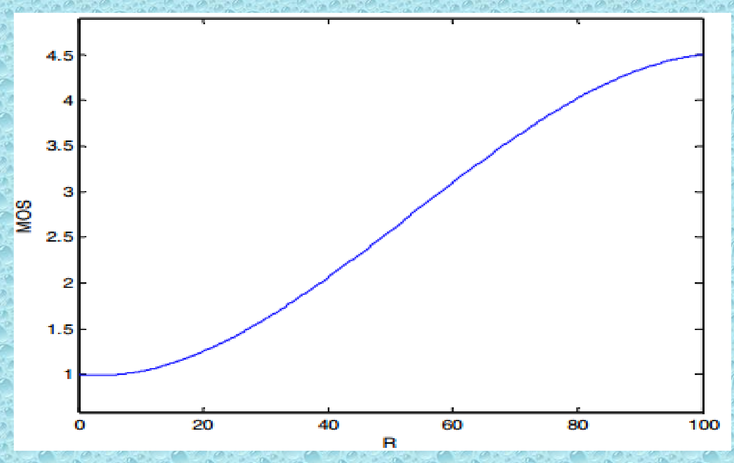

Figure 1 Relationship between MOS values and R values

Table 1 Simulation Results (MOS values)

VoIP Codec	System Bandwidth	
	(MOS) in 1.4 MHz	(MOS) in 20 MHz
GSM FR	2.51	3.49
G.729 A	3.02	3.03
G.723.1 5.3K	2.51	2.51
G.711	3.64	4.64

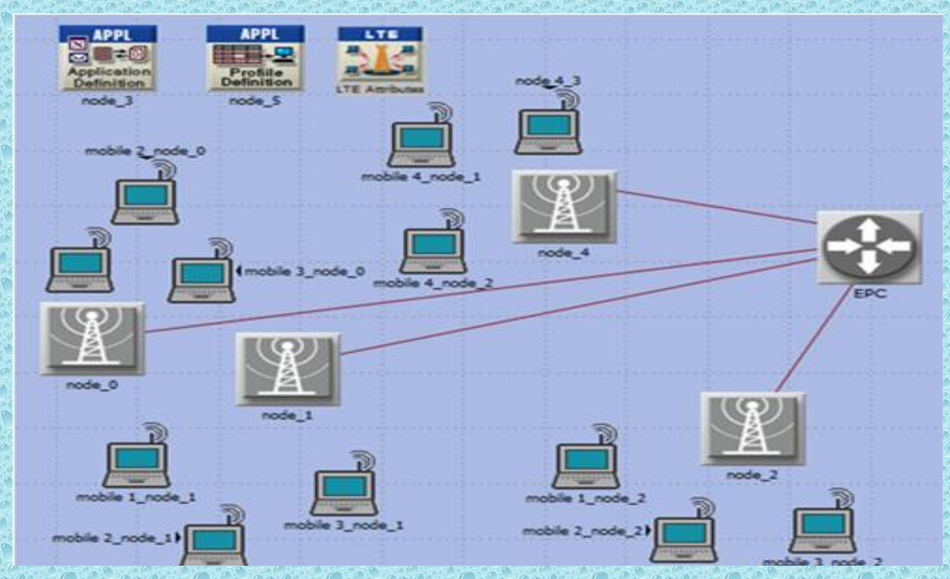

Figure 2 simulation design

The simulation results for LTE network show that MOS changed for each codec with 1.4 MHz and 20 MHz, which means when increasing the bit rate according to the type of codec, will lead to an increase MOS in the network

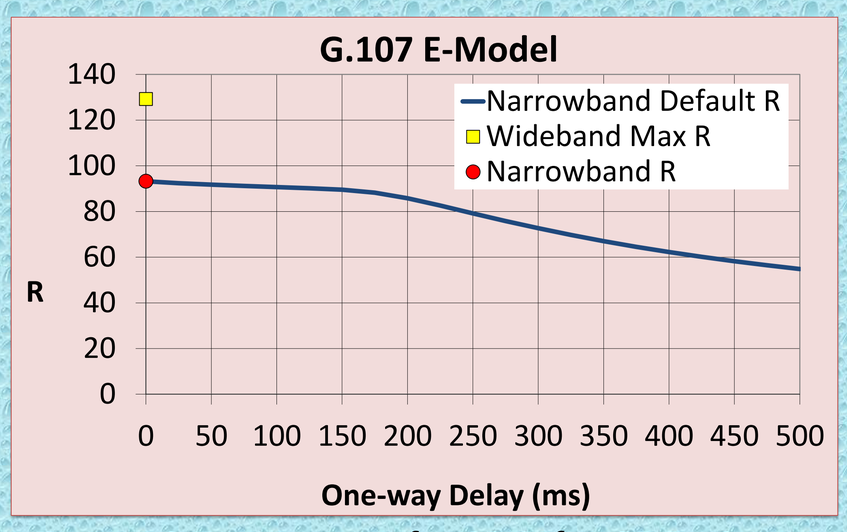

Figure 2 Rating transfer 93.2 for SLR=8

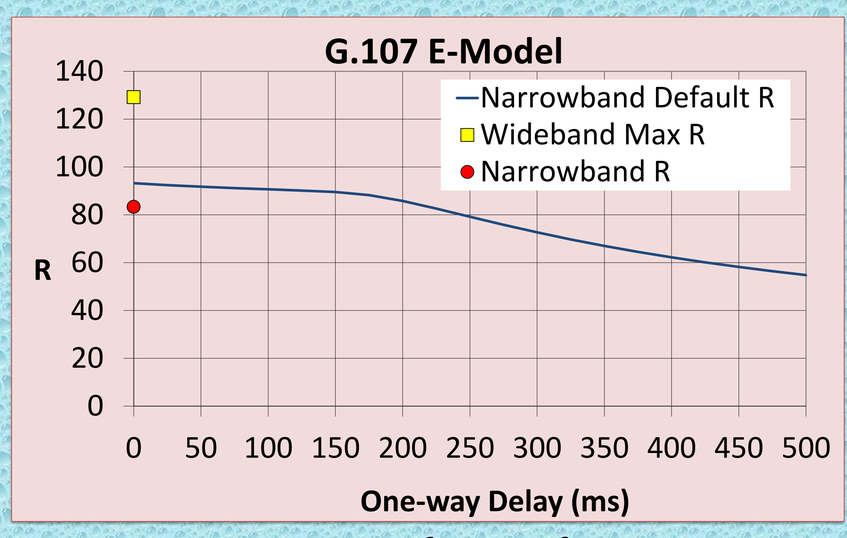

Figure 3 Rating transfer 83.3for SLR=15

Conclusions

Changing SLR from 8 to 15 lead to change in R from 93.2 as default to 83.3 and MOS change from 4.409421 to 4.143209 respectively this effect on network therefore; to perform a good quality in voice the rating transfer must raised and a minimum delay should be considered in a signal which represent one of the parameters which was simulated and modeled in the current work from E-model.

Simulation results for LTE network show that MOS change according to the change in each codec with 1.4 MHz and 20 MHz which mean when increasing bit rate according to the type of codec will leads to an increase in the MOS in network.

References

[1] G.107 ITU-T. The E-Model, A Computation Model for Use in Transmission Planning, 2005.

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