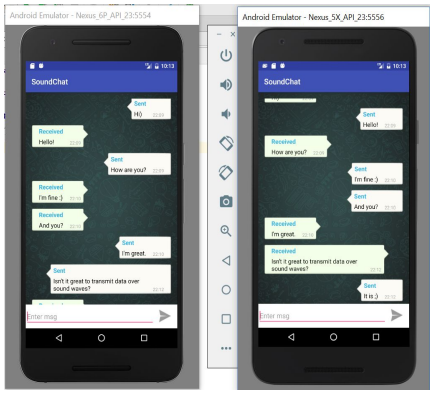

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12th February 2017

Data Over Sound Proof of Concept

Introduction

Over the year, data has been transferred from mobile devices using known technology like Bluetooth, Wi-Fi Direct, NFC etc. which does not use the internet. In 2015, Mark Zuckerberg had promised that internet.org initiative will help deliver cheap and affordable broadband services to rural communities in Africa via a satellite.Sending information in the most affordable way has been a growing concern in some remote areas in Africa with a mobile phone penetration of about sixty seven per cent (67%) of Africa's population, estimated to be about 1.13 billion, now having a mobile phones.

Due to the to the unreliability of internet services especially in developing countries and rural areas, voice channels (sound) can be used for the transmission of data. We explored this possibility in a Proof of Concept Android Chat application that uses sound waves for the transmission of data between two android devices.

Implementation

The data was converted to bits and encoded in the sound wave by modulating its phase. On the receiving end, the sound waves are demodulated back to bits. The sound waves is broadcast twice to check for data integrity. Additionally, at the start and end of each broadcast, an agreed synchronization sound is broadcasted to signal the start and end of the data.

Conclusion

While this Proof of Concept application uses the external speakers and mic to send and receive sound, it is possible to transmit the sound waves over the voice channel of a rooted Android phone. In addition, while the application is limited by the amount of data that can be transmitted in a single broadcast, it is possible to remove this limitation and allow unlimited data transmission.
The future work will involve allowing unlimited data transfer over sound for all files types and data transmission over the voice channel of an Android phone.

This project is available on GitHub: https://github.com/medalionk/sound_chat

License: Apache License

References

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