FINAL REPORT

Topic title	Audio-based probing of the environment		
Group ID	ID - A1 - 8		
Member 1	Dibyojyoti Sanyal	**Matr. Nr.**	2688349
Member 2	Anirban Chatterjee	**Matr. Nr.**	2391571
Member 3	Pranay Sarkar	**Matr. Nr.**	2337328

1. Which of your initial goals did you achieve? Please describe the outcomes of your project.

1. The app uses wifi-direct with service discovery. App have 2 modes, a. Server mode - which passively awaits for clients running the app and if client tries to make a connection and the connection is established then it goes to 3 way handshake mode. If one client is already connected to the server it rejects other clients by terminating the 3 way handshake. Sever starts recording sound in lossless format after the connection establishment and saves it in server_id_client_id.flac format. It should be noted tht we have used android device ID to uniquely identify the servers and clients. If server sends busy tag then the client tries again after 2 seconds. b. Client Mode - which actively searches for servers, it adds the server to its server list and tries to make P2P connection and if the connection is sucessful, it goes to 3 way handshake mode. If done sucessfully, client plays the sound after the connection establishment. If client fails in any step mentioned before then it tries to reconnect to the server all over again. It should be noted that, WiFi direct pairing request have to be manually accepted both by client as well as server.

2. If applicable to your topic, what were your evaluation results?

We have tested our app with 3 devices. 1 device working in client mode and other 2 devices are working in server mode. After we turned on the servers, the client chooses one of them randomly and connects. After sucessful connection client starts playing the sound which server records and after sucessful playing & recording, the connection closes between them. Then the client connects to another server and performs the same set of tasks. We can get the recorded files from SD card, where it is stored.

3. Did you follow the initial plan or did you need to make changes? Please provide a short description of the tasks each group member carried out.

As per our initial plan we tried to implement the app with wifi service discovery, where client, after discovering server service tries to bind itself to the sever using bindservice(), and call and send messages using message handler. But we came to know that binding another service is possible only if both services are running in the same device but in different apps or process. Thus that scenario failed. So went to the aporoach where after discovering the service we established p2pconnection and then when the p2p connection is established, socket connection is established to do the message passing.
We also tried to make a scenario where 2 clients and 1 server is running and both the clients tries to connect to server. This scenario failed because only one of the clients was sucessful to connect to server and after it plays it sound and disconnects, even after that the other client is unsucessful to connect to the server. At that point of time server service is found from other device but it can not connect to the server for some reason which is beyond our knowledge.

4. What were the lessons learnt, both practical and in terms of planning?

1. We tried to use wifi direct with service discovery, but service name, being same on both client and server, did not work out.
2. We learned how to use Android's WiFi direct technology and learnt to use the recorder and media player module of android.
3. We also learnt how to block requests to a specific service if the service is already busy.

5. How would you further develop this project if you were to work on it for another semester?

1. Server and client have to manually accept the initial connection request. This feature can be automated in future.
2.Sometimes, Multi client and multi server scenario fails. The reasons could be due to limited BroadcastReceiver functionality. This issue could be addressed during further iterations in future.