CO324 project 1

Android audio multicast

February 23, 2015

1 Problem description

You will design and build an Android "walkie-talkie' application for voice communication. The application may be used in two modes:

one-to-one full-duplex communication between two devices.

one-to many Broadcast a device's recorded audio to a group.

2 Implementation considerations

The sample application provided demonstrates the use of Android's audio APIs. It records audio to a queue and plays it back. Note the use of a separate thread for audio I/O, otherwise the user interface would become unresponsive!

You will add the networking functionality using UDP multicast. Assume all participants are directly reachable by their IP addresses (no NAT) and, that multicast is available. However, all participants need not be on the same (wireless) LAN or subnet!

3 Design criteria

Pay special consideration to the following criteria when designing your application.

1. Proper definition of application message format.
2. Appropriate logic to handle loss or reordering of messages in transit.
3. Audio and network I/O in separate thread to ensure UI stays responsive.
4. Modular and testable code structure that cleanly separates UI code from application logic.
5. Use of appropriate data structures to simplify your design.

Teams will present and debate their design decisions at a design review session during week 1.

4 Marking

You submission will be marked according to the following criteria.

1. Test of functionality in one-to-one and one-to-many modes[1]: 30%
2. Conformance to criteria given in section 3: 50%
3. A report (5-page maximum) describing the design: 10%.
4. Unit tests for core application logic: 10%.

[1] maximum of three clients

Bonus marks will be awarded for creative features or clever implementation[2]. However, you must ensure that the basic functionality works exactly as defined!

Late penalties will apply as per course and department policy. **Remember that plagiarism gets you zero!**

5 Tips

- Clean modular code will let you do most of the testing on the Android emulator, speeding up development.
- Familiarise yourself with Android's logging facilities, to ease debugging.
- Learn to use the SDK command-line tools for quicker deployment and testing
- Don't waste time on the UI!

[2] A fancy UI will NOT earn you bonus marks!