# Project proposal:
# Group chat for Linphone
# (Agile DO-178)

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*and the*

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# Scope

The purpose of this project is to extend Linphone's Instant Messaging (IM) implementation on Android platforms to include group chat and to implement other minor improvements to Linphones IM capabilities and user interface.

This project will give the student group exposure to:

- Android development (Java and C)
- Open source contribution
- Cryptography
- Session initiation protocol (SIP)
- DO-178 certification

This project also forms part of a larger Masters study on development methodologies for projects seeking DO-178 certification.

# Background

Instant messaging (IM) applications have gained wide spread adoption in the market, especially the leaders in the field namely Whatsapp and WeChat. Linphone is the leading open source implementation of Voice over IP (VoIP) and IM functionalities, and is compatible with iOS, Android, Blackberry, Windows Phone, Windows desktop and web browser clients. Even so, Linphone's IM implementation lacks some of the functionality present in closed source competitor offerings.

# Problem statement

The students are required to develop the following functionality for the Linphone project

- Group chat (Invite additional members to a chat, all members receive chats)
- Secure group chat (AES256)
    - A basic message encryption implementation will be provided
- Creation and deletion of groups
- Voice record and send over IM
- Rework the messaging user interface
    - Spacing between words are terrible
    - Make the text bigger
    - Block indents required to better specify who said what
    - Presence indication to show a remote user is typing
    - User picture portraits

# Developmental requirements

All development will be based off the Linphone project:



http://www.linphone.org/

Development will be done in a Linux environment, using the Eclipse IDE and the Android Developer Tools (ADT) plugin. Students are required to provide their own laptops to do the development on.

Students will each be provided with a Zest T1 Android phone (https://www.zestmobile.net/) to do the development on.  The phone remains the property of Nanoteq and must be returned at the end of the project.



Furthermore the students will be required to generate additional deliverables to satisfy DO-178 requirements.

# Deliverables

- Source code and build instructions.
- DO-178 deliverables as specified by the supplied Plan for Software Aspects of Certification (PSAC) and Software Development Plan (SDP).
- A demonstration of developed features.
- A pull request to the Linphone maintainer for the inclusion of the developed code into the Linphone project.

# Intellectual ownership

The aim is to open-source the project which would be published on Github as forked from Linphone project. To this end the required permissions will be sought from the University.

# Masters study

As stated this project will form part of a masters study. For this project you will be required to follow an agile development methodology i.e. SCRUM + TDD + CI + CD.

You will be guided by Mr. Kobus Coetzee on a weekly basis on how to approach and complete your project. This guidance will take the form of emails and in person meetings when appropriate.

Agile development is a preferred software development methodology where risks are not known or feature creep is expected.