

SIP/VoIP Based Mobile Calling Application



About the Client

The client is a market leader in innovation, technological design and development of integrated systems specifically featuring videos and audio intercom, emergency help point and public address systems. The communications solutions developed are most suited to commercial applications where security, safety and information provision is vital.

Client's Product Offerings

To build a basic app for in-house SIP (Session Initiation Protocol) based communication where users can make VoIP calls via mobile. The mobile app (available on iOS and Android platforms), communicates with client's SIP based intercom devices using both audio and video modes. The application registers with Asterisk server configured over local network and initializes itself as a communication point. The application can handle different phone calling events like hold/unhold, mute/unmute or loudspeaker. The application supports incoming calls even when it is locked.

Key Challenges

- In-house Asterisk server setup and configuration to build SIP based VoIP solution
- PJSIP C language library to be compiled and configured for various architecture features and usage with iOS and Android platform
- Seamless communication with intercom devices along with audio and video sync
- Handling network connectivity issues and call drop scenarios
- Maintaining voice and video quality when connecting with different devices
- Implementing CallKit API to handle calls received while application is in background and even enabling users to receive calls on lock screen (iOS 10 and above)

Solution Approach & Methodology

PSI developed the proof of concept (POC) natively using XCODE and Android Studio as development platform, with Objective C and Java as development language. We developed the solution on Model View Controller based approach to ensure reusability with best definitions of all the interfaces. Storyboards with auto-layout based approach were used for UI to ensure that the design works with multiple iOS screens. Core data was used to ensure seamless integration of the client side data layer with UI components.

Key Highlights of the Approach

- 1 PSI team created PJSIP library in different OS architecture and combine them to create fat library
- 2 The opus codec and h264 codec were compiled and configured with PJSIP library for high quality audio and video calling
- 3 TCP transport mode was enabled at asterisk server to implement background calls on device
- 4 Developed custom dial plans for application's specific requirements
- 5 Push notification and iOS CallKit were integrated to notify device for calls and handle call events in application background and terminate state

Achievements

- Achieved complex UI Integration for Audio and Video call functionality
- Hosted phone calling events like hold/unhold, mute/unmute or loudspeaker
- Handled call sessions in app's terminate/background state by integrating CallKit framework
- Handled network connectivity issues for irregular mobile connectivity
- Handled background calls, specifically in iOS using CallKit and VoIP notifications

Technology Deployed

Framework	: PJSIP Lib, iOS SDK, Android SDK, NDK
Presentation Tier Frameworks	: iOS app. using Objective C, Android app using JAVA
Servers	: Asterisk Server, Apache Server
Database	: Key-store for user specific data
Operating Systems	: iOS, Android
Development Tools	: Xcode, Android Studio
Design Tools	: Storyboards, Photoshop for design slicing wherever required

Project Highlights

Client	Market leader in design and manufacturing of Integrated Communication Systems
Location	Australia
Industry	IP Communication System
Duration	2 months
Team Size	4
Delivery Model	Offshore
Engagement Model	Turnkey

About PSI

Pratham Software (PSI) is a global IT services company (with established ISO 9001:2015 & ISO/IEC 27001:2013 practices) providing software product development, consulting and outsourcing solutions to enterprises worldwide. While providing a wide range of solutions, we focus on Outsourced Product Development (OPD), Business Process Management (BPM), Application Development and Maintenance (AMD) and Content Engineering. Our extensive experience in OPD helps us build strong relationships with Independent Software Vendors (ISVs), as we work with them throughout the product development lifecycle. In terms of technology and platform, we work across all major technologies such as Microsoft, Java and Open source and have capabilities and experience in developing solutions for web, mobile, Cloud and social media. For Enterprise customers, in addition to Process Automation, we also offer development and support services in BI and DWH.

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