ABC SBC: Mobile Subscriber Support

FRAFOS GmbH

Introduction

Applications supporting mobile VoIP are such as Viper or Skype increasingly becoming the default communication means for mobile users. Affordable flat rate plans and powerful and easy to use smart phones have driven this trend. With support for exchanging text and pictures as well as video communication these applications offer a wider range of features than plain telephony services.

A major problem with mobile VoIP applications is that they need to be active to be able to receive an incoming call. This would, however, drain the phone's battery. Hence, when a VoIP application is not used it is put into inactive mode. In this mode, the application does not consume battery but also cannot receive incoming requests and cannot update its registration status.

If a subscriber's registration is not updated periodically the registrar will at some point delete it and the service provider will cease to have any information about the location, e.g. the currently used IP address, of the user. In case a user is behind a Network Address Translator (NAT) then the regular registration requests are also used to keep a NAT binding for this user open. This NAT binding is used by the operator to forward incoming calls to the user.

In order to avoid having to keep the VoIP application active all the time but still ensure that the user is reachable, providers of smart phone operating systems offer a push notification service. When a certain application at a smart phone is to be contacted a push notification service is used to wake up the application on the mobile.

For Android devices, this is the C2DM (Cloud to Device Messaging Framework) service, for mobile IOS (iPhone/iPod/iPad) devices it is the Apple Notification Service (APNS). Both services are used through an API at Google's respectively Apple's servers.

Mobile Subscriber Support with the ABC SBC

The ABC SBC enables VoIP service providers to support mobile users using any SIP-based mobile VoIP application that supports the C2DM service on Android.
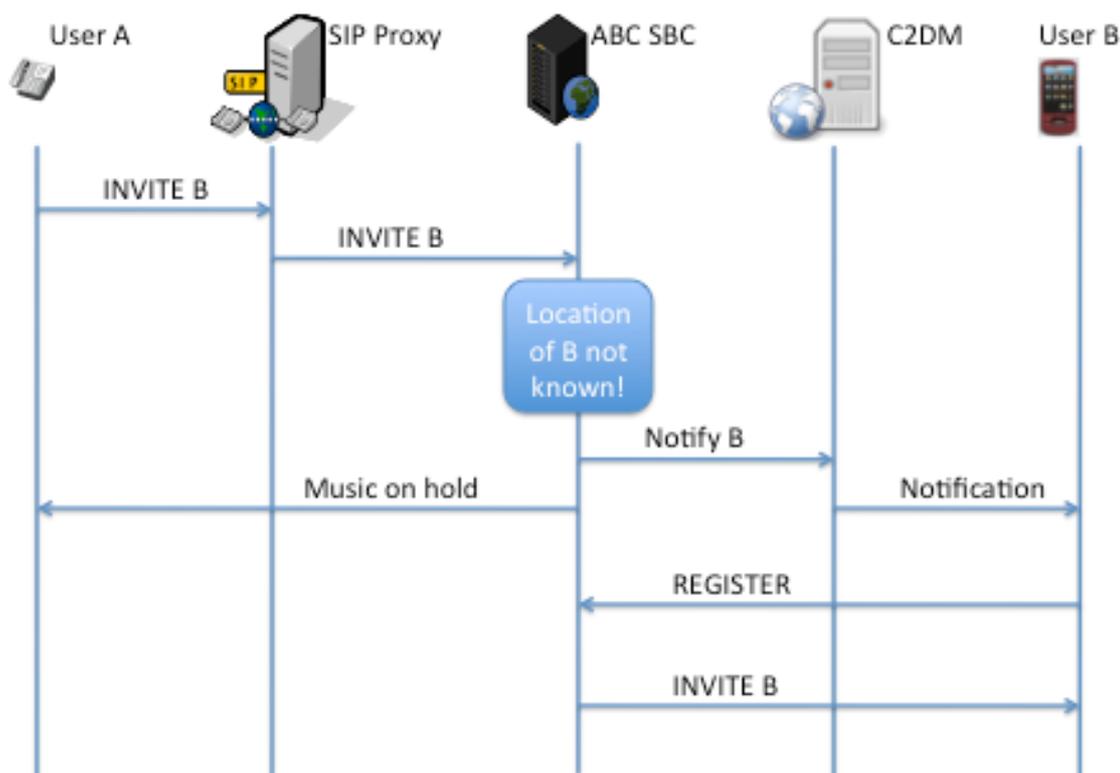

Figure 1 Mobile user notification

As depicted in Figure 1 once the ABC SBC receives an invitation for a user for which no registration information can be found, the ABC SBC contacts the C2DM service and asks to notify the subscriber's application. Once the subscriber's application receives the notification it becomes active and sends a registration request to the VoIP service provider. The registration request contains the subscriber's location information and opens a NAT port through which the subscriber can be contacted. Once the subscriber is registered at the VoIP service provider, the call can be forwarded to the subscriber. The process of contacting the C2DM platform and activating the user's application can consume some time. This might cause caller to just give up if he does not hear a ringing tone from the callee. To avoid this scenario the ABC SBC can play some music on hold or an

announcement that the call is in progress.

Summary

In summary the ABC SBC implements the following features needed for supporting mobile subscribers:

- Interface to the C2DM service for sending notifications to the subscribers

- Playing music on hold or announcement to the callers to indicate that the call is in progress

- Monitoring the registration state of users by subscribing to the registrar according to RFC3265 for the Event Package for Registrations defined in RFC3680.

VoIP service providers deploying the mobile subscriber support package of the ABC SBC increase their target customers to include mobile users. Mobile users can subscribe to any VoIP provider deploying the FRAFOS solution and use their preferred VoIP mobile application.

Technical Specifications

Supported Platforms	High Availability
Linux	Active/Hot Standby redundancy model

WebRTC Features	QoS Control
Javascript SIP over WebSocket NAT traversal using ICE, TURN, STUN JsSIP support	Bandwidth limitation and management Call admission control per peering partner/trunk

Media Services	Call Routing
Routing audio codec including G.711 and OPUS. Routing of video codec including VP8 Dynamic jitter control NAT/NAPT on media RTP inactivity monitoring Codec filtering	Call blocking and filtering Embedded routing engine Load balancing Peer monitoring and availability detection Alternative routing on failure Table based routing for LCA

Media Applications	SIP
Call recording Announcement services Software based transcoding (G711u/a, G726, OPUS, iLBC, L16, G722, Speex; on request: G729a, G729a/b, AMR)	Registration pass-through Registration caching and offload SIP header manipulation SIP Back2Back UA

Management Capabilities	Protocol Support
GUI based configuration and monitoring Secure embedded web-based GUI SSH access SNMP V2 status and logs Local logging of alarms, events and statistics REST and XML RPC based open interfaces	UDP, TCP WebSocket Translation between transport protocols Per source/destination transport layer mediation SNMP, NTP, SSHDNS RTP, RTCP, SRTP TLS, DTLS, SDES

Virtualization	Hardware
Amazon cloud Virtualization software OVM, KVM ..	Hardware independent

About FRAFOS

FRAFOS GmbH is a manufacturer of VoIP solutions with offices in Berlin and Prague. FRAFOS was incorporated as privately held company in May 2010, in Berlin, Germany.

The history of FRAFOS team and technology goes back to the late nineties. As researchers at the prestigious German public R&D institute Fraunhofer FOKUS, the FRAFOS founders were the among the first to work the SIP and RTP standards and to develop open source solutions that paved the way for the VoIP revolution.

FRAFOS offers SIP session management and security solutions of the latest generation that come either as a standalone solution or as a cloud ready implementation. The flagship product of FRAFOS, the ABC SBC, offers open interfaces and built in multimedia applications such as recording and announcements. The ABC SBC enables the operators to simplify their service infrastructure and prepares them for future challenges.