

Proposal for Master Thesis in OptiCall Solutions Company

Title: Implementation and provisioning of mobile extensions for telephonic calls.

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Description

The increased demand of people for communication and the great costs of regular telephonic calls created the need of new research for inventing cheaper but of the same quality telephonic calls. A solution came with the usage of GSM Gateways, a device which is consisted of GSM Radio, SIM cards and special software in which all calls into cellular networks can be routed via the gateway instead of via the PSTN (Public Switched Telephone Network). The gateway together with a PBX system can route call traffic in a private network area so costs and additional fees from accessing different telephonic networks are drastically eliminated.

The aim of this master thesis project is to investigate ways for content and subscriber provisioning in a business environment for reducing the time and economical costs of executing and maintaining mobile services in client's mobile devices. The work includes an implementation of a telephonic client in JavaME for making different type of calls namely: direct calls, call-through, call-back and presence services and the investigation of current mobile provisioning methods and the development and/or deployment of such a system for tracking content delivery to customers.

Work Specification

The work specification is defined as:

- Development of a mobile client in JavaME for enabling direct calls, call-through and presence operations in the system.
- Integration of the existing call-back operation in the new JavaME client.
- Investigation and comparison of different solutions for mobile content and subscriber provisioning.
- Deployment of the selected solution or implementation of a prototype.

Services description

A **call-through** is an indirect telecommunication call service which is mainly used for cheaper long distance calls. A client can call someone from abroad using his/her subscription from his/her own country in order to call someone in his/her country and pay a short distance fee. In a more technical detail, the mobile device calls the PBX system which uses the client's local subscription and phone to call the targeted phone as this is depicted in the picture below.

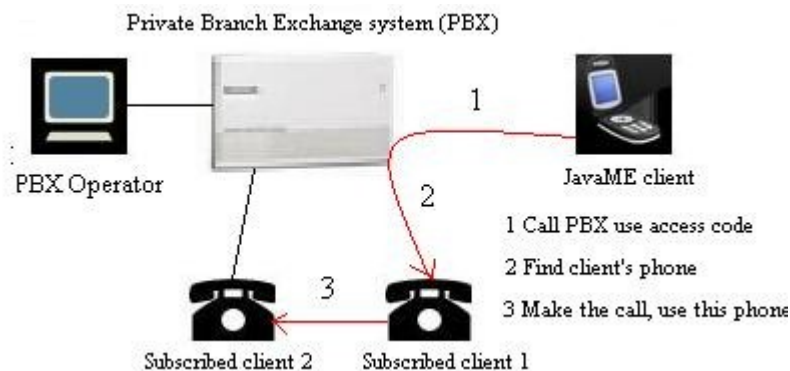


Fig1. Call-through Operation

A **Presence** service is used by a client to set his/her current status of availability towards other calling users. For instance, a client can set his/her status to condition "Lunch time – not available" and the PBX system will send to all users that call this phone number, the indication "Not available" or "Lunch time, call later!". Technically speaking, a client that want to use the service use an activation code, sets the type of condition and the hour that this will start taking effect in a well-defined format and type it to his/her mobile device. For example, a number format can be *23*31600# which indicates the activation code 23 between two asterisk characters, code 3 which indicates a condition taken from a condition list and 1600 which is the service's starting hour.

A **call-back** service is a method of making low-cost international calls. It occurs when the originator of a call is immediately called back in a second call as a response. In order to use a callback service, a subscriber is allocated a unique number in which must first be dialed in order to trigger a return call. On hearing a ringing tone, the subscriber simply hangs up and awaits the callback. On receiving this, usually within a few seconds, the customer picks up the phone and the required number is dialed as this is depicted in the picture below. The existed call-back service will be integrated in the new JavaME client.

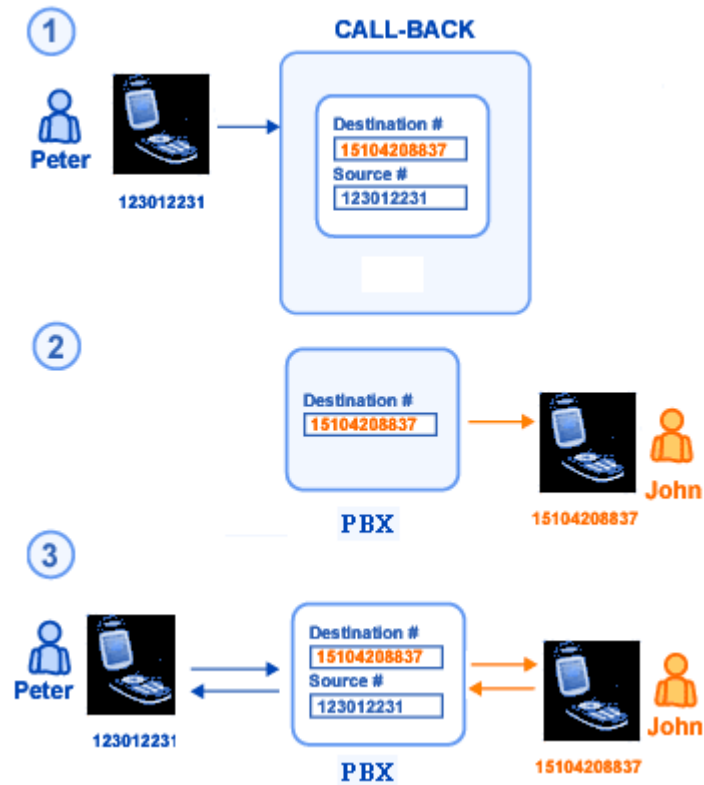


Fig2. Call-back Operation

A **Provisioning system** manages the process of software and devices preparation for content delivery from a company's software distributor server to its customer's client devices by following rules and specifications for stable and safe operations. Here, the provisioning system will be used for distributing the telephonic mobile extension clients to customers' devices by authenticating them and keep track of their requests for installations and deletions for supporting and billing purposes.

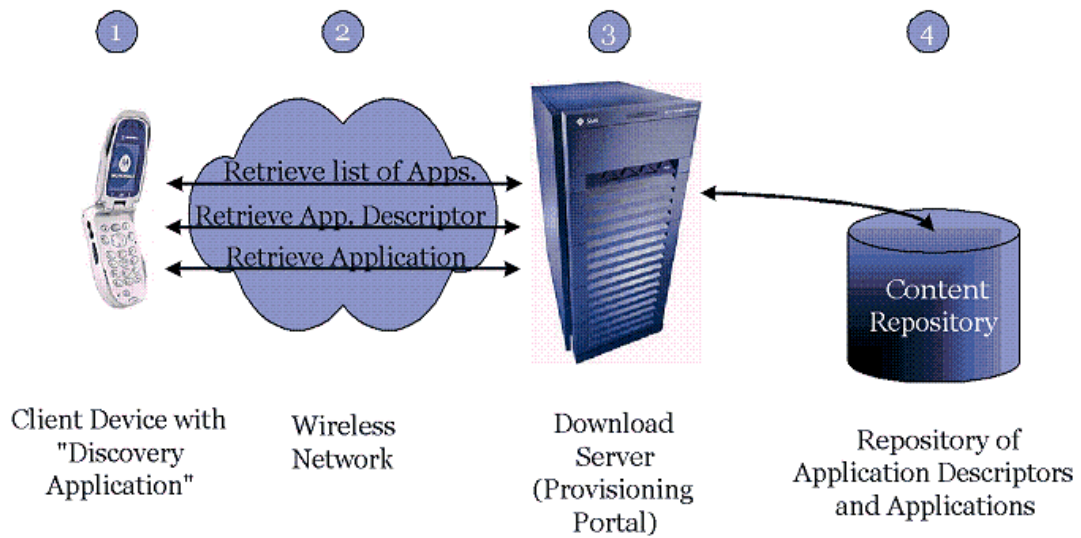


Fig3. Provisioning System

Preliminary Time Plan

<i>Month</i>	<i>May</i>					<i>June</i>					<i>July-August</i>		<i>September</i>				
<i>Week</i>	1	1	2	2	2	2	2	2	2	2	28-34	35	36	37	38	39	
	8	9	0	1	2	3	4	5	6	7							
Pre-study Phase												Vacations					
Specification																	
Working plan																	
Investigation of provisioning systems																	
Experimental Phase																	
Implementation of JavaME client																	
Test of Implementation																	
Enhancements & Modifications																	
Comparison with Symbian client																	
Provisioning System setup & configurations																	
Tests & comparisons with other systems																	

Writing Phase															
Results & Measurements															
Report writing for company															
Report writing for KTH															
Presentation															

Motivation and Subjects of Study

Problem Statement

Is Symbian OS or JavaME programming language more efficient and user friendly for implementing and distributing mobile extensions to customers for telephonic calls?

Telephonic methods

Methods: Direct call, call back, call through, presence service

Topics: Advantages, disadvantages, differences, similarities (?), where to use each call type

Programming languages

Languages: JavaME VS Symbian OS

Topics: User Friendliness, abilities of call manipulation, optional packages needed (?), portability, and devices supported, features limitations (Voice Call Back?), which to use in what way and where...

Evaluation and comparison of Java and Symbian clients for making calls

Topics: Estimate time of implementation, response times for each type of call, friendliness (minimization of # of screens?), installation in different manufacturers' devices, can they look and function exactly the same?

Security

Topic: SSL Certificates for safe content delivery

Mobile Applications Provisioning Specifications

1. JavaME
 - MIDP1 suggests...
 - MIDP2 defines...
 - MIDP3 will add...

2. Symbian OS

Commercial VS Open Source Provisioning Systems

Projects: JVending, Portencross, Open Content Delivery Server, OracleAS Wireless J2ME Provisioning Server, Sun Java System Content Delivery Server

Topics: Advantages, disadvantages, differences, similarities (?), where to use each system. Is it better to develop your own? (!)

Concepts: Security, billing, number of customers supported, MIDlets' tracking. Are there systems that can support both Java and Symbian midlet provisioning?

Evaluation: Response times, number of steps as user and administrator environment friendliness, user and request capacities.

Expected Results

1. Implementation of JavaME client for making calls
2. JavaME client architecture.
3. Response times for both JavaME and Symbian clients for each type of calls
4. Implementation and/or deployment of a content and subscriber provisioning
5. Evaluation of provisioning system.
6. Final answer about suitability of both programming languages to implement clients that make different type of telephonic calls and their mechanism to deliver content to customers.