

EzWeb application over TID SDPLabs: “PII Message Sender”

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I. SHORT USE CASE DESCRIPTION

Telefónica is opening some of its network functionalities to third party companies through a SDP (Service Delivery Platform) exposing a number of open APIs (SOAP and REST based) that can be used by companies and developers to build a new generation of telecommunication enabled applications and services. The TID SDPLabs is an environment meant for development and experimentation, which can be offered to third parties companies and developers around the world to develop their applications in an environment that offers real and simulated core telecommunication network capabilities. A third party company using the testbed TID SDPLabs will be able to make use of the following initial set of Telefónica’s network capabilities: Messaging, Contacts and Presence.

The use case presented in this paper consists in accessing the Telefónica’s SDP SMS capability through the Panlab infrastructure [1] to allow the customer to make use of this capability to develop its own customised applications. In the present case, an open and standard Web platform called EzWeb [2] is presented as an example of third party application that makes use of the SMS capability exposed by TID SDPLabs. EzWeb is a Web Platform that allows the user to create his own work environment by selecting, configuring, combining and interconnecting the available mini applications (gadgets), in a new application. In this case, a new gadget called “PII Message Sender” has been created over Ezweb as a new gadget that makes it possible to send SMSs using the TID SDPLabs SMS capability.

Previously to have access to the SMS capability, a VCT (Virtual Customer Testbed) has to be built in the Panlab infrastructure by the customer. Through the appropriate provision, the customer obtains authorisation and access to the capability. The provisioning and configuration interfaces use a number of Telefónica’s private provisioning APIs, transparently managed by software adaptation layer to PII (*resource adapters* in PII’s terminology). Access to public API’s —those really exposed to third party users— is granted by means of an implementation of the OAuth protocol (RFC 5849).

Before starting the use case, the customer needs to be registered to Panlab so that it is possible to have access to the available tools for creating an own VCT. Panlab [3] offers a tool called “VCT tool” [4] that allows customers to book their own versions of VCTs very easily: just by selecting, dragging

and dropping virtual graphical objects, which represent the experimentation resources, to a virtual canvas area offered by the VCT tool GUI, where also the dependencies between the selected resources can be specified just by “drawing arrows” from one resource to another on the GUI canvas. Therefore the customer selects the resources, configures the parameters and resource dependences, and proceeds to the booking step. Then a booking summary containing the description, availability and price of the selected resources will be ushered to the customer. After confirming that the information is correct, the VCT creation process starts: a number of SDPLabs internal resources will be deployed and automatically configured according to Telefónica’s SDP process model, including the simulation of a testing scenario composed by at least one application developer, one testing application and one final user, in a realistic 3-tier non-trusted environment. The final result of this provisioning phase consists in the sending of four OAuth credentials to the customer’s email provided in the selected resources parameters mentioned earlier, granting access to the deployed testing scenario. These four keys — Consumer Key, Consumer Secret, Access Token, and Access Token Secret— are finally destined to be used by the EzWeb “PII Message Sender” gadget, authorising thus the sending of SMS messages by means of the public APIs provided by SDPLabs (SMS sending and monitoring capabilities in this case). Figure 1 shows the configuration of the EzWeb test gadget using the provisioning information generated by the VCT deployment, according to the OAuth 3-legged security model.



Figure 1 EzWeb PII Message Sender gadget

In a similar manner, other use cases could be presented making use of other SDP capabilities like Presence and Contacts.

A further demonstration of such use cases, which is beyond the scope of this document, shows the possibility to build new applications with the available capabilities, for example mixing up a newsletter gadget with the SMS and Contacts capabilities resulting thus in an application that allows the users to receive interesting/useful news information and send it afterwards directly to the user's friends/contacts via SMS in a very straightforward manner. There is a wide range of possibilities completely open to the third party developer creativity.

A. Technical environment

Figure 2 presents a general overview of the testbed, centred on the concept of SDP as a common platform for the opening of Telefónica's network capabilities to third parties. The SDP is connected to a number of internal Telefónica's infrastructures in order to make possible the exposure of their enablers. All configuration operations and any further interaction will take place by the mediation of the SDP, and therefore this element will be the one and only component to be directly used by third parties.

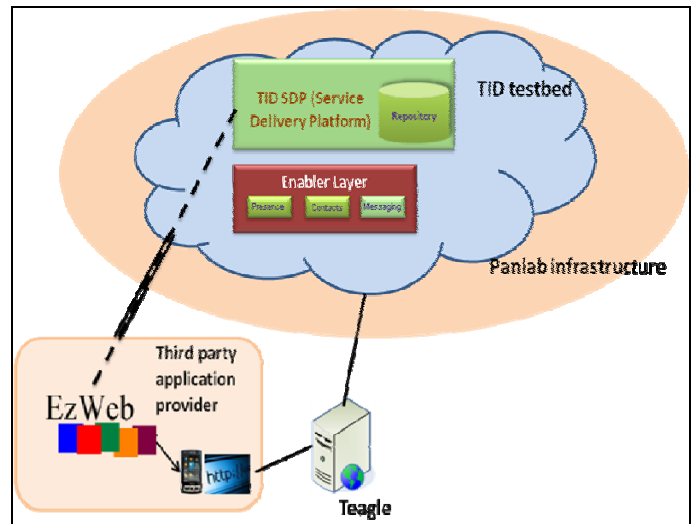


Figure 2 Overview of EzWeb over TID SDPLabs

The testbed hardware environment is composed of:

- ❖ Linux based machine, containing:
 - A virtual machine supporting both the PTM (Panlab Testbed Manager) on Glassfish and resource adapters running on Oscar OSGi.
 - A virtual machine for the IGW (Interconnection Gateway) component.
- ❖ A rack based server, composed of several Linux servers for the SDP.
- ❖ The communication between the main components of the testbed will be accomplished by a LAN interconnecting PTM, IGW and SDP.

The PTM is responsible for configuring the domain's resources. It implements the so called Resource Adaptation Layer where Panlab partners "plug-in" their Resource Adapters (RA). A Resource Adapter—which is a concept similar to a device driver—wraps a domain's resource configuring capabilities into an API, defined by Panlab to manage testing resources all over the PII network in a homogeneous way.

In this case, the RAL contains four RAs, one of them is the general SDP RA, and the other three RAs represent the SDP available capabilities—SMS RA, Presence RA, and Contacts RA.

The communication protocols used for interconnection and communication are: IP, TCP-UDP, SSL, HTTP, REST, and SOAP.

Generally, the provisioning process of the TID SDPLabs consists of two main phases:

1. A general configuration phase including the provisioning of an Application Provider, Consumer (representing a testing application in SDP internal terminology) and a all the permissions needed to be granted to the Consumer to access different kinds of capabilities—SMS sending, presence detection, access to contact lists, etc.

2. A RA specific configuration phase consisting of granting access to final users. This final step enables the developers to test the complete behaviour of their applications when used by final users.

The first phase of the TID SDPLabs configuration process, which is common for all the final services to be exposed by TID's platform, is implemented by the SDP Resource Adapter. The second phase is implemented by the rest of the resource adapters for each one of the basic TID SDPLabs public enablers —SMS, Contacts and Presence. The way the RAs interact with the other components of the Panlab infrastructure can be seen in the Figure 3 .



Figure 3 TID SDPLabs logical components

It is necessary to remark that some of the resulting data retrieved by the SDP RA, as a result of its provisioning operation, are used by the rest of resource adapters. Therefore a reference dependency exists between all RAs.

In short, the functionality of each RA is based on a set of RA specific CRUD operations [6] received from Teagle at the booking stage, which initiates SDPLabs resource creation and provisioning process, giving as a final visible result a set of four OAuth credentials, which are sent to the user's e-mail address, to gain access to the SDPLabs SMS capabilities, as mentioned before.

These four credentials also contain customer specific information upon the testbed availability period, which depends on the type of contract agreement.

B. Results

By using the VCT Tool, the VCT was configured and booked successfully, and the four mentioned OAuth credentials were generated correctly and effectively delivered to the customer provided e-mail address. These credentials were generated and tested several times with the EzWeb "PII Message Sender" gadget which successfully used them each time to gain access to the SDP Messaging capability, thus allowing the user to send real SMSs over the Telefónica's real network infrastructure.

Because the generated tokens are unique for each user and contribute to give access to the SDP resources, without using the Panlab infrastructure and specifically the VCT Tool to

book the SMS resource, the customer could not have authorised access to use TID's Messaging API.

The purpose of this paper is to show the appropriate operation of the network capabilities offered by TID SDPLabs by describing a specific use case which involves the usage of the SMS capability through a third party application which is able to make use of this capability through the Panlab infrastructure. Furthermore it proves the simplicity of booking resources from the customer point of view by using Panlab's tools. The usability of the VCT Tool's GUI and the low requirements for Panlab booking process, support the customer to achieve easily the goal of selecting and booking customised resources within the Panlab infrastructure.

II. TESTBED AVAILABILITY

Currently, TID SDPLabs hosts the capabilities mentioned above (SMS, Contacts and Presence) but only the SMS resource is fully functional. Soon, the resources for creating similar scenarios using Presence and Contacts capabilities will be available to be used under the Panlab Service Offerings, always complying with the legal and administrative conditions defined by the Panlab federation.

III. REFERENCES

- [1] <http://www.panlab.net/objectives.html>
- [2] <http://ezweb.morfeo-project.org/Ing/en/>
- [3] <http://www.panlab.net/>
- [4] <http://www.fire-teagle.org/>
- [5] http://trac.panlab.net/trac/wiki/TID#ra_operations
- [6] http://trac.panlab.net/trac/wiki/TID#CRUD_operations

IV. TERMINOLOGY

API	–	Application programming interface
CRUD	–	Create, Read, Update, Delete –operations
GUI	–	Graphical User Interface
HTTP	–	Hypertext Transfer Protocol
IGW	–	Interconnection Gateway
OSGi	–	Open Services Gateway Initiative
PTM	–	Panlab Testbed Manager
RA	–	Resource Adapter
RAL	–	Resource Adapter Layer
REST	–	Representational State Transfer
SDP	–	Service Delivery Platform
SMS	–	Short Message Service
SOAP	–	Simple Object Access Protocol
TCP	–	Transmission Control Protocol
TID	–	Telefónica I+D
UDP	–	User Datagram Protocol
VCT	–	Virtual Customer Testbed