Socializing Virtual Worlds with Facebook

A prototypical implementation of an expansion pack to communicate between Facebook and OpenSimulator based Virtual Worlds

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ABSTRACT

In this paper we present a prototypical implementation of a novel expansion pack called OMFacebook for OpenSimulator based virtual worlds. The idea is to provide the user with a light-weight platform-independent Web application to communicate with friends from the virtual world and therefore profit from the success of Facebook as a social network platform. This add-on is to the best of our knowledge the first approach to allow the user of an OpenSimulator based virtual world to connect an in-world avatar with an existing Facebook profile.

Keywords

OpenSimulator, Virtual Worlds, SecondLife, Facebook, Social Media

1. INTRODUCTION

Over the past years computer simulated environments, referred to as virtual worlds, have became more and more popular. Users are represented as avatars and interact with each other by using text or voice chat. Avatars can create and contribute content to this environment and share or even sell these objects [6]. Today's most successful and most popular virtual environment is SecondLife by Linden Labs [5]. Due to its closed environment and restrictions by the operator, there are open source initiatives like the OpenSimulator[1] project or Sun's Project Wonderland[2]. For the remainder of this paper we focus on OpenSimulator-based virtual worlds due to its popularity and extensibility.

Virtual worlds are created as a grid of OpenSimulator application servers with each server responsible for one or more quadratic regions of land with a size of 256x256 meter. As all these instances are connected to each other, inhabitants

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[1] http://www.opensimulator.org
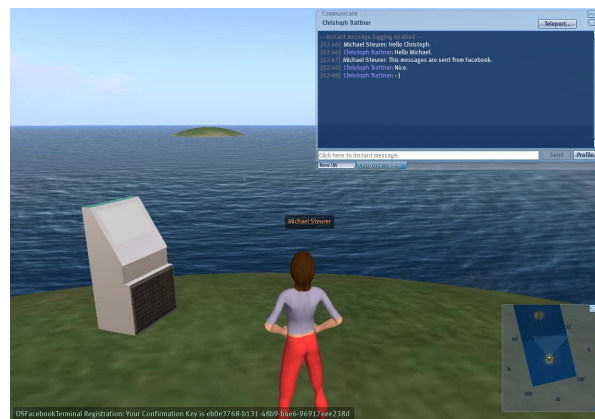[2] https://wonderland.dev.java.net

Figure 1: This screenshot shows the in-world registration terminal of OMFacebook Module. By clicking on the terminal, the user is provided with a unique registration key for the identification in the OMFacebook Application. Additionally, one can follow the chat log of an in-world avatar called "Michael.Steurer" and a Facebook user named "Christoph Trattner".

of the virtual world are allowed to move from one region to another, *i.e.* move from one server to an other [3, 5].

Basically, all these virtual environments are implemented as client-server applications. Thus, users have to download a special client viewer application [2] in order to connect to the virtual world server. The main issue here: The client viewer typically cannot be run on a "slow" hardware device such as a mobile phone or PDA. To overcome this issue, nowadays software engineering companies invest a lot of money to provide the user with lightweight applications which can be run on any platform. Thus, the applications are typically run within a Web browser which is present on most devices that provide access to the Internet, *e.g.* Google applications[3].

Another popular Web application is the social network platform Facebook[4]. Facebook is the world's largest social network platform and hosts over 400 million users that spend over 500 billion minutes on the platform [1] blogging, chatting, or gaming each month. According to Hitwise [4], an

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[3] http://www.google.com/apps/
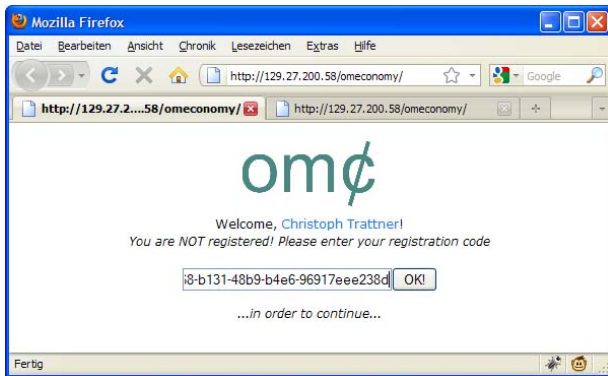[4] http://www.facebook.com

Figure 2: This screenshot shows OMFacebook Application during the first time registration process and while entering the confirmation key.

NYC-based tracking firm, Facebook soaked up 7.07 percent of all US Internet activity for the week ending March, 13th and actually outstripped Google as the most popular Web application. An interesting feature provided by Facebook is the possibility to extend the platform's functionality with Web applications which are written by users. The main advantages over traditional forms of Web application publishing are on the one hand the already present shear amount of users and on the other hand the social network to spread and popularize the application.

In this paper we present a prototypical implementation of an expansion pack called Open Metaverse Facebook (OM-Facebook add-on) which allows the user of an OpenSimulator based virtual world to connect an in-world avatar with an existing Facebook profile. The idea is to provide the user on the one hand with a light-weight platform-independent Web application to communicate with friends from the virtual world and on the other hand to profit from the success of Facebook as a social network platform. To the best of our knowledge, this work describes the first attempt to implement such an add-on.

The paper is structured as follows: Section 2 presents the basic idea of this new approach. Section 3 shortly discusses the implementation of the idea. Finally, Section 4 concludes the paper and provides an outlook for future work in this area.

2. APPROACH

The basic idea is to connect a Facebook account with an in-world avatar and provide the user with a light-weight Web application to communicate with friends from the virtual world. Thus, as a first step a plug-in called OMFacebook Module was implemented to extend the OpenSimulator server-side application with a simple module which visually provided the user with an in-world terminal (see Figure 1) to connect the avatar with a Facebook account. By clicking on the terminal the OMFacbook module generates a unique confirmation key which is then provided to the user. Now, in order to create a link between an in-world avatar and a Facebook profile the user opens the Facebook profile and installs a certain Facebook application called OMFacebook Application. After installing the application the user enters the secret key into the application (see Figure 2) and as soon

as the confirmation key gets validated by the OMFacebook Application the registration procedure is suppressed before launching the application the next times. The user is then directly forwarded to the OMFacebook Application. Currently, the OMFacebook Application (see Figure 3) provides a simple to use text chat which allows the user to communicate from Facebook with the virtual world.

3. IMPLEMENTATION

The first prototypical implementation of OMFacebook add-on consists of three main modules. The following section will give a short overview of their functionality and implementation.

3.1 OMFacebook Module

This module is implemented as a dynamic-link library (dll) in C# and compiled under the mono 2.6.4[5] environment. The resulting binaries were placed into the root directory of the simulator and loaded automatically after restarting the server. The module consists of a message handler and an interface to fetch an avatar's friends and their online status. The OpenSimulator application server listens to XML-RPC messages and redirects them to the responsible module to be processed. The request to send a message to an in-world avatar consists of an identifier for the avatar and the actual text message. The module extracts all these parameters and sends the message to the specified avatar. The response to the XML request depends on the success of the operation and returns a fault code in case of problems, *e.g.* avatar cannot be found. The in-world avatar receives the message in a chat window (see Figure 3) and can immediately start typing an answer. The module again listens to this message, extract information about the sender, recipient, and the actual message and sends it as HTTPS POST request to the OMFacebook gateway. The gateway's response is a simple success or error notification.

To get an avatar's friends from the OpenSimulator server we have again implemented an XML-RPC request handler. A request just contains the identifier of the actual avatar and responds with the friends list in JSON data format. This response comprises avatars unique identifier, their name, and the actual online status.

Unfortunately, the OpenSimulator application server does not provide encrypted XML-RPC requests and therefore all messages are in plain text. Further, the simulator does not provide standardized authentication mechanisms to prevent malicious clients to send XML-RPC requests.

3.2 OMFacebook Gateway

This module is core of the OMFacebook add-on. On the one hand this module implements the whole functionality to link an avatar with existing Facebook account and on the other hand it provides an API to communicate between the virtual world and the Facebook application. The gateway is implemented in PHP and communicates via XML-RPC with the server-side OpenSimulator module. In our case the gateway is installed on an Apache Web server.

The communication to the Facebook application is done via AJAX using HTTP GET requests. In order to link a Facebook user and an in-world avatar properly, this service uses a mySQL table that stores unique identifiers for both
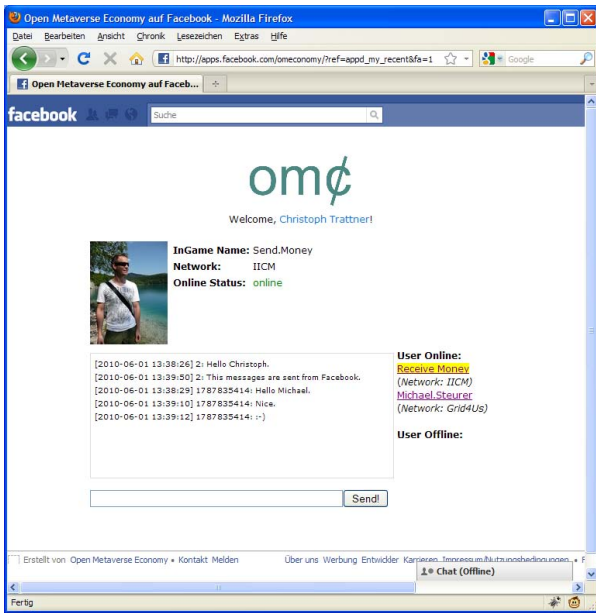
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[5]`http://www.mono-project.com`

Figure 3: This screenshot shows OMFacebook Application in action.

accounts (avatarUUID for avatars and facebookID for Facebook accounts). Additionally, this table holds the confirmation key used for the registration process. Currently, the module provides the following PHP function calls:

```
interface {
  getAvatarInfoFromAvatarUUID($avatarUUID);
  getAvatarInfoFromFacebookID($facebookID);
  getAvatarsFriends($facebookID);
  translateAvatarToFacebook($avatarUUID);
  translateFacebookToAvatar($facebookID);
  sendMessageFromFacebook($senderUUID, $recipientUUID, $message);
  sendMessageFromInworld($senderUUID, $recipientUUID, $message);
  getMessage($facebookID);
  getMessages($facebookID, $limit);
}
```

3.3 OMFacebook Application

This module is the last part to complete the OMFacebook expansion pack as whole. It is written in PHP and uses PHP library of Facebook and "Facebook Connect" functionality to connect an existing Facebook account with the OMFacebook Application. In contrast to common Facebook applications this application type can be run by a user without actually visiting the Facebook platform site. Another big advantage if compared to the common Facebook application type is that one is not limited to use complex JavaScripts which are typically filtered by Facebook. Within Facebook, the application is run as an IFRAME application.

In order to retrieve a user's profile elements, we employ the Extended Facebook Markup Language (XFBML). The page rendering procedure is thereby a simple to include Facebook JavaScript snippet that provides a rendering function to manipulate the DOM on page load.

On top of this basic Facebook connect application we set our own application which allows the user to connect an in-world avatar with an existing Facebook account. If the user is logged into Facebook and requests the application for the first time the user is asked to enter the confirmation key obtained by the in-world terminal by a simple input form. By clicking the "OK" button the key is sent to the OMFacebook Gateway to be validated. If the key gets validated, the user is redirected to the application otherwise she is blocked. Currently, the application interface provides a simple overview of the Facebook profile of the user plus a text chat to communicate with in-world friends. The chat is thereby implemented as a simple JavaScript and AJAX driven service which requests the `sendMessageFrom-Facebook($senderUUID, $recipientUUID, $message)` and `get-Messages($FacebookID, $limit)` functions from the OMFacebook Gateway.

4. CONCLUSIONS AND FUTURE WORK

In this paper we presented a prototypical implementation of a novel expansion pack called OMFacebook for OpenSimulator based virtual worlds. The idea is to provide the user with a light-weight platform-independent Facebook Web application to communicate with friends in the virtual world.

Future work will include the extension of the current OMFacebook Application. For instance, we plan to integrate a virtual warehouse to trade virtual goods out of Facebook and to trade goods with the **O**pen **M**etaverse **C**urrency (OMC) [7].

5. REFERENCES

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