Virtual World Interoperability of Avatar Information

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1   Introduction

With the growth of online communities and authenticated systems, users have begun to accumulate a large number of authentication tokens, typically consisting of a username and password sequence. Authentication and access control solutions have arisen in an attempt to assist users in countering this plethora of tokens. Services such as the XMPP communication protocol [2], OpenID [5] and others allow one to utilize a single authentication token for multiple systems. The sharing of information across various communities, such as multiplayer games, blogs, forums and websites, has also become very popular, prompting the launch of several social development frameworks such as Facebook Applications [1].

Similarly, as virtual worlds have emerged, the issue of managing the multitude of authentication tokens has become an important topic. Virtual worlds manage additional information, such as user preferences and avatar information, and have started to encounter the same issue of exuberant authentication tokens. Contrary to the fast pace of virtual world development, authentication and management services have slowly begun to appear, such as NCsoft's "PlayNC™" service [3] and Nexon's "Nexon Passport" service [4]. These services allow games to share minimal user preferences, avatar information, and authentication tokens, similar to the previously mentioned access control services. However, sharing of information between virtual worlds has not gone beyond these existing authentication services involving minimal amounts of user information and preferences or bare statistics. Experiments[6] have been performed in which extensive amounts of player information and preferences have been transmitted between virtual worlds. Non-experimental virtual world access control services currently only offer advantages that are similar, if not the same, as the standard authentication token access control services.

Despite the plethora of services available that offer grouping of authentication and basic user information, the issue of sharing avatar information has not yet been addressed. A single sign-on is the ideal solution to these issues, however converting current infrastructures to such a system would require multiple iterations of change. Such iterations would be identifying core avatar information that will be transferrable, creating a middle-man service to facilitate the conversion, and finally implementing a centralized single sign-on. This project will focus upon an iteration where multiple virtual worlds are beginning to share avatar information amongst one another to facilitate the sharing of avatars via a middle-man service.

My goal is to develop a more robust and extensible methodology for communicating and transferring avatar information between virtual worlds. This methodology will go beyond the currently existing authentication services to address the need for interoperability of virtual environments. The transmission of player information and player preferences will be a focus, as a stepping stone towards allowing player data to be transmitted across virtual worlds and ideally eliminating the need for numerous authentication tokens.

2   Project Description

To facilitate the flow and distribution of avatar data from virtual worlds, a common protocol is required. Utilizing this standard protocol, one would be able to pull distinct attributes (i.e. eye color and hair color) pertaining to a player's avatar, in addition to partial listings of attributes or even full profiles. However, depending on a virtual world's environment, setting, availability of avatar customizations, and restrictions pertaining to its specifications, some avatar information may need to undergo business logic due to restrictions and conversions to ensure that it complies with the destined virtual world's universe of discourse and business logic.

Numerous virtual worlds allow for the detailed customization of avatar characteristics and physical attributes, which results in ample user-specified data. However, other virtual worlds restrict a user's ability for customization or preferences due to its setting or environmental preference options. Under these circumstances, logistics will be required to administrate conformity with the target virtual world, so that improper or unnecessary avatar data originating from the source virtual world is either omitted or not requested.

The creation of such a sharing protocol, as well as an approach for enforcing a dynamic set of attributes to allow for a varying range of flexible virtual environment rules will be the main focus of this project. To allow for a fluid, simplistic, and accessible protocol to also support pliancy and restrictions where applicable will be a secondary goal of the project. Additionally, the management of authenticated access will also be core to this project and will be covered in detail with examples where necessary.

3 Project Overview & Goals

The overall goal of this project is to provide an intermediate solution that will allow players to transport avatar information between selective cooperating virtual worlds, with the ideal situation being that a user can transport his or her avatar to multiple virtual worlds. To accomplish the overall goal, numerous sub-goals will need to be met:

- Choose a communuication technology to act as a basis

- Develop necessary tools to facilitate transfer of information

- Design a core standard layout for transferring avatar information

- Develop a connection between two virtual worlds using the created tools and layout

The initial stage of this project will be to research into preexisting integration implementations, such as OpenID [5] and the interoperability milestone documentation compiled by Linden Labs and IBM [6]. By studying these predeveloped intercommunication examples, various concepts can be deduced for possible implementation within the project. Components such as common protocol methodologies, recommended best practices, and previous experiment results can also be extracted from these resources.

This way, similar functionality or portions of preexisting technologies can be evaluated for inclusion into the proposed protocol, reducing the amount of retooling or learning required for users experienced with them and building upon proven methodologies. Identifying possible technologies that can be utilized will also assist in any migrations that will need to be made for systems that wish to support the proposed protocol, such as online virtual worlds attempting to communicate with other worlds.

Following this review, documentation will be drafted detailing the proposed protocol for transferring avatar information. Utilizing previous research and current technological progress, an outline of said protocol will be created, providing ample information for dynamic usage and application of the data contained within the protocol. In addition to documentation, multiple sample cases will be included to inform and possibly assist any readers with possible uses.

For this project, I will provide various documents and a proof of concept. The documents that will be provided are a review and a critical analysis of current solutions available, a draft of the proposed avatar data exchange protocol, a finalized document of said protocol, written examples that demonstrate the protocol, and one proof of concept example demonstrating the protocol and the actual exchange of avatar data.

The benefit of these documents is that it allows one to understand the current state of technologies that address the issue of sharing avatar information and to provide one possible solution. In addition, the methodology documentation may provide a proper starting place for those who wish to fully implement the methodology or develop a similar solution.

3.1 Review & Analysis of Current Solutions

As previously described before, numerous solutions are available for similar methodologies of transferring information between similar services or grouping one's authentication data together. However, since these systems do not contain or support as much information transfer as the proposed protocol data, a review of the various existing systems is required to see if any are usable as a starting point or basis for the new protocol. Each solution will be reviewed to assess its ability to group authentication tokens, the type and amount of information that can be produced, and what technologies that each utilizes. These services' technologies can be taken under consideration during the development of the proposed protocol, to possibly assist and improve upon the solutions.

3.2 Proof of Concept Protocol Example

A proof of concept of the protocol methodology will also be presented. This demonstration will establish how the described protocol can be utilized to export and, depending on the desired usage and business decisions, to transfer avatar information to other virtual worlds or even third party systems, such as an avatar preview system or gallery. This will demonstrate that not only is the documentation and source code provided sound, but also usable and presentable.

Examples of the protocol in action will be provided as a deliverable. Said examples will include the generation of protocol messages by pulling avatar information from virtual worlds and the receiving, reading and utilization of these protocol messages. These demonstrations will be written as a proof of concept and to allow for the ease of adoption by allowing developers to have pre-existing examples by which to base their systems upon.

Such demonstrations will be helpful for people wishing to see a variety of situations in which the protocol could apply and assist the developers of technologies that assist with interoperability and user adaptability. In addition to assisting developers, these examples will also show use cases, which will allow others to visualize where and how this protocol may apply to a variety of situations.

3.3   Avatar Data Exchange Protocol Documentation

This document will provide an overview of the project and the proposed protocol, the layout of the protocol's data payload with descriptions of the payload attributes, source code for this protocol, and a brief example of how to utilize the provided payload inforamtion. This document is meant to provide an implementation-ready version of the protocol, such as where a developer would perhaps utilize such a document to evaluate the adaptation or discuss the usability of such a mechanism.

4   Deliverables

For this project, a number of deliverables will be required:

- Capstone Proposal Document

- Review of Current Solutions

- Protocol Proof of Concept

- Protocol Implementation Examples

- Methodology Protocol Documentation

- Formal Presentation

- Finalized Project Document

5   Summary & Outlook

This project will provide a standard protocol for transporting avatar data between virtual worlds and possibly other sources. This will assist users by allowing them to transport an immense amount of user-generated variables and choices, to reduce the number of tasks necessary for customizations, decreasing the user's necessary adaptation time, and even providing predetermined user customizations, saving both the virtual worlds and users the time of customization and increasing comfort.

6 References

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