Implementation of google single sign on (SSO) in the library management system

A Purwinarko*, W Hardyanto and M A Adhi

1Department of Computer Science, Faculty of Mathematics and Natural Sciences, Universitas Negeri Semarang
2Department of Physics, Faculty of Mathematics and Natural Sciences, Universitas Negeri Semarang

*Corresponding author: aji.purwinarko@mail.unnes.ac.id

Abstrak. Almost all organizations provide web-based services as an effort to provide excellent services to users, such as a library, academic, financial, and other services. Organizations only need to provide Single Sign-on (SSO) services for their users, and users need one set of credentials (user name and password) to access all organizational services. The SSO service developed is based on the Google Authentication API. This SSO makes communication between systems more effective and efficient.

1. Introduction

At present, almost all organizations (universities) provide web-based services (information systems) as an effort to provide excellent services to users, such as a library, academic, financial, and other services. Between information systems in this organization are expected to provide fast and accurate services to users [1]. Thus, an organization's Information Technology (IT) team only needs to provide Single Sign-on (SSO) services to its users, and users only need one set of credentials (say, user names and passwords) to access all organizational services [2].

Web-based SSO systems can allow users to enter a single interface (such as through a web browser) and then provide SSO services to users to log into one or several web applications with the same identity. Various methods can be applied in SSO, such as form-fill, Federated (OIF), SSO Protected (OAM), and other policies [3].

In the SSO service system, IDP Providers (physical or logical) IDP verifies the credentials of all users who want to receive web-based services. At present, several social networking sites such as Facebook, Google, or LinkedIn work as IDPs, known as social logins [2,4]. Facilitating SSO in several browser instances such that user authentication on one browser instance is used as a basis to allow access to other protected browser instances [5,6,7]. Simple SSO will only have one set of credentials, for example, using an email system as an authentication authority for several systems [8].

Two variants might technically implement Single Sign-On in a heterogeneous software environment: 1) Using specialized software that cuts authentication requests sent by various web portal services to users and automatically sends their credentials, such as account names and words password. Because authentication data is stored in the Single Sign-On database, interception is not visible to end-users; 2) Integration with other software authentication processes. The main advantages of this solution are: 1)
Reducing the amount of authentication data needed to work with the organization's network services; 2) Reducing the time needed for authentication on many organizational network portals. The main disadvantage of this concept is the risk of a single password obtained by a third party, which can lead to unauthorized access to the entire work environment [9].

OAuth 2.0 is an authorization protocol that allows one to provide service rights to access resources on other services. This fact makes OAuth suitable for use in heterogeneous web service environments. The protocol eliminates the need to trust application logins and passwords, and also allows issuing a limited set of rights, rather than all at once [8]. OAuth 2.0 involves three parties, namely client, web service, and server, as shown in Figure 1.

![Figure 1. OAuth authorization flow [8].](image-url)

Social networking services widely use application Programming Interfaces (APIs) and make them available to third-party application developers to embed social logins into their applications [10]. Google has provided an API authentication version of JavaScript, where content can only be accessed after logging in with a Google account, this authentication flow is shown in Figure 2. Most application developers apply Google API as an SSO service [11].
2. Method

![Diagram of SSO method](开发者的Google.com)

Figure 3. SSO method.

Figure 3 shows the designing SSO method and is described as follows:

a. Application developers need to create a Google API Console project and client ID.
b. Need to include Google Platform Library on the page that will be integrated with SSO
3. Result and Discussion
This study produces a login page, as shown in Figure 8.
Figure 8. Login page.

Figure 8 is the initial SSO login page display. The Google login form will appear when the Sign-in button clicked, as shown in Figure 9.

Figure 9. Google login form.

After Google successfully authenticates a user's account, the user page will redirect to an SSO home page (Figure 10). Users do not need a login to enter into each of the existing applications.
4. Conclusion
By implementing Google Oauth 2 on this library system, users do not need to remember many user names and passwords. Users can sign-in using email to the SSO page, and if Google successfully authenticates, the user can open all applications. SSO makes it more efficient and effective because one login is enough to be able to access all applications.

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