

A Single-Sign-On and a Remote Login Solution to Library E-Journals and E-Resources

T. Sunitha¹ and M.G. Sreekumar²

^{1,2}Center for Development of Digital Libraries (CDDL), Indian Institute of Management Kozhikode (IIMK), IIMK Campus P.O., Calicut, Kerala
E-mail: ¹sunitha@iimk.ac.in; ²mgsree@iimk.ac.in

ABSTRACT

Information and Communication Technologies (ICTs) have propelled the growth of large numbers of electronic resources, especially E-Journal resources across the world. Libraries spend a major portion of their budget for subscribing to electronic resources such as e-journals, e-books, bibliographic/full-text databases, online services and web portals. While IP based authentication shall take care of hassle-free content access to the campus community, librarians have been relentlessly contemplating on the pressing issue of providing remote access to the e-resources for their users even when they are off-campus. It is a growing concern for users when they need to login every time to several different services and databases. This article looks at a unique solution that could be provided by the institutional library wherein users need to login just once and thereby get access to all the e-resources through that single authentication. This article also provides insights on IIMK's plans to provide their users, single-sign-on as well as remote login access to its vast treasure of electronic resources.

Keywords: Single-Sign-On Solution, Remote Access Authentication, E-Resources

INTRODUCTION

Technology has brought in a paradigm shift in the field of information access and dissemination and in the first place, it was the advent of E-Publishing which made all these possible. The proliferation of E-publishing across the world has revolutionised the domain of publishing, especially scholarly publishing [Sreekumar and Sunitha, 2006]. The intensity of the impact is mainly directed by the internet and the WWW. Recent research and developments in E-publishing offer ways to bring in a new equilibrium to the publication ecosystem, scholarly as well as trade.

As result of the above, there has been a substantial increase in the digital collections and electronic subscriptions in the academic and research libraries. Among these e-journals form the major chunk of e-resources and they are also growing at a phenomenal rate. To meet the ever increasing demand from the users, libraries are investing a major portion of their budget for the subscription of e-resources. In addition to this, libraries are getting access to a large number of e-resources through membership in various consortia agreements.

Arranging subscriptions to the multiplicity of online resources that manifest in many different resource types, providing hassle free and uninterrupted access to the e-resources are among the major challenges before the librarians. As the number of e-resources and e-services have sky rocketed, libraries are facing numerous problems and issues in the provision of their services. The overwhelming number of Web sites and URLs are flooding the library portals and library web pages, making the lives of librarians, a misery. There are many different access models being offered by publishers to the ever growing e-resources from all over.

BACKGROUND

The Indian Institute of Management Kozhikode (IIMK) Library started e-resources subscription way back in 1999. At the beginning the library had possessed some corporate databases and aggregated e-journal databases in the form of CDs. Soon it was found that the electronic contents were increasing and penetrating into the collection, and there was also an exponential growth in the number of journals covered by the aggregated full-text databases. Further more, in line with the tremendous increase in the electronic publishing front the world over, the IIMs initiated the ambitious IIM Consortium activities in 2000. The IIM Consortium was instrumental in giving a face lift to the electronic content among the IIMs [Sreekumar M. G. and Sunitha T. 2006].

Later in 2002, the Ministry of Human Resources Development (MHRD), Government of India launched the INDEST (Indian National Digital Library in Engineering, Science and Technology) Consortium. All the MHRD set up institutions such as the IISc, IITs, IIMs, NITs, RECs, IIITMs, NITIE, etc., are beneficiary of this successful consortium and all the IIMs are included as core members of the consortium. As a result of these two consortia there is a tremendous increase in the resources at IIMK.

Presently IIMK Library has a variety of electronic resources in the form of e-journals, e-books, scholarly company industry information, e-reference works, cases, e-reports, portals and databases from various service providers. IIMK library has been subscribing to 15,000 e-journals, 30,000 e-books, 46 databases, 15,000 company reports and a number of information portals. In addition to this IIMK library has a well developed digital library and an institutional repository. Various E-resources available at IIMK library are illustrated in the following figure (Fig. 1).

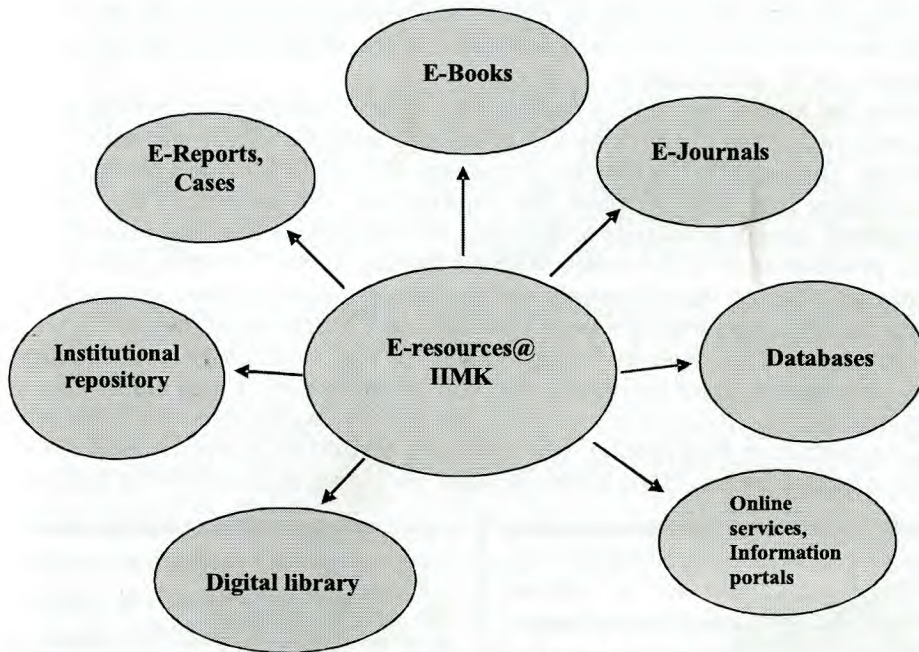


Fig. 1. E-Resources @IIMK

COLLECTION MANAGEMENT ISSUES

The collection management of e-resources is a tricky job, as there is a great deal of difference between the traditional print information resources being handled by libraries and the new genre of electronic and digital information being sourced, licensed and accessed. In the changed scenario it is observed that the librarian is becoming more and more involved in negotiating complex licensing agreements, addressing issues of copyright, organizing methods of access to information through networked resources and aggressively engaged in liaising with the academic community in the purchase of information products [Ashcroft 2000].

Collection Integration and Aggregation

As already mentioned, there is an amazing penetration of learning resources and scholarly digital information penetrating in libraries through a variety of forms such as e-books (published as such or issued as accompaniment), e-journals, portals, vortals, e-reports, CBTs, WBTs, cases, databases, etc. [Terry, 2000]. To make matters more complex, the proliferating array of different electronic file formats, standards and platforms in which documents are published, pose a multiplicity of threats to the information professional who is supposed to be the custodian and service provider of these information products once it has found its way into the library. It is imperative on the part of the information professional to have a componentized and a multi-system approach to knowledge technologies and information management. Seamless dissemination of scholarly information by means of content aggregation and content

integration through library portals, digital libraries and institutional repositories are the recommended strategy sets to be adopted and practiced by the 21st century libraries [Sreekumar, M.G. and Sunitha, T., 2006].

Among the above, the library portals play crucial and a pivotal role in showcasing and disseminating the library's wealth of online resources as a single window delivery mechanism. The portal is the library's homepage which will provide a plethora of related services taking into consideration the requirement and context of the user. It also holds together tens of hundreds of different services under one umbrella and thereby save the precious time of the user/s without having to run between posts and pillars. IIMK started offering the e-journals and e-resources services through the web portal way back in 1999, and we have been carefully and consistently improving the online access services and facilities by using a variety of Web technologies. As the number of services and journal titles increased, the Web site monitoring and maintenance work also got intensified. At times maintaining the library page(s) turn out to be extremely crucial, as users may find problems in accessing certain titles even at odd times of the day. The interface frames of the library's pages are shown in the following figure (Fig. 2).

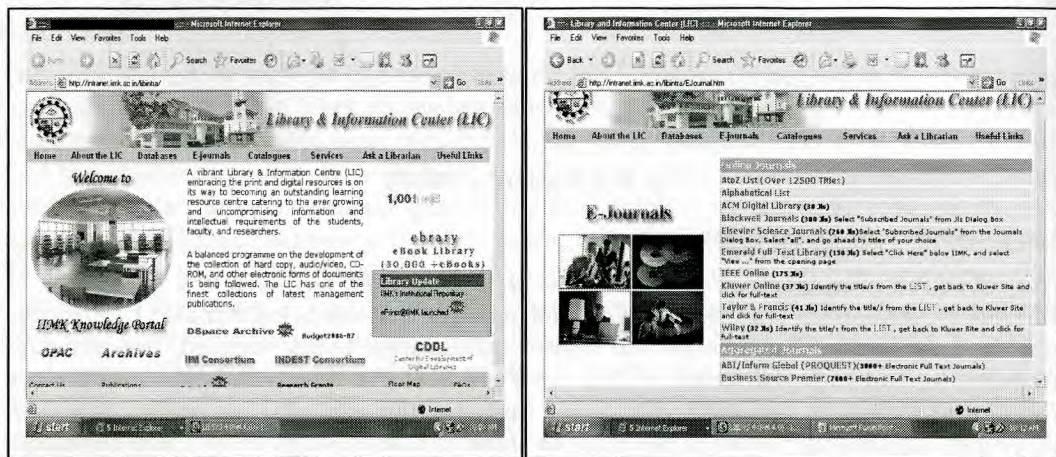


Fig. 2. Library portal pages – home page and e-journals

Access Management Issues

In the case of electronic resources, users' access goes to multiple pointers and thereby it becomes complex. Users in general prefer not to come to the library and expect access to library materials from remote sites. They expect to access all the resources seamlessly. Some of the recent genre of electronic materials do not have their physical counterparts at all. Further more, access to the e-resources is no longer controlled by the library. The terms of access and delivery are dictated by publishers, aggregators or vendors. Providers resort to different methods and technologies towards authenticating access to their products. Lack of uniform access delivery standards that could be provided to the users, customized and configured locally, is a critical issue faced by the library fraternity currently.

IIMK library caters to over 750 users which include 650 students, over 50 faculty members and the remaining, researchers and fellows. IIMK is also running interactive distance learning (IDL) courses like E-MEP, E-PGP, etc., for working executives. The

Institute has plans to start off-campus within the country and abroad. Providing quality access to the e-resources to the larger user community is really a complex and mammoth task.

Access management is becoming more and more an important concern for libraries. It provides controlled and mediated access to the library's e-resources and online services. It defines which users exist and what roles they have. It comprises creating and defining the list of users with access to the various e-resources and assigning access right in the form of roles. The most important elements of any e-resource license agreement are the determination and definition of the authorized users and how the e-resources will be accessed.

The present access management methods practiced at IIMK are predominantly IP authentication and User ID/Password based access for a small number of resources. User ID/Password based access method is among the earlier models to emerge which is the popular access authentication system. Being popular and simple, most of the service providers use this model for access authentication. But when the number of resources and users have increased, this method became a problem for libraries. Another problem with User ID/Password is that users have to deal with many passwords for a wide variety of services. User ID/Password method provides less security as it is not easy to keep the password secret for long period. As a result, IP authenticated access method become more popular. IP Authentication is one of the most commonly used authentication mechanism. IP filtering should be performed by both library and service providers. To make IP filtering work properly, library should provide the vendors the range of IP addresses of the network of the library or the parent organization. For a wider audience, IP based access is mostly preferred, as the users need not have to bother about the User ID and Password every time.

IP based access authentication is a good choice if the users are closely located and covered by a single network. This method allows (i) seamless access (ii) usage statistics for the institution (iii) greater security as there is no misuse of usernames and passwords (iv) access to all computers thereby releasing other terminals and staff time (v) direct recognition of institutional networks by publishers and vice versa [Armstrong, Alen E. et al., 2003].

Though the IP based access authentication has been found to be an appropriate and a suitable access model for the on-campus community, though the main limitation of this method is that it can not be used for remote users. For the off-campus user community the IP based access to e-resources will not be possible, as they will not be able to resolve the Institute IP while sending the URL requests from outside the campus. Thus there became a need to deploy alternative mechanisms that meet the needs of both local and remote users.

Considering the features as well as limitations associated with the above access management systems, IIMK library has been continuously exploring the possibilities with other methods and technologies also, that shall provide better and efficient access management of electronic resources.

Single-Sign-On (SSO) and Remote Login

Presently the users are provided with a vast array of electronic resources through the library portal and its internal web pages. In addition, A to Z pages such as alpha lists or subject-based pages of databases and e-journals with their persistent URLs are placed in the portal. As the number of e-resources have increased, it became difficult

for the libraries to maintain these web pages. Each service provider follows their own access management system. Similarly when the access to certain resources are provided through third party access gateways such as Ingenta, Athens, etc., users have to be authenticated multiple times. The situation became worse when each one of these systems uses its own authentication mechanism and authenticator.

Single-sign-on systems (SSO), also known as Reduced Sign on (RSO), addresses this much efficiently and successfully. SSO refers to a type of authentication system where a user only has to be authenticated once, and is able to access multiple services where he has access permission, without having to enter his password again. SSO system helps the users to access the resources very fast and secured. It also provides quality response time as well as user satisfaction [Authenticationworld.com].

Single sign-on systems provide multiple benefits to libraries by relieving the users from remembering different user names and passwords; time being spent for declaring identities; supporting conventional authentication such as Windows credentials (i.e. username/password); saving on IT costs on authentication related enquiries; hassle free secured access provisions and centralized reporting for compliance adherence. The advantage of SSO is that it uses the existing centralized authentication servers and it combines this with techniques such that the users will have to enter their credentials just once only [Wikipedia]. Figure 3 shows the single-sign-on architecture in an institutional setting.

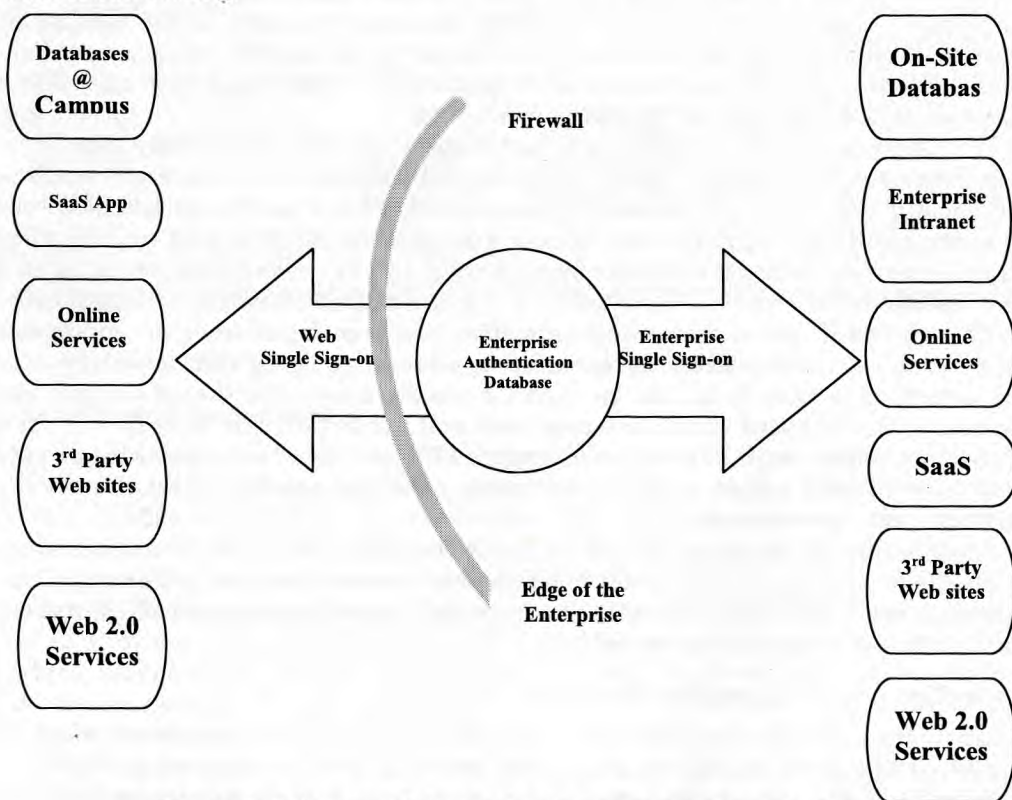


Fig. 3. Architecture of the single-sign-on remote access system

This model envisages ensuring of a seamless as well as hassle free access to the vast reservoir of digital on-site and remote online resources of IIMK, to the user community, regardless of whether they are on-campus or off-campus. Users will have to login only once for getting access to the resources.

WORKING PRINCIPLE

The remote login based SSO setting work basically in two scenarios. The first option would be a subscription/cloud service which operates through a third party site, in which registered users of an organization will be remotely accessing their licensed content using a two-factor identity secured authentication, such as User ID and Password. The parent organization of the users will work with the service provider to introduce them for the first time so that users could take it forward themselves. The second option, which is seen as the preferred one, is by installing the SSO server on site and allowing the users to login from remote locations. Users will first register with the system and the system will enroll them as authorized members. Each time users will login to the proxy server whenever they want to access the institutional licensed content.

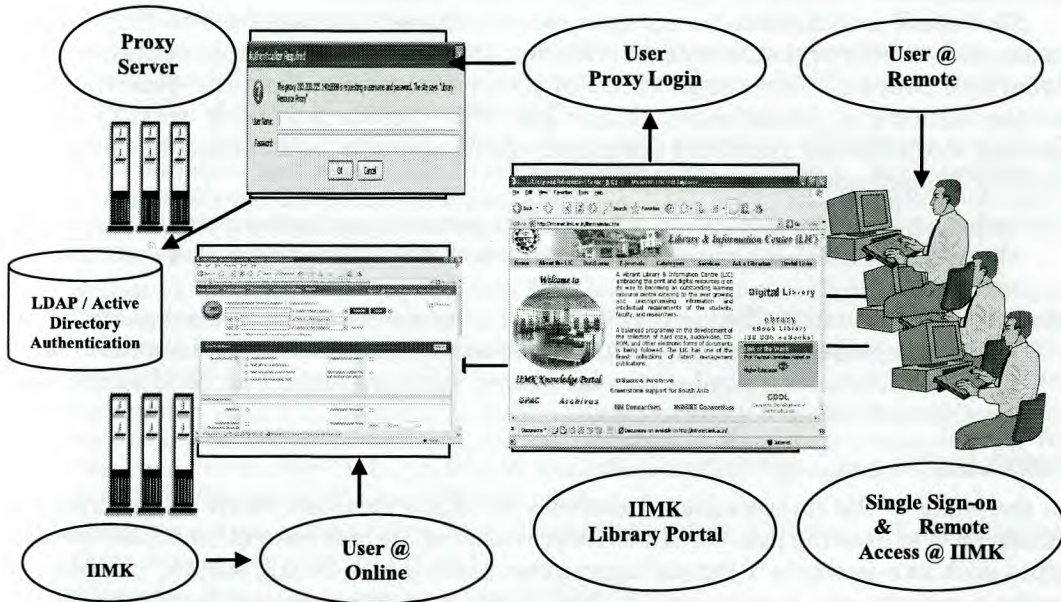


Fig. 4. Working model of single-sign-on remote access system products and solutions

There are a number of remote access authentication models that prevail in the market and are being used by organizations with varying degrees of satisfaction. There are a few open source solutions and prominent among them include Shibboleth. Prominent commercial solutions include EZproxy and Athens. *EZproxy* is a web proxy server program extensively used by libraries to give access from outside the library's computer network to restricted-access websites that authenticate users by IP address. *EZproxy* helps provide users with remote access to web-based licensed content offered

by libraries. EZproxy provides a number of benefits to the libraries. It is an industry leading, robust middleware solution for remote user authentication; it connects to a large number of content providers; it connects to a wide variety of authentication services (including LDAP, SIP, and Shibboleth) which reduces the number of authorizations/passwords and provides a better end-user experience; it is an easy to setup and easy to maintain program [wikipedia].

Athens is a popular access and identity management service, offering single sign-on, to protected resources combined with full user management capability. Athens allows individuals to use single sign-on to access web resources and reduces the administrative burden for librarians and information managers. Classic Athens provides organisations with the tools necessary to create and manage usernames for single sign-on access to protected web resources. Major benefits of Athens are: secure single sign-on access to multiple web-based services; devolved administration facilities at organisation level; remote access user accounts; encrypted bulk user account upload services; highly scalable services-supports millions of user accounts; replicated, load balanced and fully resilient architecture. A recent extension of Athens, the OpenAthens framework, enables organisations to manage user identity and enable secure access to online resources through a single sign-on identity. [Athens].

Shibboleth is standards based, open source software package for web single-sign-on across or within organizational boundaries. It is software that implements Security Assertion Markup Language (SAML) protocols, separating the functions of authentication and authorization. Major goal of shibboleth is to allow users to access internal and external resources seamlessly using a single, institutionally controlled identity. Major benefits of shibboleth include:

- (1) reducing the time needed to manage and access to protected resources such as sharing resources among several institutions and managing a large number of accounts;
- (2) increased security (Single-Sign-On-SSO – do not need to remember multiple passwords, acquire information about the users from reliable providers, etc.); and
- (3) interoperability with similar standard-based solutions [John Paschoud and Masha Garibyan, 2005].

CONCLUSION

In the wake of the unprecedented increase in online services which are distributed among an ever growing number of service providers and which span in multiple resource types such as e-journals, e-journal aggregator databases, e-books, portals, e-reference works, e-reports, etc., it is imperative that libraries resort to access solutions which are simple and easy for the users to cope with. More over the access models should take into account the on-campus as well as the remote users of the Institution. The present systems definitely address the on-campus users' access requirements as in most cases publishers provide IP based access to campus communities. For a long time libraries have been pondering on solving of this issue and SSOs and remote login applications are welcome solutions. Ultimately the library fraternity's interest is that their users are assured of anywhere and anytime access, and also that they are relieved from the burden of passing through multiple authentications time and again. There are a number of applications found to be used by libraries such as EZproxy, One Log, Shibboleth,

Athens and so on, and each having its own advantages. Among these Shibboleth is an open source application though customizing it is not so simple. IIMK has been test running some of these services during the recent past and soon will implement one of these permanently. Looking at the long term and the landscape of the online information resources SSO and remote login solutions promise a strong and long standing stake in the upcoming library services. A possible addition in the wish list would be to have a federated or a meta search functionality also embedded into this, with a view to encompass all important functions in a single shot.

REFERENCES

1. Armstrong, Alan E. et al. Electronic Resources Access: issues and resolutions in two academic libraries. (<https://research.wsulibs.wsu.edu:8443/jspui/bitstream/2376/2025/1/Armstrong%20Electronic%20resources.pdf>).
2. Ashcroft, L. (2000). Win-win-win: Can the evaluation and promotion of electronic journals bring benefits to library suppliers, information professionals and users? *Library Management*, 21(9): 466-471.
3. Athens (<http://www.athens.ac.uk/>).
4. Authenticationworld.com (<http://www.authenticationworld.com/Single-Sign-On-Authentication/>)
5. John Paschoud and Masha Garibyan. (2005). Shibboleth for new generation access management (UK Perspective) (http://gate-test.library.lse.ac.uk:8080/dspace/bitstream/1988/2783/4/jpmg_IADIS2005paper.doc).
6. Sreekumar, M.G. and Sunitha, T. (2006). Community acceptance of E-journals as a robust print surrogate and scholarship supplement: The IIMK experience. In Proceedings of the International Conference on Digital Libraries (ICDL 2006). Ed. By TERI, New Delhi, pp. 531-541. [Proceedings of the International Conference on Digital Libraries (ICDL 2006). New Delhi, India. 06-08 December 2006. Organized by TERI, India].
7. Sreekumar M.G. and Sunitha, T. (2006). Seamless Aggregation and Integration of Diverse Datastreams: Essential Strategies for Building Practical Digital Libraries and Electronic Information Systems. *The International Information and Library Review*. 37, pp. 383-393.
8. Sreekumar, M.G. and Sunitha, T. (2006). Library capacity building through e-journal consortia: the Indian scenario, In *Digital Libraries in Knowledge processing* Ed. By Sreekumar et al., New Delhi, pp. 93-108. Available at: <http://dspace.iimk.ac.in/bitstream/2259/249/1/09-mgssunitha-paper?p=new.pdf>)
9. Terry, Ana Arias. (2000). How today's technology affects libraries' collection choices. *Computers in Libraries*, 20 (6): 51-55.
10. Wikipedia (<http://en.wikipedia.org/wiki/EZproxy>)
11. Wikipedia (http://en.wikipedia.org/wiki/Single_sign-on).