

Beyond the Boundaries: Remote Access to Online Resources at the University of Moratuwa Library

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Abstract

Though libraries have invested very high percentage of its annual budget to subscribe e-resources, limited attention was paid to ensure consistent and reliable access of those resources. Many library users access e-resources from outside of the University. Therefore many requests have been made to implement a remote access mechanism for e-resources. The objective of the study was to design a proper remote access mechanism to the users for accessing the e-resources provided by University of Moratuwa library. Publishers have provided access to e-resources through Internet Protocol (IP) authentication and not by user identity (user ID) and password. This kind of access created many problems to the users specially for the postgraduate students who do not visit the University regularly as many users need to access e-resources from anywhere, anytime. Using the concept of proxy server, a joint project was conducted between the Center for Information Technology Services (CITeS), University of Moratuwa and the library to provide remote access. Existing Lightweight Directory Access Protocol (LDAP) was used to authenticate the user access. This allowed remote user to obtain regular, secure access to library e-resources.

Keywords: Electronic journals, E-Resources, Usage statistics, Remote access, Academic library

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Introduction

Computers and related technologies have created a remarkable impact on information dissemination in modern society. Electronic databases, e-books, e-journals and their indexes are the most important information resources for organizing knowledge. Access to online journals, bibliographic databases, online catalogues and the Internet have altered the traditional library usage patterns, behaviors and expectations of modern library users over the last few decades. Online searching has become a norm and users always expect Google or Wikipedia style access to the library resources. Libraries should have a mechanism for supporting these expectations and behaviors to provide a quality customer service and to fulfill their mission to support teaching, learning and research. As a result, many academic institutions have built collections of e-resources to provide a better service to their users.

The University of Moratuwa library is a pioneer technological library serving a broad range of courses in Engineering, Information Technology and Architecture. The University of Moratuwa consists of approximately 3950 undergraduate students, 815 postgraduate students and 290 academic staff members. The 950 students of the Institute of Technology University of Moratuwa (ITUM) also belong to the student community of the University. The library is always committed towards providing access to both print and electronic resources for its patrons in supporting research and curricula. Computers and computer applications have been widely introduced within the library in addition to the integrated library management system (Libsys) introduced in 2000.

Literature Review

Threpathi and Jeevan (2013) have mentioned in their study, that “the use of licensed electronic information resources will continue to expand and in some cases become the sole or dominant means of access to scholarly content in future”. The usage level of e-resources will be one of performance indicators for future libraries. Therefore conducting

user surveys is important to identify the user requirements, problems and solutions towards e-resources.

Many surveys have been conducted to investigate library users' acceptance and use of electronic resources. Their findings have indicated a decrease in the use of print journals suggesting online journals as the most preferred source in finding research literature. Also Threpathi and Jeevan (2013) have highlighted that the usage of e-resources should be consistently monitored to identify the users' attitude, behavior and their mode of searching, browsing and reading. They have further emphasized that according to the results of these studies, library strategies should be modified and properly fine-tuned towards the user needs.

Punchihewa (2008) conducted a similar study to identify user attitudes towards online resources at the library, University of Moratuwa. During the period of the study, he analysed the obstacles of the users that had to face when accessing e-resources. Unavailability of remote access was the prominent obstacle highlighted by many users in that study. Kiriella (2010) has also highlighted the user requests to improve the facilities provided for accessing e-resources collection of the library, University of Moratuwa. In addition, Punchihewa (2012) has emphasized the value of providing remote access for e-resources as a key factor to increase the usage level in the study of cost effectiveness of e-resources at University of Moratuwa.

Most of the time online resources are offered on the basis of IP based access, allowing the use of these electronic materials only within the institution premises. This is due to various practical issues occurred when the remote access was provided with user name – password method. Vendors prefer to provide IP based access to prevent unauthorized access. But this is a limitation to the users. Users are always willing to access e-resources from anywhere, anytime. Therefore libraries always should take necessary steps to fill the gap between commercial vendor restrictions and academic user practice.

Resnick, Ugaz, Burford and Carrigan (2008) have described the evolution of library electronic resource (ER) problem-reporting help desk that assist the users with ER access problems at the Texas A&M University libraries. They have much attention on frequent requests of the users to ER problem-reporting help desk regarding the remote access mechanism, such as EZProxy (easy Proxy). According to this EZProxy mechanism, all off-campus users are authenticated by logging in through the library web site with a University-issued ID and password. This directs users to the proxy server, which has an IP address recognized by content providers as an on-campus IP (Resnick, Ugaz, Burford & Carrigan, 2008).

Covey (2003) has mentioned a more secure access mechanism to e-resources filling the gap between vendor restrictions and user practice called "Shibboleth". This is an architecture that enables organizations to build single sign-on environments that allow users to access web-based resources using a single login. Shibboleth is an Internet2 project developing and testing software to support inter-organizational web authentication and access control (Covey, 2003). Shibboleth provides comprehensive and flexible structure to authenticate the users and to control access to Internet resources and services. The most important feature of this architecture was that it uses the institution's local authentication system to verify the identity of the users. It eliminates the need to create different user IDs and passwords or to worry about the IP address of the computer. Lightweight Directory Application Protocol (LDAP) was used to provide attributes for controlling the access.

E-Resources at University of Moratuwa Library

Since 2003, the library has been provided access to many online resources. In the beginning of 2003, the IEE initiated giving access to online versions of their journals, along with print subscriptions, on a complimentary basis. Under this scheme, the Library of the University of Moratuwa gained access to 17 online journals in 2003. After that, the Library started to purchase online databases in 2004 with two databases other than IEE. Also from

2005 to 2008, Sri Lanka gained free country-wide access for 5 online databases and 4 websites of academic publishers under the PERI (Programme for the Enhancement of Research Information) project with the assistance of the Swedish International Development Cooperation Agency / Department for Research Cooperation (SIDA/ SAREC). In year 2013, the Library has subscribed to 5 full text databases and 28 individual online journals and magazines. ACM Digital Library, Emerald, IEEE Explore, Grove Art Online and Science Direct are databases available for year 2013.

The University of Moratuwa Library is not in a position to purchase all the modules of the above databases due to budgetary constraints. Considering the needs of different departments, some sections or modules of the databases have been subscribed. The access is provided only for engineering and environmental modules along with thirteen (13) individual journals in ScienceDirect database. The Emerald Management Xtra 175 package of the Emerald database and the ASPP package (All Society Periodical Package) of the IEEE database are the other database packages available for the research community of the University of Moratuwa. Other than these subscribed electronic resources, library has introduced a number of free e-journals and e-books to its users. Table 1 shows availability of subscribed electronic periodical titles during the period of 2009 – 2013.

Table 1: Subscribed periodical titles (2009-2013) at University of Moratuwa library

Year	Number of Individual e-Journal Titles	Subscribed Databases				Total Number of e-Journal Titles
		ACM Digital Library No. of Titles	Emerald No. of Titles	IEEE No. of Titles	ScienceDirect No. of Titles	
2009	50	290	150	120	291	901
2010	50	290	175	120	292	927
2011	33	290	175	154	314	966
2012	34	290	175	154	314	967
2013	33	290	175	154	314	966

According to the above data, University of Moratuwa library has offered the access to over 900 online journals for its users during 2009 – 2013. Other than the journals included in the databases, the library has subscribed to some individual online journals according to the requirements of the departments. The number of subscribed individual online journals has been reduced from 2009 to 2013. The library decided to discontinue some online journals due to the low usage. In 2013, there are 33 individual online journals.

Table 2: Subscription cost for online periodicals (2009 – 2013)

Year	Online Databases	Online only Journals	Online & Print Journals	Total
2009	10.06	3.15	2.87	16.08
2010	10.60	5.34	1.26	17.20
2011	10.81	4.09	0.51	15.41
2012	13.93	5.00	0.56	19.49
2013	14.67	6.29	0.62	21.58

*Values are in Sri Lankan Rupees (millions)

The cost of periodicals have increased year by year (generally by 6% annually) and libraries have to spend an increasing percentage of their annual budgets for purchasing periodicals (PURCEL 2000, cited Kidd 2002). In 2013, the University of Moratuwa library has spent Rs.21.58 million for purchasing online periodicals. This is an increase of almost Rs. 5.50 million compared to the year 2009. Increase of subscription cost is much significant and it justifies the need to make e-resources available to maximum number of users. Table 2 highlights the library cost for each online periodical format from 2009 to 2013.

It is really important to monitor the usage of online resources as the library has spent very high percentage of its budget to purchase them. According to Kidd (2002), viewing of a full-text article would probably be the most meaningful single statistic to understand the

usage level of electronic resources. Table 3 shows the full text article downloads from each database for the period of 2009-2013.

Table 3: Yearly distribution of full text downloads (2009 – 2013)

Year	ACM Digital Library	Emerald	IEEE	ScienceDirect
2009	1,162	20,287	3,899	28,119
2010	787	23,794	9,029	19,310
2011	415	25,062	5,594	26,410
2012	1,238	22,006	6,214	21,357
2013**	1,019	13,649	5,070	16,312

** Up to June 2013

For year 2012, Emerald database had the maximum number of full text article downloads. According to the table 3, large number of full text articles has been downloaded from the subscribed databases. These downloads highlight the impact of e-resources on research community at University of Moratuwa. Though the statics indicate high percentage of usage of e-resources, according to the study conducted by Punchihewa (2008) postgraduate students have faced many difficulties in accessing library materials. The lack of time to come to the library was the most prominent reason for the minimum usage of materials by the postgraduate students. Most of the postgraduate students are employed and most postgraduate courses are conducted on a part time basis or as weekend courses. Therefore, the majority of the postgraduate students have very limited time to spend in the library or university. This is a critical issue for them to find the time for accessing e-resources within the University. The researchers also have the personal experience regarding the student requests on remote access when they conduct different academic programmes to the students. One of the postgraduate students had stated following statement as his comment in the feed-back form after the session on e-resources at library, University of Moratuwa. The statement was “there is no value of these e-

resources without having the access from home". This reflects the value of the remote access of e-resources for the users. Therefore as the information professionals, librarians should pay a serious attention to identify and address the issues of users related to remote access of e-resources.

Statement of the Problem

Even though library has subscribed to many e- resources, publishers have provided access through IP authentication and not by user ID and password. Publishers have restricted the access by institutional IP address. Library has provided the range of IP address to publishers when the agreements were signed. In this way, access is possible only within the University premises for all the users. This has created a major barrier for the users who need to access e-resources remotely and mostly through their home desktops. Users always expect to access information from anywhere, anytime. Unavailability of remote access is a critical problem specially for the postgraduate students who do not visit the University regularly.

Objective

As there are frequent inquiries and demands for accessing library e-resources remotely and also to increase the usage, library should provide a proper remote access mechanism for its e-resources by fulfilling the gap between vendor restrictions and user requirement.

Design

The proxy server concept explained by Covey (2003) was applied in providing a solution for remote access problem. Proxy server can be defined as a computer system or an application that acts as an agent for requests from clients seeking resources from other servers. The proxy server controls the transactions between users and real servers (Covey, 2003).

With the solution provided by the library for remote access, the users accessing from outside the University IP range (outside the University) must change their web browser proxy setting according to the instructions provided. Then they must login to the new proxy server using their official University email address and the individual email password. Thereafter, user requests are forwarded to the new proxy server which has University IP address and the proxy server will direct the user requests to the real servers. The real servers can recognize this as authorized IP to allow access to commercially licensed resources. The proxy server accomplishes the task of authentication and verifying that the user is associated with University of Moratuwa. Also the proxy server accomplishes the task of access control and verifying to the publishers' server that the user is authorized by University of Moratuwa to receive their licensed materials.

It is needed Lightweight Directory Application Process (LDAP) or Single Sign On (SSO) system for the authentication process of the user IDs and passwords. The LDAP is an application protocol for querying and modifying directory services running over TCP/IP (Transmission Control Protocol/Internet Protocol) (Liu & Shih, 2008). Covey (2003) has further explained LDAP directory as a repository of user and group information. Each user or group has an entry in the directory with associated fields such as user's name, email address, department, user ID and password etc. Authentication services contact LDAP server to get user information which are needed to access control. The SSO authentication process enables the users to access multiple web-based resources by entering their user names and passwords only once (Covey, 2003).

Using this concept, a joint project was conducted between Center for Information Technology Services (CITeS), University of Moratuwa and the library to provide remote access. The 'Squid' software was used to create the new proxy server at University of Moratuwa which enables the remote access for the users. Squid is a web proxy cache server application which provides proxy and cache services for Hyper Text Transport Protocol (HTTP), File Transfer Protocol (FTP) and other popular network protocols. It

reduces bandwidth and improves response times by caching and reusing frequently-requested web pages. Squid has extensive access controls and makes a great server accelerator. It runs on most available operating systems (Optimising web delivery, 2013). FreeBSD 8.1 was the operating system used to run the new proxy server in this project. FreeBSD is a free Unix-like advanced operating system used to power modern servers. Its advanced networking, security and storage features have made FreeBSD the platform for many of the busiest servers in the world today (FreeBSD, 2013). The LDAP server of University of Moratuwa was used to authenticate the user access. This allowed remote user to obtain regular, secure access to library e-resources.

Discussion

Many academic staff members and postgraduate students have reported different difficulties in accessing library materials. Lack of time to come to the library was the most prominent reason for low usage of e-resources reported by the postgraduate students. The majority of the postgraduate students have very limited time to spend in the University as large percentages of them are employed. Further, most of the postgraduate courses are conducted on a part time basis or as weekend courses. Therefore, it is a critical issue for them to find time for accessing electronic materials within the University.

Library has initiated many steps to remove barriers and to facilitate convenient, easy access to e-resources. However library cannot do this alone. For example, library cannot manage security issues and other access control of University network without corporation of relative network administrators of the University. Obtaining this technical support was one critical factor to delay in establishing the remote access facility. Also the low band width of the University network in last few years was another issue that affected in providing remote access. University has expanded its Internet band width recently and the technical support required was provided by newly established Center for Information Technology Services (CITeS) who obtain the authorization to administrate all networks of the University.

Providing remote access to library's e-resources was one of main objectives that could not be achieved despite frequent requests being made during last few years. Finally library has accomplished this task and now expects the usage of current e-resources to be multiplied by several folds.

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