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Open-Source Cloud Storage Solution in Library and Information Centres

Kannan S

[1]Library Officer, Vikram Sarabhai Space Centre, Indian Space Research Organisation, Thiruvananthapuram – 695022, India
Email: *Kannan.satheesan[at]gmail.com*

Abstract: ***A typical modern library encompasses various software, practices and technologies to collect, collocate, index and retrieve information in various formats. The cataloguing module with Online Public Access Catalogue (OPAC) takes care of print resources, the digital library solutions heed to digital documents and library websites, particularly the content management systems organises and disseminates other information to the clientele. Even then, in spite of the existence of these three corner stones a lacunae is sometimes felt. This paper attempts to bring out the features and applications of ownCloud, a private cloud solution, its potential uses in library/information centre environment for bridging gap in between the trio of library management software, Digital library software and content management system.***

Keywords: Open-Source Software, OSS, Library Automation, Library

1. Introduction

Cloud storage solutions are not new to any modern-day information professionals and definitely everyone will be using solutions like Dropbox or Google Drive. Cloud storage service allows users to store their data at remote disks and access the data anytime from any place [1]. At one point or the other, all might have felt the need for such a service within one's own organisation where data flow can be monitored and regulated. Two major cloud deployment models can be found nowadays. On the one hand, there are public clouds which allow paying customers to access their services via common internet protocols, web applications, or application programming interfaces (APIs). Private clouds, on the other hand, offers services only to a limited number of clients by restricting the access methods, e.g. only within a company's intranet [2]. OwnCloud is a generic private cloud storage solution, not specifically designed for any particular environment, but can be extensively customised to tailor suit the demands of library and information centres.

OwnCloud is a free and open source software released under AGPL (Apache General Public Licence) . It has a nice and intuitive interface and its basic installation requirements are modest, a server with adequate storage capacity, a database preferably mysql and a web-server. The source and installation guide is available in the internet and anyone with sufficient computer knowledge can install it. Putting a file into the server is quite easy, one need not have expertise in file permissions but has to just put it into any designated local folder in the local personal computer and it would be momentarily synchronised with user's folder in server. Trashed files are still retained within the server and can be re-instated.

2. OwnCloud Features

Owncloud outruns the functionalities of similar software. It integrates functions of multiple software, making it a tool or solution for mirroring, back-up, online editing, and much more. Some of its key features are:

a) Free and open source: Libraries are finding it difficult to make both ends meet with respect to user expectations and funds at its disposal. Free and Open Source Software (FOSS) pose a promising way out and librarians are gaining insights into using them by gradually accustoming themselves to applications like Koha, Dspace, Drupal etc. OwnCloud is freely available, is easily customisable and its installation requirements are modest with minimum memory, software dependencies and little expertise to manage.

b) Cross platform compatibility: - Majority of Open source software solutions run best on Linux environment owing mainly to licence restrictions. It would be ideal if the application runs from within Linux and user interface is platform independent. OwnCloud can be installed in Linux as well as windows server and its client module supports cross platform functionalities.

c) Web interface: Web based software models are here to stay and it replaces traditional client-server architecture-based software models. Web interface offers ubiquitous, standard, Omni-present interface which is highly customisable for the end user. Files can be sent to server onto one's account by just dragging and dropping it into the browser wherein the user is logged in. OwnCloud's look and functionalities can be extensively customised and additional features can be added as 'apps' as the source code is available freely.

d) Data security: - The data that the user stores in the cloud storage should be secure so that it prevents intruders from accessing private data[3]. Authentication and authorisation are two main mechanisms that determines the security of multi-user software. User must be authenticated to access the service from cloud. The commonly used security mechanism for data access is username and password pair [4]. In addition, own cloud has got its own logging module where all user activities are monitored and logged. Files input in to user accounts are saved in separate folder s and other data including user details and file meta-data is stored in mysql

database. So it is quite easy for taking backup of all the files and database as well. The whole process can be automated with the help of a computer professional and it will be a onetime activity.

e) Simple administration: A new user looks at any software critically from a view point of its easiness to use rather than at the potentials of the software. The learning curve should be gentle as far as possible for any user - and ownCloud excels in this aspect. The links and modules are quite self-explanatory and the installing person and the user will find it quite easy.

3. OwnCloud in Libraries and Information Centres

OwnCloud is by and large a File Transfer Protocol (FTP) server designed with web interface and connected to user's local PCs through client application (optional) which makes it an application serving various purposes for libraries.

a) Secure cloud storage: Desktop or a PC if it is connected to ownCloud server, via internet is accessible 24x7 across the campus or the globe. You can log in to the system with proper authentication and use it securely through browser with 'https' security level. As modern day information managers are required to be connected 24x7, and this omni access to OwnCloud is the perfect solution and it is to be borne in mind that similar functionalities are out there with Drop box or such software, but there the data flows out on to external servers, and it can be against your organisation's policies.

b) Collaborative editing: Join hands with co-authors, not by sending files back and forth through emails, but by just start creating a document with integrated open source document writers like open office word or libre-office writer functionality in Owncloud and share the documents with peers for editing. Librarians or documentation officers will definitely find this feature useful if the information centre brings out publications collocating information from various sources and if the document is to be routed through different persons before reaching a final state.

c) File versioning: One usual mistake that all commit while editing a document using a word processor is using ‘save’ in place of ‘save as'. Very often it is necessary to revert back to a previous version of the file and gets struck there. When using ‘save as’, there will be a number of saved copies at each stages that would still make it difficult find the copy one needs among all the copies left behind. OwnCloud editor makes use of file versioning that uses 'incremental snapshot backups' of all files edited through its web interface so that one can move back and forth through the document at various time stages.

d) Selective sharing: Documents or folders can be shared with peer users either through local PC with mouse click function or through simple mouse click through web interface. OwnCloud creates for you shares which are open, password protected and time limited based upon your choice. These features are particularly useful for a librarian or information manager who is interested in sharing a document to a specific user or group for a limited period of time. If the library/information centre brings out a 'volatile' document, like a status report, which is likely to be replaced at a point of time in future, one can give a time limited link such that the link will cease to work at the expiry of the time limit, saving the end user from unnecessary confusion.

e) Minimalistic indexing: There are quite a few types of documents which are useful but yet not worth of thoroughly indexing. The meta-data of such documents itself is minimum. Eg. Annual reports of organisations which are frequently received at other libraries as a compliment/gratis. These documents can be easily hosted over a cloud with appropriate file name, which acts as its 'access point' thereby saving considerable man power for its indexing, and conserves space required to store its hard copy.

f) Document delivery via ownCloud: The architecture of owncloud supports 'inter cloud' cloud file sharing wherein an user of an instance of a cloud will be able to share documents with his fellow peers as well as users of other instances provided 'inter cloud' data transfer is enabled across both servers and they are connected to the same network or the internet. Thus, if OwnCloud instances are running on two or more research centres or libraries they can be hooked together to provide extended services and same functionality can be used if library happens to be a part of branch library network.

g) Easy temporary file hosting: Contents like book reviews, content pages or price proofs are sometimes needed to be hosted somewhere for making presentations etc. for library advisory committee or other such bodies. Such files can be easily put on a folders in your local PC and mirrored to server. They can be accessed, viewed and modified through any PC having a browser and connected to LAN/WAN. Putting in circulars and notices for circulation among the users is very easy and ultimately it enhances the productivity of information professionals, creating a new channel of communication and serves a sort of perpetuality to its access.

h) Cloud storage as an incentive for active research: - Library and information centres are putting to use technological capabilities to extend all possible support to its research clientèle. Setting up researchers’ profile in research networks and teaching them the use of reference management tools are such initiatives in this direction. Offering an account in institution’s ownCloud for personal storage of research materials as a complimentary gift would certainly become an impetus in bringing them closer to libraries. It does not cost much if the library has a decent server with adequate storage space lying vacant. Through ownCloud’s administration settings, administrator can easily fix storage quota for each user account.

i) Backend indexing: The architecture of OwnCloud supports external search engines to be employed across its storage folders making it feasible to index the contents in-depth even upto full text searching. Thus, if such search interfaces are established, 'deep search' can be made across all user accounts, provided the administrator has obtained consent from the user regarding indexing of the content put in by him in cloud account.

4. Conclusion

Free and Open Source Software opens up a wide avenue for library and information professionals through which potential and diverse demands of clientèle can be met without expending much. OwnCloud, the software as such is beneficial for the library professionals and for the library users. It would be beneficial for both stake holders to have such an application running, and in this competitive era, customer satisfaction is a surpassed goal and now it is customer delight that wins their hearts and makes them stay closer and connected to library and information centres.

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