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The use of a Digital Rights Management System for Document Supply

Andrew Braid

The British Library, Boston Spa, United Kingdom

Abstract

The paper describes: (i) the use of digital rights management (DRM) systems in providing a secure electronic document supply service; (ii) the reasons for the use of DRM systems by document suppliers; (iii) the system adopted by the British Library, with reasons for the rejection of some systems; and (iv) some insight into how the chosen system has been received by users.

Introduction

The British Library is one of the world's major national libraries and also operates world-renowned document supply and interlibrary loan services. The Library is in the process of realigning its strategy and its new vision is to 'support anyone who wants to do research' by offering services that are 'time and space independent'. In this context supply of information to a researcher's desktop is a key component to realise the vision and electronic document delivery is a major plank in achieving the vision for remote users.

Electronic document delivery is a relatively new addition to the older traditions of document supply and inter-library loan. It involves the supply of a non-returnable surrogate copy of the required item, usually an article in a journal, by an electronic method. This can be very fast and can be almost instantaneous if the delivery can be

directly to the users desk-top. Electronic document delivery has proved to be very popular with users who can easily obtain a copy of an article that is not held locally. However, publishers see the possibility of users obtaining copies of articles at almost the same speed as if they were available by subscription to an electronic journal, but without the need for a subscription. They claim that electronic document delivery gives libraries even more reason to cancel subscriptions to journals and rely on document suppliers and other libraries instead – the so called ‘just-in-case’ versus ‘just-in-time’ argument. Publishers have made these claims since well before the introduction of electronic document delivery.

Libraries see instant supply as a natural progression in the evolving nature of the document supply process. They want to be able to offer a service level that is equivalent to that of local supply. The only method to do this is to offer electronic document delivery. In order to offer electronic document delivery libraries need the agreement of publishers because in many countries not having such an agreement would be an infringement of copyright legislation. Because of the concerns outlined above, some publishers are unwilling to provide such agreement unless a way of controlling electronic document delivery is in place. One method of controlling it is by the use of digital rights management on the transmitted file. This paper offers a background on the use of such systems and describes the implementation of such a system by one major document supplier.

Digital Rights Management

Digital Rights Management (often referred to as DRM) can mean either the digital management of rights, as in the context of this presentation, or the management of digital rights. The latter term, which is a market enabling technology, encompasses the identification and description of content and includes information about the rights and permissions associated with that content; usually this is done in such a way as to be interoperable with other content and access systems.

The digital management of rights means the technical protection measures that are added to (or wrapped around) a piece of content. This usually involves the use of some form of encryption and access control mechanism. As well as preventing unauthorised access, the controls limit various aspects of use of the content. Such limitations include the number of copies that may be printed, whether the file may be copied, the length of time that the file may be accessed and whether the content may be ‘cut and pasted’. Unlike the management of digital rights there is little standardization in the digital management of rights.

Many systems have been developed for controlling the use of digital objects, for example e-books. Here the user, after downloading the necessary access software, can obtain an e-book and obtain rights to access it using a variety of business models. These business models are usually based on analogies with the borrowing of physical books, for instance the length of time the e-book is available can be controlled and whether or not the e-book can be loaned to another user.

Reasons for implementing DRM for document supply

At least three major document suppliers, the British Library, the Canada Institute for Scientific and Technical Information and Infotrieve, have implemented a method of

secure electronic delivery. Although the three systems differ technically, they have all been implemented for the same reason. That is, as I said earlier, unless such systems are in place, some publishers will not grant the necessary rights for electronic delivery to be provided.

This may seem an irrational response from publishers, nearly all of whom allow unsecured access to their online journals for subscribers and pay-per-view customers. There are three reasons as to why publishers are unwilling to grant similar access through document suppliers:

- (i) publishers are not in direct control when supply is through a third party;
- (ii) they fear that inappropriate use might result; and
- (iii) as stated above, they fear erosion of subscriptions.

DRM systems do not provide a solution to all of these fears but they do give comfort to publishers in controlling inappropriate use.

The British Library and electronic document delivery

The British Library has experimented with several forms of electronic delivery over the last twenty years and the Ariel[®] system has been used for the last ten years. Internally, this was a stand-alone system and it was impossible to integrate into the automated request processing systems. Furthermore, Ariel is not much liked by publishers as they claim that there is little, if any, control possible. It is also not possible to transmit documents directly to the end-user without the addition of further action on the part of the intermediary.

The British Library's aim was to offer electronic access to information through a service which any user could use, and which did not require the Library to offer bespoke software. The first challenge, however, was to ensure that all of our copying created a digital file which we could then transmit securely. In 2003 the Library upgraded its copying processes and replaced all the photocopy machines with electronic scanners using the Relais system. Although principally used for output in print format, this gave the possibility to supply any item from the collection by electronic delivery, including the integration of the Ariel system as well as the possibility of additional methods of electronic document delivery. The British Library was keen to implement a method of electronic document delivery direct to the user's desk-top, so as to provide near-instantaneous delivery. To do so it was necessary obtain agreement from either individual publishers or their agent in the United Kingdom, the Copyright Licensing Agency. For the reasons stated above, in order to obtain the required rights it was necessary to implement a secure electronic delivery system.

The chosen system

Several forms of secure electronic delivery were investigated. All of these were based on DRM systems. Many of the early systems were rejected for one or more of three reasons:

- (i) they were too expensive;
- (ii) they were too complicated; or
- (iii) they did not work properly.

Trials did begin with one system in 2001 but it proved to be inadequate technically.

During 2002, the British Library worked closely with Elsevier to develop a system which, it was hoped, might develop into an industry standard. The Adobe® Content Server and Adobe eBook Reader® systems were chosen. These permit the encryption of existing PDF files in real time and allow a variety of security levels to be set. Initially, the following parameters were chosen:

- Use of the file was restricted to the machine on which it was downloaded;
- Printing was set to one copy only;
- Saving and viewing of the article was permitted, but for a limited period of time. (The time period varies depending whether the article originates from a scanned image or a digital original);
- Forwarding and copying was disabled;
- Annotations and conversion to speech were permitted.

An added advantage for users was that the system used software that was readily available at no cost from a well know and reputable company. Many of the other systems rely on plug-in software, often supplied from very small companies. Since the initial work Adobe has integrated its eBook Reader software into Adobe Reader from version 6 onwards. This has the added advantage that, as most users already use Adobe Reader, it is not necessary to install any additional software to use the secure document delivery system. However, the requirement for version 6 has caused some challenges – to which I shall refer later.

It was decided that, rather than ‘push’ the PDF file to the requester, it would be better for the requester to ‘pull’ the file from a British Library server. There were several reasons for this, for instance, many of the problems associated with the transmission of large files as email attachments and that of firewalls are overcome if the requester controls the process. The drawback is that, for the standard requesting methods, the user is not online to the British Library and so cannot initiate the downloading process. However, the British Library does offer some services that can be used for online delivery.

These online services (called Inside and British Library Direct) allow users to search for and select individual articles from the listing of journal content pages. Individual articles can be requested for delivery through a web interface. The British Library has agreements with some publishers for the storage and use of online journals. These publishers permit the delivery of requested articles to be online (a PDF icon alongside the bibliographic citation signifies that the article is available for immediate downloading). When such a request is placed, the PDF file is retrieved from the electronic store and encrypted using Adobe Content Server before being downloaded by the user for viewing and printing using Adobe Reader. The file is encrypted according to the parameters listed above.

For material held in paper format a different approach has been adopted as the user cannot keep the online session open while the paper original is retrieved and scanned. After the article has been scanned it is converted to PDF format and encrypted in the same way as above. The article is then loaded onto a server. An email message containing a link to the article on the server is sent to the user. Because the security permits only the person who opens the link to download the file, it is important that the requester should be the person to do this. Thus, if the request is sent via an

intermediary, the intermediary should forward the email message to the original requester before downloading takes place. An added advantage is that, as the encryption and access software is exactly the same for born-digital and scanned files, both types can be transmitted and accessed in exactly the same way. This method has also been adopted for non-online services. For all of these an email message is sent to the user or intermediary after the encrypted file has been loaded onto the server. In all instances the link to the file is only available for a limited period of time and the link is disabled after the first download has taken place.

The system in practice

The system has been rolled out in a phased manner; it began in December 2002 for Inside users, with the name 'Secure Electronic Delivery'. Additional phases were delayed until the problems caused by Adobe changing the reader software from eBook Reader to Adobe Reader v6 (in June 2003) were resolved. The version linked to scan on demand from paper originals became operational in December 2003. It is now available for almost all the services offered and, at the time of writing (May 2005), Secure Electronic Delivery is now responsible for over 15% of all items supplied.

There are still some problems to be resolved, as with any form of DRM which requires specialist software. The main ones are:

- Some organisations have been slow to upgrade to the latest version of Adobe Reader. These are particularly large organizations with complex infrastructures and where the library does not have any influence to demand software upgrades.
- Some customers who mediate requests have asked for the ability to check the item before it is forwarded to the end user. At present the system does not permit this, but we are close to developing a solution.

For those who have used it reaction to the system has been very positive. Many users have commented favourably on the speed of delivery and the ease of using the system.

Conclusion

Supplying electronic information to a user's desktop is a key strategic mission of the British Library. Researchers want to be able to access information wherever they are – and helping them do so is important if libraries are to remain relevant. Given the complexities of copyright legislation, DRM has been our chosen mechanism to allow us to do this with the support of the copyright owners.

The DRM system chosen by the British Library has proved to be successful and well received by many users. At first sight, the use of such a complex system for what is a relatively low-cost product may seem overkill, but it was the best way for the British Library to obtain the rights that it required to be able to continue to offer electronic document delivery. It is hoped that, as both publishers and users become more familiar with the use of such technology, the technology will become more sophisticated and even easier to use. One system that is currently being examined is the use of watermarking. This should require no special software on the part of the user but at the same time provide an audit trail in cases where abuse is suspected.

For over 40 years the British Library has adopted an innovative approach to supplying remote users. Secure Electronic Delivery is just the latest innovation in the Library's continuing efforts to remain as a world-class library.