Virginia Electronic Access Document

CDL Mechanisms

(Updated June 2021)

Introduction

Controlled Digital Lending is a new and evolving concept, and while a few software solutions have emerged to support this effort, there is not yet an industry standard. Provided below is an introduction and overview of some current options for managing the preparation and delivery of files to patrons. The solutions have unique features that should be considered with regard to the legal implications and local workflows of your institution will be assumed by participating in CDL. As software solutions are evolving, please note the **update date** on this page for the currency of the review and options.

Software comparison chart

CDL Software	Features	Hosted/Local	Cost	Notes
Readium	Integrates with most systems via Restful APIs. Standard-compliant. Works with multiple formats (EPub, PDF, Word, Audiobook).	Local	Free (open source)	Needs local expertise to maintain.
Occam's Reader	Can integrate with ILLiad through Add-on. Easy for staff and users to use. Includes web-based user reader. Minimal IT support needed.	Hosted (older version open source)	Low to subscribe, and low staff resources required.	Not ADA compliant, so will not support CDL for accessibility concerns. View access only/content not searchable.
Adobe DRM	Familiar tool. Used by many publishers and vendors. Easy to implement for staff.	Hosted	Medium	Reader and Adobe ID free to users. Potentially cost prohibitive.
Google Drive	Minimal IT support needed. Familiar product.	Hosted	Free (see note)	Available to paid G Suite members.

				The shortest time frame you can use Drive to lend materials is by date, rather than hour (e.g. checkout from 10/21-10/22 rather than 2 hour lending).
ALMA D	Integrates with ALMA.	Hosted	High	CDL is not the intended purpose for this tool, so it might be an appropriate solution if already licensed by your institution. Otherwise, this may be financially and logistically prohibitive.
Digify	Cloud based, straightforward, appropriate DRM. Easy access control, and timed expiration of material viewing.	Hosted	High (custom enterprise price)	Not designed with libraries in mind, no integration with catalog.
Open Library (Internet Archive)	Straightforward. DRM is applied by Open Library, so lending ease is high. Users must create their own accounts with Internet Archive. Optional: Affiliate libraries send print holdings to Open Library, which can provide a file of links to the corresponding digital versions of the holdings' records. Internet archive sets the lending time and waitlist for materials.	Hosted	Free	Library affiliates can loan digitized copies of the materials they hold through Open Library. The Open Library platform and provided links to digitized materials uses DRM software that limits the loan for a select number of hours, without the library having to apply additional software. All of a library's print collection may not be available within the Open Library.
Caltech DIBS	Designed for CDL. Simple and straightforward staff and user interface. The software provides two main components: a loan tracking system, and in integrated digital content viewing interface. DIBS embeds the Universal Viewer to display materials that comply with the International	Local	Free	Designed for CDL. Must install source code from GitHub, is written in Python3. There is an example demo on the installation page: https://caltechlibrary.github.io/dibs/installation.html Requirements include: a IIF server, a web server, an authentication layer, some modification to the metadata

	Image Interoperability Framework (IIIF).			retrieval code, and modification to the html templates.
DLSG CDL Solutions	Strong DRM and DLSG supports accessibility features (PDFA/UA, ReadAlong Audio) Directed lending profile from server set up by staff.	Hosted	>$5,000 per institution - scanner may be expensive.	Designed for CDL. Includes features that the company states make this type of use transformative. Easily emulates standard physical reserves systems. Access is controlled via single sign on. Integrates with scanning the company's scanning systems.

Mechanisms: Advantages & Disadvantages

Readium

Url: https://www.edrlab.org/readium-lcp/

Readium is a vendor-neutral, passphrase-based rights management tool for distribution of protected content. This solution, which is based on EPUB 3 was designed specifically for library lending. The nonprofit developer, EDRLab, promotes the solution as interoperable with "any" catalog, format, platform, or device. Readium also supports multiple DRM technologies. The LCP open specification on which Readium is based is expected to shortly become ISO-compliant under ISO TS 23078. Anyone can implement the Readium LCP as an open source software available on Github. However, in order to preserve interoperability with publishing platforms and data protection, as well as to eliminate costly and labor-intensive local maintenance, EDRLab recommends licensing the Readium LCP implementer either as a developer or as a service provider for an annual fixed cost based on the annual budget of a library. The service provider (e.g. library) is then able to deploy a local license server using Readium and a relational database using SQLite, MySQL or SQLServer. Libraries are able to test the implementation before integrating with the library's distribution platform which can be called through an authentication system, such as a reverse-proxy server. Once the local system has been tested, EDRLab will "LCP certify" the site to assure publishers and copyright holders.

Advantages include:

- Vendor neutral
- Partially open source
- Interoperable
- DRM model agnostic
- Locally hosted
- Utilizes Restful API technology
- Intent to certify with ISO

Disadvantages include:

- Requires a level of technological expertise, including knowledge of SQL and Restful APIs
- Requires some local care and feeding (i.e., server space, software installation and maintenance, establishing and maintaining necessary connections via API)
- Requires in-house authentication set up
- Minimal administrative functionality; requires local development of administration tool
- Not yet certified as a standard

Occam's Reader

URL: http://occamsreader.org/

This system was developed at Texas Tech University in collaboration with the University of Hawaii at Manoa and the Greater Western Library Alliance to allow the loaning of ebooks through its platform. This tool was built to support lending ebooks between libraries, and initially worked with Springer content only. Lending staff upload PDF or TXT files to the system, which converts them to the Occam's Reader format. Once the request is processed within the system, the user is provided with a secure link to view the file using Occam's proprietary e-reader platform for 14 days or chapter content for 30 days. This loan period may be customizable. The cost of the product ranges from $350 to $500 per year depending on whether libraries join as a single entity or as part of a library group.

Advantages:

- Vendor neutral
- DRM built into system
- Cloud-based system, hosted by Texas Tech University
- Integrates with ILLiad through an Add-on (for ILLiad users)
- Source code for earlier version is open source
- System is fairly easy for staff and users to use
- Inexpensive
- Allows any PDF to be uploaded and shared through the system
- Minimal system support needed locally

Disadvantages:

- Not ADA compliant
- Provides view access to files only (though this may also be an advantage for CDL)
- Users cannot print or download pages easily (only through print screen functionality on computer) or annotate pages and save those annotations
- Very little local control over system

Adobe DRM

URL: https://www.editionguard.com/learn/what-is-adobe-drm/

Adobe DRM is applied and managed on the content distributor's end with Adobe Content Server (ACS). On the user's end, an ebook encrypted by an ACS is opened and read by software built on an Adobe engine. This is usually Adobe Digital Editions (ADE). When a user purchases or attempts to download an ebook, they typically click on a download ebook link, and when using Adobe DRM, they will first download a small .acsm (Adobe Content Server message) file. This file is not the ebook. If the user has Adobe Digital Editions installed on their device, that software can open the .acsm file. If not, the user's device doesn't know what to do with the file. The .acsm file contains instructions and a link telling the user's ADE where to get the ebook. After clicking on that link, the user's ADE and the content distributor's ACS connect, ADE gives the ACS the user's Adobe ID (if they have an Adobe ID set up), and the ACS packages an ebook file for that ID. The ACS checks Adobe's signing server, the server checks credentials, and gives the go-ahead for ACS to deliver the ebook. The ebook can now be downloaded by ADE – only on the authorized Adobe ID device. After the file is downloaded, the user can open and read the content in Adobe Digital Editions. Pricing information is not available without requesting a quote, but several sites price Adobe DRM at $6,500 for the initial license fee, $1,500 annual maintenance, and $.22 per ebook sold/downloaded. Some of the sites offering prices appear to be Adobe DRM alternatives, including LockLizard and EditionGuard.

Advantages:

- Adobe is an established company providing DRM for numerous vendors
- Adobe Digital Editions and an Adobe ID are free for the user
- Adobe Digital Editions reading interface offers numerous features and supports multiple file formats (EPUB, EPUB3, and PDF) ACS packages

Disadvantages:

- The Adobe DRM model is intended to be monetized
- Requirement to download Adobe Digital Editions and have an Adobe ID
- Adobe Digital Editions is not compatible with all devices. List: https://support.ebooks.com/hc/en-gb/articles/204721459-Devices-with-support-for-Adobe-Digital-Editions (Links from Adobe listing supported devices are on Adobe's Blog, and the site has been archived)

Google Drive

URL instructions: https://drive.google.com/file/d/1RuV75bWeLFMH0G-vTyuouxMVaK9Yo7lq/view?usp=sharing. Also see this (updated) 2020 video: https://www.youtube.com/watch?v=Ro_dt6-5-5E

Advantages:

- Freely available to share files with an expiration date (if your university/institution is a paid G Suite organization) in Google Drive
- Most file types supported on Google Drive (PDF, video files, Word, etc.)

- Can limit whether individuals can download or further share the file (with or without paid G Suite organization membership), which is a requirement of CDL

Disadvantages:

- Expiration dates can only be set by days, not in hours or minutes, limiting the number of loans
    - It may be possible to limit it by hours if a script is written
    - If done manually without expiration dates, this could be managed (see next sub-bullet)
- Expiration date feature only available to paid G Suite organizations
    - Alternatively, the loan could be manually tracked and then "unshared" with the user and shared when a new user requests access (or when the library decides the loan period is over). It is easy to see how many individuals have access to the document at once
- Would likely have to use a spreadsheet or Google sheet to keep track of loans to ensure owned-to-loaned ratio
- Would likely be more feasible for a small-scale pilot project, such as a few high circulation course reserves

Alma Digital

URL: https://exlibrisgroup.com/products/alma-library-services-platform/digital-resources/

Alma Digital is a digital repository and management solution from Ex Libris. Although promoted also as a standalone, Alma Digital, for CDL purposes, seems to have the most benefit for existing customers, particularly those libraries with Alma. The metadata, collections and workflow management platforms for Digital closely resembles that used for Alma management of print and electronic resources. In addition, for Alma libraries, the connection already exists between the catalog, the digital repository, and the digital rights management with user authentication through Alma or Primo, simplifying the entire CDL process.

Advantages:

- Ability to scan and store local holdings
- Fairly detailed access control, including:
    - DRM controls to prevent copying or downloading
    - ability to set use limits via loans or concurrent use
    - ability to establish and enforce a granular loan period
    - ability to integrate user authentication
    - ability to establish unmediated access to content
- Enables users to place a "hold" on an item and be notified of availability
- Includes native reader, but is compatible with other readers
- Offers a number of user reading features such as zooming, text highlighting, annotating, and searching (with OCR file) capabilities
- For Ex Libris customers, integration with existing catalog, discovery layer, and established workflows
- Allows student to link to CDL and reserve content via several learning management systems

Disadvantages:

- Implementation can require several months if a library does not already have Alma Digital implemented and depending on internal technical support, implementation still may require some time.
- Requires some work by staff to implement CDL whether an existing system or a new implementation, but vendor does provide some support for working through issues.
- Cost is not insignificant and can vary depending on storage needs, number of files, current Ex Libris contract, etc.

Digify

URL: https://digify.com/

Digify is a cloud-based document security service with built-in encryption, digital rights management, file tracking and virtual data room capabilities. It works by allowing the library, or user, to create a data room, and then invite users to access DRM protected documents. It's appeal for CDL is that it allows for access control, restriction of forwarding, an ability to revoke access, default view only (so no printing or downloading), administrative control, and time expiration on digitized materials. It is cloud based and uses AES-256 encryption in-transit and at rest. Their hosting infrastructure is certified for ISO 27001, FedRAMP, FIPS, PCI DSS Level 1.

Advantages:

- Cloud based, straightforward, appropriate DRM
- Easy access control, and timed expiration of material viewing

Disadvantages:

- High/custom enterprise price
- Not designed with libraries in mind
- No integration with the catalog
- Not currently being used by many libraries

Open Library

URL: http://openlibraries.online/join/

Open Library is a service of the Internet Archive. Open Library restricts digital loans in an owned to loaned manner and has been in operation since 2006. It is in some ways a crowd-sourced CDL platform. The more libraries contribute to it and add their own records, the more lending numbers increase for the entire world. For example, if the Open Library has two libraries that share their MARC records of one book, and each library says they have one copy of that book, then the Open Library can simultaneously lend two digital copies of that book. In addition to sharing their records with the Open Library (optional), libraries can integrate the OL records with their own, which will give patrons another option for borrowing the book; however, the user would still have to sign up for an account to borrow a digital book for a limited time (e.g., for an hour) from that platform.

From the website: "Libraries that are interested in lending digital books to their patrons should join Open Libraries and contribute to the community of practice we are building together. By joining Open

Libraries, libraries can identify the overlap in their physical holdings with our digital holdings and provide free digital books to patrons where there are matches. Additionally, libraries can add their holdings into Open Libraries to increase lending counts."

There has been confusion between Open Library and the Internet Archive's National Emergency Library, which was launched on March 24, 2020 and closed on June 16, 2020. Paraphrased from ASERL, this service allowed libraries to loan an unlimited number of digital copies during a time when many universities, schools, training centers, and libraries were closed due to COVID-19. The National Emergency Library included all the books from Phillips Academy Andover and Marygrove College, and much of Trent University's collections, along with over a million other books donated from other libraries to readers worldwide that are locked out of their libraries. Although the National Emergency Library shared the same distribution platform as Internet Archive's earlier CDL efforts (Open Library), the National Emergency Library was not an implementation of CDL (and IA did not claim it to be) because IA did not restrict access based on physical ownership of copies. On June 16, 2020, the Internet Archive returned to its normal CDL operations -- Open Library -- once again restricting digital loans to the "owned to loaned" limits that were in place prior to the pandemic, and putting any additional users on wait lists. IA continues to operate in this manner to this day. Nevertheless, IA's lifting of the "owned to loaned" limits for the three months in Spring 2020 brought about a lawsuit on June 1, 2020 from publishers Hachette, Penguin Random House, Wiley, and HarperCollins. As of this writing, this legal action persists despite IA's return to its previous owned to loaned limits.

Form to apply:
https://docs.google.com/forms/d/e/1FAIpQLSc_8y_ahE6gtOGVInd5y0R74AnHhz7RsX6cMmwpbjmDxYrOnQ/viewform

Instructions for contributing MARC records or ISBN data to Open Libraries:
https://docs.google.com/document/d/1EnmeLTWhJMRpS860UMFkqCNzb-FEfiT8x

CalTech DIBS

URL: https://caltechlibrary.github.io/dibs/

Caltech DIBS ("***Di****gital* ***B****orrowing* ***S****ystem*") is the Caltech Library's basic implementation of a web-based controlled digital lending system. The system was developed in the year 2021 to help Caltech students and faculty continue their studies and work during the global COVID-19 pandemic.

The core DIBS software provides two main components of a CDL system: a loan tracking system, and an integrated digital content viewing interface. DIBS embeds the Universal Viewer to display materials that comply with the International Image Interoperability Framework (IIIF). To use DIBS as part of a complete CDL system at another institution, you need to set up a IIIF server and a web server that implements user authentication.

Advantages:

- Free, code from GitHub.
- Designed for CDL.
- User and staff interface easy to navigate.

- Straightforward workflow

Disadvantages:

- Requires high level of institutional technical support.
- Requires IIIF server.
- Not an externally supported system.

DLSG

URL: https://www.dlsg.com/

Advantages:

- >$5000/institution
- Hosted
- Strong DRM
- Accessibility features

Disadvantages:

- Scanner may expensive
- Set-up and integration with systems may be intensive.

Directed Lending Solution supports Controlled Digital Lending with Digital Rights Management. Supports one to one lend to owned ratio, institutional settings on checkout times, system that mimics printed book lending, and includes extensive user accessibility features, and transformative research features.

HathiTrust

HathiTrust's Emergency Temporary Access Service (ETAS) allows HT member libraries to provide users from their institutions online access to digital copies of materials that are owned by the HT member library in physical form during an **unexpected, involuntary temporary disruption** to access to the library's print collection. HathiTrust stresses that ETAS differs from Controlled Digital Lending, and that they have conducted their own legal analysis independent of the CDL white paper. Specifically, copies of the work are not distributed, but instead are read online in a web browser, and that this service is only available in this manner during the parameters listed above. However it is very similar in that it is controlled and follows an "owned to loaned" ratio. Once access to the library's print collection is restored, access to digital copies via ETAS must be discontinued.