October 2020
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KEYSTONE MacCentral

printout

Keystone MacCentral Macintosh Users Group ❖ www.keystonemac.com

KeystoneMacCentral October Program
Oct 20, 2020 06:30 PM Eastern Time (US and Canada)

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https://zoom.us/j/94735074224?pwd=S0V4VFJQQ1pFdmZDOXZ3aTEzU2toQT09

Meeting ID: 947 3507 4224
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Our main emphasis this month will be about the newly released iOS 14. This seems like a major update with lots of changes. We might even talk about the Apple presentation held on October 13, featuring the Apple Watch Series 6.

We will be having virtual meetings via Zoom on the third Tuesday of each month.
Just follow the directions/invitations each month —
that is, just click on the link.
They will be sent out prior to each meeting. Just follow the directions as outlined.

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Keystone MacCentral is a not-for-profit group of Macintosh enthusiasts who generally meet the third Tuesday of every month to exchange information, participate in question-and-answer sessions, view product demonstrations, and obtain resource materials that will help them get the most out of their computer systems. Meetings are free and open to the public. *The Keystone MacCentral printout* is the official newsletter of Keystone MacCentral and an independent publication not affiliated or otherwise associated with or sponsored or sanctioned by any for-profit organization, including Apple Inc. Copyright © 2020, Keystone MacCentral, 310 Somerset Drive, Shiresmanstown, PA 17011.

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By David Shayer

The Case of the Top Secret iPod

It was a gray day in late 2005. I was sitting at my desk, writing code for the next year's iPod. Without knocking, the director of iPod Software—my boss's boss—abruptly entered and closed the door behind him. He cut to the chase. "I have a special assignment for you. Your boss doesn't know about it. You'll help two engineers from the US Department of Energy build a special iPod. Report only to me."

The next day, the receptionist called to tell me that two men were waiting in the lobby. I went downstairs to meet Paul and Matthew, the engineers who would actually build this custom iPod. I'd love to say they wore dark glasses and trench coats and were glancing in window reflections to make sure they hadn't been tailed, but they were perfectly normal thirty-something engineers. I signed them in, and we went to a conference room to talk.

They didn't actually work for the Department of Energy; they worked for a division of Bechtel, a large US defense contractor to the Department of Energy. They wanted to add some custom hardware to an iPod and record data from this custom hardware to the iPod's disk in a way that couldn't be easily detected. But it still had to look and work like a normal iPod.

They'd do all the work. My job was to provide any help they needed from Apple.

I learned that an official at the Department of Energy had contacted Apple's senior vice president of Hardware, requesting the company's help in making custom modified iPods. The senior VP passed the request down to the vice president of the iPod Division, who delegated it to the director of iPod Software, who came to see me. My boss was told I was working on a special project and not to ask questions.

Background

I was the second software engineer hired for the iPod project when it started in 2001. Apple Marketing hadn't yet come up with the name iPod; the product was known by the code name P68. The first software engineer later became the director of iPod Software, the guy who gave me this special assignment. I wrote the iPod's file system and later the SQLite database that tracked all the songs.

Over time, I worked on almost every part of the iPod software, except the audio codecs that converted MP3 and AAC files into audio.

(Those audio codecs were written by two engineers with advanced degrees from Berkeley and Stanford. When they weren't teasing each other about which school was better, they were writing mathematical audio code that I was scared to touch. You would no more let a regular engineer mess with code like that than you'd let a bike mechanic rebuild the transmission in a Porsche. They had an occasional poker game I played in. The only reason I didn't lose all my money was that one of them enjoyed his vodka.)

Compiling the iPod operating system from source code, loading it onto an iPod, and testing and debugging it was a fairly complex process. When a new engineer started, we typically gave them a week to learn all this before we assigned them any actual tasks.

The iPod operating system wasn't based on another Apple operating system like Classic Mac OS or Darwin, the underlying Unix core of macOS, iOS, iPadOS, watchOS, and tvOS. The original iPod hardware was based on a reference platform Apple bought from a company called Portal Player. Portal Player had also provided the lower levels of the iPod OS, including power management, disk drivers, and the realtime kernel (which Portal Player had licensed from another company called Quadros). Apple bought the higher levels of the iPod OS from Pixo, a company started a few years earlier by ex-Apple engineers trying to write a general-purpose cell phone operating system to sell to mobile phone companies like Nokia and Ericsson. Pixo code handled the user interface, Unicode text handling (important for localization), memory management, and event processing. Of course, Apple engineers modified all this code, and over time, rewrote much of it.

iPod OS was written in C++. Since it didn't support third-party apps, there was no external documentation on how it worked.

Finally, the iPod team developed on Windows computers. Apple didn't have working ARM developer tools yet, because this was before the iPhone shipped. The iPod team used ARM developer tools from ARM

Ltd., which ran only on Windows and Linux.

My job was to get Paul and Matthew up and running on a new operating system they'd never seen before, much less developed for.

Getting Started

I requisitioned an empty office for Paul and Matthew in our building. I had IS&T (Apple's IT department) reroute the Ethernet drops in that office so they connected only to the public Internet, outside Apple's firewall, preventing them from accessing Apple's internal network. Apple's Wi-Fi network always connects outside the firewall. Even inside Apple buildings, if you're using Wi-Fi, you need a VPN to get past Apple's firewall. This wasn't a collaboration with Bechtel with a contract and payment; it was Apple doing a favor under the table for the Department of Energy. But access for that favor went only so far.

Needless to say, Paul and Matthew weren't allowed to access our source code server directly. Instead, I gave them a copy of the current source code on a DVD and explained it couldn't leave the building. Ultimately, they were allowed to keep the modified copy of the iPod OS they built, but not the source code for it.

Apple didn't provide them any hardware or software tools. I gave them the specs for the Windows computers they needed, along with the ARM compiler and JTAG debugger. They bought retail iPods to work on, several dozen at least, possibly many more.

As with all Apple buildings, everyone had to present an Apple badge to the badge reader to unlock the door and enter the iPod building. Only employees cleared for our building were allowed in. On each floor, there was another locked door and badge reader, and only people cleared for that floor were allowed in.

So every day, Paul and Matthew called me from the lobby since they didn't have Apple badges. I signed them in as guests and escorted them to their office. Eventually, I arranged to get them vendor badges, as if they were selling Apple coffee or memory chips, so I didn't have to sign them in daily. I was a programmer, not a babysitter.

Top Men

Paul and Matthew were smart—top men, even—and with a little help, they were up and running pretty quickly. I showed them how to set up the development tools, build a copy of the operating system from source, and load it into the iPod. We made some temporary changes to the user interface, so we could see that their build was actually running. I showed them how to use the JTAG hardware debugger, which was rather finicky. They dove into their work.

As they learned their way around the system, they explained what they wanted to do, at least in broad strokes. They had added special hardware to the iPod, which generated data they wanted to record secretly. They were careful to make sure I never saw the hardware, and I never did.

We discussed the best way to hide the data they recorded. As a disk engineer, I suggested they make another partition on the disk to store their data. That way, even if someone plugged the modified iPod into a Mac or PC, iTunes would treat it as a normal iPod, and it would look like a normal iPod in the Mac Finder or Windows Explorer. They liked that, and a hidden partition it was.

Next, they wanted a simple way to start and stop recording. We picked the deepest preferences menu path and added an innocuous-sounding menu to the end. I helped them hook this up inside the code, which was rather non-obvious. In all other respects, the device functioned as a normal iPod.

At the time, the latest iPod was the fifth-generation iPod, better known as the "iPod with video." It was relatively easy to pop open the case and close it again without leaving obvious marks, unlike the iPod nano models that became popular shortly after. Plus, the fifth-generation iPod had a 60 GB disk, so there was plenty of room to have lots of songs and still record extra data. And it was the last iPod for which Apple didn't digitally sign the operating system.

That was important because it made the fifth-generation iPod somewhat hackable. Hobbyists enjoyed getting Linux to run on iPods, which was hard to do without the special knowledge and tools Apple possessed. We on the iPod engineering team were impressed. But Apple corporate didn't like it. Starting with the iPod nano, the operating system was signed with a digital signature to block the Linux hackers (and others). The boot ROM checked the digital signature before loading the operating system; if it didn't match, it wouldn't boot.

I don't think Paul and Matthew ever asked Apple about signing their custom operating system build so it would run on the iPod nano. I'm pretty sure Apple would have refused. The larger fifth-generation iPod was better suited to their purposes anyway.

After a few months of on-again, off-again work in their requisitioned office, Paul and Matthew finished integrating their custom hardware into the iPod and wrapped up the project. They moved their computers and debugging hardware back to Bechtel's office in Santa Barbara. They returned the latest DVD with Apple source code to me, along with their Apple vendor badges. They said goodbye, and I never saw them again. The DVD sat on a shelf in my office for years, until I finally tossed it while cleaning up.

What Were They Doing?

The Department of Energy is huge. Its 2005 budget was $24.3 billion. It's responsible for the US nuclear weapons and nuclear power programs, including the Los Alamos National Laboratory, which was part of the Manhattan Project. As the DOE's budget request says:

The FY 2005 budget proposes $9.0 billion to meet defense-related objectives. The budget request maintains commitments to the nuclear deterrence requirements of the Administration's Nuclear Posture Review and continues to fund an aggressive strategy to mitigate the threat of weapons of mass destruction.

My guess is that Paul and Matthew were building something like a stealth Geiger counter. Something that DOE agents could use without furtively hiding it. Something that looked innocuous, that played music, and functioned exactly like a normal iPod. You could walk around a city, casually listening to your tunes, while recording evidence of radioactivity—scanning for smuggled or stolen uranium, for instance, or evidence of a dirty bomb development program—with no chance that the press or public would get wind of what was happening. Like all other electronic gadgets, Geiger counters have gotten smaller and cheaper, and I was amused to run across the Radiation Alert Monitor 200, which looks an awful lot like a classic iPod.

Whenever I asked Paul and Matthew what they were building, they changed the subject and started arguing about where to go for lunch. Standard geeks.

The Custom iPod That Never Existed

Only four people at Apple knew about this secret project. Me, the director of iPod Software, the vice president of the iPod Division, and the senior vice president of Hardware. None of us still work at Apple. There was no paper trail. All communication was in person.

If you asked Apple about the custom iPod project and got past the stock "No comment," the PR people would tell you honestly that Apple has no record of any such project.

By Julio Ojeda-Zapata

Skip the Library Trip, Borrow Ebooks and More at Home

I once loved dropping into my local public library and reemerging hours later, weighed down with hardcovers, paperbacks, CDs, and DVDs.

Needless to say, I no longer do this. The COVID-19 pandemic has made me leery of public indoor spaces, and I now steer clear of bookstores, cafes, cinemas, gyms, and restaurants, while embracing alternatives like Amazon book purchasing, homebrewed joe, Hulu, my stationary-bicycling rig (see "Zwift Transforms Stationary Bicycling into a Shared Virtual Experience," 1 July 2020) and curbside takeout.

Likewise, I've stayed out of public libraries (many of which are still partly shuttered due to the pandemic) as I avail myself of their digital borrowing options. For this, all I need is a Mac or iOS device, along with an Internet connection. Available electronic content includes ebooks, audiobooks, magazines, comic books, and music downloads, all at my fingertips with no need to leave my home. Some libraries offer streaming videos, too, but mine don't.

If you haven't yet taken advantage of these digital resources from your library, now would be a good time to try, for both convenience and safety. Virtually all US public library systems offer such lending options—the precise mix will vary from system to system. Libraries are able to offer such digital goodies by subscribing to third-party services that license such content for free distribution. Your tax dollars are at work here—you may as well benefit.

You can often apply for library cards from large libraries in your state, even if you don't live nearby—a few libraries offer out-of-state and even out-of-country subscriptions that might be ideal for some people.

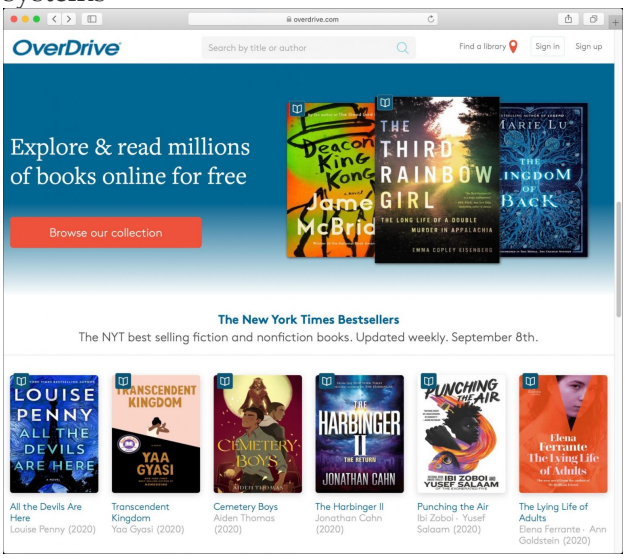
In this article, I will attempt an accounting of top public library digital services. I focus on US libraries, though some of these services are also available in libraries elsewhere. I will surely overlook some services—if that happens, please set me straight in the comments below.

I have organized this article with detailed descriptions of the services I have used toward the top, and others covered more succinctly further down because I don't have direct experience with them. If you know more about them, please share your experiences in the comments.

OverDrive

If there's a leading public library digital service, OverDrive would seem to be it. OverDrive is a Cleveland-based company that purchases digital distribution rights from content publishers for ebooks, audiobooks, magazines, comics, and streaming video. It then licenses such catalogs to public libraries so they can offer the content to their patrons.

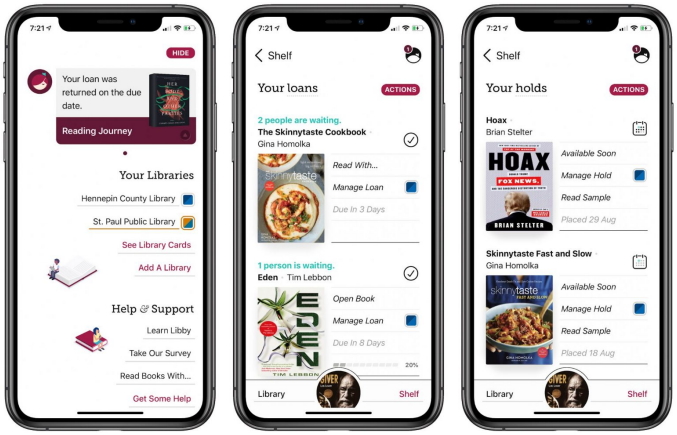
Each library system decides how big its catalog will be, what titles will be in the catalog, and how many instances of each title it can lend out at one time. As a result, content availability will vary from system to system, something that becomes obvious if you have borrowing privileges at multiple library systems



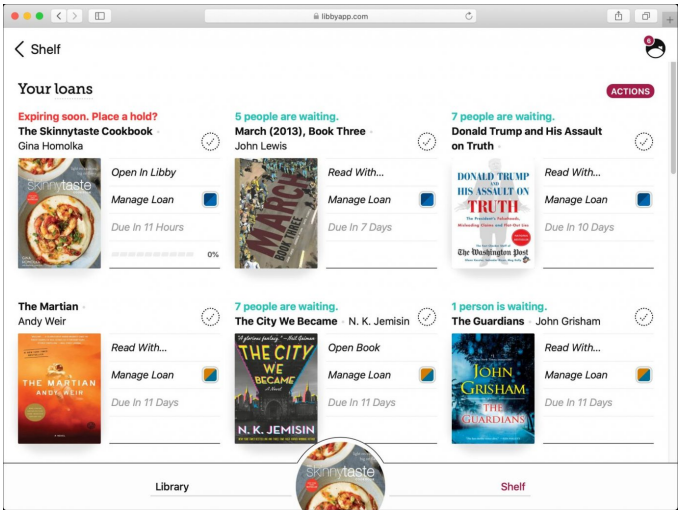
Figuring out OverDrive can be headache-inducing because it is a vast, disorganized ecosystem with multiple apps, broad device compatibility, and even Web browser extensions. Rather than dissect its every nook and cranny, I'll guide you on what I think is the most painless path.

OverDrive's apps include the aging OverDrive, the newer and much improved Libby, and Sora, an app intended for use by school systems. Amazon's popular Kindle app is also part of the mix since you can optionally read books checked out in OverDrive in the Kindle app.

Let's stick with Libby for now. Versions of it have long been available for iPhone and iPad (plus Android), and it now also works in a desktop Web browser. Enter all your household library cards into Libby on your iPhone or iPad to manage all borrowing in one place.



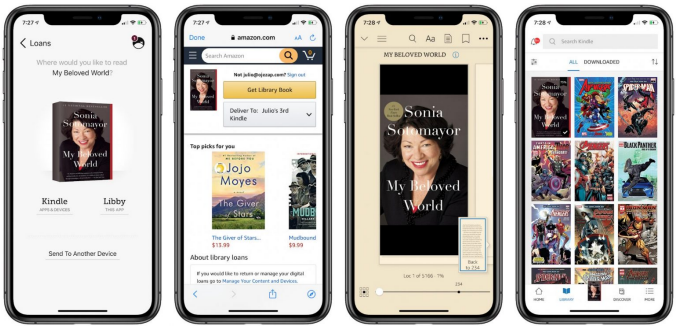
If you're also using a Mac, touch and hold on the Libby icon in the upper-right corner of your iOS app to reveal a numeric code for pasting into a desktop browser to sync all your library cards and corresponding data.



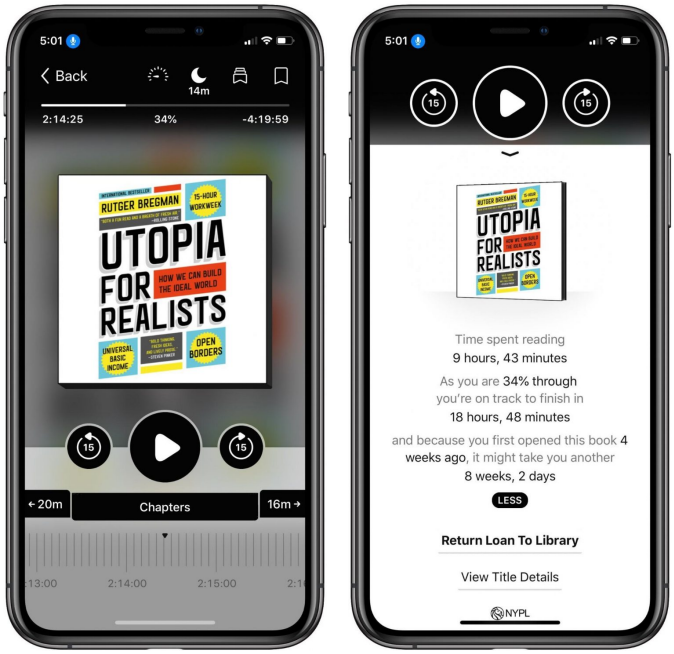
Libby lets you add cards from multiple library systems, which lets me borrow from both the St. Paul Public Library and the nearby Hennepin County Public Library in Minneapolis. Not every library system offers every content format in Libby (mine offer ebooks and audiobooks but not magazines, music, or video) so check with your library to see what's available. Libby doesn't support video, so you'll need the OverDrive app for that. Annoyingly, Libby doesn't run searches across multiple library systems automatically, although it does show which books you've read in one library system while searching another.

For ebooks, audiobooks, and magazines, you can search for titles in Libby or browse the library catalogs. Sometimes, you won't find what you're looking for at all; more commonly, you'll find what you want, but you won't be able to borrow it immediately. Libraries buy a set number of copies of each title and can't loan out more than that at once. If a title isn't available, place a hold on it, and Libby will alert you when it becomes available for borrowing—be sure to allow Libby notifications on your iPhone and iPad.

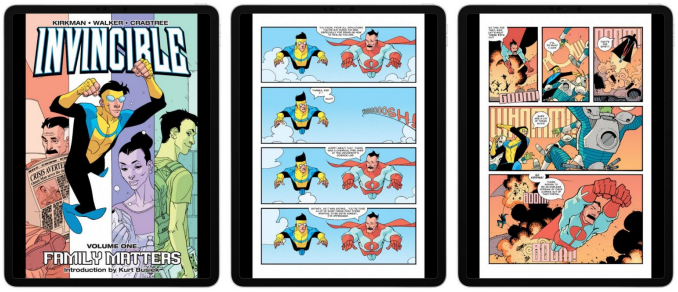
When borrowing a book, you'll have to decide in which app—Libby or Kindle—you will read it. If the former, tap to open the volume in Libby. If the latter, tap for transfer to an Amazon page so you can authorize the loan. It'll pop up everywhere you read Kindle ebooks. Unless you're heavily involved with the Kindle ecosystem, it's easiest to read in Libby.



For audiobooks, Libby provides a stellar experience. You can increase playback speed, set a sleep timer to stop playback automatically, set bookmarks, fast-forward or rewind 15 seconds with the tap of a button, and navigate easily by chapter or with a scrubber. Tapping the book cover reveals details like reading time stats and estimates, which can be helpful when managing loans.



Comic book lovers take note: many libraries include graphic novels in their OverDrive catalogs. I just powered through *Invincible* on a recommendation from TidBITS publisher Adam Engst, and the superhero series looks, well, super on an iPad.



You can also use the OverDrive app, but Libby is more attractive and easier to use. An OverDrive app for the Mac also exists, but it apparently is no longer being updated and currently can't run in Catalina or Big Sur.

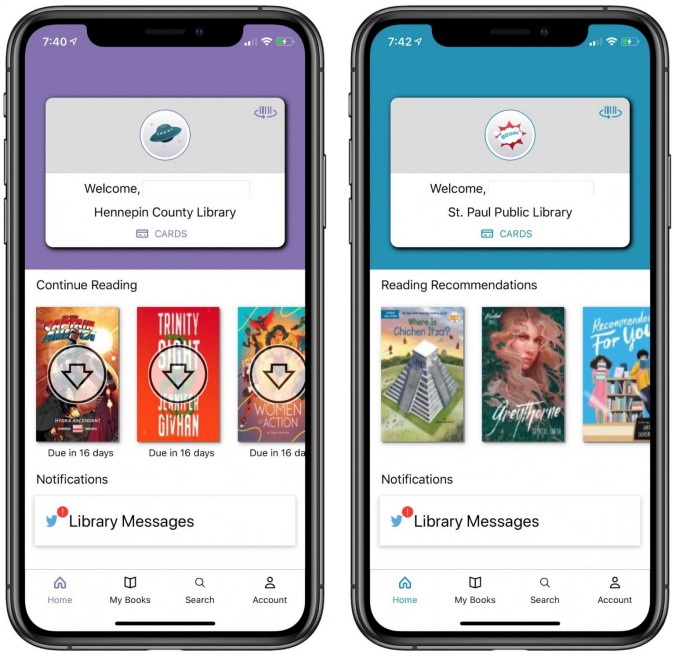
If you use a Chromium browser like Google Chrome, Microsoft Edge, Brave, or Vivaldi, check out extensions that let you do automatic OverDrive searches when you visit certain reading-related sites. When you pull up book listings on Amazon, for instance, Available Reads and Library Extension both display OverDrive availability info for libraries you specify. Available Reads does the same for listings on the Goodreads social network. Library Extension also can search many libraries' physical book catalogs.

Cloud Library

Sometimes I can't find books using OverDrive, so it's nice to have an alternative. I always try Cloud Library, owned by the European firm Bibliotheca with development just down the road from me in Oakdale, Minnesota. Both of my local libraries provide ebooks, comics, and audiobooks via Cloud Library, which doesn't do magazines, music, or video at all.

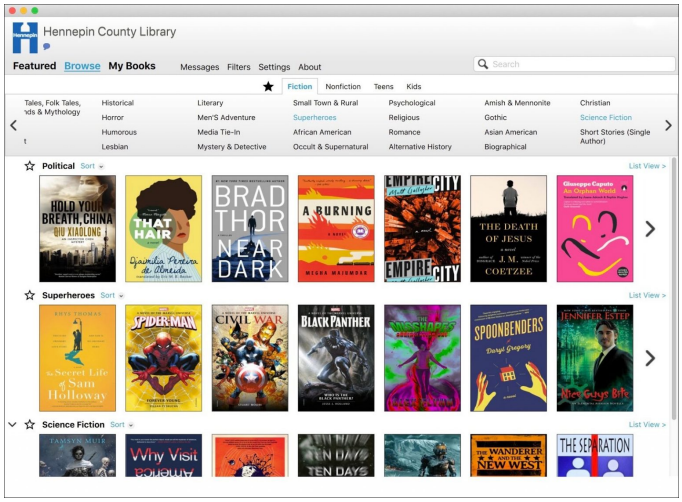
Operationally, Cloud Library is quite similar to OverDrive, although it's less polished in look and feel—particularly in comparison to Libby—and it has some irritating limitations and quirks.

The Cloud Library iOS app runs natively on both the iPhone and the iPad. As with Libby, you can enter multiple library card numbers for different library systems for consolidated loan management. The app offers a few nice touches, such as an option to customize your cards with colors and whimsical icons.



How ebook pages display in Cloud Library has historically been scattershot in typography and general presentation compared to the consistent, attractive look in the Libby and Kindle apps. The service has recently made strides to keep pace, but it still has more work to do. App performance is an issue, too, with lengthy waits for screens that sometimes fail to load.

Cloud Library's native Mac app looks a bit dated, but it's responsive, easy, and fun to use. It's particularly useful for browsing for titles by subject heading. You can designate certain genres that interest you and conduct combination searches that filter out other genres.



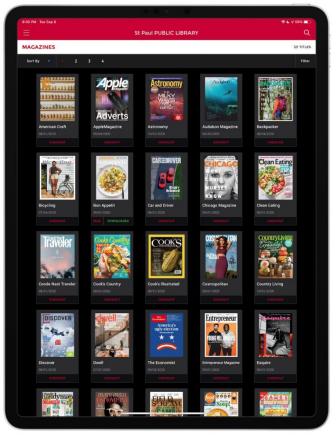
Cloud Library doesn't work in a desktop Web browser. The service does provide a ChromeOS app, but it works only on Chromebooks, not the Chrome browser on Macs. You also can't transfer books from Cloud Library to a Kindle, other than Android-based Kindle Fire tablets that can run the Android Cloud Library app. As far as I can tell, OverDrive is the only public library digital service with full Kindle support.

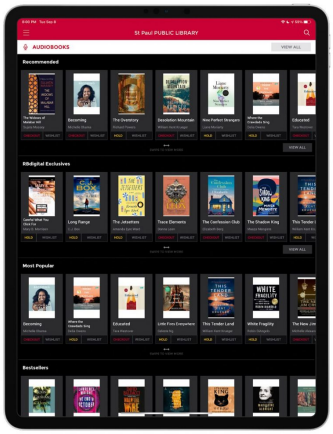
RBdigital

While OverDrive and Cloud Library emphasize ebooks, RBdigital instead focuses on magazines, audiobooks, comics, and newspapers. It's my preferred way of reading magazines, via my local libraries and their RBdigital catalogs.

The RBdigital app works on both the iPhone and iPad, though most magazines are nearly unreadable on an iPhone screen, apart from certain titles that have phone-friendly formatting. Like comics, digital magazines look terrific on the iPad. RBdigital also works in a desktop Web browser.

Using RBdigital is straightforward. For magazines, it presents you with several grids of titles corresponding to your library's magazine catalog. You can also search for titles by genre or language. Tap to see a magazine's current and past issues; tap an issue to get a checkout screen that will trigger a download for offline use.





For audiobooks, you'll whiz through carousels of titles in several categories or search for titles by genre, availability, and age suitability. Tap a title to

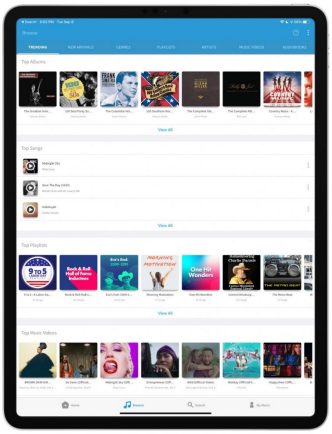
check out or reserve it. You play audiobooks right in the app.

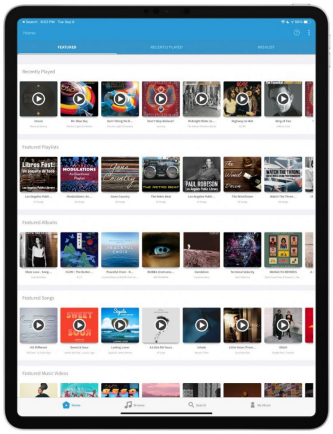
RBdigital looks a bit crude and dated (especially on the Web) compared to the $9.99-per-month Apple News+ (see "Should You Pay For Apple News+? Warning: It Has Issues," 9 April 2019). Your library's catalog is likely less extensive than that offered by Apple, too. Apple's service also has an edge in reformatting many top magazines for viewing on iPhone screens. But because most of my favorite magazines are available from my libraries for free, I am not inclined to pay for Apple News+ despite its usability edge.

Freegal

Public library patrons seeking a free alternative to commercial streaming music services like Apple Music are sure to dig Freegal, which works via an attractive if slightly buggy iOS app and in a desktop browser.

Freegal sports hundreds of genres, thousands of artists, tens of thousands of albums, and millions of songs from many labels—including Sony Music Entertainment labels. Freegal also provides thousands of music videos. You'll find many big names: music from Itzhak Perlman and Mariah Carey, music videos from Miley Cyrus and Pentatonix, and audiobooks from George Carlin and Jim Gaffigan. Freegal's content spans dozens of countries.



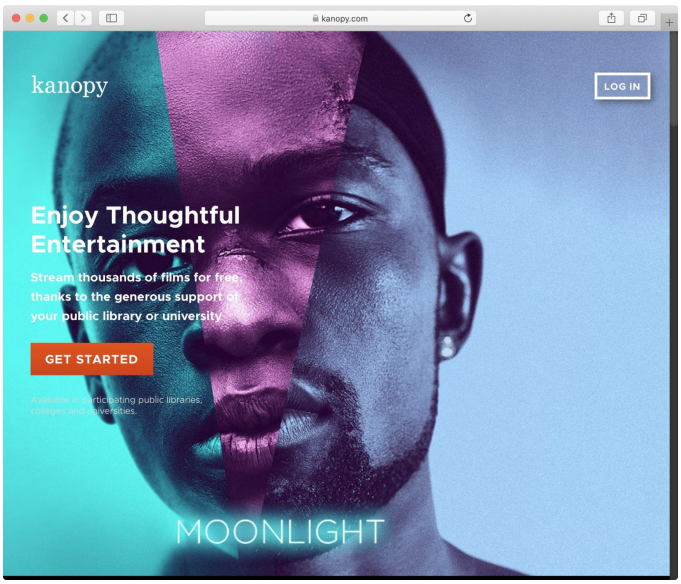


Nevertheless, expect limitations. You can't download willy-nilly, for starters. Users get only a handful of credits per month. Downloading one audio file eats up one credit, and a music video consumes two credits. What's more, streaming may be capped to a certain number of hours a day, although this seems to vary from library system to library system with some offering unlimited streaming. Songs are not always offered in original forms but often as covers, DJ remixes, and so on. Frankly, it's a little weird.

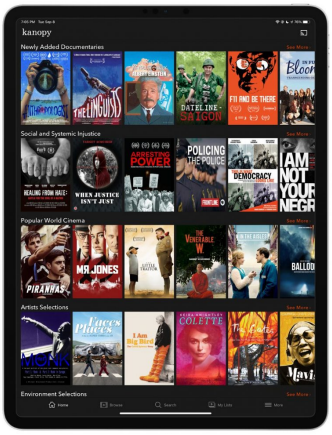
But the service's MP3 audio and MP4 video downloads are all free of digital rights management protections, so you can use them however you like within copyright restrictions.

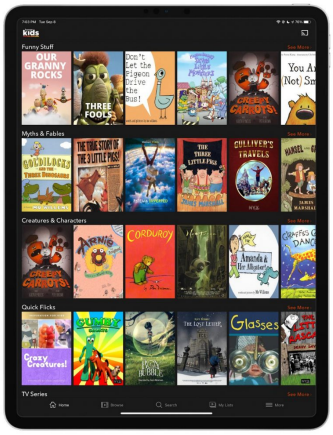
Kanopy

Perhaps the most polished of the services in this story, Kanopy focuses on video streaming. It offers more than 30,000 titles in a highbrow video library that offers classic movies, recent feature films, and documentaries. It won't replace the likes of Netflix or Hulu, but it has plenty of great stuff to watch.



Here's where you'll find Oscar best-picture winner *Moonlight*, the Oscar-nominated *Lady Bird*, the New Zealand feature *Boy*, the dark comedy *My Friend Dahmer*, the PBS documentary *The Central Park Five*, and the 1954 Japanese epic *Seven Samurai*. Kanopy also has a Kanopy Kids collection for those 2 to 8 years old.



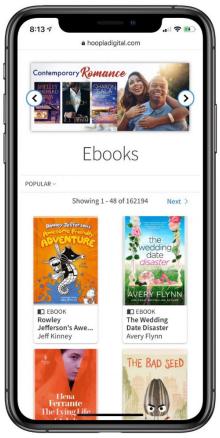


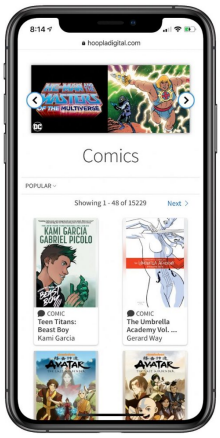
Kanopy is notably Apple-friendly. In addition to an iPad-native iOS app, the service offers an Apple TV app. Stream on your Mac via your favorite browser, too.

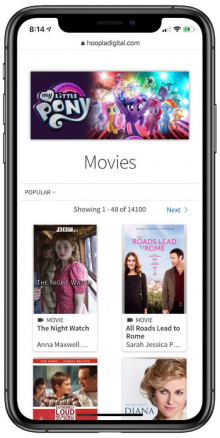
Hoopla

Hoopla is another full-service content provider that provides ebooks, audiobooks, comics, music, and video, including movies and television shows. Compared to other services, Hoopla has some distinct advantages and disadvantages.

On the plus side, Hoopla is also rather Apple-friendly. In addition to a decent iOS app and access via a desktop Web browser, it offers an Apple TV app for video and audio consumption. Hoopla also supports AirPlay mirroring from iOS devices to the Apple TV, a rare capability among library iOS apps.







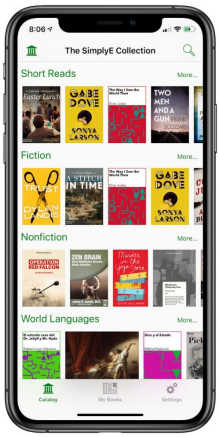
On the minus side, Hoopla content availability might seem restrictive compared to the likes of OverDrive and Cloud Library. Hoopla allocates download credits on a monthly basis. My libraries don't support Hoopla, but the Finger Lakes Library System that Adam Engst uses in New York State restricted him to four checkouts per month regardless of content type—and unused credits didn't roll over to the next month. (His library system subsequently dropped Hoopla, due to the cost.) OverDrive and Cloud Library accounts, on the other hand, keep a rolling tally of content loans with simultaneous checkouts by the dozens per library system.

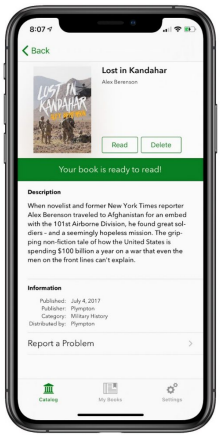
Hoopla video loans last two to three days, depending on the publisher. Music loans typically last a week. Book loans, including comics and audiobooks, are three weeks.

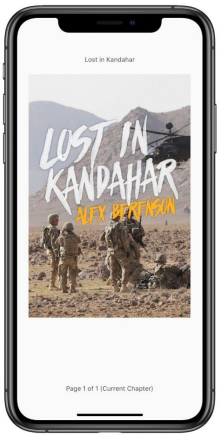
Remember the Chrome-based Library Extension that shows when Amazon and Goodreads titles exist in a library's physical and OverDrive collections? It can also check for Hoopla availability.

SimplyE

Developed by the New York Public Library, SimplyE is a free, open-source reading app that aims to provide a single interface for browsing, borrowing, and reading ebooks from multiple vendors (including OverDrive and Cloud Library), along with public domain ebooks. SimplyE is now used by dozens of other libraries around the United States.







Even if your local public library doesn't support SimplyE, you aren't entirely out of luck. Within the app is a free, available-to-all SimplyE Collection with Project Gutenberg-compiled classic books

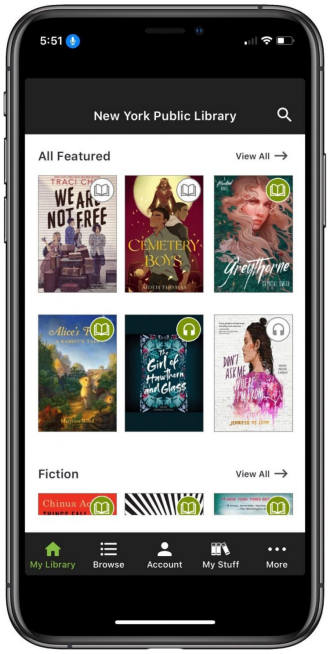
along with modern works, including public papers such as the Mueller Report, and recent fiction such as Ken Liu's renowned science-fiction short story "The Paper Menagerie."

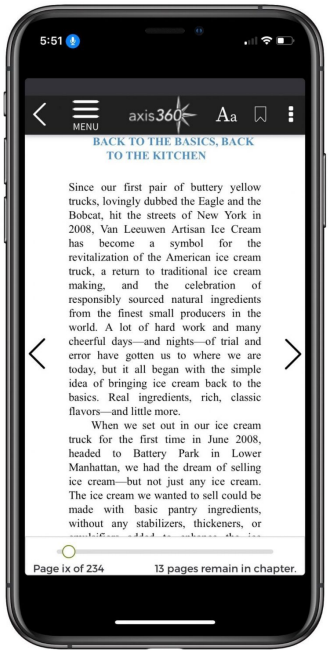
It might take some time to unearth content in the SimplyE Collection given the app's simplistic search capabilities, but it will likely be worth the effort.

Axis 360

Publisher Baker & Taylor has created its own digital library service, called Axis 360. It's yet another ebook- and audiobook-lending service with thousands of titles for adults, teens, and children. Like others, you can use it via its Axis 360 app or via a desktop Web browser.

I wasn't able to test Axis 360 because my libraries don't support it. However, Adam Engst was able to look at it via the New York Public Library. He reports that the app is slow and crude, and while it has received recent updates, it doesn't even use the entire iPhone 11 Pro screen. The reading experience is terrible. The Axis 360 collection is also hard to quantify; if the browsing numbers are an accurate indication (66 titles in Biography & Autobiography), it's minuscule compared to others.





You Get What You Get (and Don't Get Upset)

I've been using public library digital services for years, and I've been excited to see them evolve to keep pace with the modern Internet. Having vast amounts of content at my fingertips without having to leave home never gets old.

But I've also been somewhat frustrated. I've come to realize that I'm at the mercy of my libraries' choices. Both of the library systems I use provide ebooks, audiobooks, and magazines, but neither has streaming video, likely because of the costs. The Hennepin County Library offers music (via Freegal, which the St. Paul Public Library gave up) and has a decent comic book catalog, which the St. Paul library lacks. While researching this story, I came to hunger for the video choices on Kanopy and Hoopla.

It's healthier to look at the digital resources provided by your library just as you'd look at its physical collections. You wouldn't walk into your library and assume it would have every book, magazine, audiobook, album, movie, and TV series. If nothing else, someone else might be reading the book you want. Instead, if you took a few minutes to browse the shelves, you'd probably have no trouble walking out with an armload of materials.

The digital world is both better and worse. A small library can—if it has the money—subscribe to digital services that far exceed its physical collections. But those digital services are still limited. Even the vaunted New York Public Library, which is the second-largest public library in the United States (behind the Library of Congress) and the third-largest in the world (behind the British Library) has gaping holes in its digital collections. It's limited to what the likes of OverDrive and Cloud Library and Kanopy can provide, which is a far cry from the NYPL's 53-million-item physical collection.

Regardless, your public library's choices might or might not be sufficient for your borrowing desires. Now that I have a better idea of what I'm missing, I plan to encourage my libraries to add more services to their digital portfolios. This, to coin a library

term, is overdue—especially with a pandemic afoot. Of course, libraries are also chronically underfunded, and while these services are free for patrons, they may make up a significant portion of a library's acquisition budget. So I'll also be lobbying with my local elected representatives to increase library funding. As I said before, we're talking about tax dollars here.

SOFTWARE REVIEW

Security Update 2020-005 (Mojave)
Sep 24, 2020 — 1.69 GB

System Requirements
- macOS 10.14

Security Update 2020-005 is recommended for all users

Security Update 2020-005 (High Sierra)
Sep 24, 2020 — 2.12 GB

System Requirements
- macOS 10.13

Security Update 2020-005 is recommended for all users and improves the security of macOS.

macOS Catalina 10.15.7 Combo Update
Sep 23, 2020 — 4.82 GB

System Requirements
- macOS 10.15

macOS Catalina 10.15.7 provides important security updates and bug fixes for your Mac.

- Resolves an issue where macOS would not automatically connect to Wi-Fi networks

- Fixes an issue that could prevent files syncing through iCloud Drive

- Addresses a graphic issue that may occur on iMac (Retina 5K, 27-inch, 2020) with Radeon Pro 5700 XT

Some features may not be available for all regions, or on all Apple devices.

macOS Catalina 10.15.7 Update
Sep 23, 2020 — 2.86 GB

System Requirements
- macOS 10.15.6

macOS Catalina 10.15.7 provides important security updates and bug fixes for your Mac.

- Resolves an issue where macOS would not automatically connect to Wi-Fi networks

- Fixes an issue that could prevent files syncing through iCloud Drive

- Addresses a graphic issue that may occur on iMac (Retina 5K, 27-inch, 2020) with Radeon Pro 5700 XT

Some features may not be available for all regions, or on all Apple devices.