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THE INTERNET

Understanding Software End of Life

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What is end of life?

While end of life sounds final and certain, it's actually often a phased process, and even concrete dates are dates after which something can happen rather than dates on which something happens with certainty. This article will try and give a feel for end of life so that you can plan around it when an end of life date is announced for software you are using.

Wikipedia gives the following definition for end of life:

> "End-of-life" (EOL) is a term used with respect to a product supplied to customers, indicating that the product is in the end of its useful life (from the vendor's point of view), and a vendor stops marketing, selling, or rework sustaining it. (The vendor may simply intend to limit or end support for the product.)"
>
> Wikipedia, *End-of-life (product)*, available at https://en.wikipedia.org/wiki/End-of-life_(product) (last visited May 21, 2019)

The key point in this definition is that the software doesn't magically disappear. Instead, the software doesn't get updates, and changes in the world around the software eventually make it difficult to run, cause security issues such that running the software is a bad idea, or bring the world to a point where the output of the software is no longer useful.

Cloud hosted software.

Cloud hosted software includes tools like Google Drive, Adobe Creative Cloud, or MS Office 365. These run on a server held by someone other than you. You don't and can't own the computer that the code runs on.

For these, if the vendor takes down the server and eliminates your access, then that's a concrete cut off unless the host gives an extension. The best you can hope for is some kind of export tool that gives you your information in a format you can use. For these services, an end date really is the end in a very concrete way.

Because fast internet connections make it possible, easy, and convenient to run software in the cloud, this is a huge issue that's only going to get bigger. The ArchiveTeam, which is distributed webscraping (you can download Virtual Box then run their scripts to try and capture significant sites scheduled for demise), maintains a Deathwatch list of once popular sites

with user generated content which are now gone: https://www.archiveteam.org/index.php?title=Deathwatch. While that's more focused on sites with a public presence and user generated content, software obsolescence and hosted software is a growing issue. Recently, Adobe announced that using older versions of software to access Creative Cloud is not allowed under the license. Under Creative Cloud, users pay a monthly fee to run software, which runs partially on desktop and partially in the cloud (it authenticates on an ongoing basis to make sure that the subscription is current). See Vice, *Adobe Tells Users They Can Get Sued for Using Old Versions of Photoshop* (May 14, 2019), available at https://www.vice.com/en_us/article/a3xk3p/adobe-tells-users-they-can-get-sued-for-using-old-versions-of-photoshop. The key point is that features or a whole platform can be removed on short notice, and there's no stopping it.

Desktop software.

In general, desktop software should work as long as you have a computer that can run it. So, if you buy something fully run on your machine, for example, a license for MS Word that you install and run locally, then as long as you keep the files to install from and the license code and you have access to a computer that can run the software, you should be fine.

Maintaining a computer that can run the software may be trickier with increasing connectedness. There's the physical hardware. In general, if you buy a computer and it plugs into a standard electrical outlet, then really all you need is the electrical outlet, and until the computer breaks, you are good to go.

But, it's also very rare for a modern computer not to be connected to the internet. So, your desktop computer is interacting with other computers around the world, and that's a built-in background thing that it does. Your computer also may pull updates, as when you go to restart and get a message about "Installing Windows Updates" and wait while your computer installs files it downloaded in the background.

Any desktop software is going to have a whole ecosystem it runs in, which is the operating system, and a modern operating system likely is grabbing some kinds of updates by itself without you actively doing anything. The issue here is that the operating system can become end of life. Windows XP was phased out by Microsoft in 2014 with end of support. Microsoft clarifies that this means no security updates or tech support and warns, "Security updates patch vulnerabilities that may be exploited by malware and help keep users and their data safer. PCs running Windows XP after April 8, 2014 are not considered secure." Microsoft, Support for Windows XP ended, available at https://www.microsoft.com/en-us/windowsforbusiness/end-of-xp-support (last visited May 21, 2019). You can run Windows XP, then you can run software in Windows XP. But you don't get background updates to protect against newer viruses, so if the computer you are using is internet connected, you are in a precarious position. End of support isn't any kind of cut off, but it's also the first day of a new level of risk. (And because of that, if you are using the software for work, it may be the case that your organization's IT comes and shuts your computer down.)

This is extremely frustrating regarding software drivers for expensive machinery (for example, a microfilm scanner which is expensive, not heavily used, but allows access to materials that are even more expensive to rent electronically). When equipment is older, it's common for software drivers to no longer be released for newer operating systems. This doesn't immediately render the equipment unusable, but eventually, the equipment will be rendered unusable through software, not mechanical failure, due to circumstances surrounding an end to security updates for the operating system required to run that software and the fact that computers today are assumed to be internet connected.

Server based software.

Open source software is software where the source code is available to you. Generally, this is through an open license which allows anyone to run the software, but it also can be where when you purchase, you get a single copy of the source code licensed specifically to you or specifically for a certain use (i.e. licensed for a specific URL that you own). You download and own your copy of code. You can run it on someone else's machine or your machine.

A significant example of server based software licensed for single use is CONTENTdm. A few years ago, OCLC provided two ways to run the CONTENTdm software: hosted through OCLC and running on OCLC's servers for a subscription fee or licensed for running on a server within the organization purchasing the license. In killing off the in-house hosting model, OCLC stopped providing software updates.

This is very similar to desktop software, but run on a web server. Significant examples are WordPress and Drupal, which are licensed for open use.

If you are confronted with an end of life announcement for software you use, it may be written for someone with a different technical background or a wider/narrower focus relative to that software. An end of life announcement for Drupal 7 is posted

to https://www.drupal.org/psa-2019-02-25. Drupal.org, Drupal 7 will reach end-of-life in November of 2021 - PSA-2019-02-25 (Feb. 25, 2019). It's pretty standard for a software community announcement. It's clearly written, but not easy to read for a regular person who is using the software as opposed to involved in open source development. Drupal has a critical mass of highly technical people implementing Drupal at their organizations but not already engaged in the conversations leading up to the end of life announcement. It's written in a more technical way to give them the details. I am active with the Islandora digital library software community. Islandora 7, the dominant version of Islandora among the user community, uses Drupal 7 as a front end. In trying to communicate an end of life timeframe, the foundation coordinating releases and community tried to make clear the significant dates: dates on which "No new features will be added," "No new bug fixes will be made," and "No new security fixes will be made." Islandora Foundation, Islandora 7 and 8: Version Support Timeline (Feb. 11, 2019), available at https://www.islandora.ca/content/islandora-7-and-8-version-support-timeline. This is an end of life announcement written specifically for non-technical users. Neither approach is better, but each is definitely geared toward a specific user community.

The really key thing to focus on in an end of life announcement is the timeframe in which security updates will be ended. That's true for the high level view, where you can stop there, and for a more technical view, where you can go into details later.

Here's why the date on which security updates will be ended matters. With no security updates, it may be the case that a vulnerability is discovered in part of the software, no patch is available, and so an organization hosting in house would have to either code a patch (potentially lots of staff time and not necessarily a possibility since you need staff with a specific skillset) or limit access to the software (for example, by limiting a website to visitors coming from a known IP range coming from within the organization). It's common for the information technology (IT) divisions within large organizations to periodically scan web presences for security vulnerabilities, and if there's a security issue that can't be resolved, then that site will get shuttered. There is also security on the server that the software runs on. Wordpress, Drupal, and CONTENTdm all run on web servers. Over time, the background server architecture will have to be updated, at a minimum to address security issues. Common web server architectures, notably LAMP (Linux Apache MySQL PHP), are not backwards compatible. Code that runs on an older server architecture will not necessarily run in the newer architecture, and this means that eventually a necessary server update will make it to where the software cannot safely be run on a server that's open to the web at large. Regarding server architecture, the key thing is that it can force a change to code, which won't be coming once updates aren't available, but updates to server architecture aren't going to give you more time.

LIBRARY METRICS

Diving into the U.S. News' New Scholarly Impact Ranking

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This past February, Robert Morse, chief data strategist at U.S. News, announced they were expanding their Best Law Schools data collection through a new scholarly impact ranking (Morse 2019a). The ranking measures faculty productivity and impact based on "a number of accepted indicators" and "other bibliometric measures" (Morse 2019a). The underlying data is HeinOnline's Law Journal Library and Hein's proprietary citation analysis tool, ScholarCheck. The new ranking will be published sometime in 2019, separately from their well-known Best Law Schools rankings. Since the announcement of the new ranking, both U.S. News and HeinOnline have responded to comments and concerns from the law school community (Morse 2019b) (Mattiuzzo 2019). What I hope to accomplish is to summarize the conversations that have taken place thus far and highlight some of the issues that I think would be of interest to the technical services community.

Methodology

The basis of the ranking's methodology rests in three "phases." Author information will be collected by law schools and submitted to Hein to be compiled in HeinOnline's Author Profiles. Hein will cross-reference the data in their Author Profiles with the Law Journal Library database to compile citation metrics. Finally, the citation metrics will be provided to U.S. News for a final analysis to produce the official ranking.

As early as Summer 2018, law schools were asked to submit a spreadsheet with faculty information including: last name, first name, title, known name variations, e-mail address, birth year, affiliation, and an institutional website url. Only tenure and tenure-track faculty/librarians were included. These names/name variants are currently being recorded in Hein's Author Profiles and associated in Hein's name index. The next steps as summarized on the TaxProf Blog are: the names in the Author