

Protecting intellectual property from digital piracy

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Abstract. While this is often labeled as a publisher’s problem, the reality is that piracy of intellectual property is illegal and that compromised a university network infrastructure is a problem for all. This brief paper reviews a case study of a popular illegal website, the implications of its usage, the disruption that it is causing, and what publishers are doing to manage and/or combat this illegal activity.

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Protecting Intellectual Property (IP) from illegal access and distribution is a concern relevant to the entire publishing community - from publishers, to librarians, to authors. The consequences of digital piracy include: loss of usage data, unintended continued security breaches of university networks, theft of quality/valued content, damaged relationships with end users, and loss of revenue. As hackers become more sophisticated, we - publishers and librarians alike - are all becoming increasingly vulnerable. Unfortunately, there is no one perfect solution, but we can be smarter, more effective, and most-importantly, proactive.

As a result of contacting a university in the UK about Sci-Hub [1] activity, IEEE received a report that indicated an instance where content was attempted to be accessed from more than three hundred and sixty sites (via forty-eight thousand requests) through a compromised user account. This was just one of many illegal attempt to access IEEE Xplore, [2] through the university’s subscription, using one user account that accessed all of these sites.

This activity is happening to our customers every hour, every day. If IEEE had not alerted the university about this illegal activity and blocked the affected IP address, the activity would have continued to occur. IEEE exerts a great deal of effort to protect its Intellectual Property and is working with others in the industry and the academic community to do the same.

Sci-Hub is a pirated content site, and is considered to be the biggest threat to scholarly publishing globally. It is popular for the following reasons:

It is:

- Free
- In sync with the current culture of openness
- Easy to Use

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- A single source for volumes of aggregated content
- Often covered by the media
- Open Access without the Article Publishing Charge (APC), completely undermining the sustainability of Open Access.

In an interactive browser on Github, Dr. Daniel Himmelstein demonstrates the data that Sci-Hub shared in a tweet from March 2017 where you can explore the illicit site's activity in greater detail (see: <https://greenelab.github.io/scihub//publishers>). As you can see, IEEE is not the only publisher whose content is being stolen and the percentages are pretty high.

In addition, according to data from an article in the April 2016 *Science Magazine*, "Who's downloading pirated papers? "Everyone is," [3] it is clear that this is a global problem - from rich countries to poor countries. The article provides server log data for Sci-Hub from September 2015 through February 2016 that paints a revealing portrait of its users and their diverse interests. During that time, Sci-Hub had twenty-eight million download requests, from all regions of the world and covering most scientific disciplines.

How are they operating? Accessing content via phishing attempts and other means using credentials stolen from universities. Surveillance data that IEEE obtained by tracking Sci-Hub activity since March 2015 indicates that the number of universities that have been compromised on a monthly basis as well as the resultant phishing activities have increased significantly since December 2016.

Sci-Hub's existence could ultimately affect the sustainability of organizational subscriptions and cause disruption of the publishing ecosystem. This means that publishers - particularly not-for-profit societies such as IEEE - will be unable to continue to support their mission. IEEE's mission is advancing technology for the benefit of humanity, which includes activities that encourage interest in engineering, career development, conferences, and membership. The loss of intellectual property results in damage including loss of visits to IEEE Xplore (our digital library) which results in librarians not seeing the full value and use of subscriptions, possibly resulting in the cancellation of journal subscriptions. It also means that we lose our connection with the users and readers of IEEE Xplore. As a not-for-profit, IEEE has no shareholders. Any surplus that we earn is invested in activities directly related to our mission, such as launching new journals and holding conference activities in emerging technologies. Harming publishers in this manner could also compromise our ability to develop and maintain top publications that develop this content. Usage statistics, on which many libraries rely, could also be impacted as activity is skewed by illicit activity. The same applies to authors of publications who can no longer track all of the usage of their content due to it being downloaded from illegal websites.

There are numerous publishing community efforts taking place in the industry to address this issue. One of these is RA21 (<http://ra21.org/>) an initiative in which publishers are partnering with compromised academic institutions to develop mutually-beneficial solutions. Another is a group effort through which publishers are combatting Sci-Hub collaboratively through various means. And others include efforts with organizations such as like Publisher Solutions International (PSI- <http://www.publishersolutionsint.com/>), OCLC, and the Department of Justice.

IEEE's overall strategy and next steps are to continue to seek and test technological advancements to identify and impede misuse, to collaborate with other publishers and organizations to stop misuse, and to educate libraries, authors, and other publishers on IEEE/industry efforts by speaking at industry conferences such as those offered by the American Society of Engineering Education (ASEE), the International Association of STM Publishers (STM), Electronic Resources and Libraries (ER&L), the National Federation of Advanced Information Services (NFAIS), the Society for Scholarly Publishing (SSP), and the Special Libraries Association (SLA).

About the Author

Sari Frances is the Manager of Digital License Compliance at IEEE, the world's largest organization dedicated to advancing technology for humanity where she has managed IEEE's Intellectual Property Protection Program since 2008. Sari is responsible for monitoring infringement activity across products and services, creating sales leads, and certifying proper compliance for all IEEE member and nonmember subscription sales. She also represents IEEE in industry trade associations in anti-piracy efforts and ensures anti-piracy resources are used effectively.

Sari has a BA in Humanities from Montclair State Univ. She also received a certificate in Copyright Management from the Special Libraries Association in June 2015, and received her Project Management certification (PMP) in Dec 2017.

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