

If just one tree falls out of four, will there still be a forest?

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Abstract

Consider the case where a perfect age-verification technology exists. Will that actually make it possible to implement a world-wide platform that achieves the adult population's goals of restricting motivated youth to access content they're interested in? In this document, we discuss the motivation levels of both the *Publisher's* and *Consumer's* cases that must be considered, along with the potential challenges faced in addressing the problem space.

1 Introduction

On the Internet today there are both information *Publishers* and *Consumers*. Simply put, *Publishers* place content on the Internet for *Consumers* to find, read, view, interact with, download, etc. Note: some classify a third party of resharers and/or influencers, but for the sake of this document we will consider them to simply be an alternate form of a *Publisher*.

When a third party (a government, a parent, an ISP, an employer, etc) wishes to block or limit access to content from *Publishers* for a segment of the population, they need technical mechanisms to ensure access violations do not occur. One common form of desired access limitation is age-based, which is especially desired by parents and governments. For the sake of this document, **we assume that a perfect age-verification system exists**. We assume this so we can instead turn to studying the ramifications of the inevitable only partial-deployment of said technology. The Internet has already proven that ubiquitous, mandatory deployment of restrictive technologies is functionally impossible.

2 Motivation Considerations

To study the problem space, we first divide it in two sets of motivations: those of the *Publishers* and those of the *Consumers*. And in each of these we further divide the space into compliant and non-compliant cases.

2.1 Publisher motivations

Simply put, *Publishers* want *Consumers* to find and consume their content. Sometimes its for profit, sometimes for fame, sometimes to spread knowledge, etc. But in the end, the common, primary goal is to distribute their content as far and wide as possible. Restricting their published content to just a subset of the larger potential audience may be done voluntarily (e.g. for moral reasons, or to ensure access only by paying customers). Or restrictions may be imposed on *Publishers* mandated by an external force, as described above. The end result is that ***Publishers* are either compliant or not with publication restrictions**.

If a goal is to have every *Publisher* ideally participate, then either they have to choose to do so voluntarily or they need to be imposed upon by regulation or financial restrictions. Recent, good examples of this include the regulation within the U.S. state of Texas to require ID verification for pornography websites [2], or the credit industry requiring adult games to be removed from the popular *Steam* and *Itch* distribution sites. A good analysis will be hopefully be conducted to figure out whether or not consumers were actually affected in these cases, or whether they worked around the restrictions themselves (see §2.2).

These two example cases actually have a subtle difference between them: the distribution of pornography to minors is unlikely to be affected because there is still a large quantity of other sites that minors in Texas or similar jurisdictions can likely turn to for nearly identical content, while the number of alternative adult game redistributors is significantly smaller and thus the choke point may be more effective. This may be particularly effective for games that only distribute via *Steam*, which is arguably the most common distribution platform for PC games.

Finally, non-compliant *Publishers* have significant opportunities to simply ignore regulations by placing their distribution servers in places where legal enforcement is difficult. Software piracy has existed long before the Internet and shows no signs of slowing down [3], and certainly minors will have no issue discovering these alternate distribution sites if no additional access restriction mechanisms are put in place (e.g. [4]). Of particular note is that regardless of the world majority’s agreement about a general desire to prohibit even extreme forms of content like CSAM and hate speech, the wide spread availability of “Bullet Proof Hosting” (BPH) [1] and free-speech protecting web-proxy [5] services available that have shown that our current society has generally failed in enforcing even these commonly held social norms.

In the end, if only compliant *Publishers* deploy even perfect age-restriction technologies, will the impact be noticeable?

2.2 Consumer motivations

Consumers fall into the same categories: those that wish to be compliant with impositions placed on them, and those willing to attempt circumvention to find the online content they are looking for. If a *Consumer* is not voluntarily willing to accept age or other restrictions, can they actually be prevented from accessing restricted content? A perfect age verification technology not only requires *Publishers* to be compliant, but also requires that the compliant age verification techniques be deployed everywhere that the non-compliant minor might interact with the Internet. This is becoming increasingly difficult as the number of Internet access points available even to the youngest children is constantly increasing.

Unfortunately, even *Consumers* that would normally consider being compliant may choose to not comply out of embarrassment or not wanting to be tracked. Privacy issues must be carefully considered in any resulting solution, or there will be a significant set of otherwise willing *Consumers* looking for legitimate ways to bypass restrictions even though they might be of age. A good recent example is the sudden increase in VPN usage in Texas after the age verification laws were put into place [6].

The effectiveness of age verification techniques will likely be directly correlated with the age of the minor in question.

3 Conclusion

So where does that leave us, even if we actually succeed in implementing a perfect age-verification technique? Unfortunately, the best we can likely achieve is good protection in only the overlap of both compliant *Publishers* and compliant *Consumers*, as summarized in Table 1. Unfortunately, in this case the current “this site contains material for adult audiences” banners are already likely sufficient.

The point of this position paper is not to say “we shouldn’t even try it”, but rather just to be aware of the limitations, challenges, and likely limited effect many solutions may have in achieving the end goals. The existing movie, software and gaming industries have been battling nearly identical situations for decades and have had only limited success in curtailing their content protection problems, even given the large resources they bring to bear on the problem space.

Maybe by carefully breaking down the problem space into the different quadrants of Table 1 can we hope to achieve better success by deploying different solutions that target each space.

		<i>Publishers</i>	
		Compliant	Non-Compliant
<i>Consumers</i>	Compliant	Success	Partial Success
	Non-Compliant	Partial Success	<u>Fail</u> VPNs BPH Jurisdictional Boundaries ...

Table 1: *Success states of compliant and non-compliant Publishers and Consumers*

References

- [1] Sumayah Alrwais, Xiaojing Liao, Xianghang Mi, Peng Wang, Xiaofeng Wang, Feng Qian, Raheem Beyah, and Damon McCoy. Under the shadow of sunshine: Understanding and detecting bulletproof hosting on legitimate service provider networks. In *2017 IEEE Symposium on Security and Privacy (SP)*, pages 805–823, 2017.
- [2] BBC. Us supreme court upholds texas law requiring id verification for porn sites. <https://www.bbc.com/news/articles/cpd1xp2l4wno>, June 2025.
- [3] VPN Central. 10+ unsettling software piracy statistics to know in 2025. <https://vpncentral.com/software-piracy-statistics/>, January 2025.
- [4] OpenDNS. Opendns: Dns services for your home or small business. <https://www.opendns.com/home-internet-security/>.
- [5] Matthew Prince. Cloudflare and free speech. <https://blog.cloudflare.com/cloudflare-and-free-speech/>, 08 2013.
- [6] VPN Mentor Research Team. <https://www.vpnmentor.com/news/vpn-demand-surge-texas/>. <https://www.vpnmentor.com/news/vpn-demand-surge-texas/>, 03 2024.