

# Four year study shows there are patterns in the ways users download BitTorrent files

October 7 2014, by Bob Yirka

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Credit: George Hodan/Public Domain

(Phys.org) —A team of researchers with members from Spain and the U.S. has conducted a four year study of the file sharing habits of thousands of BitTorrent users and has found that predictable patterns have emerged. In their paper published in *Proceedings of the National Academy of Sciences*, the team describes how they carried out their study, what they found, and how their results might be used by systems

planners in the future.

BitTorrent is a peer-to-peer (P2P) [file sharing](#) scheme, thus, it doesn't exist at just one site—rather it can be used by any site that so chooses to serve as an organizing station of sorts, allowing members to use their own computers to host files and to share them with other people on any given site. It's a popular way to share pictures, music and movies, though a lot of what is shared is considered piracy. Because of its decentralized, distributed nature, it's difficult for computer science (or sociological) researchers to gain an understanding of how files are shared, who those people are and what sorts of files they are sharing. To gain a better perspective, the researchers with this new effort devolved a software plug-in called Ono that allows for transferring files much faster than is ordinarily possible with BitTorrent—the catch, is that any user that uses it must allow their activities to be monitored by the team—anononymously, of course.

Ono allowed the researchers to see how big the files being shared were and how long they took to download. Over time, they noticed that they could figure out which sort of files were being transferred due to size—movies are a lot bigger than songs, for example. Over the four years the study has run thus far, the researchers have recorded activity on over 10,000 users, and that has been enough for the team to start spotting patterns. They've noticed for example, that people living in richer countries are more likely to share or download music files, while those in poorer counters are more likely to do the same with movie [files](#). This the team attributes to the relatively inexpensive access to [movies](#) users in more advanced countries have, e.g. Netflix, etc.

Because the study shows that it's possible to track data on a P2P network, it's likely others will try a similar approach. Finding user trends on such networks is becoming more important as the networks themselves grow in both use and importance—the researches note that

currently all of the BitTorrent networks collectively are responsible for approximately one third of all Internet traffic.

**More information:** Impact of heterogeneity and socioeconomic factors on individual behavior in decentralized sharing ecosystems, Arnau Gavaldà-Miralles, *PNAS*, [DOI: 10.1073/pnas.1309389111](https://doi.org/10.1073/pnas.1309389111)

## Abstract

Tens of millions of individuals around the world use decentralized content distribution systems, a fact of growing social, economic, and technological importance. These sharing systems are poorly understood because, unlike in other technosocial systems, it is difficult to gather large-scale data about user behavior. Here, we investigate user activity patterns and the socioeconomic factors that could explain the behavior. Our analysis reveals that (i) the ecosystem is heterogeneous at several levels: content types are heterogeneous, users specialize in a few content types, and countries are heterogeneous in user profiles; and (ii) there is a strong correlation between socioeconomic indicators of a country and users behavior. Our findings open a research area on the dynamics of decentralized sharing ecosystems and the socioeconomic factors affecting them, and may have implications for the design of algorithms and for policymaking.

[Press release](#)

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