

**UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF INDIANA**

Dallas Buyers Club, LLC,

Plaintiff,

v.

DOES 1-20

Defendants

Case No. 1:14-cv-1142-WTL-MJD

DECLARATION OF DELVAN NEVILLE

1. My name is Delvan Neville. I am over the age of 21 and competent to execute this Declaration.
2. I am the owner of Amaragh Associates, LLC, a digital forensics company specialized in BitTorrent investigation. I am an ACE (AccessData Certified Examiner) as well as the author of a BitTorrent monitoring suite, EUPSC2k.
3. I was contacted by Gabriel J. Quearry of Quearry Law, LLC on October 8, 2014 in order to determine if I have previously performed monitoring of swarms associated with the Plaintiff and/or Crystal Bay Corporation (CBC), and whether or not a) records of such monitoring would establish the likelihood of a Doe defendant having been interconnected with a group of 20 IPs associated with the same infohash based on “hit dates” reported by CBC, and b) whether my records support allegations that it is IPP/GuardaLey performing the actual BitTorrent monitoring for Plaintiff, not CBC. I answered in the affirmative to both inquiries on October 8, 2014, and was provided with a copy of the initial complaint, the list of hit dates and the Declaration of Daniel Macek, and retained to provide a sworn declaration on my findings.
4. From mid-September through October 3rd of 2013, I performed BitTorrent monitoring and analysis work for the Electronic Frontier Foundation (EFF) meant to characterize the inter-connectivity of peers within a swarm¹. For these “soaks”², I monitored 24 swarms associated with IPP International-backed lawsuits, Crystal Bay Corporation (CBC) backed lawsuits, and swarms legally redistributing open-source software.
5. Though I had substantial pre-existing logs from soaks relating to both companies, I added new features to EUPSC2k for the purposes of this work to allow deep analysis of Peer Exchange protocol messages.
6. Peer Exchange (PEX) is an extended BitTorrent protocol whereby, following a handshake message between two peers, the peers will notify each other of the IPs of all other peers they are

¹ Here, the term “swarm” is used as a generic label of all BitTorrent clients who are attempting to share a torrent with the same infohash at the same time. Because the infokey used to generate an infohash is not dependent on the list of trackers or attached to whether any peers use alternative means of finding other peers, a “swarm” is not necessarily a single interconnected collection of computers. The most overt example are private trackers i.e. the now-defunct Demonoid, which will only accept & share peer information for registered members of a given community, even if there are other individuals sharing a torrent with the same infohash with each other via a public tracker i.e. The Pirate Bay.

² A “soak” is a continuous period of time during which one more EUPSC2k nodes are connecting to peers in a swarm to monitor and record their activity.

currently connected to within the same swarm, and subsequently update in later messages when any of those peers have disconnected. The purpose of PEX is to allow swarm members to discover each other in addition to the use of one or more trackers and/or Distributed Hash Table (DHT).

7. Through the use of PEX, I was able to not only characterize how long a typical swarm participant remained as a leecher³ and as a seeder⁴, but with what percentage of the observed swarm any PEX-enabled peer contacted during their lifetime in a swarm. Although the inter-connectivity of peers who do not support PEX cannot be directly observed, it stands to reason that peers that do not support this optional method to find more peers in a swarm will at the most be as equally interconnected as PEX-supporting peers, if not less so due to non-PEX peers having fewer options for finding new peers.
8. During the first soak, which consisted of a day long monitoring of 17 swarms of either IPP-monitored, CBC-monitored or legal (thus presumably unmonitored) swarms, the average time spent in a swarm as a leecher was 0.996 hours and the average time spent as a seeder was 3.117 hours, though both distributions had standard deviations approximately 3 times the value of the mean, indicating that both leeching time and seeding time are highly variable on an individual basis.
9. Based on a record of all IPs detected in each swarm by an EUPSC2k node and PEX communication by the subset of peers who report PEX data, the average peer contacts only 0.61% of the total number of swarm participants over the course of their time in the swarm, with a standard deviation of 1.35%. This indicates that a typical peer contacts only a sliver of all swarm participants, and while this distribution is also highly variable, 95% of swarm participants would have contacted between just a single peer to a maximum of 3.247%.
10. A second soak was performed on 7 more swarms, this time over a two-week period. This was directly inspired by mass-Doe litigation wherein the “hit dates”⁵ would often be days or weeks apart, rather than consisting of Does present in a swarm on the same day. The findings for time spent in the swarm were similar to those from the day-long soak: the average download time was 0.603 hours, and the average upload time 2.042 hours. As before, the standard deviations were large, in this case much larger (over 6 times the mean for both average download as well as upload times). Percent connectivity was an order of magnitude lower, however, at 0.05% on average with a standard deviation of 0.15%. This finding was not surprising, if peers only remain in the swarm for an average total of less than 3 hours, it is extraordinarily unlikely that peers from one day will have communicated with peers on a second day, let alone peers separated in time by weeks.
11. These results show that mass-joinder BitTorrent litigation is not based upon any real likelihood that the joined peers have engaged in any series of transactions with each other. Even if one were to assume that all 20 peers named in this suit were at the high end of the distribution of connectivity (3.247%), the likelihood that there is any series of peer-to-peer connections that could link all 20 peers together in the same series of transactions is 0.01%⁶.

3 A “leecher” as used here is a member of a swarm who has not yet finished downloaded the contents of a torrent.

4 A “seeder” as used here is a member of a swarm who has finished downloading the contents of a torrent, but is still connected with members of the swarm, typically in order to continue to share the file(s) with others.

5 “Hit date” is used here only to coincide with the terminology used in IPP/CBC exhibits, and is not meant to endorse the concept that a “hit date” is an appropriate way to describe how and when a peer participated in a swarm.

6 This probability was calculated on the basis that any arrangement of communication that links each peer in this suit to at least one other peer would be sufficient. The probability is even more unlikely if there must be a contiguous series of links connecting all 20 peers through each other.

