

**SUBJECT TO PROTECTIVE ORDER
-FILED UNDER SEAL**

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

ARISTA RECORDS LLC; ATLANTIC
RECORDING CORPORATION; BMG
MUSIC; CAPITOL RECORDS, INC.;
ELEKTRA ENTERTAINMENT GROUP
INC.; INTERSCOPE RECORDS; LAFACE
RECORDS LLC; MOTOWN RECORD
COMPANY, L.P.; PRIORITY RECORDS
LLC; SONY MUSIC ENTERTAINMENT, fka
SONY BMG MUSIC ENTERTAINMENT;
UMG RECORDINGS, INC.; VIRGIN
RECORDS AMERICA, INC.; and WARNER
BROS. RECORDS INC.,

Plaintiffs,

v.

LIME WIRE LLC; LIME GROUP LLC;
MARK GORTON; GREG BILDSON; and
M.J.G. LIME WIRE FAMILY LIMITED
PARTNERSHIP,

Defendants.

06 Civ. 05936 (KMW)
ECF CASE

**REPLY DECLARATION OF PROFESSOR ELLIS HOROWITZ IN SUPPORT OF
PLAINTIFFS' MOTION FOR A PERMANENT INJUNCTION**

I, Professor Ellis Horowitz, the undersigned, hereby declare as follows:

1. My name is Ellis Horowitz. I am over eighteen years of age, of sound mind, and in all ways qualified and competent to make this declaration. I have personal knowledge of the facts contained in this declaration and they are true and correct.

2. I have been retained by the Plaintiffs in this action to provide expert analyses and opinions. I have previously submitted an Expert Report and an Affidavit in support of Plaintiffs' Motion for Partial Summary Judgment. (*See* Volume XIII of Exhibits to November 7, 2008 Declaration of Katherine B. Forrest), and a Declaration in support of the pending Motion for a

Permanent Injunction. This declaration assumes the reader is familiar with that Declaration, and my Expert Report dated April 18, 2008 (“Report”), which is attached to my initial Declaration as Exhibit A and incorporated in full by reference.

3. At Plaintiffs’ request, I reviewed the declaration submitted by Lime Wire LLC’s Vice President of Engineering, John F. Pavley that I am told was submitted in connection with Defendants’ opposition to Plaintiffs’ motion for a permanent injunction. I also reviewed the publicly-available source code for the LimeWire Client, which I downloaded on May 24, 2010. I have based my opinions in this declaration on the documents reviewed and experiments conducted in preparing my Report, as well as my review of the source code.

4. In Mr. Pavley’s declaration, he states that Lime Wire LLC “has no ability . . . to retroactively redesign, control, or alter functionality in past versions of LimeWire that users have already downloaded.” Pavley Decl., ¶ 43. I understand that Lime Wire LLC also argues that it has no means to communicate with existing users who have already downloaded the LimeWire software. I disagree with these assertions. Lime Wire LLC is able to communicate with past versions of LimeWire that users have already downloaded when those versions are used. Through these communications, Lime Wire LLC may alter the functionality of existing installed versions of the LimeWire client.

5. As I explained in my expert report: By using the so-called Signed Message Parameter Passing (SIMPP) mechanism, Lime Wire LLC can control remotely various settings of installed LimeWire file-sharing applications, once those installed versions connect to other LimeWire clients. Lime Wire LLC accomplishes this by using the following mechanism: when a LimeWire client starts, it reads a set of properties from the file limewire.props. It then connects to one or more other computers on the network to receive any updates. Each simpp.xml

file includes a string by which LimeWire can verify that the file comes from Lime Wire LLC. This guarantees that the messages were actually created by Lime Wire LLC and prevents entities other than Lime Wire LLC from successfully distributing simpp.xml files. After confirming that a message is legitimate, the LimeWire client copies the update values into the file simpp.xml and uses those values while it is running. Eventually, when the program exits, the corresponding properties in simpp.xml are copied into limewire.props, and hence they will be used the next time LimeWire is started. The entire process is started when Lime Wire LLC creates a simpp.xml file with a new version number and seeds it to one or more computers on the network. *See Horowitz Report*, ¶ 113.

6. Two sample simpp.xml files were attached to my Report as Exhibit D. The same samples have been attached to this Declaration as Exhibit A. The simpp.xml file contains dozens of settings for various parameters (“SIMPP settings”) that Lime Wire LLC actively sets today using this mechanism. Lime Wire LLC has regularly changed the settings of installed LimeWire clients by using this mechanism, and thereby affected the functioning of installed clients.¹ By setting these parameters to extreme values, Lime Wire could affect the operation of installed versions of the LimeWire client.

7. For example, several of the SIMPP settings work together to define which computers LimeWire clients will and will not connect to. The SIMPP settings establish the minimum qualifications a computer must meet to become a sort of a hub on the network, known as an ultrapeer. A LimeWire client normally operates in a “peer” mode, but can shift into “ultrapeer” mode under certain circumstances. Ultrapeers are clients on the network with special responsibility for routing search queries and requests. Changing the parameters that define which computers may serve as ultrapeers would affect the LimeWire client’s ability to connect to

¹ *See Berlin Tr.*, 129:22; 140:14, attached to the Declaration of Melinda LeMoine.

the network. The settings could be configured so that a far fewer number of computers could qualify to serve as ultrapeers. Fewer available ultrapeers would alter the searching and thus the downloading efficacy of the installed LimeWire clients.

8. Another SIMPP setting defines the maximum number of peers, called “leaves” in this context, that may be connected to one ultrapeer at a time. Reducing the maximum number of leaves that one ultrapeer can support could impede the operation of the Lime Wire system and software, especially in combination with a reduction in the number of ultrapeers. If there are fewer ultrapeers and each ultrapeer is constrained to be connected to fewer leaves, then it should become more difficult to connect to an ultrapeer. As a consequence, there should be a decrease in the searching and thus the downloading efficacy of the LimeWire software.

9. Another SIMPP setting that could be changed to affect performance is in the lines “FilterSettings.hostileIps=128.108.*.*; 208.109.*.*;” (a long list of IP addresses). The FilterSettings.hostileIps property defines a list of IP addresses of users with which the LimeWire application will not communicate. If this setting were set to a different value, it would affect the way the Lime Wire software interacts with the network. For example, if a list of IP addresses broad enough to encompass a significant number of all existing IP addresses were listed as hostile IPs, that could prevent the Lime Wire software from connecting to a significant number of computers. Or, the hostile IP list could simply be emptied of content allowing any computer to interact with the LimeWire client. Removing the hostile IP block from the LimeWire software could significantly degrade the user experience and, as a result, alter performance.

10. These are but a few examples of how changes to the SIMPP settings could alter the functionality of installed versions of the LimeWire application. There are dozens of other parameters Lime Wire LLC may remotely set through the SIMPP file.

11. There are ways other than the SIMPP file that Lime Wire LLC can communicate with existing users of the LimeWire client. As I explained in greater detail in my report at Paragraph 118, Lime Wire can send messages to installed versions of the LimeWire client. For example, Lime Wire LLC is able to notify running LimeWire clients that a new version is available. Lime Wire LLC can cause installed clients to display an announcement regarding the new version in a line near the bottom of the client's window. Lime Wire LLC also sends a message to running installed clients that appears on its start page once the LimeWire client is started. Through these and other methods, Lime Wire LLC thus is capable of communicating with existing users of installed LimeWire clients.

12. I will now address the portions of Mr. Pavley's declaration that describe Lime Wire LLC's hash-based filtering efforts. Mr. Pavley says that Lime Wire LLC released a version 5.5.9 as of May 28, 2010 that makes changes to the hash-based filter first incorporated in 2006. The hash-based filter Mr. Pavley describes is the same one I describe in my Report, and in the Declaration submitted in support of Plaintiffs' Motion for a permanent injunction. *See* Horowitz Report, ¶¶ 93-103. The changes to the hash-based filter that Mr. Pavley describes do not change my opinions about the filter's efficacy or efficiency. In fact, Mr. Pavley's testimony that Lime Wire LLC has so far collected over 40,000 hashes for only 30 sound recordings confirms my findings regarding the inefficiency and ineffectiveness of hash-based filtering alone. It also contradicts Mr. Pavley's conclusion in his declaration that the number of hashes per protected work has an "upper limit" that "is generally within a consistent and reasonable range." (Pavley Decl., ¶ 14).

13. I also understand from Mr. Pavley's declaration that version 5.5.9 of the LimeWire software now sets the default for the hash-based filter to "on." Because the filter

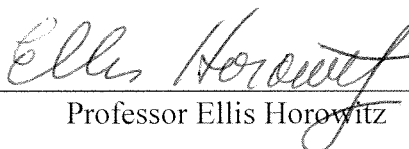
remains optional, a user could still elect to disable the filter by turning it to “off.” The filter is also only set to “on” in the new version, so users must upgrade to change the default.

14. Mr. Pavley’s declaration also describes Lime Wire LLC’s plans to eventually incorporate acoustic fingerprinting technology into the LimeWire filtering mechanism. From Mr. Pavley’s declaration, apparently Lime Wire LLC has yet to even select an acoustic fingerprinting technology vendor. And yet acoustic fingerprinting technology is not new. As I described in my report, iMesh and Kazaa implemented acoustic fingerprinting technology years ago. Lime Wire considered implementing a filter based on acoustic fingerprinting as far back as 2006.² The solutions Mr. Pavley describes could have been implemented years ago, as my Report explains. Horowitz Report, ¶¶ 104-112.

15. In Mr. Pavley’s declaration Paragraph 21 and again in Paragraphs 37-42, he claims that the reliability of Lime Wire LLC’s approach would be improved if the Plaintiffs provided original metadata and original audio files for their works. This is false. Metadata and file information would be included within the data returned once a fingerprint match is made. Lime Wire LLC need only contract with an existing audio fingerprinting technology vendor (such as Audible Magic) to obtain access to a database of existing fingerprints and complete metadata. There is no advantage in having Plaintiffs submit their data beforehand.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Dated: June 28, 2010
Los Angeles, CA



Professor Ellis Horowitz

² See Exhibits 289-290 to the Declaration of Katherine Forrest (Vol. 4).