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13 **UNITED STATES DISTRICT COURT**  
14 **FOR THE NORTHERN DISTRICT OF CALIFORNIA**

<p>15 CHEVRON CORP.,</p> <p>16</p> <p>17 v.</p> <p>18 STEVEN DONZIGER, <i>et al.</i></p> <p>19</p> <p>20</p> <p>21</p> <p>22</p>	<p>Plaintiff,</p> <p>Defendants.</p>	<p>) Case No. CV-12-80237 MISC <del>CRB</del>(NC)</p> <p>)</p> <p>) <b>DECLARATION OF SETH SCHOEN IN</b></p> <p>) <b>SUPPORT OF MOTION OF NON-</b></p> <p>) <b>PARTY JOHN DOE MOVANTS TO</b></p> <p>) <b>QUASH SUBPOENAS TO GOOGLE,</b></p> <p>) <b>INC. AND YAHOO! INC. SEEKING</b></p> <p>) <b>IDENTITY AND EMAIL USAGE</b></p> <p>) <b>INFORMATION</b></p>
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1 I, Seth Schoen, declare as follows:

- 2 1. I am a Senior Staff Technologist with the Electronic Frontier Foundation in San Francisco,  
3 California, and I make this declaration on my own personal knowledge. I have worked  
4 with computers professionally for over a decade and have testified about communications  
5 systems in three courts and before the United States Sentencing Commission.
- 6 2. The purpose of this declaration is to provide a general introduction to IP addresses, the use  
7 of IP addresses to track location, and how that information could be used to associate a  
8 person with others.

9  
10 **Introduction to Internet Protocol Addresses**

- 11 3. An Internet Protocol address (or "IP address") is a numeric value used to identify the  
12 network location of a computer or set of computers on the Internet. Every computer on the  
13 Internet needs to have an IP address in order to communicate with other computers on the  
14 Internet. Internet routers use the IP address to decide where to send communications a  
15 particular computer user.<sup>1</sup> The address is normally written as four numbers from 0 to 255  
16 separated by dots.<sup>2</sup> For example, one of the web servers operated by the Electronic Frontier  
17 Foundation uses the address 64.147.188.11, while the District Court for the Northern  
18 District of California's web server uses 206.18.146.127, while the District Court for the  
19 Northern District of New York's web server uses 199.107.21.60.
- 20 4. IP addresses are allocated to Internet service providers (ISPs) in blocks of consecutive  
21 addresses out of a worldwide pool of around four billion possible addresses through  
22 geographically based non-profit organizations known as regional Internet registries.<sup>3</sup> ISPs

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24 <sup>1</sup> Eric A. Hall, *Internet Core Protocols: The Definitive Guide*, 37-40 (O'Reilly and Associates, 2000).

25 <sup>2</sup> See Radia Perlman, *Interconnections Second Edition*, 199 (Addison Wesley Longman, 2000).  
26 This declaration uses "Internet Protocol address" to refer to addresses using version 4 of the  
27 Internet Protocol ("IPv4"), which has been extensively used worldwide since 1980. Due to  
exhaustion of the pool of distinct IPv4 addresses, the Internet is now in the course of switching to  
version 6, which uses significantly longer addresses.

28 <sup>3</sup> See American Registry for Internet Numbers, "Internet Number Resource Distribution,"  
<https://www.arin.net/knowledge/distribution.pdf> (last visited Oct. 22, 2012).

1 can further delegate these addresses to smaller entities such as businesses, Internet cafés, or  
2 smaller ISPs.<sup>4</sup> ISPs can also assign an IP address directly to an individual computer. This  
3 assignment process is frequently automated and the assignment can be short- or relatively  
4 long-term.<sup>5</sup>

5 5. Because IP addresses are allocated in this way, they can convey approximate information  
6 about a computer's location, how the computer is connected to the Internet, and what  
7 individual or entity is using that computer to connect.

8 6. Individual users connect using different IP addresses depending on where they are.  
9 Multiple users who are using the same local-area network can share a single IP address  
10 (most often when they use a shared router or wireless connection) and hence appear to  
11 connect to the Internet through the same IP address, whether at different times or at the  
12 same time.<sup>6</sup> If users of the same local-area network are *not* sharing a single IP address, and  
13 instead have distinct addresses, their IP addresses will generally be numerically adjacent  
14 (with the beginning portion of the address identical, and only the final portion different).<sup>7</sup>

15 7. An IP address may identify the network through which a network-enabled device (such as a  
16 desktop computer, laptop computer, tablet or smartphone) is accessing the Internet. When a  
17 portable device moves from an Internet connection on one network (the network connection  
18 at one's home, for example) to an Internet connection on another network (a local coffee  
19 shop), the IP address associated with the portable device changes to reflect that the device is  
20 connected to that particular network. This change is normally carried out completely  
21 automatically and is transparent to the user.<sup>8</sup>

22 <sup>4</sup> Hall, *supra* note 1, at 40-41.

23 <sup>5</sup> See IP address, [http://en.wikipedia.org/w/index.php?title=IP\\_address&oldid=518867856](http://en.wikipedia.org/w/index.php?title=IP_address&oldid=518867856) (last  
24 visited Oct. 22, 2012).

25 <sup>6</sup> See Yinglian Xie *et al.*, "How Dynamic Are IP Addresses?," in *Proceedings of the 2007*  
26 *Conference on Applications, Technologies, Architectures, and Protocols for Computer*  
27 *Communications*, <https://research.microsoft.com/pubs/63680/sigcomm07-onefile.pdf> (last visited  
28 Oct. 22, 2012); Jeff Tyson, "How Network Address Translation Works,"  
<http://computer.howstuffworks.com/nat.htm/printable> (last visited Oct. 22, 2012).

<sup>7</sup> See "Subnetwork," <http://en.wikipedia.org/w/index.php?title=Subnetwork&oldid=517971549>  
(last visited Oct. 22, 2012); "Classless Inter-Domain Routing," [http://en.wikipedia.org/w/  
index.php?title=Classless\\_Inter-Domain\\_Routing&oldid=518823902](http://en.wikipedia.org/w/index.php?title=Classless_Inter-Domain_Routing&oldid=518823902) (last visited Oct. 22, 2012).

<sup>8</sup> Today, the automatic assignment of a new address would be handled by the Dynamic Host  
(footnote continued on following page)

1 8. Many host computers of websites, including the operators of popular web-based e-mail  
2 services like Yahoo! Mail, Gmail, and Microsoft Hotmail, maintain logs that list the IP  
3 address of visitors along with date and time information. Websites that utilize a log-in  
4 feature typically maintain a log of IP addresses and other data associated with the particular  
5 user who logged in, such as the date and time of log-in and the duration of time the user  
6 visited the website. If a user accesses the website with a portable device from different  
7 locations, then the log data about that user will include a variety of different IP addresses.  
8 Because of the way they were assigned, these different IP addresses will reflect the location  
9 and movement of the device and its owner.

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11 **Using IP Addresses and Associated Information  
to Determine Location**

12 9. A large amount of data accumulated over a lengthy period of time that includes IP  
13 addresses and dates and times of usage sessions—as one might get from a heavily trafficked  
14 and frequently used web service such as an email provider—can readily present a detailed  
15 picture of a person’s movements from one location to another, especially if that person is an  
16 avid laptop or tablet user.

17 10. For instance, a laptop will receive a different IP address when it connects to the Internet  
18 from different locations.<sup>9</sup> If a laptop’s owner uses the machine from her workplace in the  
19 morning, a café in the afternoon, and her home in the evening, she will present at least three  
20 different IP addresses over the course of a single day. A traveler who brings a laptop to a  
21 different country and goes online there will receive an IP address unrelated to the IP  
22 address he used at home.

23 11. The WHOIS service, which can be accessed through web sites such as  
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25 *(footnote continued from preceding page)*  
26 Configuration Protocol (DHCP). “Dynamic Host Configuration Protocol,” [http://en.wikipedia.org/  
w/index.php?title=Dynamic\\_Host\\_Configuration\\_Protocol&oldid=519194559](http://en.wikipedia.org/w/index.php?title=Dynamic_Host_Configuration_Protocol&oldid=519194559) (last visited Oct. 22,  
27 2012).

28 <sup>9</sup> See University of Illinois Campus Information Technologies and Educational Services, “Network Access While Traveling,” <http://www.cites.illinois.edu/network/access/travel.html> (last accessed Oct. 22, 2012).

1 http://www.domaintools.com, is a public database that permits a user to find out to whom a  
2 regional Internet registry has allocated a block of IP addresses. A user can input a  
3 numerical IP address and obtain the registry's information about the assignee of that IP  
4 address, which might be an ISP or other entity. When IP addresses have been allocated  
5 directly to an organization that makes use of them, WHOIS can sometimes associate an IP  
6 address with an exact physical location. For example, inputting the IP address  
7 156.128.118.200 into WHOIS shows that the number is associated with the Administrative  
8 Office of the U.S. Courts, which is located at One Columbus Circle NE, Washington D.C.  
9 On most occasions, however, WHOIS will only associate an IP address with an Internet  
10 service provider's office, which is often in the same region as its subscribers or users but  
11 does not reveal their exact locations.

12 12. WHOIS records and other information sources provide geographic information about where  
13 ISPs operate and where they use particular ranges of IP addresses. This means that servers  
14 located in California typically have IP addresses traceable to California, servers located in  
15 New York typically have IP addresses traceable to New York, and servers in Ecuador  
16 typically have IP addresses traceable to Ecuador. This geographic location information is  
17 generally publicly available. For instance, the IP address 199.83.220.233 is easily traceable  
18 to San Francisco through free websites available to the public such as www.geobytes.com.  
19 Even when location information is not publicly available, a subpoena to an ISP can  
20 generally elicit the specific geographic location for a particular IP address.

21 13. Where that is the case, IP address records can still be used in the service of pinpointing a  
22 person's location and movements, particularly in the context of litigation where parties can  
23 exercise subpoena power. Internet service providers typically maintain records of the  
24 physical addresses associated with a given subscriber, for both billing and service purposes,  
25 and typically also record historical information about which subscriber used a particular IP  
26 address. Once the a litigant has a list of IP addresses, it can subpoena subscriber  
27 information from the corresponding ISPs for the specific IP addresses and develop a  
28 detailed picture of a person's location and movements from that subscriber information.



