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19 **a Delaware limited liability company**

20 UNITED STATES DISTRICT COURT

21 NORTHERN DISTRICT OF CALIFORNIA

22 PERSONALWEB TECHNOLOGIES,
23 LLC, a Texas limited liability company,
24 and
25 LEVEL 3 COMMUNICATIONS, LLC,
26 a Delaware limited liability company,

27 Plaintiff,

28 v.

LITHIUM TECHNOLOGIES, INC., a
Delaware corporation,
Defendants.

CASE NO.: 3:18-cv-164

**COMPLAINT FOR PATENT
INFRINGEMENT**

DEMAND FOR JURY TRIAL

1 Plaintiff PersonalWeb Technologies, LLC ("Plaintiff" or "PersonalWeb") files
2 this Complaint for patent infringement against Defendant Lithium Technologies, Inc.
3 ("Defendant"). Plaintiff PersonalWeb Technologies, LLC alleges:

4
5 **PRELIMINARY STATEMENT**

6 1. PersonalWeb and Level 3 Communications, LLC ("Level 3") are parties
7 to an agreement between Kinetech, Inc. and Digital Island, Inc. dated September 1,
8 2000 (the "Agreement"). Pursuant to the Agreement, PersonalWeb and Level 3 each
9 own a fifty percent (50%) undivided interest in and to the patents at issue in this
10 action: U.S. Patent Nos. 5,978,791; 6,928,442; 7,802,310, 7,945,544 and 8,099,420
11 ("Patents-in-Suit"). Level 3 has joined in this Complaint pursuant to its contractual
12 obligations under the Agreement, at the request of PersonalWeb.

13 2. Pursuant to the Agreement, Level 3 has, among other rights, certain
14 defined rights to use, practice, license, sublicense and enforce and/or litigate the
15 Patents-in-Suit in connection with a particular field of use ("Level 3 Exclusive Field").
16 Pursuant to the Agreement PersonalWeb has, among other rights, certain defined
17 rights to use, practice, license, sublicense, enforce and/or litigate the Patents-in-Suit in
18 fields other than the Level 3 Exclusive Field (the "PersonalWeb Patent Field").

19 3. All infringement allegations, statements describing PersonalWeb,
20 statements describing any Defendant (or any Defendant's products) and any
21 statements made regarding jurisdiction and venue are made by PersonalWeb alone,
22 and not by Level 3. PersonalWeb alleges that the infringements at issue in this case
23 all occur within, and are limited to, the PersonalWeb Patent Field. Accordingly,
24 PersonalWeb has not provided notice to Level 3 – under Section 6.4.1 of the
25 Agreement or otherwise – that PersonalWeb desires to bring suit in the Level 3
26 Exclusive Field in its own name on its own behalf or that PersonalWeb knows or
27 suspects that Defendant is infringing or has infringed any of Level 3's rights in the
28 patents.

THE PARTIES

1
2 4. Plaintiff PersonalWeb Technologies, LLC is a limited liability company
3 duly organized and existing under the laws of Texas with its principal place of
4 business at 112 E. Line Street, Suite 204, Tyler, TX 75702.

5 5. Plaintiff Level 3 Communications, LLC is a limited liability company
6 organized under the laws of Delaware with its principal place of business at 100
7 CenturyLink Drive, Monroe, Louisiana, 71203.

8 6. PersonalWeb's infringement claims asserted in this case are asserted by
9 PersonalWeb and all fall outside the Level 3 Exclusive Field. Level 3 is currently not
10 asserting patent infringement in this case in the Level 3 Exclusive Field against any
11 Defendant.

12 7. Defendant Lithium Technologies, Inc., is, upon information and belief, a
13 Delaware corporation having a principal place of business or regular and established
14 place of business at 225 Bush Street, 14th Floor, San Francisco, CA 94104.

15
16 **JURISDICTION AND VENUE**

17 8. The court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331
18 and 1338(a) because this action arises under the patent laws of the United States,
19 35 U.S.C. §§ 1 *et seq.*

20 9. Venue is proper in this federal district pursuant to 28 U.S.C. §§ 1391(b)-
21 (c) and 1400(b) because Defendant is incorporated in the State of Delaware, has a
22 regular and established place of business in this District, has done business in this
23 District, has committed acts of infringement in this District, and continues to commit
24 acts of infringement in this District, entitling PersonalWeb to relief in this District.

PERSONALWEB BACKGROUND

1
2 10. The Patents-in-Suit cover fundamental aspects of cloud computing,
3 including the identification of files or data and the efficient retrieval thereof in a
4 manner which reduces bandwidth transmission and storage requirements.

5 11. The ability to reliably identify and access specific data is essential to any
6 computer system or network. On a single computer or within a small network, the
7 task is relatively easy: simply name the file, identify it by that name and its stored
8 location on the computer or within the network, and access it by name and location.
9 Early operating systems facilitated this approach with standardized naming
10 conventions, storage device identifiers, and folder structures.

11 12. Ronald Lachman and David Farber, the inventors of the Patents-in-Suit,
12 recognized that the conventional approach for naming, locating, and accessing data in
13 computer networks could not keep pace with ever-expanding, global data processing
14 networks. New distributed storage systems use files that are stored across different
15 devices in dispersed geographic locations. These different locations could use
16 dissimilar conventions for identifying storage devices and data partitions. Likewise,
17 different users could give identical names to different files or parts of files—or
18 unknowingly give different names to identical files. No solution existed to ensure
19 that identical file names referred to the same data, and conversely, that different file
20 names referred to different data. As a result, expanding networks could not only
21 become clogged with duplicate data, they also made locating and controlling access
22 to stored data more difficult.

23 13. Lachman and Farber developed a solution: by replacing conventional
24 naming and storing conventions with system-wide “substantially unique,” content-
25 based identifiers. Their approach assigned substantially unique identifiers to all “data
26 items” of any type—“the contents of a file, a portion of a file, a page in memory, an
27 object in an object-oriented program, a digital message, a digital scanned image, a
28 part of a video or audio signal, or any other entity which can be represented by a

1 sequence of bits.” Applied system-wide, this invention would permit any data item
2 to be stored, located, managed, synchronized, and accessed using its content-based
3 identifier.

4 14. To create a substantially unique, content-based identifier, Lachman and
5 Farber turned to cryptography. Cryptographic hash functions, including MD4, MD5,
6 and SHA, had been used in computer systems to verify the integrity of retrieved
7 data—a so-called “checksum.” Lachman and Farber recognized that these same hash
8 functions could be devoted to a vital new purpose: if a cryptographic hash function
9 was applied to a sequence of bits (a “data item”), it would produce a substantially
10 unique result value, one that: (1) virtually guarantees a different result value if the
11 data item is changed; (2) is computationally difficult to reproduce with a different
12 sequence of bits; and (3) cannot be used to recreate the original sequence of bits.

13 15. These cryptographic hash functions would thus assign any sequence of
14 bits, based on content alone, with a substantially unique identifier. Lachman and
15 Farber estimated that the odds of these hash functions producing the same identifier
16 for two different sequences of bits (i.e., the “probability of collision”) be about 1 in 2
17 to the 29th power. Lachman and Farber dubbed their content-based identifier a “True
18 Name.”

19 16. Using a True Name, Lachman and Farber conceived various data
20 structures and methods for managing data (each data item correlated with a single
21 True Name) within a network—no matter the complexity of the data or the network.
22 These data structures provide a key-map organization, allowing for a rapid
23 identification of any particular data item anywhere in a network by comparing a True
24 Name for the data item against other True Names for data items already in the
25 network. In operation, managing data using True Names allows a user to determine
26 the location of any data in a network, determine whether access is authorized, and to
27 selectively provide access to specific content not possible using the conventional
28 naming arts.

1 17. On April 11, 1995, Lachman and Farber filed their patent application,
2 describing these and other ways in which content-based “True Names” elevated data-
3 processing systems over conventional file-naming systems. The first True Name
4 patent issued on November 2, 1999. The last of the Patents-in-Suit has expired, and
5 the allegations herein are directed to the time period before expiration of the last of
6 the Patents-in-Suit.

7 18. PersonalWeb has successfully enforced its intellectual property rights
8 against third party infringers, and its enforcement of the Patents-In Suit is ongoing.
9 This enforcement has resulted in PersonalWeb obtaining settlements and granting
10 non-exclusive licenses regarding the Patents-in-Suit.

11 DEFENDANT’S BACKGROUND

12
13 19. On information and belief, Defendant operates or has operated a website
14 located at klout.com and has done so since before expiration of the last to expire of
15 the Patents-in-Suit, which has operated to provide webpage content to its authorized
16 users in the manner herein described.¹ On information and belief, Defendant’s
17 webpage servers utilize a system of notifications and authorizations to control the
18 distribution of content, *e.g.*, what webpage content may be served from webpage
19 servers and intermediate caches and what webpage content a user’s browser is
20 authorized to use to render Defendant’s webpage(s). On information and belief,
21 Defendant’s system and its associated method of providing webpage content, use
22 CONDITIONAL GET requests with IF-NONE-MATCH headers and associated E-
23 Tag values for each file required to render a webpage of the Defendant, including the
24 index file for that webpage. In this manner, Defendant’s system and associated
25 method force both intermediate cache servers and end point caches to check whether it

26
27
28 ¹ While the complaint is sometimes written in the present tense, and though it
is believed that Defendant’s system operates in substantially the same manner
currently, all specific allegations are focused on the system’s operations in the
relevant time period.

1 is still authorized to access the previously cached webpage files of Defendant, or
2 whether it must access new content in rendering Defendant's webpage.

3 20. On information and belief, Defendant has thereby reduced the bandwidth
4 required and the amount of data to be served from origination servers or intermediate
5 cache servers to field user requests to render Defendant's webpages, because such
6 servers only need to serve files whose content has changed. This has allowed for the
7 efficient update of cached information only when such content has changed, thereby
8 reducing transaction overhead and allowing the authorized content to be served from
9 the nearest cache.

10 21. On information and belief, Defendant's website uses a Ruby on Rails
11 architecture to develop and compile its webpage files that are required to render a
12 webpage, and to generate a fingerprint of the content of each of the files when
13 compiled. On information and belief, the fingerprint of each file that is part of the
14 webpage's content is appended to Defendants Uniform Resource Locator ("URL") to
15 make it a Uniform Resource Identifier ("URI") used to access the file; wherein when
16 the file's content changes, a new fingerprint is generated and appended to its URL.
17 On information and belief, the file fingerprint has been generated with a message
18 digest hash function.

19 22. On information and belief, once Defendant's webpage files have been
20 compiled and are complete, Defendant uploads them to an Amazon S3 host system as
21 objects. On information and belief, Defendant has contracted with, directed and/or
22 controlled the uploading of its files and subsequent actions that occur on the S3 host
23 system due to Defendant's contractual choice of using content-based identifiers, e.g.,
24 fingerprints of content of files necessary to render webpages, as well as Defendant's
25 relationship with Amazon, so that it may control its content distribution in an
26 infringement of the Patents-In-Suit in the manner specified herein.

27 23. On information and belief, the object's value comprises a sequence of
28 bits, and the object's associated E-Tag value generated, on Defendant's behalf, upon

1 upload by applying a hash function to the sequence of bits; wherein any two objects
2 comprising identical content have identical associated E-Tag values. Thus, when the
3 object's content changed, such as where the overall webpage to be rendered required
4 updated content, and a new associated E-Tag value was generated, on Defendant's
5 behalf, to authorize or disallow the respective service or use of the object's content
6 by intermediate cache servers and end point caches such as browser caches.

7 24. On information and belief, Defendant's webpages have generally
8 comprised one or more asset files and each webpage is represented by an index file.
9 The index file lists each asset file needed to render the webpage to be loaded, where
10 each of these files is uploaded as an individual object with its own URL.

11 25. On information and belief, when an intermediate cache server or an end
12 point browser has requested a webpage of the Defendant for the first time, it has sent
13 an HyperText Transfer Protocol ("HTTP") GET request with the webpage's URL and
14 Defendant's origination server has responded by sending individual HTTP 200
15 messages respectively containing the index file and asset files necessary to render that
16 webpage, along with their respective associated E-Tags. On information and belief,
17 upon receipt of the HTTP 200 message, the intermediate cache server and end point
18 browser have cached the index and asset files with their associated URI and associated
19 E-Tag values and the browser has used them in rendering the requested web page of
20 the defendant. On information and belief, the intermediate cache and browser caches
21 have maintained a database/table which maps the URI of each asset/index file to its
22 associated E-Tag.

23 26. On information and belief, by responding to a HTTP GET request for a
24 given webpage by sending down the authorized index/asset file content with an
25 associated E-Tag, Defendant has forced the browser cache and all intermediate cache
26 servers to use the E-Tag in an HTTP CONDITIONAL GET with "IF-NONE-
27 MATCH" protocol to re-verify that they are still authorized to serve or use the content
28

1 the next time that they are called to do so, or whether they are not still authorized to
2 use that content and must use new content, in the manner as follows.

3 27. On information and belief, when the user has again requested the
4 Defendant's webpage, the user's browser sends a CONDITIONAL GET 'IF-NONE-
5 MATCH' request using the associated E-Tag value and the URI for the index file so
6 as to be notified whether the browser still has Defendant's authority to render the
7 webpage with its locally cached asset files for that webpage. On information and
8 belief, a responding intermediate cache server having an unexpired E-Tag for that
9 URL responds to the request by determining whether it has the same associated E-Tag
10 value in its list of associated E-Tag values; (if it had no E-Tag value for that URL, the
11 request was passed up to an upstream server capable of responding or, if none, to the
12 Defendant's origination server which performed the response). On information and
13 belief, if the responding server had webpage content for that URL and there was a
14 match between the E-Tag it received in the request with the E-Tag it currently had
15 associated for that URL, it has sent back an HTTP 304 message; this message
16 notifying the browser that the same webpage content was present at the responding
17 server and that the browser was still authorized to again use the previously cached
18 asset files to render the webpage. On information and belief, upon receipt of the
19 HTTP Protocol 304 response, the browser accessed the locally cached asset files in
20 rendering the webpage.

21 28. On information and belief, if the index file's associated E-Tag sent by the
22 browser in the 'IF-NONE-MATCH' request did not match the associated E-Tag
23 maintained at the responding server for that URI, the responding server sent back an
24 HTTP 200 response along with the new index file along with its new E-Tag value.
25 The HTTP 200 indicated to the downstream server and/or the browser that it was not
26 authorized to use (or serve, as the case may be) the previously cached web page
27 content but must acquire some newly authorized content. In response to receiving the
28 HTTP 200 message, the intermediate cache server and browser were forced to update

1 their respective caches with the new index file and associated E-Tag. The browser
2 read the new index file to identify the list of asset file URIs contained therein.

3 29. On information and belief, for any asset file URI for which it already had
4 a cached associated E-Tag value, the browser likewise sent an 'IF_NONE_MATCH'
5 CONDITIONAL GET request with the URI and associated E-Tag to the first
6 intermediate cache server. On information and belief, if the responding server had an
7 unexpired E-Tag value for the URL from that URI, the responding server compared
8 the associated E-Tag value received in the CONDITIONAL GET with its list of
9 associated E-Tag values for the URL from that URI. On information and belief, if
10 there was a match, then the responding server sent an HTTP 304 message with the
11 new max-age value and associated E-Tag value, which reauthorized the browser to
12 use the previously cached content of that asset file to render the webpage. If there was
13 not a match, the responding server sent an HTTP 200 message with the new content
14 for that asset file and its new associated E-Tag value. The HTTP 200 message directed
15 the downstream server or the browser that it was not authorized to access the
16 previously cached content for that URL to serve it or to render the webpage. Rather, in
17 response to receiving such a message, the browser accessed the new asset file content
18 provided in the HTTP 200 message in rendering the webpage. Thusly the end cache
19 and the intermediate caches in the network updated their respective databases to map
20 the new URI to the new content and E-Tag value.

21 30. On information and belief, the browser has repeated this process for each
22 asset file for which it has an associated E-Tag value.

23 31. On information and belief, for any asset file for which it did not have
24 cached a previously received associated E-Tag value, the browser sent an HTTP GET
25 request with the asset file's URI; and the responding intermediate or origination server
26 responded to the GET request by sending the asset file for that URI and the
27 corresponding associated E-Tag with an HTTP 200 message. On information and
28 belief, in response to receiving the HTTP 200 message, the browser cached the asset

1 file and its associated E-Tag and used the newly received asset files in rendering
2 Defendant's webpage. On information and belief, when the downstream intermediate
3 cache or the browser was later required to again render the webpage, it went through
4 the above process to determine which file content it still had authority to access or
5 whether it needed to access different authorized content to render the webpage via the
6 HTTP 304 and HTTP 200 messages.

7 32. On information and belief, in this manner, Defendant used E-Tag values
8 to control the behavior of in-network intermediate cache servers and end point caches
9 to make sure that they only accessed authorized webpage content to serve or to use.

10 33. On information and belief, recognizing that some out of network
11 intermediate cache servers rendered their own E-Tag by hashing the index or asset
12 file's URI, Defendant appended to the URL a content fingerprint that was generated
13 by applying a hash function to the file's content. On information and belief,
14 Defendant's appendment of the fingerprint to the URL similarly controlled the
15 behavior of such intermediate cache servers by making sure that such intermediate
16 cache servers always revalidated whether they are still authorized to serve the cached
17 content or had to access new authorized content to serve or use in rendering
18 Defendant's webpages.

19
20 **FIRST CLAIM FOR RELIEF**

21 **INFRINGEMENT OF U.S. PATENT NO. 5,978,791**

22 34. PersonalWeb repeats and realleges paragraphs 1-33, as if the same were
23 fully stated herein.

24 35. On November 2, 1999, United States Patent No. 5,978,791 (the "'791
25 patent") was duly and legally issued for an invention entitled "Data Processing System
26 Using Substantially Unique Identifiers to Identify Data Items, Whereby Identical Data
27 Items Have the Same Identifiers." PersonalWeb has an ownership interest in the '791
28 patent by assignment, including the exclusive right to enforce the '791 patent within

1 the PersonalWeb Patent Field, and continues to hold that ownership interest in the
2 '791 patent. A true and correct copy of the '791 patent is attached hereto as Exhibit A.

3 36. Defendant has infringed at least claims 38 and 42 of the '791 patent by its
4 manufacture, use, sale, importation, and/or offer for sale of products or services,
5 and/or controlling the distribution of its webpage content in the manner described
6 herein. Defendant is liable for its infringement of the '791 patent pursuant to
7 35 U.S.C. § 271.

8 37. For example, claim 38 covers “a method of locating a particular data
9 item at a location in a data processing system.” On information and belief,
10 Defendant’s website has been a data processing system and has performed the
11 claimed method by using a system of notifications and authorizations to locate and
12 control the distribution of data items necessary to render its webpages such as various
13 index and asset files.

14 38. Claim 38 then recites the act of “(A) determining a substantially unique
15 identifier for the data item, the identifier depending on and being determined using all
16 of the data in the data item and only the data in the data item, whereby two identical
17 data items in the system will have the same identifier.” On information and belief,
18 Defendant’s website has determined a substantially unique identifier for the data item
19 by calculating a hash fingerprint and E-Tags of the file’s contents, and only its
20 contents; for example, each asset file has comprised a sequence of bits and the hash of
21 any two files comprising the identical sequence of bits has had identical substantially
22 unique identifiers, *e.g.*, identical fingerprints and E-Tags. If either the file’s content
23 has changed, a new substantially unique identifier has been determined for the index
24 file both during compilation of the file and its upload as an object into Defendant’s
25 chosen content distribution system.

26 39. Claim 38 then recites the act of “(B) requesting the particular data item
27 by sending the data identifier of the data item from the requester location to at least
28 one location of a plurality of provider locations in the system.” On information and

1 belief, Defendant's use of the E-Tags and fingerprints has controlled how multiple
2 provider locations such as origin or intermediate servers have interfaced with
3 requester locations such as users' browsers to perform this act. On information and
4 belief, for example, by including the E-Tags in the HTTP 200 messages and by
5 appending the fingerprint to the URL, Defendant forced intermediate cache servers
6 and end caches (such as used by a browser) to use CONDITIONAL GET requests
7 with IF-NONE-MATCH headers and associated E-Tag values for each file needed to
8 render Defendant's webpages, and forced the responding upstream servers to respond
9 to the CONDITIONAL GET requests with HTTP 200 and HTTP 304 messages to
10 verify whether they were still authorized to serve or use previously cached file
11 contents needed to render Defendant's webpages, or must access newly provided
12 authorized content to serve or use.

13 40. Claim 38 then recites the act of "(C) on at least some of the provider
14 locations, (a) for each data item of a plurality of data items at the provider locations,
15 (i) determining a substantially unique identifier for the data item, the identifier
16 depending on and being determined using all of the data in the data item and only on
17 the data in the data item, whereby two identical data items in the system will have the
18 same identifier; and (ii) making and maintaining a set of identifiers of data items." On
19 information and belief, Defendant's origination servers stored URI's (that include
20 appended content fingerprints) mapped to the authorized content and its E-Tag; and by
21 sending the URI and the E-Tag in each HTTP 200 message containing their website
22 content, Defendant forced intermediate cache servers and end-point caches to do the
23 same.

24 41. Claim 38 then recites "(b) determining, based on the set of identifiers,
25 whether the data item corresponding to the requested data identifier is present at the
26 provider location." On information and belief, by doing so, Defendant has also forced
27 the intermediate cache servers and end point caches to send the URI and E-Tag back
28 in CONDITIONAL GET requests with IF-NONE-MATCH headers; and thereby

1 forced a responding server (origination or intermediate cache server) that received
2 such a CONDITIONAL GET request from a downstream cache server or end point
3 cache, to determine whether the file content corresponding to the received E-Tag, is
4 present on the responding server by comparing it to the E-Tag values identifiers it has
5 in its database to determine whether there is a match. On information and belief, this
6 same process has been used for out-of-network intermediate cache servers that
7 generate their own E-Tag value by hashing the URI.

8 42. Claim 38 then recites "(c) based on the determining, when the provider
9 location determines that the particular data item is present at the provider location,
10 notifying the requestor that the provider has a copy of the given data item." On
11 information and belief, by using this system, Defendant forced the responding server
12 to issue an HTTP 304 message to the requesting downstream cache when there has
13 been a match between the E-Tag in the CONDITIONAL GET request and the E-Tag
14 in the database thereby notifying the requesting location that the same file content is
15 present both at the responding and requesting locations and that it was therefore re-
16 authorized to serve/use the existing content corresponding to that E-Tag value.

17 43. Defendant's acts of infringement have caused damage to PersonalWeb,
18 including impairment of the value of the '791 patent, and PersonalWeb is entitled to
19 recover from Defendant the damages sustained by PersonalWeb as a result of
20 Defendant's wrongful acts in an amount subject to proof at trial.

21 **SECOND CLAIM FOR RELIEF**

22 **INFRINGEMENT OF U.S. PATENT NO. 6,928,442**

23 44. PersonalWeb repeats and realleges paragraphs 1-33, as if the same were
24 fully stated herein.

25 45. On August 9, 2005, United States Patent No. 6,928,442 (the "'442
26 patent") was duly and legally issued for an invention entitled "Enforcement and
27 Policing of Licensed Content Using Content-Based Identifiers." PersonalWeb has an
28 ownership interest in the '442 patent by assignment, including the exclusive right to

1 enforce the '442 patent within the PersonalWeb Patent Field, and continues to hold
2 that ownership interest in the '442 patent. A true and correct copy of the '442 patent
3 is attached hereto as Exhibit B.

4 46. Defendant has infringed at least claims 10 and 11 of the '442 patent by its
5 manufacture, use, sale, importation, and/or offer for sale of products or services,
6 and/or controlling the distribution of its webpage content in the manner described
7 herein. Defendant is liable for its infringement of the '442 patent pursuant to
8 35 U.S.C. § 271.

9 47. For example, claim 10 covers “a method, in a system in which a
10 plurality of files are distributed across a plurality of computers.” On information and
11 belief, Defendant has used a system of notifications and authorizations to distribute a
12 plurality of files, e.g., Defendant’s files containing content necessary to render its
13 webpages, across a plurality of computers such as origin servers, intermediate cache
14 servers and end point caches used by browsers rendering Defendant’s webpages.

15 48. Claim 10 then recites the act of “obtaining a name for a data file, the
16 name being based at least in part on a given function of the data, wherein the data
17 used by the function comprises the contents of the particular file.” As set forth
18 above, on information and belief, Defendant obtained E-Tags and fingerprints for its
19 index and asset files used to render its webpages using a hash function, wherein the
20 E-Tag and fingerprint has been based on the contents of the particular file.
21 Moreover, Defendant caused the intermediate caches servers and end point caches to
22 obtain the E-tags and URIs (which contain the fingerprint) in HTTP Protocol 200
23 messages sent from Defendants origination servers. On information and belief,
24 Defendant caused intermediate cache servers and its origination servers to obtain E-
25 tags and URIs (which the fingerprint) in CONDITIONAL GET messages from end
26 point and intermediate caches, as described *supra*. On information and belief, by
27 also inserting the fingerprint into the URI for the file, Defendant caused certain out-
28 of-network intermediate cache servers (that obtain their own E-Tag by hashing the

1 URI) to make content based E-Tags, so that when the content of the file has changed,
2 these out-of-network caches were caused to verify that they already had or needed
3 Defendant's latest authorized content in the same manner outlined *supra* for in-
4 network servers via the HTTP 200 and HTTP 304 message system or to notify such
5 caches that they already had and were still authorized to access the previously cached
6 content or to provide such latest authorized content.

7 49. Claim 10 then recites the act of "determining, using at least the name,
8 whether a copy of the data file is present on at least one of said computers." On
9 information and belief, as set forth above, Defendant has caused its origination servers
10 and the intermediate cache servers in-between an end point cache and one of its
11 origination servers, in response to receiving a CONDITIONAL GET request with the
12 IF-NONE-MATCH header, to compare the E-Tag in the CONDITIONAL GET

13 50. to the E-Tags of files it has present and determine whether a copy of the
14 content having that E-Tag is present.

15 51. Claim 10 then recites the act of "determining whether a copy of the data
16 file that is present on a at least one of said computers is an unauthorized copy or an
17 unlicensed copy of the data file." On information and belief, as set forth above, if
18 there was a match, the origination or intermediate cache server determined that the
19 copy of the file present at the downstream intermediate cache server and/or the end-
20 point cache was an authorized or licensed copy of the data file. Conversely, if there
21 was no match, it determined that the copy of the file present at the downstream
22 intermediate cache server and/or the end-point cache was an unauthorized or
23 unlicensed copy of the data file.

24 52. Defendant's acts of infringement caused damage to PersonalWeb,
25 including impairment of the value of the '442 patent, and PersonalWeb is entitled to
26 recover from Defendant the damages sustained by PersonalWeb as a result of
27 Defendant's wrongful acts in an amount subject to proof at trial.

28

THIRD CLAIM FOR RELIEF

INFRINGEMENT OF U.S. PATENT NO. 7,802,310

1
2
3 53. PersonalWeb repeats and realleges paragraphs 1-33, as if the same were
4 fully stated herein.

5 54. On September 21, 2010, United States Patent No. 7,802,310 (the
6 "'310 patent") was duly and legally issued for an invention entitled "Controlling
7 Access to Data in a Data Processing System." PersonalWeb has an ownership
8 interest in the '310 patent by assignment, including the exclusive right to enforce
9 the '310 patent within the PersonalWeb Patent Field, and continues to hold that
10 ownership interest in the '310 patent. A true and correct copy of the '310 patent is
11 attached hereto as Exhibit C.

12 55. Defendant has infringed at least claims 20, 69 and 71 of the '310 patent
13 by its manufacture, use, sale, importation, and/or offer for sale of products or services,
14 and/or controlling the distribution of its webpage content in the manner described
15 herein. Defendant is liable for its infringement of the '310 patent pursuant to
16 35 U.S.C. § 271.

17 56. For example, claim 69 covers a "system operable in a network of
18 computers, the system comprising hardware including at least a processor, and
19 software, in combination with said hardware." On information and belief, Defendant
20 has controlled the distribution of its website content across a network of computers,
21 such as its origin servers, intermediate cache servers and end-point caches,
22 comprising hardware including a processor. On information and belief, Defendant has
23 utilized the Ruby on Rails code, software utilized in implementing the HTTP web
24 protocol, and both hardware and software hosted on the Amazon S3 hosting system
25 that Defendant uses to serve its content.

26 57. Claim 69 then recites the system "(a)...receive at a first computer, from a
27 second computer, a request regarding a data item, said request including at least a
28 content-dependent name for the data item, the content-dependent name being based at
least in part on a function of the data in the data item, wherein the data used by the

1 function to determine the content-dependent name comprises at least some of the
2 contents of the data item, wherein the function that was used is a message digest
3 function or a hash function, and wherein two identical data items will have the same
4 content-dependent name.” On information and belief, as set forth above, Defendant
5 has caused downstream intermediate cache servers and end-point caches to send
6 CONDITIONAL GET requests with IF-NONE-MATCH headers containing E-Tags that
7 are fielded by upstream cache or origination servers. On information and belief, the
8 E-Tags have been content-dependent names for a data item calculated by hashing the
9 file’s contents; and when the file’s content has changed a new content-dependent
10 name has been determined. On information and belief, in Defendant’s system, a first
11 computer, such as the intermediate cache server or origination server, received
12 CONDITIONAL GET requests from a second computer, such as a user browser,
13 regarding data items, such as index or asset files, using content-dependent names (E-
14 tags) associated with the data items.

15 58. Claim 69 then recites “in response to said request: (i) to cause the
16 content-dependent name of the data item to be compared to a plurality of values; and
17 (ii) to determine if access to the data item is authorized or unauthorized based on
18 whether or not the content-dependent name corresponds to at least one of said
19 plurality of values, and (iii) based on whether or not it is determined that access to the
20 data item is authorized or unauthorized, to allow the data item to be provided to or
21 accessed by the second computer if it is not determined that access to the data item is
22 unauthorized.” On information and belief, the first computer, such as an upstream
23 intermediate cache server or origination server, has maintained a plurality of E-tag
24 values associated with Defendant’s asset and index files; has compared the E-tag
25 received in the CONDITIONAL GET request from the second (downstream)
26 computer to that plurality of values; that comparison having allowed the first
27 computer to determine whether the content-dependent name in the request
28 corresponded to one of the plurality of stored values and to determine whether access
to the data item was still authorized or not. On information and belief, in particular,

1 when there was a match, the first computer determined the associated content present
2 at the downstream computer was still authorized to be used/served or whether new
3 authorized content must be provided thereto. If it was determined that the data item
4 corresponding to received E-tag was not still unauthorized to be used, the first
5 computer has sent back an HTTP 304 message authorizing the downstream cache
6 server or end-user cache to access the file content already present in order to serve it
7 or to use it to render the webpage. On information and belief, if it has been
8 determined that the data item corresponding to received E-tag was unauthorized, the
9 first computer has sent back an HTTP 200 message which indicated to the
10 downstream cache server or end-user cache that was not authorized to access the old
11 content and must access the new authorized file content contained in the HTTP 200
12 message to serve it or to use it to render the webpage.

13 59. Defendant's acts of infringement have caused damage to PersonalWeb,
14 including impairment of the '310 patent, and PersonalWeb is entitled to recover from
15 Defendant the damages sustained by PersonalWeb as a result of Defendant's wrongful
16 acts in an amount subject to proof at trial.

17 **FOURTH CLAIM FOR RELIEF**

18 **INFRINGEMENT OF U.S. PATENT NO. 7,945,544**

19 60. PersonalWeb repeats and realleges paragraphs 1-33, as if the same were
20 fully stated herein.

21 61. On May 17, 2011, United States Patent No. 7,945,544 (the "'544 patent")
22 was duly and legally issued for an invention entitled "Similarity-Based Access Control
23 of Data in a Data Processing System." PersonalWeb has an ownership interest in the
24 '544 patent by assignment, including the exclusive right to enforce the '544 patent
25 within the PersonalWeb Patent Field, and continues to hold that ownership interest in
26 the '544 patent. A true and correct copy of the '544 patent is attached hereto as
27 Exhibit D.

1 62. Defendant has infringed at least claims 46, 48, 49, 52, 55 and 56 of the
2 '544 patent by its manufacture, use, sale, importation, and/or offer for sale of products
3 or services, and/or controlling the distribution of its webpage content in the manner
4 described herein. Defendant is liable for its infringement of the '791 patent pursuant
5 to 35 U.S.C. § 271.

6 63. For example, claim 46 covers a claimed “computer-implemented
7 method.” On information and belief, Defendant uses the claimed computer
8 implemented method by using a system of notifications and authorizations to locate
9 and control the distribution of data items, such as various index and asset files,
10 necessary to render its webpages.

11 64. Claim 46 then recites the act of “(A) for each particular file of a plurality
12 of files: (a2) determining a particular digital key for the particular file, wherein the
13 particular file comprises a first one or more parts.” On information and belief, each of
14 Defendant’s webpages comprises one or more asset files and an associated index file,
15 the index file lists the URI’s of a plurality of asset files comprising the webpage, and
16 once the asset files are compiled and complete, Defendant uploads them to the S3 host
17 system as objects. On information and belief, the object’s associated E-Tag value is
18 generated by applying a hash algorithm to the object’s contents, wherein any two
19 objects comprising the identical content will have identical associated E-Tag values.
20 On information and belief, whenever a new object is uploaded to an S3 server or the
21 object’s content changes, Defendant determines and associates an E-Tag for the object
22 by receiving or identifying the associated E-Tag value generated at the time of upload.
23 On information and belief, this applies also to webpage’s E-tag, which is generated
24 when its index file is uploaded, and this E-Tag value is a search key to contents of the
25 webpage.

26 65. Claim 46 then recites “each part of said first one or more parts having a
27 corresponding part value, the part value of each specific part of said first one or more
28 parts being based on a first function of the contents of the specific part, wherein two
identical parts will have the same part value as determined by the first function, and

1 wherein the particular digital key for the particular file is determined using a second
2 function of the one or more of part values of said first one or more parts.” On
3 information and belief, the webpage’s E-Tag value is generated by applying a second
4 hash function to the index file’s contents, which consist of the URI’s of one or more
5 of the asset files which comprise the webpage’s contents. On information and belief,
6 because the respective asset file’s URI’s include the fingerprints of their content, the
7 webpage’s E-Tag value will change and a new associated E-Tag value is generated to
8 represent the webpage’s content, when the content changes and two identical
9 webpage’s having the identical content represented by their index file will have the
10 same E-Tag value.

11 66. Claim 46 then recites the act of “(a2) adding the particular digital key of
12 the particular file to a database, the database including a mapping from digital keys of
13 files to information about the corresponding files.” On information and belief, the
14 origination server, intermediate caches and browser caches maintain a database/table
15 which maps the E-Tag of each webpage’s index file to its URI, storage location and
16 information about the corresponding file, and whenever a new index file is uploaded
17 to an S3 server for that webpage (e.g. when the webpage’s content changes and
18 therefore it’s index file’s content changes), Defendant determines and associates a
19 new E-Tag for the index file by receiving or identifying the associated E-Tag value
20 generated at the time of upload. On information and belief, this associated E-Tag is
21 added to the database/table and maps to the corresponding file information.

22 67. Claim 46 then recites “(B) determining a search key based on search
23 criteria, wherein the search criteria comprise a second one or more parts, each of said
24 second one or more parts of said search criteria having a corresponding part value, the
25 part value of each specific part of said second one or more parts being based on the
26 first function of the contents of the specific part, and wherein the search key is
27 determined using the second function of the one or more of part values of said second
28 one or more parts.” On information and belief, when a downstream intermediate
cache server or a browser again requests a webpage of Defendant, it sends a

1 CONDITIONAL GET request with IF-NONE-MATCH with the webpage's
2 associated E-Tag value. On information and belief, the receiving server will
3 determine the received E-Tag value and use it as a search key to check whether the
4 webpage's content has changed.

5 68. Claim 46 then recites "(C) attempting to match the search key with a
6 digital key in the database." On information and belief, when the responding server
7 receives the webpage's E-Tag value in a CONDITIONAL GET request with IF-
8 NONE-MATCH header, it compares the received E-Tag with the current list of
9 associated E-Tags it has maintained in a database/table to determine if there is
10 matching value for that webpage.

11 69. Claim 46 then recites "(D) if the search key matches a particular digital
12 key in the database, providing information about the file corresponding to the
13 particular digital key." On information and belief, if the responding server has a
14 matching unexpired E-Tag value for the webpage, the responding server sends an
15 HTTP 304 message, which informs the downstream server and/or browser that the
16 content of the webpage has not changed, and that the downstream server and/or
17 browser is reauthorized to access all the previously cached content necessary to render
18 the webpage. On information and belief, if there is not a match, the responding server
19 sends an HTTP 200 (Modified) message with the new index file for that webpage and
20 its new associated E-Tag value, and the HTTP 200 message informs the downstream
21 server and/or browser that it is not authorized to access all the previously cached asset
22 files need to render that webpage. On information and belief, the receipt of the HTTP
23 200 message with the webpage's new index file and E-Tag informs the downstream
24 server and/or browser that it is authorized to use the new index file provided in the
25 HTTP 200 message in determining what parts of the webpage it already has cached
26 that it can use and which new parts it needs to render the webpage. On information
27 and belief, the end cache and the intermediate caches in the content delivery chain
28 also update their respective databases to map the new index file URI and contents to
the new index content and E-Tag value.

1 70. On information and belief, in this manner, the webpage's E-tag value
2 informs the downstream cache server or end point cache via the HTTP 304 and HTTP
3 200 messages whether it is authorized to serve/use all of the previously cached parts
4 of the webpage, or must use CONDITIONAL GET request(s) with IF-NONE-
5 MATCH header(s) and E-Tags at the asset file level to determine which parts of the
6 webpage it is re-authorized to use/serve, and what newly authorized parts of the
7 webpage it must first obtain.

8 71. Defendant's acts of infringement have caused damage to PersonalWeb,
9 including impairment of the value of the '544 patent, and PersonalWeb is entitled to
10 recover from Defendant the damages sustained by PersonalWeb as a result of
11 Defendant's wrongful acts in an amount subject to proof at trial.

12 **FIFTH CLAIM FOR RELIEF**

13 **INFRINGEMENT OF U.S. PATENT NO. 8,099,420**

14 71. PersonalWeb repeats and realleges paragraphs 1-33, as if the same were
15 fully stated herein.

16 72. On January 17, 2012, United States Patent No. 8,099,420 (the "'420
17 patent") was duly and legally issued for an invention entitled "Accessing Data in a
18 Data Processing System." PersonalWeb has an ownership interest in the '420 patent
19 by assignment, including the exclusive right to enforce the '420 patent within the
20 PersonalWeb Patent Field, and continues to hold that ownership interest in the '420
21 patent. A true and correct copy of the '420 patent is attached hereto as Exhibit E.

22 73. Defendant has infringed claims 25, 26, 27, 29, 30, 32-36 and 166 of the
23 '420 patent by its manufacture, use, sale, importation, and/or offer for sale of
24 products or services, and/or controlling the distribution of its webpage content in the
25 manner recited herein. Defendant is liable for its infringement of the '420 patent
26 pursuant to 35 U.S.C. § 271.

27 74. For example, claim 166 covers a "system comprising hardware, including
28 at least a processor, and software, in combination with said hardware." On

1 information and belief, Defendant's system has comprised hardware including a
2 processor, such as its webpage servers; and software including the Ruby on Rails web
3 code used in making its webpages and the Amazon S3 hosting system which have
4 been used in combination with its hardware.

5 75. Claim 166 then recites "(A) for a particular data item in a set of data
6 items, said particular data item comprising a corresponding particular sequence of
7 bits." On information and belief, Defendant's system has controlled the distribution
8 of asset files and index files necessary to render its webpage's which represent
9 particular data items, and each of these files comprise a corresponding sequence of
10 bits.

11 76. Claim 166 then recites that for the particular data item to "(a1) determine
12 one or more content-dependent digital identifiers for said particular data item, each
13 said content-dependent digital identifier being based at least in part on a given
14 function of at least some of the bits in the particular sequence of bits of the particular
15 data item, wherein two identical data items will have the same digital identifiers as
16 determined using said given function." On information and belief, Defendant's
17 system has applied hash functions to each of the Defendant's webpage files to all of
18 the bits of the file's content to determine both a fingerprint and an E-tag for the file's
19 content; whereby two identical data items have the same E-tag and fingerprint values.
20 On information and belief, the fingerprint was appended to the file's URL (herein, the
21 URL plus the appended fingerprint is referred to as the URI) and the E-Tag value was
22 associated with the file's URL.

23 77. Claim 166 then recites that for the particular data item "(a2) selectively
24 permits the particular data item to be made available for access and to be provided to
25 or accessed by or from at least some of the computers in a network of computers,
26 wherein the data item is not to be made available for access or provided without
27 authorization, as resolved based, at least in part, on whether or not at least one of said
28 one or more content-dependent digital identifiers for said particular data item

1 corresponds to an entry in one or more databases, each of said one or more databases
2 comprising a plurality of identifiers, each of said identifiers in each said database
3 corresponding to at least one data item of a plurality of data items, and each of said
4 identifiers in each said database being based, at least in part, on at least some of the
5 data in a corresponding data item.”

6 78. On information and belief, Defendant’s system has included one or more
7 webpage servers with databases containing E-tag values associated with the various
8 URL’s and/or URI’s for all of the asset and manifest/index files necessary to render its
9 webpages; moreover, Defendant’s system has used a system of CONDITIONAL GET
10 with IF-NONE-MATCH header, HTTP 304 and HTTP 200 messages containing the
11 E-Tags, as described more particularly *supra*, to ensure that downstream caches only
12 access authorized file content to either serve that file content further downstream or to
13 use it to render Defendant’s webpages. On information and belief, in particular, as
14 more fully described *supra*, the system compared the E-Tag received in a given
15 CONDITIONAL GET message with the E-Tags contained in the database to
16 selectively determine whether the requesting computer could access the file content it
17 already had or must access newly received authorized content.

18 79. Defendant's acts of infringement have caused damage to PersonalWeb,
19 including impairment of the ‘420 patent, and PersonalWeb is entitled to recover from
20 Defendant the damages sustained by PersonalWeb as a result of Defendant's
21 wrongful acts in an amount subject to proof at trial.

22 **PRAYER FOR RELIEF**

23 WHEREFORE, Plaintiff PersonalWeb requests entry of judgment in its favor
24 and against Defendant as follows:

25 a) Declaration that Defendant has infringed U.S. Patent Nos. 5,978,791,
26 6,928,442, 7,802,310, 7,945,544 and 8,099,420 as described in this action;

27

28

1 b) Awarding the damages arising out of Defendant's infringement of U.S.
2 Patent Nos. 5,978,791, 6,928,442, 7,802,310, 7,945,544 and 8,099,420, together with
3 pre-judgment and post-judgment interest, in an amount according to proof;

4 c) An award of attorneys' fees pursuant to 35 U.S.C. § 285 or as otherwise
5 permitted by law; and

6 d) For costs incurred and such other and further relief as the Court may
7 deem just and proper.
8

9 Respectfully submitted,

10
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DEMAND FOR JURY TRIAL

Pursuant to Fed.R.Civ.P. 38(b) and Local Rule 3-6, Plaintiff PersonalWeb Technologies, LLC hereby demands a trial by jury on all issues triable in this action.

Respectfully submitted,

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