UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

DISNEY ENTERTAINMENT & SPORTS LLC,
Petitioner

v.

ADEIA MEDIA HOLDINGS LLC,
Patent Owner.

Case No. IPR2026-00051
U.S. Patent No. 8,280,987

PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 8,280,987

TABLE OF CONTENTS

Page

I. INTRODUCTION 1
II. MANDATORY NOTICES UNDER 37 C.F.R. §42.8 1
III. FEE AUTHORIZATION 2
IV. GROUNDS FOR STANDING 2
V. PRECISE RELIEF REQUESTED 3
VI. THE CHALLENGED PATENT 3
VII. PROSECUTION HISTORY OF THE '987 PATENT 6
VIII. LEVEL OF ORDINARY SKILL IN THE ART 6
IX. PRIORITY DATE 7
X. CLAIM CONSTRUCTION 7
A. "Data object" (Claims 1, 3-13) 7
B. "Data persistence cache servers" (Claim 7) 7
XI. BRIEF DESCRIPTION OF THE APPLIED PRIOR ART 8
A. Dilley (Ex-1005) 8
B. Russell (Ex-1006) 11
C. Menon (Ex-1007) 13
XII. DETAILED EXPLANATION OF THE UNPATENTABILITY GROUNDS 14
A. Grounds 1-2: Claims 1-13 are obvious over Dilley alone or Dilley in view of Menon. 14
1. A POSITA would have been motivated to combine Dilley's teachings with Menon's teachings and would have had a reasonable expectation of success. 14
2. Independent Claim 1 16
a. Element 1[pre]: A cloud data persistence system for distribution of data, the cloud data persistence system comprising: 16

TABLE OF CONTENTS
(continued)

Page

b. Element 1[a][1]: a first server which stores a first plurality of data objects and is communicatively coupled with a plurality of cache servers, wherein: 18

c. Element 1[a][2]: the first server is located at a first location; 21

d. Element 1[a][3]: each of the first plurality of data objects comprise a link to one of a plurality of media assets; and 22

e. Element 1[a][4]: the plurality of media assets are stored at a second location separate from the first location; 23

f. Element 1[b][1]: a second server that stores a second plurality of data objects and is configured to request a data object from the first server if the data object is not present in the second plurality of data objects, wherein: 25

g. Element 1[b][2]: the second server is one of the plurality of cache servers; and.....26

h. Element 1[b][3]: the second server is communicatively coupled with a first plurality of application servers; 27

i. Element 1[c][1]: a third server that stores a third plurality of data objects and is configured to request the data object from the first server if the data object is not present in the third plurality of data objects, wherein: 30

j. Element 1[c][2]: the third server is one of the plurality of cache servers; and.....31

k. Element 1[c][3]: the third server is communicatively coupled with a second plurality of application servers; and.....32

TABLE OF CONTENTS
(continued)

Page

l. Element 1[d][1]: a fourth server that stores a fourth plurality of data objects and is configured to request the data object from the second server if the data object is not present in the fourth plurality of data objects, wherein: 33

m. Element 1[d][2]: the fourth server is one of the first plurality of application server[s]; and 36

n. Element 1[d][3]: the fourth server is configured to receive a request from a first client for the data object;..... 36

o. Element 1[e][1]: a fifth server that stores a fifth plurality of data objects and is configured to request the data object from the second server if the data object is not present in the fifth plurality of data objects, wherein: 37

p. Element 1[e][2]: the fifth server is one of the first plurality of application servers; and 38

q. Element 1[e][3]: the fifth server is configured to receive a request from a second client for the data object;..... 39

r. Element 1[f][1]: a sixth server that stores a sixth plurality of data objects and is configured to request the data object from the third server if the data object is not present in the sixth plurality of data objects, wherein: 40

s. Element 1[f][2]: the sixth server is one of the second plurality of application servers; and 41

t. Element 1[f][3]: the sixth server is configured to receive a request from a third client for the data object; and..... 42

TABLE OF CONTENTS
(continued)

Page

u. Element 1[g][1]: a seventh server that stores a seventh plurality of data objects and is configured to request the data object from the third server if the data object is not present in the seventh plurality of data objects, wherein: 43

v. Element 1[g][2]: the seventh server is one of the second plurality of application servers; and 44

w. Element 1[g][3]: the seventh server is configured to receive a request from a fourth client for the data object. 45

3. Independent Claim 5 46

a. Element 5[pre]: A cloud data persistence system for distribution of data, the cloud data persistence system comprising: 46

b. Element 5[a][1]: a first server which stores a first plurality of data objects and is communicatively coupled with a second server and a third server, wherein: 46

c. Element 5[a][2]: the first server is located at a first location; 47

d. Element 5[a][3]: each of the first plurality of data objects comprises a link to a media asset of a plurality of media assets; 47

e. Element 5[a][4]: the plurality of media assets is located at a second location ; and the second location is distinct from the first location;.....48

f. Element 5[b][1]: the second server stores a second plurality of data objects and is configured to request a data object from the first server if the data object is not present in the second plurality of data objects, ...48

TABLE OF CONTENTS
(continued)

Page

g. Element 5[b][2]: wherein the second server is communicatively coupled with a fourth server and fifth server; and.....48

h. Element 5[c][1]: the fourth server stores a third plurality of data objects and is configured to request the data object from the second server if the data object is not present in the third plurality of data objects,.....50

i. Element 5[c][2] wherein the fourth server is configured to receive a request from a first client for the data object. 50

4. Dependent Claims 2-4 and 6-13 50

a. Claim 2: The cloud data persistence system of claim 1, wherein the second location comprises a content delivery network. 50

b. Claim 3.....51

c. Claim 4: The cloud data persistence system of claim 1, wherein the first plurality of data objects comprises all data objects in the second plurality of data objects, the third plurality of data objects, the fourth plurality of data objects, the fifth plurality of data objects, the sixth plurality of data objects, and the seventh plurality of data objects. 53

d. Claim 6: The cloud data persistence system of claim 5 wherein the first plurality of data objects comprises all data objects present in the second plurality of data objects and the third plurality of data objects. 54

e. Claim 7.....55

f. Claim 8.....57

TABLE OF CONTENTS
(continued)

Page

g. Claim 9: The cloud data persistence system of claim 5, wherein the request from the first client for the data object comprises a universal resource indicator. 60

h. Claim 10: The cloud data persistence system of claim 5 wherein each of the first plurality of data objects comprise a universal resource locator and a title linked to a media asset of the plurality of media assets. 62

i. Claim 11: The cloud data persistence system of claim 5, wherein data objects in the second plurality of data objects and the third plurality of data objects are at least partially determined based on a frequency of requests for those data objects received from clients. 63

j. Claim 12: The cloud data persistence system of claim 5, wherein data objects in the second plurality of data objects and the third plurality of data objects are at least partially determined based on when requests for those data objects were last received from clients. 64

k. Claim 13: The cloud data persistence system of claim 5, wherein the first plurality of data objects comprises all data objects in the second plurality of data objects, the third plurality of data objects, the fourth plurality of data objects, and the fifth plurality of data objects. 64

B. Grounds 3-4: Claims 1-13 are obvious over Russell alone or Russell in view of Menon.....64

1. A POSITA would have been motivated to combine Russell's teachings with Menon's teachings and would have had a reasonable expectation of success. 64

2. Independent Claim 1 66

TABLE OF CONTENTS
(continued)

Page

a. Element 1[pre]: 66
b. Element 1[a][1]:.....67
c. Element 1[a][2]:.....70
d. Element 1[a][3]:.....71
e. Element 1[a][4]:.....72
f. Element 1[b][1]:.....73
g. Element 1[b][2]:.....75
h. Element 1[b][3]:.....76
i. Element 1[c][1]:.....78
j. Element 1[c][2]:.....80
k. Element 1[c][3]:.....80
l. Element 1[d][1]:.....81
m. Element 1[d][2]:.....83
n. Element 1[d][3]:.....83
o. Element 1[e][1]:.....84
p. Element 1[e][2]:.....86
q. Element 1[e][3]:.....86
r. Element 1[f][1]: 87
s. Element 1[f][2]: 88
t. Element 1[f][3]: 89
u. Element 1[g][1]:.....89
v. Element 1[g][2]:.....91
w. Element 1[g][3]:.....91

3. Independent Claim 5 92
a. Element 5[pre]: 92
b. Element 5[a][1]:.....92
c. Element 5[a][2]:.....93

TABLE OF CONTENTS
(continued)

Page

d. Element 5[a][3]:.....93
e. Element 5[a][4]:.....94
f. Element 5[b][1]:.....94
g. Element 5[b][2]:.....94
h. Element 5[c][1]:.....95
i. Element 5[c][2]:.....95
4. Dependent Claims 2-4 and 6-13 95
a. Claim 2: 95
b. Claim 3.....96
c. Claim 4: 98
d. Claim 6: 99
e. Claim 7.....99
f. Claim 8.....100
g. Claim 9: 102
h. Claim 10: 103
i. Claim 11: 105
j. Claim 12: 105
k. Claim 13: 105
XIII. CONCLUSION.....105

LIST OF EXHIBITS[1]

Ex. No.	Description
Ex-1001	U.S. Patent No. 8,280,987 ("the '987 Patent")
Ex-1002	Declaration of Dr. Henry Houh
Ex-1003	Curriculum Vitae of Dr. Henry Houh
Ex-1004	Prosecution History of U.S. Patent No. 8,280,987
Ex-1005	U.S. Patent Publication No. 2007/0055764 to Dilley ("Dilley")
Ex-1006	U.S. Patent Publication No. 2002/0069420 to Russell ("Russell")
Ex-1007	U.S. Patent Publication No. 2002/0152318 to Menon ("Menon")
Ex-1008	INTENTIONALLY LEFT BLANK
Ex-1009	INTENTIONALLY LEFT BLANK
Ex-1010	INTENTIONALLY LEFT BLANK
Ex-1011	INTENTIONALLY LEFT BLANK
Ex-1012	INTENTIONALLY LEFT BLANK
Ex-1013	INTENTIONALLY LEFT BLANK
Ex-1014	INTENTIONALLY LEFT BLANK
Ex-1015	INTENTIONALLY LEFT BLANK
Ex-1016	INTENTIONALLY LEFT BLANK
Ex-1017	INTENTIONALLY LEFT BLANK

[1] Four-digit pin citations that begin with 0 are to the branded numbers added by Disney in the bottom right corner of the exhibits. All other pin citations are to original page, column, paragraph, or line numbers.

Ex. No.	Description
Ex-1018	INTENTIONALLY LEFT BLANK
Ex-1019	INTENTIONALLY LEFT BLANK
Ex-1020	Claim Mapping Table
Ex-1021	U.S. Patent No. 8,627,446 to Eaton ("Eaton")
Ex-1022	U.S. Patent No. 8,180,720 to Kovacs ("Kovacs")
Ex-1023	U.S. Patent Publication No. 2011/0289126 to Aikas ("Aikas")
Ex-1024	U.S. Patent No. 7,428,540 to Coates ("Coates")
Ex-1025	U.S. Patent Publication No. 2011/0276623 to Girbal ("Girbal")
Ex-1026	U.S. Patent Publication No. 2003/0046239 to Geilfuss ("Geilfuss")
Ex-1027	U.S. Patent Publication No. 2010/0057894 to Glasser ("Glasser")
Ex-1028	U.S. Patent Publication No. 2010/0180208 to Kasten ("Kasten")
Ex-1029	U.S. Patent No. 9,167,036 to Seed ("Seed")
Ex-1030	T. Berners-Lee, IETF Request for Comments: 3986 (January 2005) ("IETF RFC 3986")
Ex-1031	U.S. Patent Publication No. 2010/0250772 to Mao ("Mao")
Ex-1032	U.S. Patent No. 5,796,952 to Davis ("Davis")
Ex-1033	U.S. Patent No. 6,996,616 to Leighton ("Leighton")
Ex-1034	*Adeia Techs., Inc. v. The Walt Disney Co.*, No. 1:24-cv-01231, Defendants' Supplemental Disclosure of Proposed Claim Constructions (D. Del. Sept. 16, 2025)

Ex. No.	Description
Ex-1035	*Adeia Techs., Inc. v. The Walt Disney Co.*, No. 1:24-cv-01231, Plaintiffs' Initial Proposed Claim Constructions (D. Del. Sept. 5, 2025)
Ex-1036	U.S. Patent Publication No. 2007/0299681 to Plastina ("Plastina")

I. INTRODUCTION

Disney Entertainment & Sports LLC ("Petitioner") requests *inter partes* review ("IPR") of Claims 1-13 of U.S. Patent No. 8,280,987 ("the '987 Patent") (Ex-1001), currently assigned to Adeia Media Holdings LLC ("PO").

II. MANDATORY NOTICES UNDER 37 C.F.R. §42.8

Real Parties-in-Interest: Petitioner identifies the following real parties-in-interest: Disney Entertainment & Sports LLC.

Related Matters: PO has asserted the '987 Patent against Petitioner in *Adeia Technologies, Inc., et al. v. The Walt Disney Company, et al.*, No. 1:24-cv-01231-MN (D. Del.) ("Disney litigation").

Lead and Back-Up Counsel:

- Lead Counsel:

Benjamin M. Haber (Reg. No. 67,129)
O'Melveny & Myers LLP
400 South Hope Street, 18th Floor
Los Angeles, CA 90071
Telephone: (213) 430-6000
Fax: (213) 430-6407
Email: bhaber@omm.com

- Back-Up Counsel:

William M. Fink (Reg. No. 72,332)
O'Melveny & Myers LLP
1625 Eye Street, NW
Washington, DC 20006
Telephone: (202) 383-5300

Fax: (202) 383-5414
Email: tfink@omm.com

Xin-Yi Zhou (Reg. No. 63,366)
O'Melveny & Myers LLP
400 South Hope Street, 18th Floor
Los Angeles, CA 90071
Telephone: (213) 430-6000
Fax: (213) 430-6407
Email: vzhou@omm.com

Caitlin P. Hogan (Reg. No. 61,515)
O'Melveny & Myers LLP
1301 Avenue of the Americas, Suite 1700
New York, NY 10019
Telephone: (212) 326-2000
Fax: (212) 326-2061
Email: chogan@omm.com

Service Information: Petitioner consents to electronic service by email to the following addresses:

- tfink@omm.com
- bhaber@omm.com
- vzhou@omm.com
- chogan@omm.com
- ommdisneyadeia@omm.com

III. FEE AUTHORIZATION

The PTO is authorized to charge any fees due during this proceeding to Deposit Account No. LA500639.

IV. GROUNDS FOR STANDING

Petitioner certifies that the '987 Patent is available for review, and Petitioner is not barred or estopped from requesting review.

V. PRECISE RELIEF REQUESTED

Petitioner requests review and cancellation of Claims 1-13 as unpatentable based on the following grounds, supported by a declaration from Dr. Henry Houh. Ex-1002 ¶¶1-46; Ex-1003.

Ground	Summary
1-2	Claims 1-13 are obvious over Dilley (Ex-1005) alone or Dilley in view of Menon (Ex-1007)
3-4	Claims 1-13 are obvious over Russell (Ex-1006) alone or Russell in view of Menon

VI. THE CHALLENGED PATENT

The ’987 Patent relates to “distribution, storage, and retrieval of data on a cloud networking arrangement.” Ex-1001, 1:13-16. The ’987 Patent states that in “a typical data hosting architecture, multiple servers may be spread over a geographical area” but storing the same data on all of the servers “result[s] in a substantial amount of data being stored at servers that wastes storage resources and is infrequently accessed.” Ex-1001, 1:17-37. The ’987 Patent proposes a system and “method for retrieving data objects using a cloud data persistence system configured for distribution of data.” *Id.*, 2:35-37.

As shown in annotated Figure 5A below,[2] the '987 Patent's cloud data persistence system comprises a first origin server (red), which is communicatively coupled to a plurality of cache servers (i.e., a second server (green) and third server (yellow)). Ex-1001, Cl. 1, Fig. 5A. The cache servers are further communicatively coupled to a plurality of application servers (i.e., a fourth server (purple), fifth server (orange), sixth server (blue), and seventh server (pink)), which are configured to receive a request for a "data object" from a client (grey). *Id*., Cl. 1, 1:42-43.

[2] Throughout, emphasis and annotations are added unless otherwise specified.

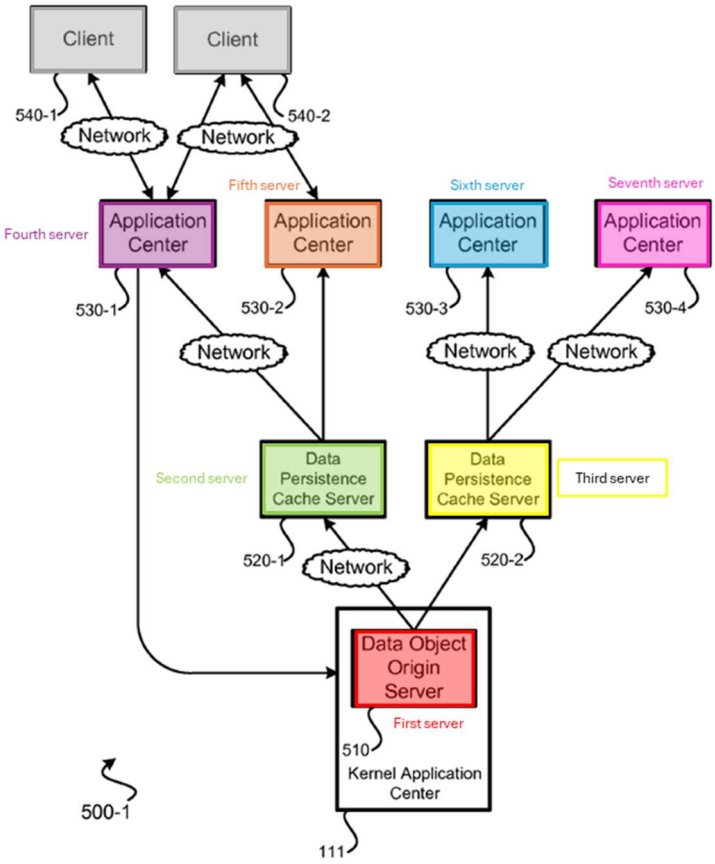


FIG. 5A

The ’987 Patent teaches that each server stores a plurality of data objects that are linked to media assets, “such as an audio file[,] a video file, or a flash file.” Ex-1001, 9:19-20, 9:30-37. The “media asset may be stored in a different location” from the data object such as on another server in the system. Ex-1001, 1:45-46, 9:38-45. The ’987 Patent further teaches that if an application server does not have the data object requested by the client stored locally, it may contact a cache server located in close proximity to determine if that server has it. Ex-1001, 10:43-51. If the cache server “does not have the data object requested” stored, it “may contact a data object

origin server, which may have all existing data objects stored." Ex-1001, 1:48-50, 11:48-52. The origin server "then transmit[s] the data object to" the cache server, which in turn, "transmit[s] the data object" to the application server to transmit to the client. Ex-1001, 12:36-48; Ex-1002 ¶¶47-49.

VII. PROSECUTION HISTORY OF THE '987 PATENT

The '987 Patent was filed on January 31, 2011. The '987 Patent claims priority to Australian Patent application No. 2010/202782, filed on July 1, 2010.

The prior art and arguments in this Petition were not before the PTO during prosecution. Ex-1004; Ex-1002 ¶¶50-51.

VIII. LEVEL OF ORDINARY SKILL IN THE ART

A person of ordinary skill in the art at the relevant time ("POSITA") would have had a bachelor's degree in electrical engineering, computer science, computer engineering, or a related field, and two-to-three years of experience in the research, design, development, or testing of media streaming technologies, user interfaces, and platforms, with additional education substituting for experience and vice versa. Ex-1002 ¶¶26-28.

IX. PRIORITY DATE

For purposes of this proceeding only, Petitioner applies the earliest alleged priority date of the '987 Patent: July 1, 2010.[3] Accordingly, pre-AIA 35 U.S.C. §102 applies and the '987 Patent was never eligible for PGR.

X. CLAIM CONSTRUCTION

For the purposes of this Petition, Petitioner identifies the following claim construction issues. Ex-1002 ¶¶52-53. Petitioner does not currently believe that any other terms require express construction. Consolidated Trial Practice Guide, 44, 45.

A. "Data object" (Claims 1, 3-13)

In the litigation, Petitioner has proposed that the recited "data object" is "metadata about a particular media asset, distinct from the asset itself." Ex-1034, 2. PO has proposed that the recited "data object" is "data structure that contains information about a media asset." Ex-1035, 2. As explained below, there is no meaningful difference between these constructions as applied to the prior art references at issue in this Petition.

B. "Data persistence cache servers" (Claim 7)

In the litigation, Petitioner has proposed that the recited "data persistence cache servers" is invalid under 35 U.S.C. §112 ¶4. *See* Ex-1025, 2. PO has proposed

[3] Petitioner respectfully reserves the right to challenge the priority date in other proceedings.

that this limitation means that "the third server and second server are on the same level." Ex-1026, 2. For the purposes of this proceeding only, Petitioner has interpreted this limitation to mean that the third and second servers are cache servers. Ex-1002 ¶54.

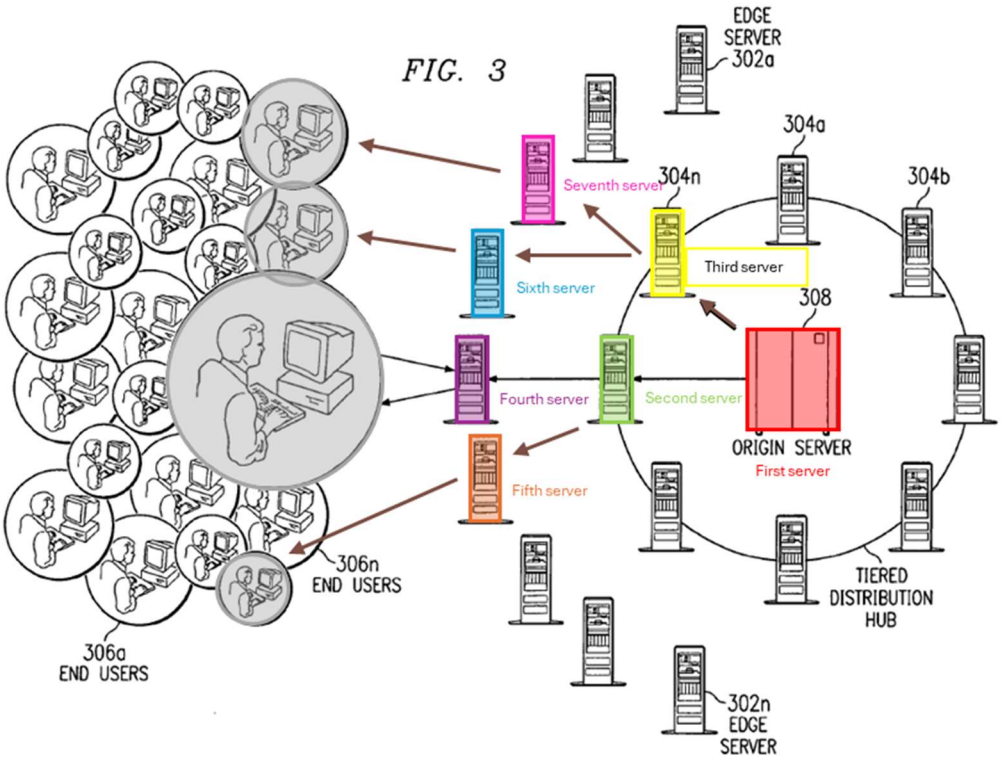
XI. BRIEF DESCRIPTION OF THE APPLIED PRIOR ART

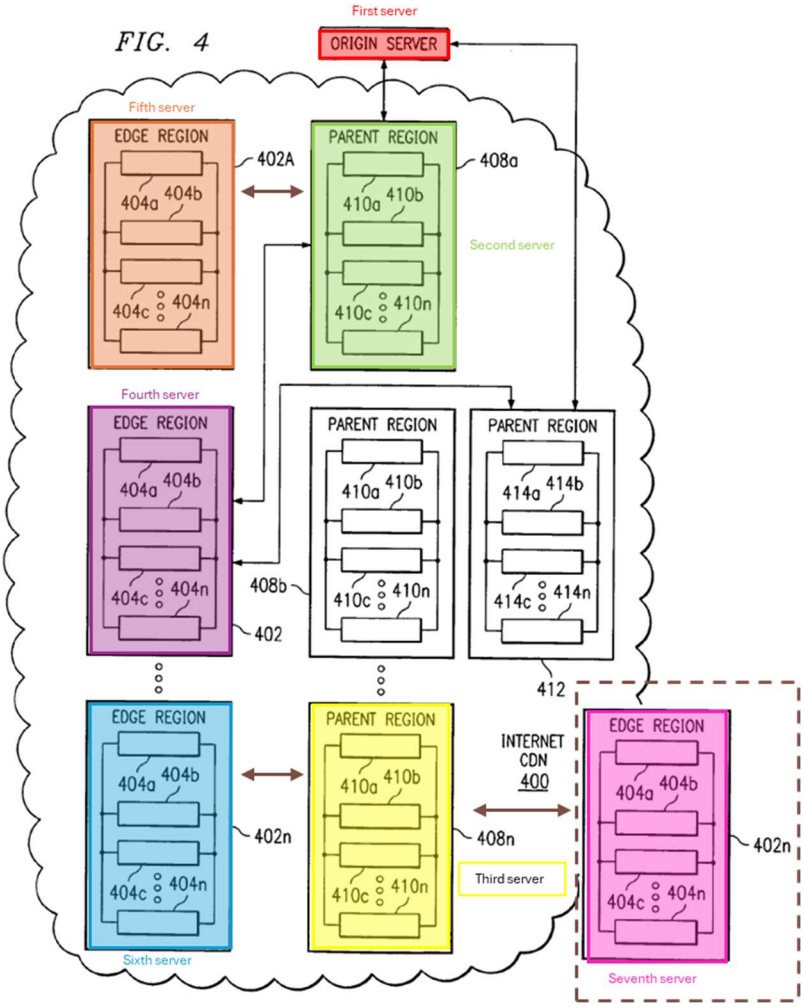
A. Dilley (Ex-1005)

Dilley (U.S. Patent Publication No. 2007/0055764) published on March 8, 2007 and is prior art under 35 U.S.C. §102(b). Ex-1002 ¶¶55-57.

Dilley teaches a "tiered distribution service … in a content delivery network (CDN)." Ex-1005, Abstract. As shown in annotated Figures 3-4 below, Dilley teaches that "a given content provider operates an origin server" (i.e., first server (red)). Ex-1005 ¶14. Dilley further teaches that "content may be marked for distribution from a so-called cache hierarchy that includes … a given subset of the origin server regions (a 'multi-region' cache hierarchy)" called parent server regions (i.e., second server (yellow) and third server (green)). Ex-1005 ¶28. Dilley teaches that the cache hierarchy also comprises "given edge server region[s]" connected to the "parent server regions" (i.e., fourth server (purple), fifth server (orange), sixth server (blue), and seventh server (pink)). Ex-1005 ¶14, Figs. 3-4 (brown arrows and dashed boxes added).

FIG. 3


EDGE SERVER 302a
304a
304b
304n
Seventh server
Third server
Sixth server
308
Fourth server
Second server
ORIGIN SERVER
First server
Fifth server
306n END USERS
306a END USERS
TIERED DISTRIBUTION HUB
302n EDGE SERVER



Moreover, Dilley teaches that "a given edge server receives a client request for an object" (Fig. 3 (grey)) and "the edge server cache management process look[s] for the object in" its cache. Ex-1005 ¶44. If the requested object is not in the edge server's cache, "the servers in the tiered distribution hubs" such as the given parent regions, "will provide the edge servers with the requested content." Ex-1005 ¶¶14, 27. The request is "only forwarded on to the origin server if it cannot be serviced by the intermediate node in the hierarchy." Ex-1005 ¶14. Additionally, Dilley teaches that the CDN service provider ("CDNSP") provides "object-specific metadata" to

the servers to determine how they "will handle a request for an object being served by the CDN." Ex-1005 ¶25. The metadata includes, for example, "a modified URL … that points an end user browser to attempt to retrieve the object from the CDN." Ex-1005 ¶¶32-33.

B. Russell (Ex-1006)

Russell (U.S. Patent Publication No. 2002/0069420) published on June 6, 2002 and is prior art under §102(b). Ex-1002 ¶¶58-60.

Russell teaches a system for delivering content over a network. Ex-1006, Abstract. As shown in annotated Figures 1-2 below, the system's "network architecture includes three or more layers of servers, including a main server" (i.e., first server (red)) "supporting an interface for recipient processors [i.e., user network device (UND) (grey)] to request content items, a plurality of parent servers" (i.e., second server (green) and third server (yellow)), "and a plurality of edge servers" (i.e., fourth server (purple), fifth server (orange), sixth server (blue), and seventh server (pink)). Ex-1006, Abstract, Figs. 1-2 (brown dashed boxes added). Russell teaches that "[a] copy of each content item available through the service is distributed from the main server to each parent servers for storage," which in turn, "distribute content to edges servers, pursuant to instructions from the main server." Ex-1006, Abstract. Russell further teaches that "[t]he content items (such as, movies)

may be supplied" to main server 12 "by content owners or holders" from "source server 18." Ex-1006 ¶32.

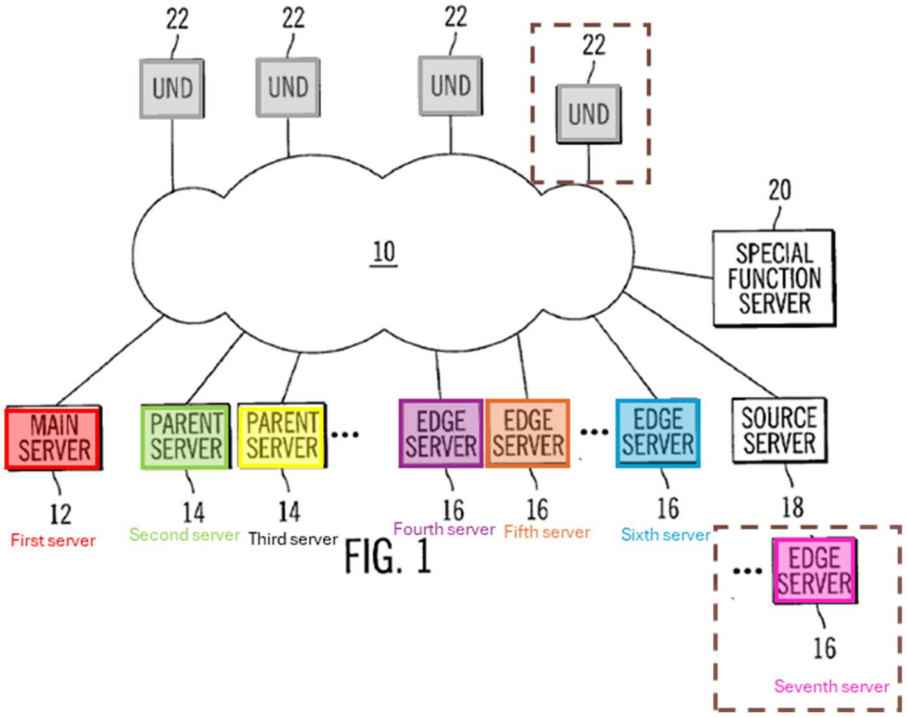


FIG. 1

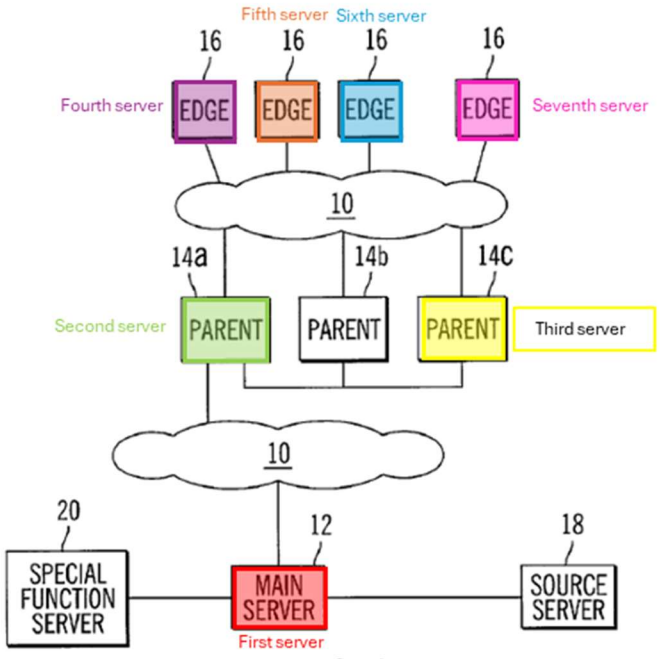


FIG. 2

Moreover, Russell teaches that "main server 12 publishes an XML document" to the parent and edge servers "containing a list of all content items … available" on main server 12 with additional information such as, for example, whether a content item is marked "hot" and "geographic restrictions." Ex-1006 ¶81. Based on the instructions, "each edge server 16 may determine whether or not its associated storage facility is storing all of the appropriate content items and, if not, … request appropriate content items from a parent server." Ex-1006 ¶82. Russell also teaches that "the main server provides the user's UND with a URL (uniform resource locator)" that allows the user "to connect to an edge server to download" a "file containing the selected content item." Ex-1006 ¶12.

C. Menon (Ex-1007)

Menon (U.S. Patent Publication No. 2002/0152318) published on October 17, 2002 and is prior art under §102(b). Ex-1002 ¶¶61-62.

Menon teaches a "metadata enabled push-pull model and method for … video-content distribution over a network." Ex-1007, Abstract. Specifically, Menon teaches a "metadata enabled server" for distributing content objects to users over a network in response to user requests, which stores "metadata describing content objects accessible to the server including a location from where a content object is stored." Ex-1007 ¶35. For example, Menon teaches that "when a user makes a selection (such as by identifying a URL) for a video … the metadata (MD)

corresponding to the selected URL is examined to see if the corresponding video object is in the cache." Ex-1007 ¶50. The metadata may comprise "(i) a globally unique identifier that identifies and optionally describes the content associated with the metadata, and (ii) a location or locations at which the content may be found" such as "the origin server identifier." Ex-1007 ¶63. The metadata is distributed "to a plurality of locations (e.g to the origin server and edge servers, or to the origin server, edge servers, and directory servers[])]." Ex-1007 ¶84.

XII. DETAILED EXPLANATION OF THE UNPATENTABILITY GROUNDS

A. Grounds 1-2: Claims 1-13 are obvious over Dilley alone or Dilley in view of Menon.

1. A POSITA would have been motivated to combine Dilley's teachings with Menon's teachings and would have had a reasonable expectation of success.

A POSITA would have been motivated to combine the teachings of Dilley and Menon and had a reasonable expectation of success in doing so because each relates to a content delivery network that uses metadata to enable efficient distribution of media content. Ex-1005, Abstract, ¶16; Ex-1007, Abstract, ¶42; Ex-1002 ¶¶63-65.

Dilley teaches a "tiered distribution service … in a content delivery network (CDN)" comprising an origin server and a plurality of parent servers and edge servers. Ex-1005, Abstract. Dilley teaches that in addition to being stored at the

origin server, the requested content may be stored at the edge servers and parent servers (Ex-1005 ¶¶27, 43), which are at separate geographical locations from the origin server that controls the metadata. Ex-1005 ¶¶15, 28, Fig. 3.

Menon teaches a "metadata enabled push-pull model and method for … video-content distribution over a network." Ex-1007, Abstract. Menon further teaches a directory server, which is "a different machine than the origin server or the edge server" where the content items are stored (Ex-1007 ¶¶66-67), and "provides a single location data structure that may be queried to identify all locations at which a content item is located." Ex-1007 ¶73.

To the extent that a POSITA was interested in additional ways to implement Dilley's content delivery network such that storage and distribution of the metadata and content were further separated, a POSITA would have looked to Menon, which teaches storing the metadata at a separate directory server. Ex-1002 ¶66. A POSITA would have been motivated to store the metadata at a separate location than the server that stores the content because, as Dilley itself acknowledges, it would have been "desirable to reduce wide-area network bandwidth and the load on a content provider's origin server as much as possible." Ex-1005 ¶6. Indeed, Menon teaches that its directory server advantageously "provide[s] redundancy and reduce[s] loading on any particular server during peak loads." Ex-1007 ¶67. In the Dilley-Menon combination, Dilley's system would store the metadata and the content at

separate locations such as in a directory server and origin server, as taught by Menon. Ex-1002 ¶¶66-67.

A POSITA would have had a reasonable expectation of success in combining the teachings of Dilley and Menon. Ex-1002 ¶68. Both describe using metadata to enable efficient distribution of media content within a tiered server network infrastructure. Ex-1005, Abstract, ¶16, Figs. 3-4; Ex-1007, Abstract, ¶42, Fig. 3. A POSITA would thus have understood that these references disclose interrelated teachings based on well-understood technologies that would have been amenable to various well-understood and predictable combinations. Ex-1002 ¶68.

2. Independent Claim 1

a. Element 1[pre]: A cloud data persistence system for distribution of data, the cloud data persistence system comprising:

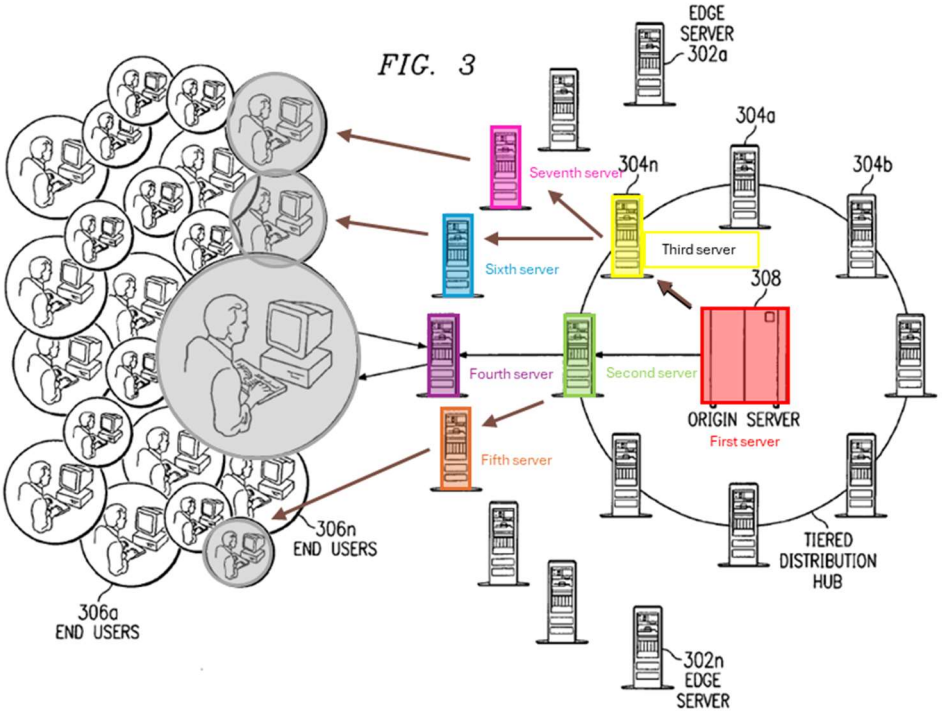
Dilley alone or Dilley in view of Menon ("Dilley-Menon") teaches[4] the preamble, to the extent it is limiting. Ex-1002 ¶¶69-71.

Dilley teaches a CDN that provides a tiered distribution service using "a set of surrogate origin (namely, 'edge') servers organized into regions," which deliver content "on behalf of participating content providers," each "operat[ing] an origin

[4] Petitioner uses the term "teaches" to include both express teachings and those fairly suggested to a person of ordinary skill in the art. *In re Baird*, 16 F.3d 380, 383 (Fed. Cir. 1994); *In re Keller*, 642 F.2d 413, 425 (CCPA, 1981) ("The test for obviousness is...what the combined teachings of the references would have suggested to those of ordinary skill in the art." (citations omitted)).

server." Ex-1005, Abstract. Dilley further teaches that "a cache hierarchy is established," which includes "a given edge server region and … a subset of the edge server regions." Ex-1005, Abstract. If a user's "request cannot be serviced in the given edge region, instead of contacting the origin server, the request is provided to" one of the other "edge server regions for handling, preferably as a function of metadata associated with the" request. Ex-1005, Abstract. Only "if the request cannot be serviced by an intermediate node" is it forwarded "to the origin server." Ex-1005, Abstract.

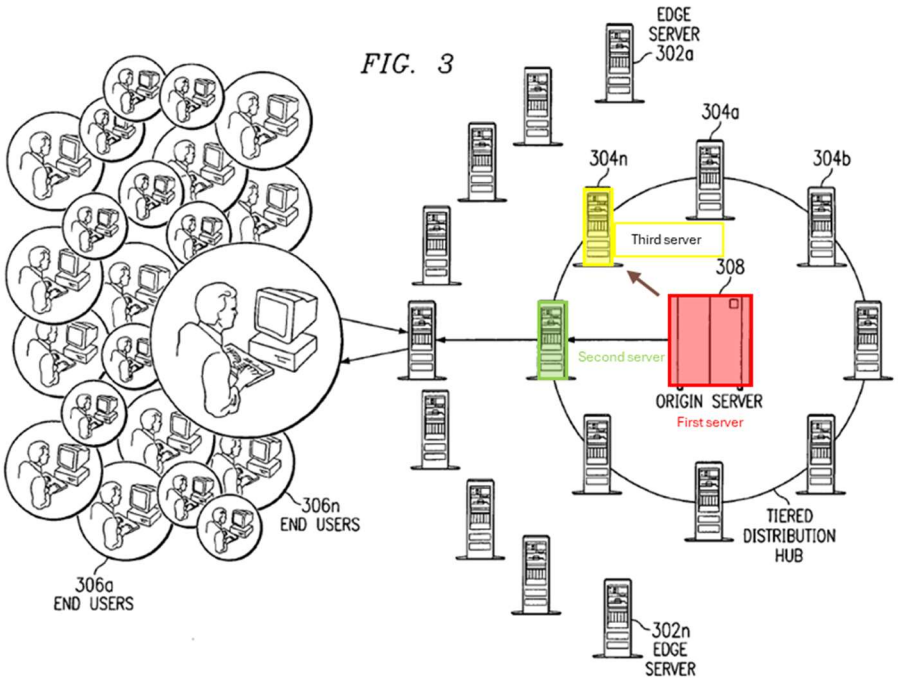
Dilly's cloud data persistence system is depicted in Figure 3, annotated below. The coloration will be discussed in further details in the subsequent element-by-element analysis.

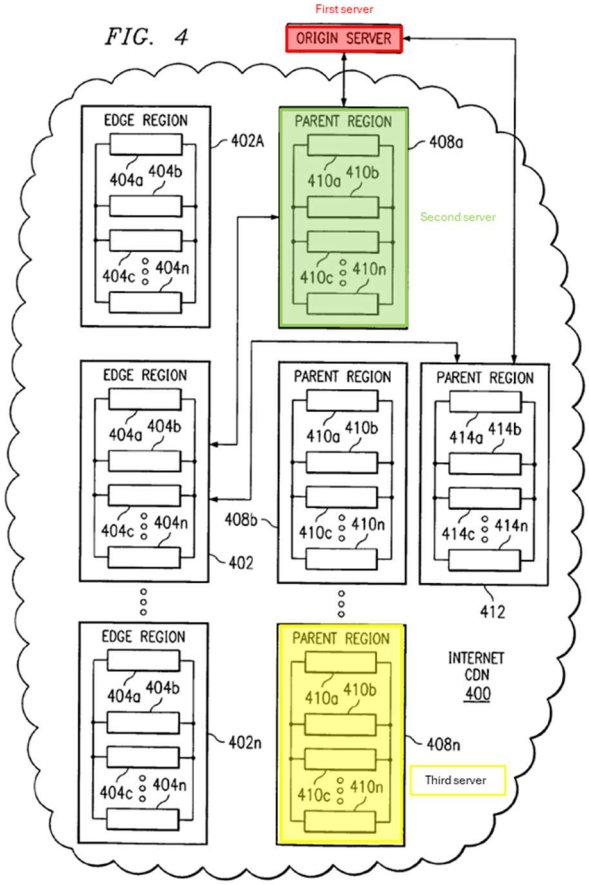


b. Element 1[a][1]: a first server which stores a first plurality of data objects and is communicatively coupled with a plurality of cache servers, wherein:

Dilley or Dilley-Menon teaches Element 1[a][1]. Ex-1002 ¶¶72-73.

As shown in annotated Figures 3-4 below, Dilley teaches a first server (i.e., origin server (red)), which is communicatively coupled with a plurality of cache servers called parent region servers (green, yellow). Ex-1005, Figs. 3-4 (brown arrow added).





Specifically, Dilley teaches that each "content provider operates ***an origin server***." Ex-1005 ¶14. Dilley further teaches that "***a cache hierarchy*** is established in the CDN comprising … ***a subset of well-connected 'core' parent server regions***." Ex-1005 ¶14.

Dilley also teaches that the origin server (i.e., first server) "stores a first plurality of data objects." The '987 Patent does not explicitly define the term "data objects" but states that a "data object may contain a link to a media asset and other information linked to the video file, such as a title and duration." Ex-1001, 1:43-45. A POSITA would thus have understood that a "data object" includes, at least

metadata (such as title, duration, etc.) about a particular media asset, distinct from the media asset itself. Ex-1002 ¶74.

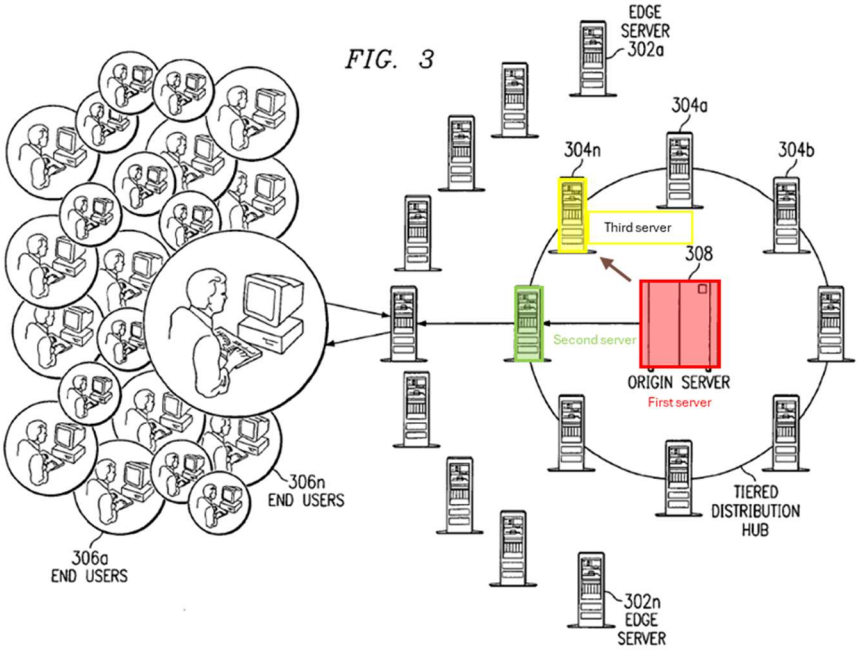
Dilley teaches that "[p]referably … objects are fetched using a default mechanism where the edge server contacts the origin server to handle a request that cannot be serviced in the edge region," with a selectivity process that is accomplished "using object 'metadata.'" Ex-1005 ¶29. Specifically, the CDNSP provides "***object-specific metadata*** to the CDN content servers to determine how" they "will handle a request for an object being served by the CDN." Ex-1005 ¶25. Dilley defines metadata as "the set of all control options and parameters for the object (e.g., coherence information, origin server identity information, load balancing information, customer code, other control codes, etc.)," which is provided to the servers "via a configuration file, in HTTP headers, or in other ways." Ex-1005 ¶25. In one example, metadata may be provided to the origin server by the content provider and periodically delivered to other servers, as necessary. Ex-1005 ¶25. Dilley also teaches that "a given metadata tag" is preferably used to "specify a policy or type of hierarchy parent to be used." Ex-1005 ¶16; *see also id.*, ¶45 (example using a "metadata tag"). Moreover, content may be "tagged for delivery from the CDN using a content migrator or rewrite tool 106 operated … at a participating content provider server," which "rewrites embedded object URLs to point to the CDNSP domain." Ex-1005 ¶25. The object-specific metadata stored at the origin

server (and other servers), for example, via a configuration file and/or tag corresponds to the recited "plurality of data objects" because it links the client to the requested content. Ex-1002 ¶75. Dilley or Dilley-Menon thus teaches the "data objects" limitation under either parties' construction because it teaches "metadata about a particular media asset, distinct from the asset itself" and more broadly teaches a "data structure that contains information about a media asset." Ex-1002 ¶¶75-76.

c. Element 1[a][2]: the first server is located at a first location;

Dilley or Dilley-Menon teaches Element 1[a][2]. Ex-1002 ¶¶77-78.

Dilley teaches that "[a] CDN is a network of geographically-distributed content delivery nodes … arranged for efficient delivery of content on behalf of … content providers." Ex-1005 ¶5. Figure 3 illustrates that the first server (i.e., origin server (red)) is located at a first location relative to the other servers in the CDN. Ex-1005, Fig. 3 (brown arrow added).



d. Element 1[a][3]: each of the first plurality of data objects comprise a link to one of a plurality of media assets; and

Dilley or Dilley-Menon teaches Element 1[a][3]. Ex-1002 ¶¶79-81.

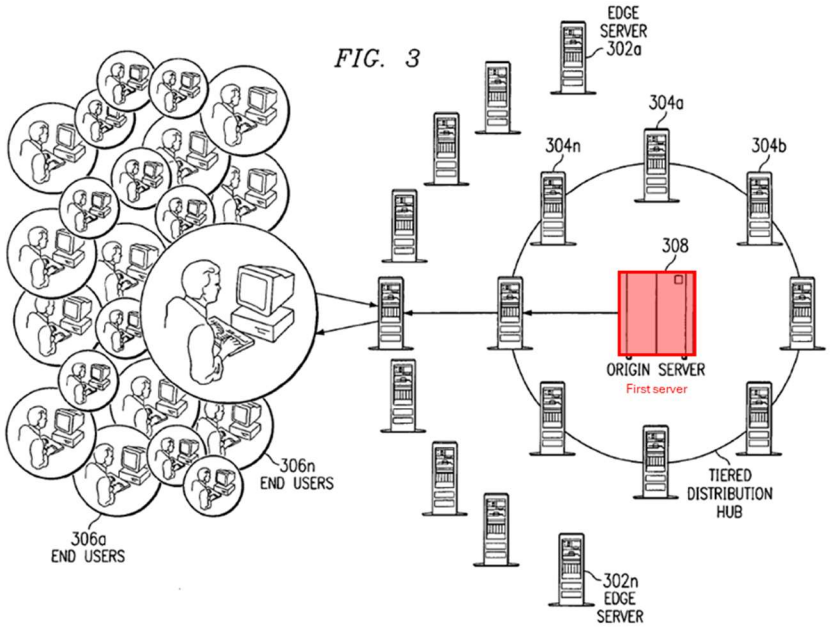
Dilley teaches that each of the first plurality of data objects (i.e., metadata) comprise a link to one of a plurality of media assets (i.e., content) for the reasons described in Section XII.A.2.b. Ex-1005 ¶¶25 (embedded URLs point to content), 29, 45. Moreover, Dilley teaches that "representative" metadata includes the "metadata tag 'use−hierarchy,'" which "turns on the cache hierarchy feature, specifies the policy or type of hierarchy parent, and lists the base domain to be used." Ex-1005 ¶31. In one example, the "default setting for cache hierarchy is OA:<mdname='use−hierarchy'>OA</md>," where "OA indicates that the edge

server is to go direct to the ***(O)rigin-server*** specified ***in the (A)RL),*** where the ARL is ***a modified URL (or portion thereof) that points an end user browser to attempt to retrieve the object from the CDN***." Ex-1005 ¶¶32-33.

e. Element 1[a][4]: the plurality of media assets are stored at a second location separate from the first location;

Dilley or Dilley-Menon teaches Element 1[a][4]. Ex-1002 ¶82.

Ground 1: Dilley teaches that the plurality of media assets may be stored at the edge servers and parent region servers. Specifically, Dilley teaches that each edge server "includes a cache for storing content provider content." Ex-1005 ¶43. Moreover, if the edge servers do not have the requested file, "the servers in the tiered distribution hubs will provide the edge servers with the requested content." Ex-1005 ¶27. The edge servers and parent region servers are at separate geographical locations from the origin server (i.e., first location) as shown in Figure 3. Ex-1005 ¶¶15 ("edge server regions typically are co-located in large hosting data centers"), 28 (same for parent servers), Fig. 3. To the extent PO argues that the first location where the metadata is stored may not also store the plurality of media assets, this would have been obvious to a POSITA, and is taught by Menon. Ex-1002 ¶83.



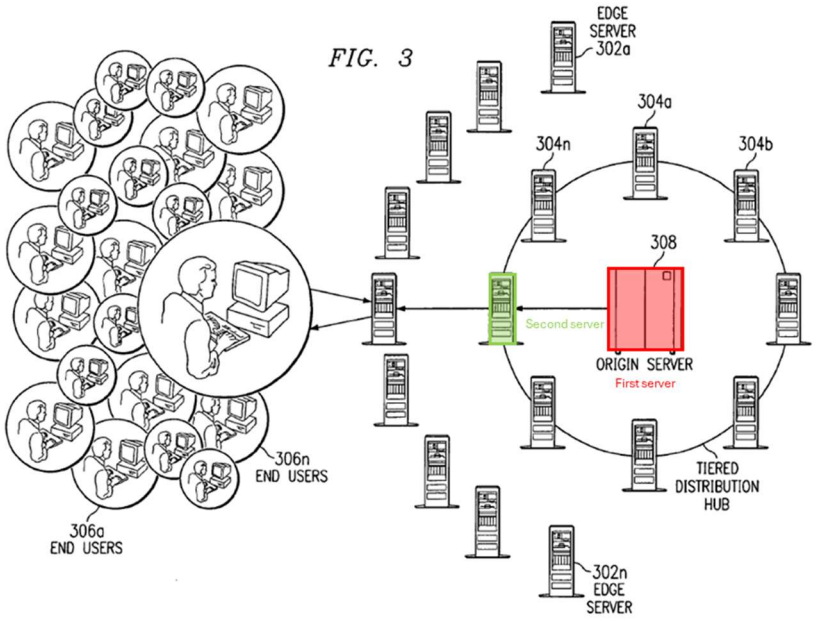
Ground 2: Menon teaches a directory server, which is "a different machine than the origin server or the edge server." Ex-1007 ¶¶66-67. Menon teaches that when the system utilizes servers other than origin and edge servers, such as a directory server "the content metadata may also be pushed to the directory server" to "provide[] a single location data structure that may be queried to identify all locations at which a content item is located." Ex-1007 ¶73. The directory server essentially acts as a metadata server in that it finds "the optimal source location for [a] requested video" and "receives metadata updates from the system." Ex-1007 ¶91; Ex-1002 ¶84. Thus, a POSITA would have understood that Menon teaches that metadata may be stored at a first location (i.e., directory server) and the content may be stored at a separate, second location (i.e., origin server). Ex-1002 ¶84. In the Dilley-Menon combination, Dilley's system would store the metadata and the

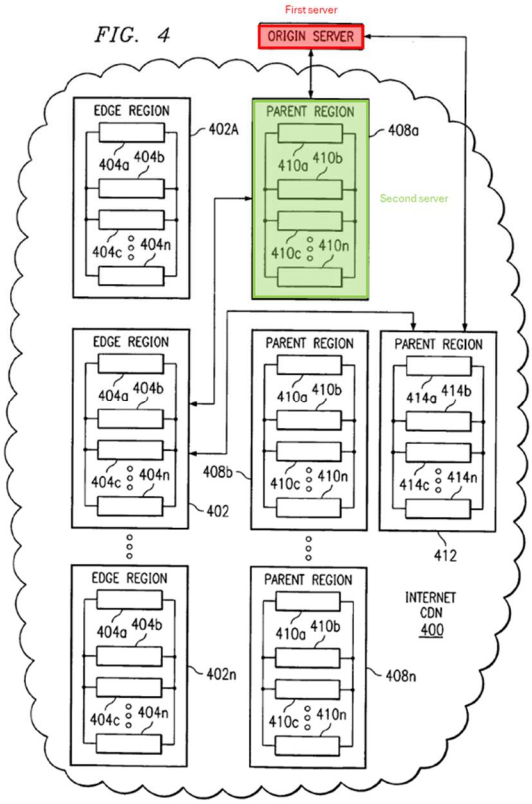
content at separate locations such as in a directory server and origin server, as taught by Menon. Ex-1002 ¶84. A POSITA would have been motivated to combine Dilley-Menon and had a reasonable expectation of success in doing so for the reasons described in Section XII.A.1. Ex-1002 ¶¶84-85.

f. Element 1[b][1]: a second server that stores a second plurality of data objects and is configured to request a data object from the first server if the data object is not present in the second plurality of data objects, wherein:

Dilley or Dilley-Menon teaches Element 1[b][1]. Ex-1002 ¶¶86-89.

As shown in annotated Figures 3-4 below, Dilley teaches a second server (green). Ex-1005, Figs. 3-4. Dilley teaches that the CDN's cache hierarchy comprises a "subset of well-connected 'core' ***parent server*** regions." Ex-1005 ¶¶14, 27.



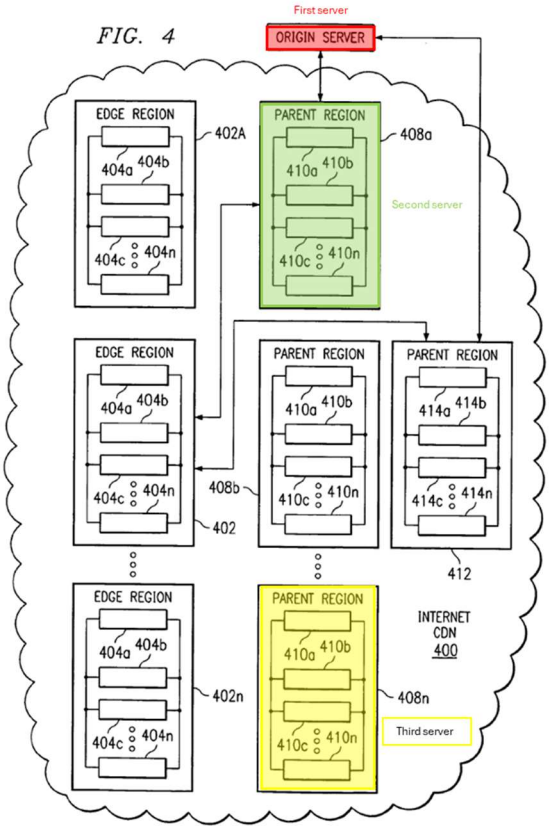


Dilley teaches that the second server stores a second plurality of data objects and requests a data object from the first server if the data object is not present at the second server. Specifically, Dilley teaches that if a request cannot be serviced by an edge server, it is provided to "one of the subset of server regions for handling, preferably ***as a function of metadata*** associated with the" request. Ex-1005 ¶14. The "request is then serviced, if possible, by a" server in the "***parent region***" and is only forwarded "to the origin server if it cannot be serviced by the intermediate node in the hierarchy." Ex-1005 ¶¶14, 51.

g. Element 1[b][2]: the second server is one of the plurality of cache servers; and

Dilley or Dilley-Menon teaches Element 1[b][2]. Ex-1002 ¶¶90-91.

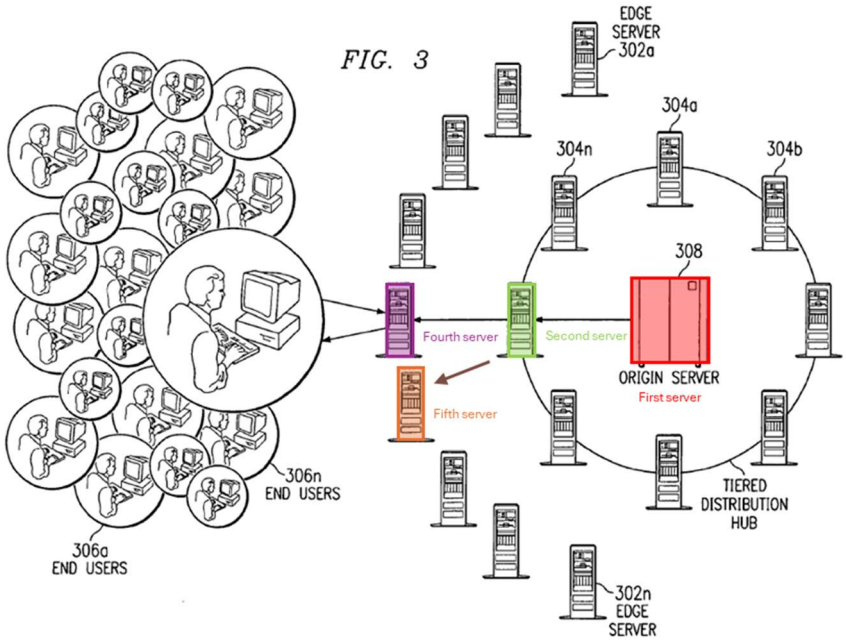
Dilley teaches that the second server is one of the plurality of cache servers. Specifically, Dilley teaches that "content may be marked for distribution from a so-called cache hierarchy that includes … ***a 'multi-region' cache hierarchy***" such as ***parent regions*** 408 a-n in annotated Figure 4 below. Ex-1005 ¶28, Fig. 4. This region "includes a cluster of 'parent' servers … co-located in large hosting data centers." Ex-1005 ¶28.

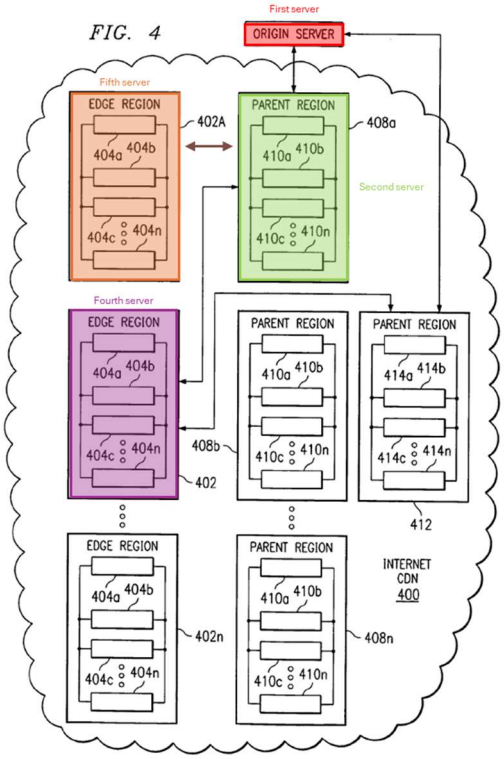


h. Element 1[b][3]: the second server is communicatively coupled with a first plurality of application servers;

Dilley or Dilley-Menon teaches Element 1[b][3]. Ex-1002 ¶¶92-95.

Dilley teaches that the cache hierarchy comprises an "***edge server region and*** … a subset of ***well-connected 'core' parent server regions***." Ex-1005 ¶14. As shown in annotated Figures 3-4 below, Dilley's second server (green) is communicatively coupled to a plurality of edge servers such as a fourth server (purple) and fifth server (orange). Ex-1005, Figs. 3-4 (brown arrows added).



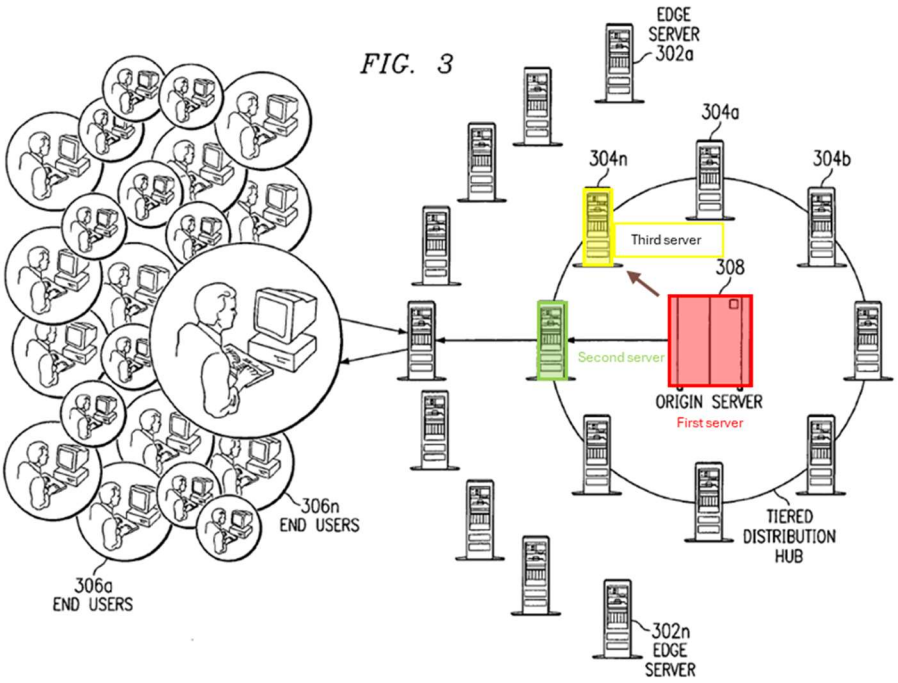


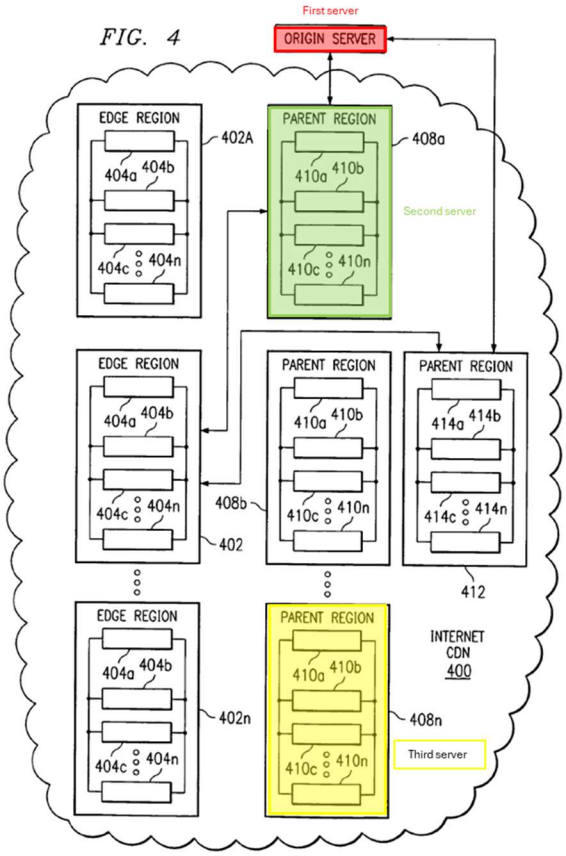
Dilley's edge servers are application servers. Dilley teaches that edge servers are typically content servers "located at or near the so-called outer reach or 'edge' of the Internet." Ex-1005 ¶24. Moreover, Dilley teaches that a representative edge server "is a Pentium-based caching appliance running an operating system … having suitable RAM and disk storage for CDN applications and content delivery network content." Ex-1005 ¶24. The edge servers include "an application programming interface (API) … to facilitate location of a parent region (from which the object can be fetched)." Ex-1005 ¶48.

i. Element 1[c][1]: a third server that stores a third plurality of data objects and is configured to request the data object from the first server if the data object is not present in the third plurality of data objects, wherein:

Dilley or Dilley-Menon teaches Element 1[c][1]. Ex-1002 ¶¶96-99.

As shown in annotated Figures 3-4 below, Dilley teaches a third server (yellow), which is a server in the parent region. Ex-1005, Figs. 3-4 (brown arrow added).





Dilley teaches that the third server stores a third plurality of data objects and is configured to request a data object from the first server if the data object is not present at the third server for the reasons described in Section XII.A.2.f. *See* Ex-1005 ¶¶14, 51.

j. Element 1[c][2]: the third server is one of the plurality of cache servers; and

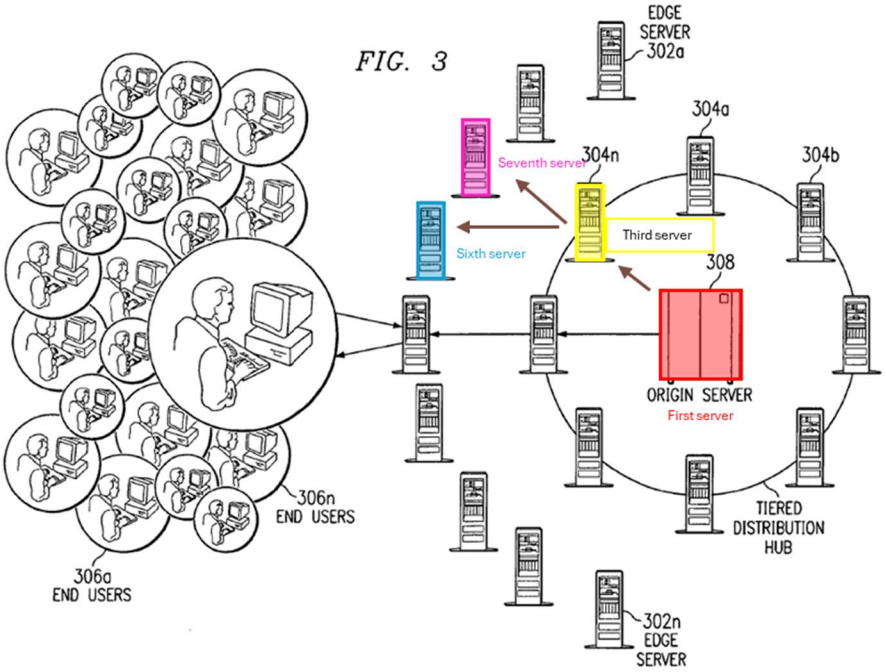
Dilley or Dilley-Menon teaches Element 1[c][2]. Ex-1002 ¶¶100-101.

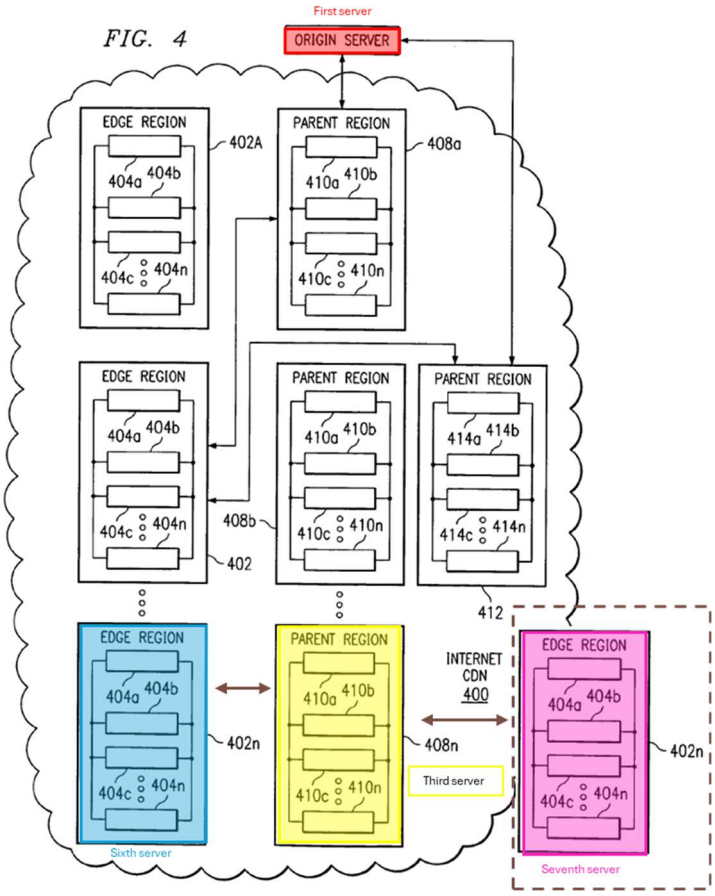
Dilley teaches that the third server is one of the plurality of cache servers for the reasons described in Section XII.A.2.g. Ex-1005, ¶28, Fig. 4.

k. Element 1[c][3]: the third server is communicatively coupled with a second plurality of application servers; and

Dilley or Dilley-Menon teaches Element 1[c][3]. Ex-1002 ¶¶102-104.

As shown in annotated Figures 3-4 below, Dilley's third server (yellow) is communicatively coupled to a plurality of edge servers such as a sixth server (blue) and seventh server (pink). Ex-1005, Figs. 3-4 (brown arrows and dashed box added), ¶14. As explained in Section XII.A.2.h, the edge servers are application servers. Ex-1005 ¶¶24, 53.





l. Element 1[d][1]: a fourth server that stores a fourth plurality of data objects and is configured to request the data object from the second server if the data object is not present in the fourth plurality of data objects, wherein:

Dilley or Dilley-Menon teaches Element 1[d][1]. Ex-1002 ¶¶105-108.

As shown in annotated Figures 3-4 below, Dilley teaches a fourth server (purple). Ex-1005, Figs. 3-4. Dilley teaches "***a set of edge servers*** and a hierarchical set of 'parent' or hub regions that service the edge servers." Ex-1005 ¶27.

FIG. 3

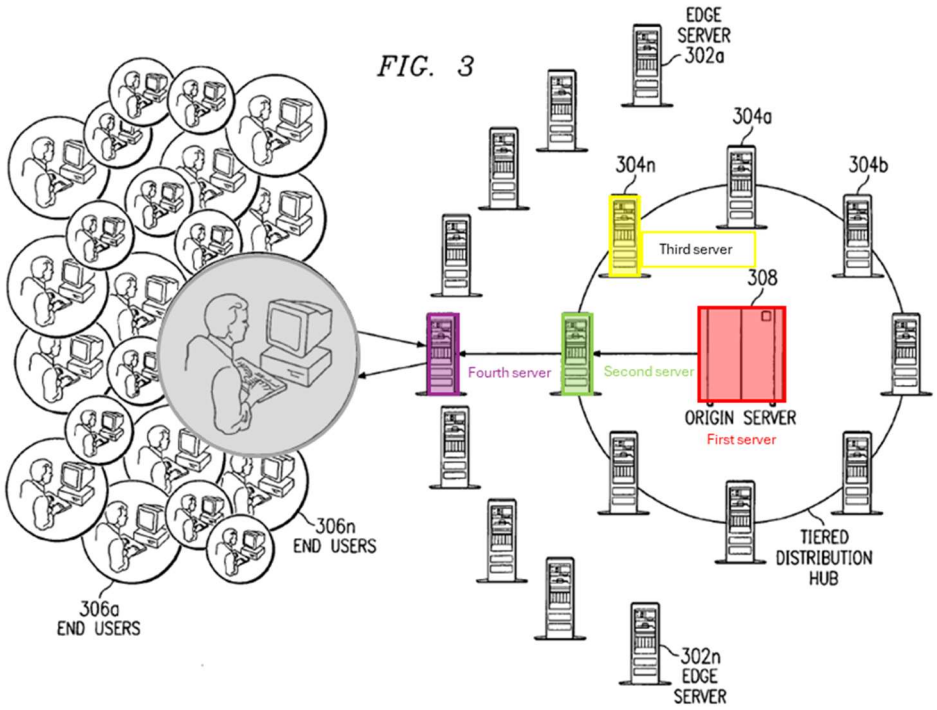
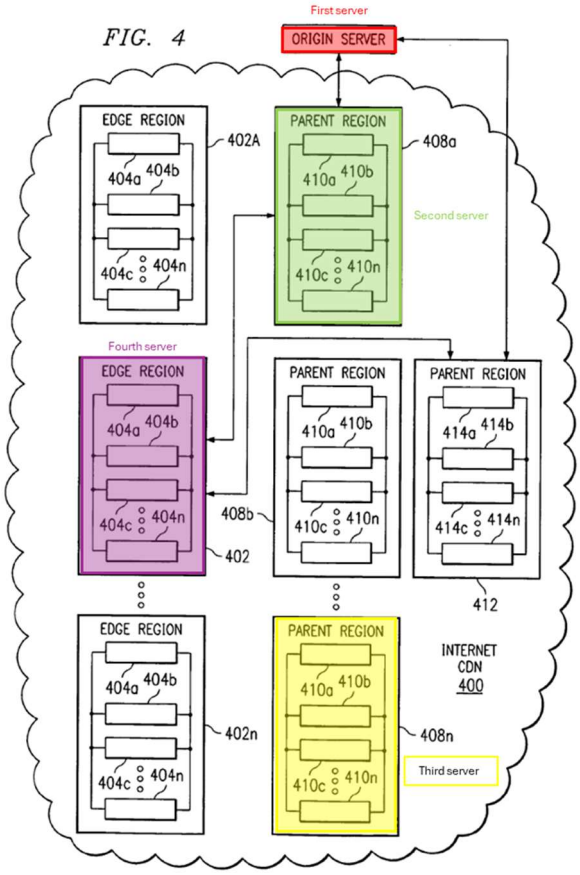
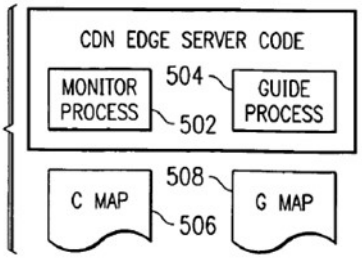

EDGE SERVER 302a
304a
304n
304b
Third server
308
Fourth server
Second server
ORIGIN SERVER
First server
TIERED DISTRIBUTION HUB
306n END USERS
306a END USERS
302n EDGE SERVER

FIG. 4


First server
ORIGIN SERVER
EDGE REGION
402A
404a 404b
404c 404n
PARENT REGION
408a
410a 410b
410c 410n
Second server
Fourth server
EDGE REGION
PARENT REGION
PARENT REGION
414a 414b
414c 414n
408b
402
412
EDGE REGION
402n
PARENT REGION
408n
Third server
INTERNET CDN 400

Dilley teaches that the fourth server stores a fourth plurality of data objects and is configured to request the data object from the second server if the data object is not present at the fourth server. Specifically, as shown in Figure 5 below, Dilley teaches that each edge server runs software and "includes a cache for storing" content, a guide process component "that directs the edge server to use another" server for a content request, a "C map," which directs client requests "from a client network address to a nearest CDN region," and a "global G map … used by the CDN service provider as" a "request routing mechanism." Ex-1005 ¶43, Fig. 5. Moreover, Dilley teaches that if the edge servers do not have the requested content "the servers in ***the tiered distribution hubs will provide***" it to them. Ex-1005 ¶27. For example, if "a given object request cannot be serviced in the given edge region" it is provided to "one of the subset of server regions for handling, preferably ***as a function of metadata*** associated with the" request. Ex-1005 ¶14. The "request is then serviced, if possible, by a" server in the "***parent region***" (i.e., second server). Ex-1005 ¶14, Fig. 4 (second server connected to fourth server).

FIG. 5



m. Element 1[d][2]: the fourth server is one of the first plurality of application server[s]; and

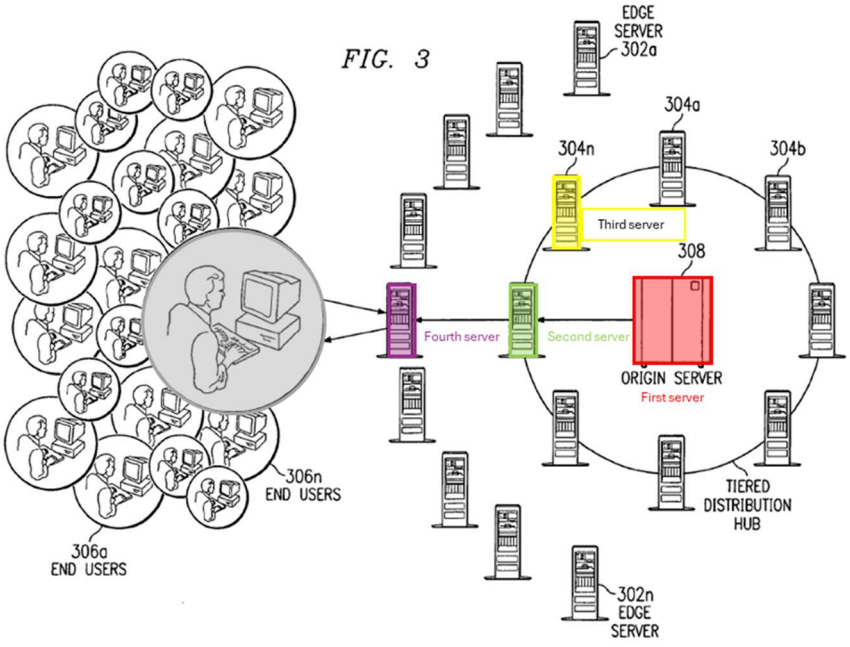
Dilley or Dilley-Menon teaches Element 1[d][2]. Ex-1002 ¶109.

Dilley teaches that the fourth server is one of the first plurality of application servers for the reasons described in the previous section and Section XII.A.2.h. Ex-1002 ¶110.

n. Element 1[d][3]: the fourth server is configured to receive a request from a first client for the data object;

Dilley or Dilley-Menon teaches Element 1[d][3]. Ex-1002 ¶¶111-113.

Dilley teaches that the fourth server is configured to receive a request from a first client for the data object. As shown in annotated Figure 3 below, the fourth server (purple) directly communicates with the client (grey) to receive requests for data objects and provide the corresponding content. Ex-1005, Fig. 3.

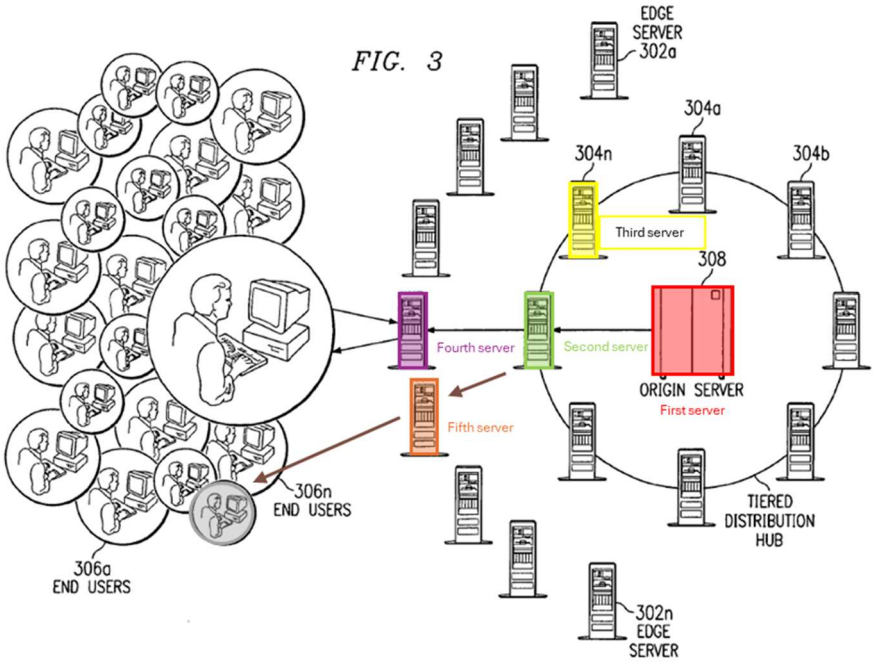


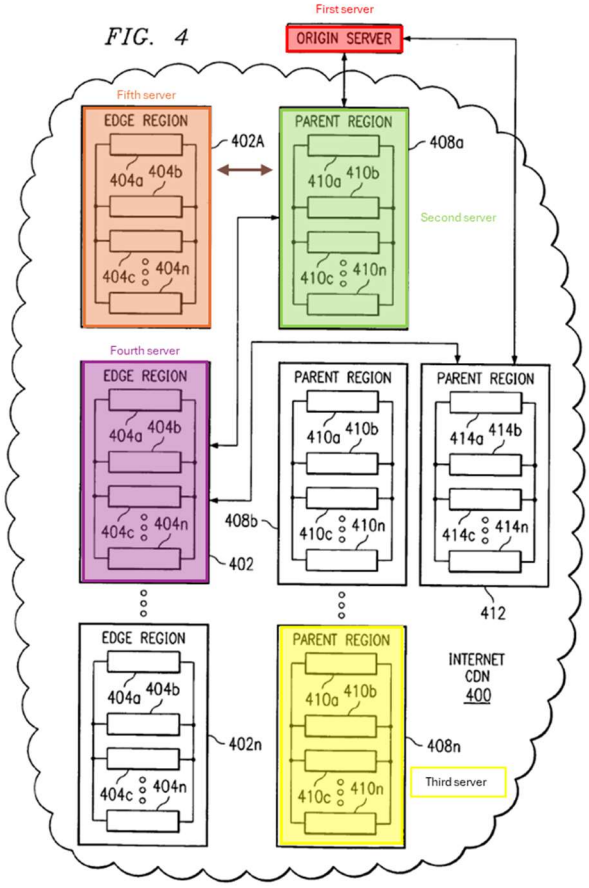
Dilley further teaches that "a given edge server receives a client request for an object" and "look[s] for the object in" its cache. Ex-1005 ¶44. "If the requested object is in cache," it "is served back to the requesting client" and, if not, "the edge server makes a request … to other edge servers in the region." Ex-1005 ¶44.

o. Element 1[e][1]: a fifth server that stores a fifth plurality of data objects and is configured to request the data object from the second server if the data object is not present in the fifth plurality of data objects, wherein:

Dilley or Dilley-Menon teaches Element 1[e][1]. Ex-1002 ¶¶114-117.

As shown in annotated Figures 3-4 below, Dilley teaches a fifth server (orange). Ex-1005, Figs. 3-4 (brown arrows added).





Dilley teaches that the fifth server stores a fifth plurality of data objects and is configured to request the data object from the second server if the data object is not present at the fifth server for the reasons described in Section XII.A.2.l. Ex-1005 ¶27 (parent servers provide content to edge servers, if needed); *see also id.*, ¶¶14, 43, Figs. 4 (second server connected to fifth server), 5 (edge server components).

p. Element 1[e][2]: the fifth server is one of the first plurality of application servers; and

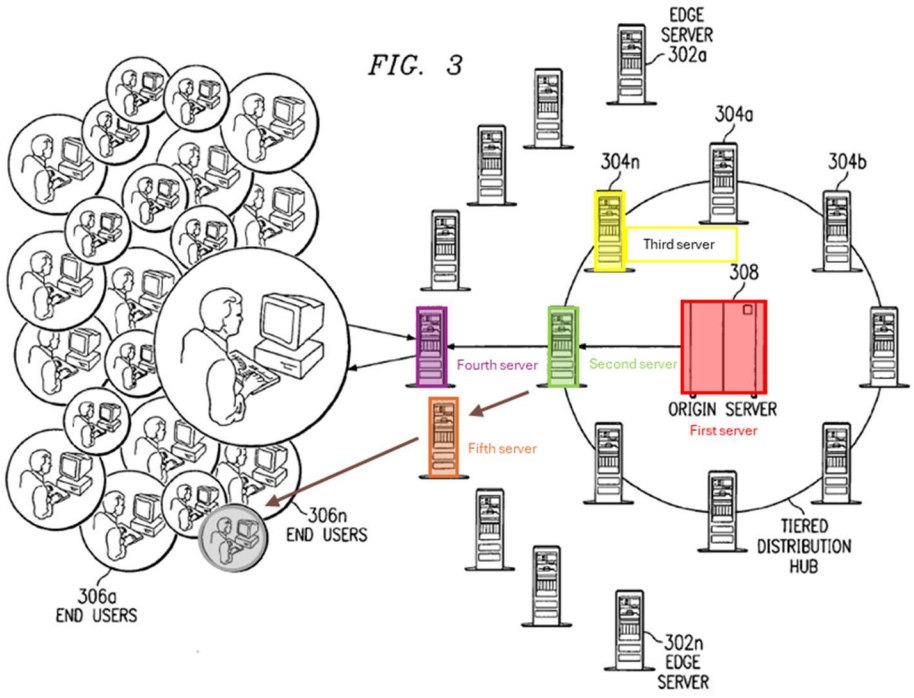
Dilley or Dilley-Menon teaches Element 1[e][2]. Ex-1002 ¶118.

Dilley teaches that the fifth server is one of the first plurality of application servers for the reasons described in the previous section and Section XII.A.2.h. Ex-1002 ¶119.

q. Element 1[e][3]: the fifth server is configured to receive a request from a second client for the data object;

Dilley or Dilley-Menon teaches Element 1[e][3]. Ex-1002 ¶¶120-122.

Dilley teaches that the fifth server is configured to receive a request from a second client for the data object. As shown in annotated Figure 3 below, the fifth server (orange) directly communicates with the client (grey) to receive requests for data objects and provide the corresponding content. Ex-1005, Fig. 3 (brown arrows added). *See also* Section XII.A.2.n; Ex-1005 ¶44.

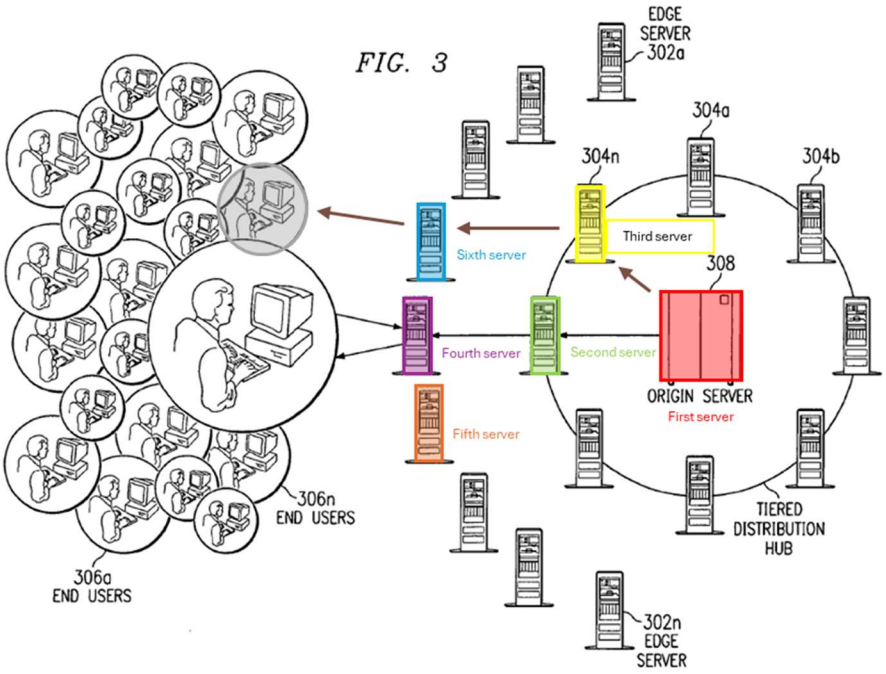


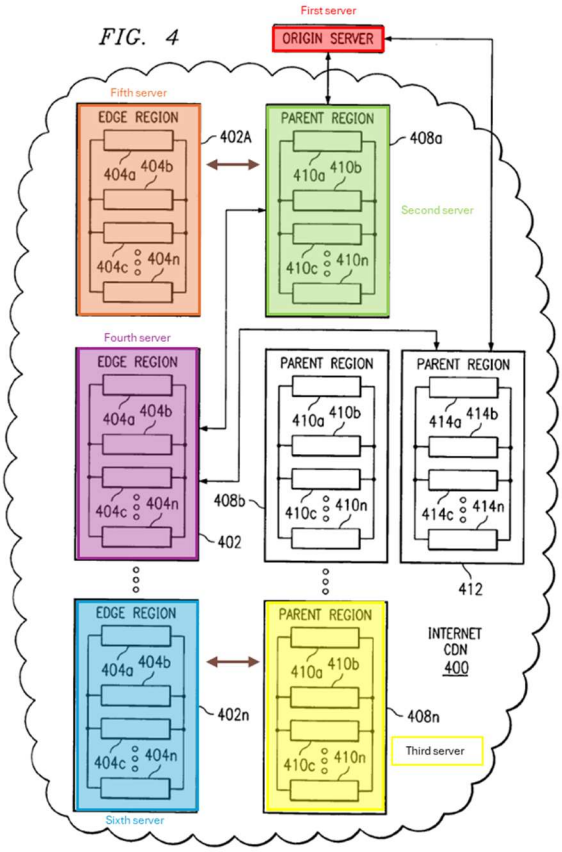
r. Element 1[f][1]: a sixth server that stores a sixth plurality of data objects and is configured to request the data object from the third server if the data object is not present in the sixth plurality of data objects, wherein:

Dilley or Dilley-Menon teaches Element 1[f][1]. Ex-1002 ¶¶123-126.

As shown in annotated Figures 3-4 below, Dilley teaches a sixth server (blue).

Ex-1005, Figs. 3-4 (brown arrows added).





Dilley teaches that the sixth server stores a sixth plurality of data objects and is configured to request the data object from the third server if the data object is not present at the sixth server for the reasons described in Section XII.A.2.l. Ex-1005 ¶27; *see also id.*, ¶¶14, 43, Figs. 4 (third server connected to sixth server), 5.

s. Element 1[f][2]: the sixth server is one of the second plurality of application servers; and

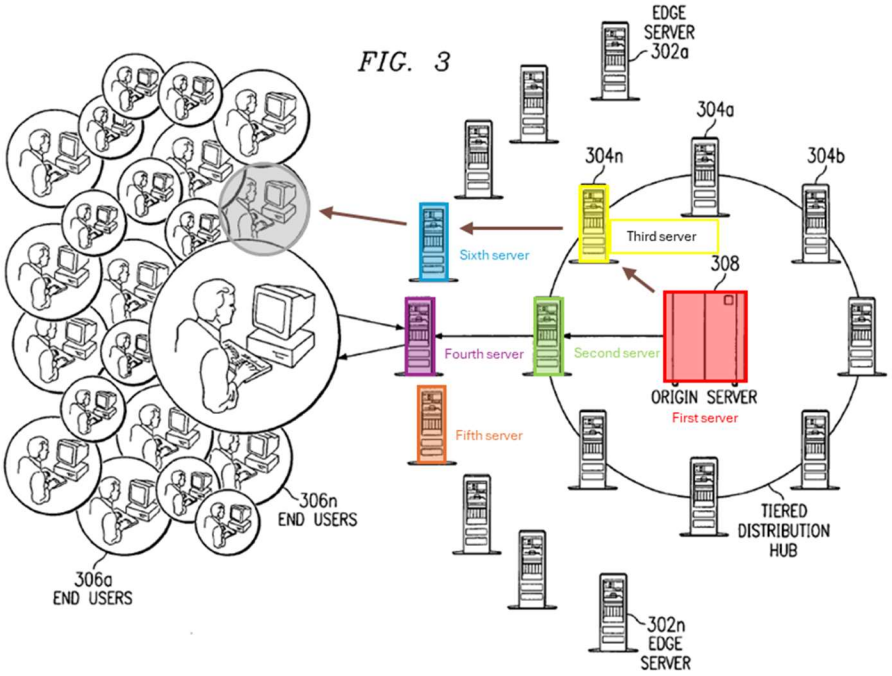
Dilley or Dilley-Menon teaches Element 1[f][2]. Ex-1002 ¶127.

Dilley teaches that the sixth server is one of the second plurality of application servers for the reasons described in the previous section and Sections XII.A.2.h and XII.A.2.k. Ex-1002 ¶128.

t. Element 1[f][3]: the sixth server is configured to receive a request from a third client for the data object; and

Dilley or Dilley-Menon teaches Element 1[f][3]. Ex-1002 ¶¶129-131.

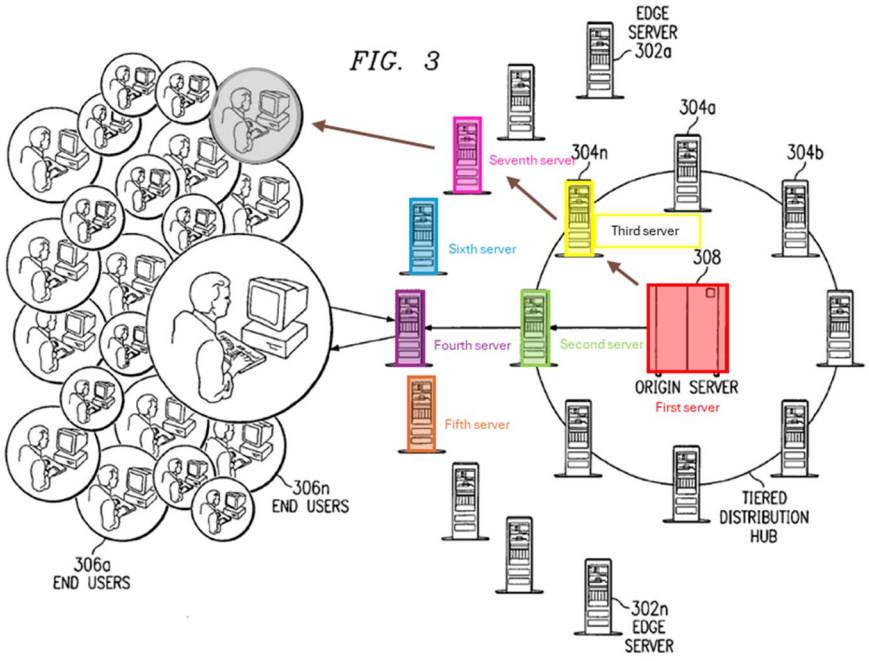
Dilley teaches that the sixth server is configured to receive a request from a third client for the data object. As shown in annotated Figure 3 below, the sixth server (blue) directly communicates with the client (grey) to receive requests for data objects and provide the corresponding content. Ex-1005, Fig. 3 (brown arrows added). *See also* Section XII.A.2.n; Ex-1005 ¶44.

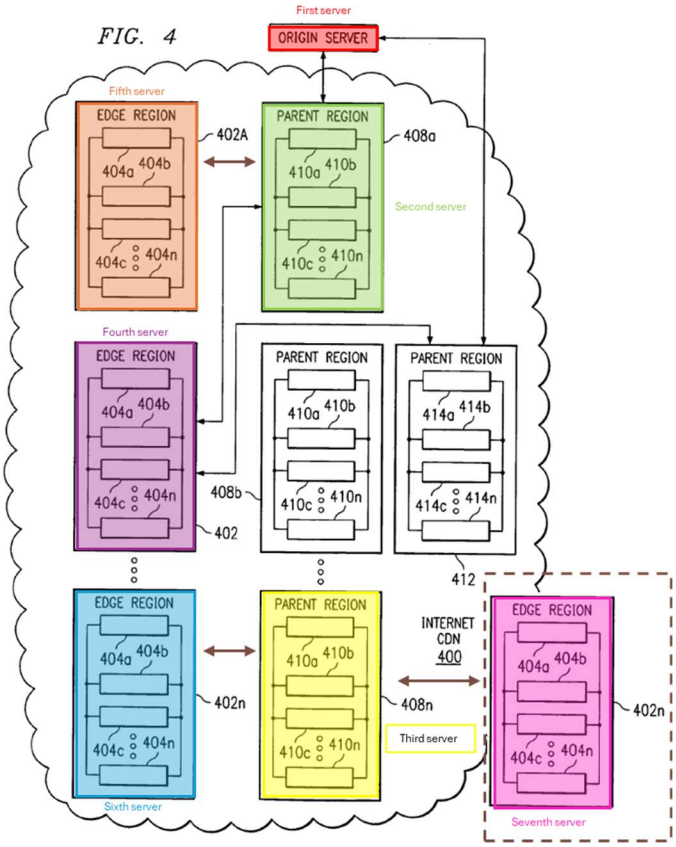


u. Element 1[g][1]: a seventh server that stores a seventh plurality of data objects and is configured to request the data object from the third server if the data object is not present in the seventh plurality of data objects, wherein:

Dilley or Dilley-Menon teaches Element 1[g][1]. Ex-1002 ¶¶132-135.

As shown in annotated Figures 3-4 below, Dilley teaches a seventh server (pink). Ex-1005, Figs. 3-4 (brown arrows and dashed box added).





Dilley teaches that the seventh server stores a seventh plurality of data objects and is configured to request the data object from the third server if the data object is not present in the seventh plurality of data objects for the reasons described in Section XII.A.2.l. Ex-1005 ¶27; *see also id.*, ¶¶14, 43, Figs. 4 (third server connected to seventh server), 5.

v. Element 1[g][2]: the seventh server is one of the second plurality of application servers; and

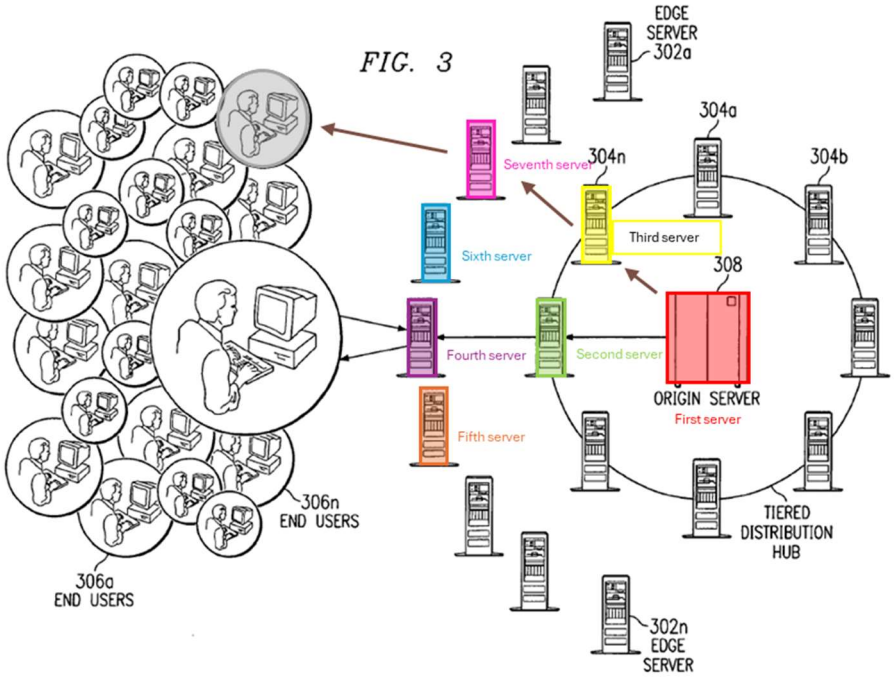
Dilley or Dilley-Menon teaches Element 1[g][2]. Ex-1002 ¶136.

Dilley teaches that the seventh server is one of the second plurality of application servers for the reasons described in the previous section and Sections XII.A.2.h and XII.A.2.k. Ex-1002 ¶137.

w. Element 1[g][3]: the seventh server is configured to receive a request from a fourth client for the data object.

Dilley or Dilley-Menon teaches Element 1[g][3]. Ex-1002 ¶¶138-141.

Dilley teaches that the seventh server is configured to receive a request from a fourth client for the data object. As shown in annotated Figure 3 below, the seventh server (pink) directly communicates with the client (grey) to receive requests for data objects and provide the corresponding content. Ex-1005, Fig. 3 (brown arrows added). *See also* Section XII.A.2.n; Ex-1005 ¶44.



Thus, Dilley alone or Dilley-Menon renders obvious Claim 1.

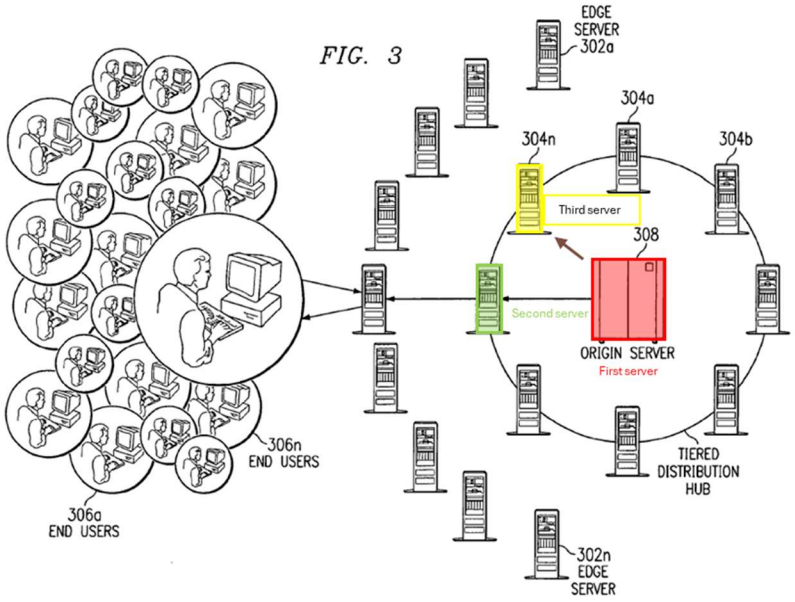
3. Independent Claim 5

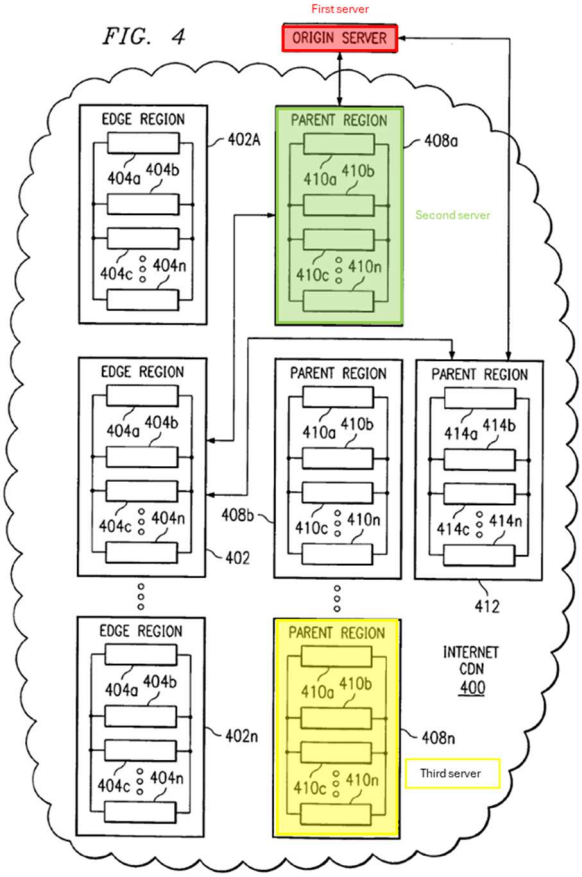
a. Element 5[pre]: A cloud data persistence system for distribution of data, the cloud data persistence system comprising:

Dilley or Dilley-Menon teaches the preamble. *See* Section XII.A.2.a. Ex-1002 ¶142.

b. Element 5[a][1]: a first server which stores a first plurality of data objects and is communicatively coupled with a second server and a third server, wherein:

Dilley or Dilley-Menon teaches Element 5[a][1]. *See* Sections XII.A.2.b and XII.A.2.f-XII.A.2.j; Ex-1005, Figs. 3-4 (brown arrow added); Ex-1002 ¶143.





c. Element 5[a][2]: the first server is located at a first location;

Dilley or Dilley-Menon teaches Element 5[a][2]. *See* Section XII.A.2.c. Ex-1002 ¶144.

d. Element 5[a][3]: each of the first plurality of data objects comprises a link to a media asset of a plurality of media assets;

Dilley or Dilley-Menon teaches Element 5[a][3]. *See* Section XII.A.2.d. Ex-1002 ¶145.

e. Element 5[a][4]: the plurality of media assets is located at a second location ; and the second location is distinct from the first location;

Dilley or Dilley-Menon teaches Element 5[a][4]. *See* Section XII.A.2.e. Ex-1002 ¶146.

f. Element 5[b][1]: the second server stores a second plurality of data objects and is configured to request a data object from the first server if the data object is not present in the second plurality of data objects,

Dilley or Dilley-Menon teaches Element 5[b][1]. *See* Sections XII.A.2.f. Ex-1002 ¶147.

g. Element 5[b][2]: wherein the second server is communicatively coupled with a fourth server and fifth server; and

Dilley or Dilley-Menon teaches Element 5[b][2]. *See* Sections XII.A.2.h and XII.A.2.l-XII.A.2.q; Ex-1005, Figs. 3-4 (brown arrows added); Ex-1002 ¶148.

FIG. 3

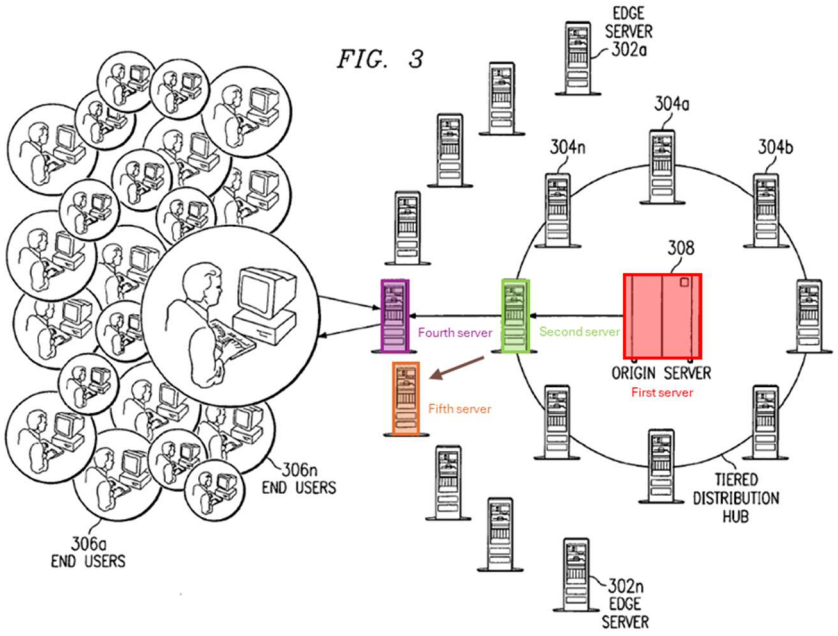
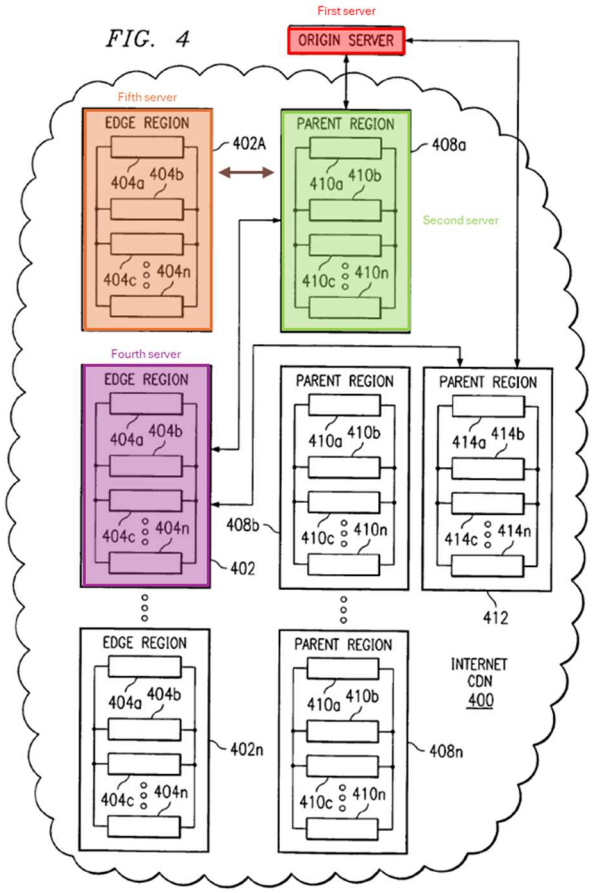

EDGE SERVER 302a
304a
304n
304b
308
Fourth server
Second server
ORIGIN SERVER
First server
Fifth server
306n END USERS
306a END USERS
TIERED DISTRIBUTION HUB
302n EDGE SERVER

FIG. 4


First server
ORIGIN SERVER
Fifth server
EDGE REGION
402A
PARENT REGION
408a
Second server
Fourth server
408b
402
412
INTERNET CDN 400
402n
408n

h. Element 5[c][1]: the fourth server stores a third plurality of data objects and is configured to request the data object from the second server if the data object is not present in the third plurality of data objects,

Dilley or Dilley-Menon teaches Element 5[c][1]. *See* Section XII.A.2.l. Ex-1002 ¶149.

i. Element 5[c][2] wherein the fourth server is configured to receive a request from a first client for the data object.

Dilley or Dilley-Menon teaches Element 5[c][2]. *See* Section XII.A.2.n. Ex-1002 ¶¶150-151.

Thus, Dilley alone or Dilley-Menon renders obvious Claim 5.

4. Dependent Claims 2-4 and 6-13

a. Claim 2: The cloud data persistence system of claim 1, wherein the second location comprises a content delivery network.

Dilley or Dilley-Menon teaches Claim 2. Ex-1002 ¶¶152-153.

Ground 1: Dilley teaches Claim 2 for the reasons described in Section XII.A.2.e, namely, because content is stored at parent region servers and edge servers within a CDN, which are at separate geographical locations from the origin server. Ex-1005 ¶¶15, 27 (CDN "employs a tiered infrastructure using two or more tiers: a set of edge servers and a hierarchical set of 'parent' or hub regions that service the edge servers"), 28, 43 (each edge server "includes a cache for storing

content provider content"), Fig. 3. Moreover, Dilley teaches that requests are only forwarded "to the origin server if" they "cannot be serviced by the intermediate node in the hierarchy." Ex-1005 ¶14.

Ground 2: Dilley-Menon also teaches Claim 2 for the reasons described in Section XII.A.2.e, namely, because the metadata is stored at a directory server separate from the origin and edge servers. Ex-1002 ¶¶154-155.

b. Claim 3

(1) Element 3[pre]: The cloud data persistence system of claim 1, wherein:

Dilley or Dilley-Menon teaches Element 3[pre]. *See* Section XII.A.2.a. Ex-1002 ¶156.

(2) Element 3[a]: data objects in the second plurality of data objects are at least partially determined based on when requests for those data objects were last received at the second server;

Dilley or Dilley-Menon teaches Element 3[a]. Ex-1002 ¶157.

Dilley teaches that one of the factors that the CDN uses in determining which server to service a request from is whether the content is "stale" or "infrequently accessed." Ex-1005 ¶27. For example, a parent server "typically sends a child (an edge server running the CDN software) with information about how long (time-to-live or TTL) the content may stay in the child cache and still be deemed fresh." Ex-1005 ¶51. Parameters such as TTL are used to determine how long cached content

in edge servers remain fresh, or current, and represents data about the content (i.e., metadata) after the request that caused it to be stored in the cache. Ex-1002 ¶158. Dilley further teaches that the metadata includes Age information indicating how long "the object has been in the CDN," and a Date header, which is "updated to the current time" of the request. Ex-1005 ¶50. Thus, Dilley's data objects in the second plurality of data objects (i.e., metadata) are partially determined based on when requests for those data objects were last received at the second server. Ex-1002 ¶¶158-159.

(3) Element 3[b]: data objects in the third plurality of data objects are at least partially determined based on when requests for those data objects were last received at the third server;

Dilley or Dilley-Menon teaches Element 3[b]. *See* Section XII.A.4.b.2. Ex-1002 ¶160.

(4) Element 3[c]: data objects in the fourth plurality of data objects are at least partially determined based on when requests for those data objects were last received at the fourth server;

Dilley or Dilley-Menon teaches Element 3[c]. *See* Section XII.A.4.b.2. Ex-1002 ¶161.

(5) Element 3[d]: data objects in the fifth plurality of data objects are at least partially determined based on when requests for those data objects were last received at the fifth server;

Dilley or Dilley-Menon teaches Element 3[d]. *See* Section XII.A.4.b.2. Ex-1002 ¶162.

(6) Element 3[e]: data objects in the sixth plurality of data objects are at least partially determined based on when requests for those data objects were last received at the sixth server; and

Dilley or Dilley-Menon teaches Element 3[e]. *See* Section XII.A.4.b.2. Ex-1002 ¶163.

(7) Element 3[f]: data objects in the seventh plurality of data objects are at least partially determined based on when requests for those data objects were last received at the seventh server.

Dilley or Dilley-Menon teaches Element 3[f]. *See* Section XII.A.4.b.2. Ex-1002 ¶164.

c. Claim 4: The cloud data persistence system of claim 1, wherein the first plurality of data objects comprises all data objects in the second plurality of data objects, the third plurality of data objects, the fourth plurality of data objects, the fifth plurality of data objects, the sixth plurality of data objects, and the seventh plurality of data objects.

Dilley or Dilley-Menon teaches Claim 4. Ex-1002 ¶¶165-167.

Dilley teaches that the first plurality of data objects (i.e., metadata stored at the origin server) comprises all data objects in the second, third, fourth, fifth, sixth, and seventh plurality of data objects because the origin server is the central hub that all servers revert to if their location and the other server locations in the hierarchy do not have the requested data objects. Specifically, Dilley teaches that each content provider "operates an origin server" and "a cache hierarchy is established … comprising a given edge server region and … a subset of … parent server regions" that respond to requests for content. Ex-1005 ¶14. If a request "cannot be serviced in the given edge region, instead of contacting the origin server, the request is provided to … one of the subset of server regions for handling, preferably as a function of metadata associated with the" request. Ex-1005 ¶14. The request is only forwarded "to the origin server if it cannot be serviced by the intermediate node in the hierarchy." Ex-1005 ¶14; *see also id.*, ¶¶24, 51.

d. Claim 6: The cloud data persistence system of claim 5 wherein the first plurality of data objects comprises all data objects present in the second plurality of data objects and the third plurality of data objects.

Dilley or Dilley-Menon teaches Claim 6. *See* Section XII.A.4.c. Ex-1002 ¶168.

e. Claim 7

(1) Element 7[pre]: The cloud data persistence system of claim 5,

Dilley or Dilley-Menon teaches Element 7[pre]. *See* Section XII.A.2.a. Ex-1002 ¶169.

(2) Element 7[a]: wherein the third server stores a fourth plurality of data objects and is configured to request the data object from the first server if the data object is not present in the fourth plurality of data objects, wherein:

Dilley or Dilley-Menon teaches Element 7[a]. *See* Section XII.A.2.i. Ex-1002 ¶170.

(3) Element 7[b]: the third server and the second server are data persistence cache servers; and

Dilley or Dilley-Menon teaches Element 7[b]. *See* Sections XII.A.2.g and XII.A.2.j. Ex-1002 ¶171.

(4) Element 7[c]: the third server is communicatively coupled with a sixth and seventh server.

Dilley or Dilley-Menon teaches Element 7[c]. *See* Sections XII.A.2.k and XII.A.2.r-XII.A.2.w; Ex-1005, Figs. 3-4 (brown arrows and dashed box added); Ex-1002 ¶172.

FIG. 3

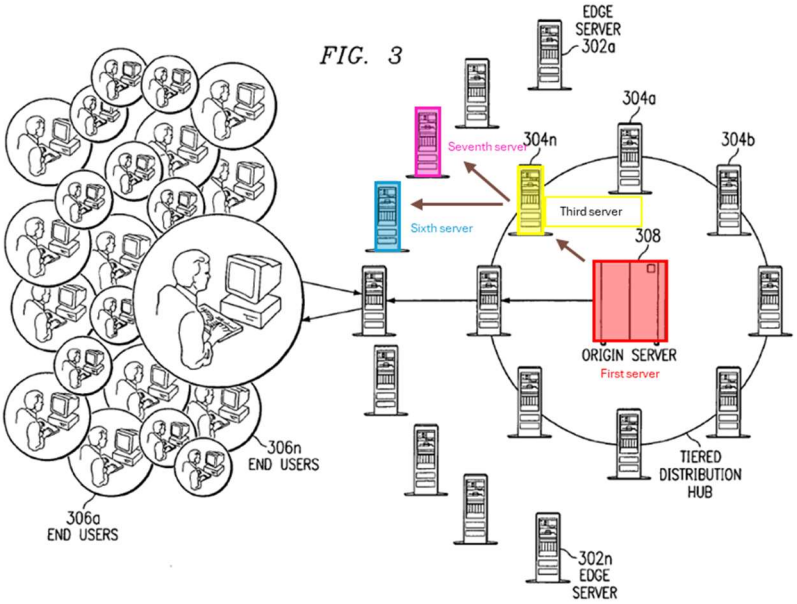
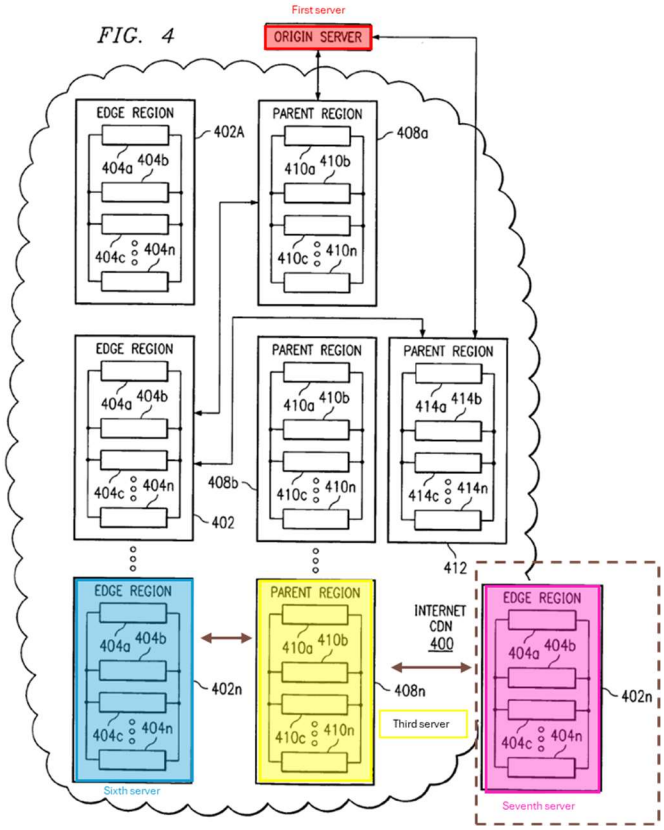

EDGE SERVER 302a
304a
304b
304n
Seventh server
Third server
Sixth server
308
ORIGIN SERVER
First server
TIERED DISTRIBUTION HUB
306n END USERS
306a END USERS
302n EDGE SERVER

FIG. 4


First server
ORIGIN SERVER
EDGE REGION
PARENT REGION
402A
408a
404a 404b 404c 404n
410a 410b 410c 410n
408b
402
414a 414b 414c 414n
412
INTERNET CDN 400
402n
408n
Third server
Sixth server
Seventh server

f. Claim 8

(1) Element 8[pre]: The cloud data persistence system of claim 5,

Dilley or Dilley-Menon teaches Element 8[pre]. *See* Section XII.A.2.a. Ex-1002 ¶173.

(2) Element 8[a] wherein the fifth server stores a fifth plurality of data objects and is configured to request the data object from the second server if the data object is not present in the fifth plurality of data objects, wherein:

Dilley or Dilley-Menon teaches Element 8[a]. *See* Section XII.A.2.o. Ex-1002 ¶174.

(3) Element 8[b]: the fifth server and the fourth servers are application servers; and

Dilley or Dilley-Menon teaches Element 8[b]. *See* Sections XII.A.2.m and XII.A.2.p. Ex-1002 ¶175.

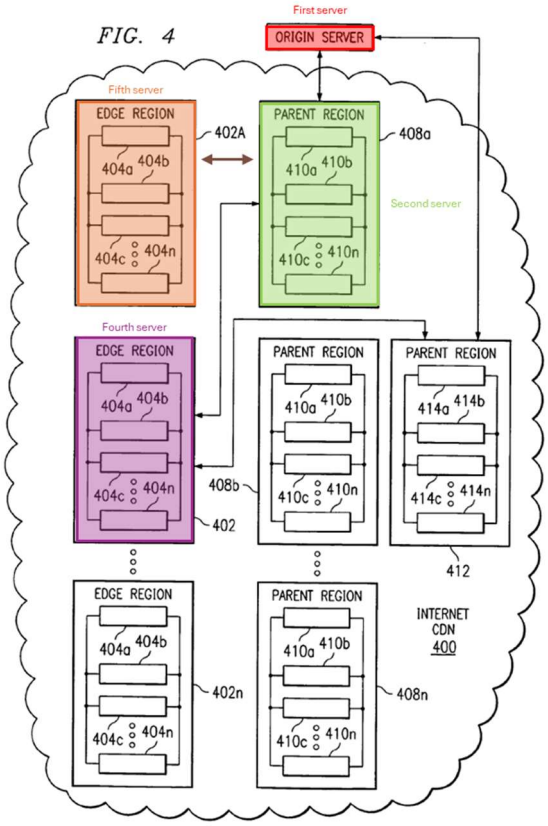
(4) Element 8[c]: the fifth server is configured to receive requests from a second client for the data object; and

Dilley or Dilley-Menon teaches Element 8[c]. *See* Sections XII.A.2.q. Ex-1002 ¶176.

(5) Element 8[d]: the fifth server is geographically separated from the fourth server.

Dilley or Dilley-Menon teaches Element 8[d]. Ex-1002 ¶177.

Ground 1: Dilley teaches that edge servers "are located at strategic locations" such as "Internet network access points" to deliver "copies of content to requesting end users." Ex-1005 ¶24. Dilley also teaches "***a set of regions 402 a-n***, each of which comprises ***a set of content (or 'edge') servers 404 a-n***" and a "subset of parent regions" 408 a-n, each of which "includes a cluster of 'parent' servers … 410 a-n" which "may be co-located in large hosting data centers." Ex-1005 ¶28. Dilley further teaches that the "[t]he number of parent regions in the given subset is variable and ***their particular location*** and configuration … ***is selectable***." Ex-1005 ¶28. As shown in annotated Figure 4 below, the fourth server (purple) and fifth server (orange) are geographically separated in different CDN "edge region[s]." Ex-1005, Fig. 3 (brown arrow added); Ex-1002 ¶178.



Ground 2: This limitation is also taught by Menon. Menon teaches that "[w]hen a user requests the content … ***the edge server closer to the user*** is directed to serve the replicated content to the user." Ex-1007 ¶15. Menon further teaches that "[e]dge server 'closeness' may be defined in a number of ways" including "***geographic proximity***." Ex-1007 ¶15. Thus, a POSITA would have understood that Menon's edge servers are geographically separated from one another. Ex-1007 ¶¶58, 86; Ex-1002 ¶179. In the Dilley-Menon combination, Dilley's fourth and fifth servers would be geographically separated such that the edge server in closest proximity to the user is used to service the request. Ex-1002 ¶179. In addition to the reasons described in Section XII.A.1, a POSITA would have been motivated to

implement Menon's teachings in Dilley because "[s]erving content from a cache closer to the end user [] improves performance." Ex-1007 ¶18; Ex-1002 ¶¶179-180.

g. Claim 9: The cloud data persistence system of claim 5, wherein the request from the first client for the data object comprises a universal resource indicator.

Dilley or Dilley-Menon teaches Claim 9. Ex-1002 ¶181.

Ground 1: Dilley teaches that the request from the first client for the data object comprises a URL. Dilley teaches that "content is tagged for delivery from the CDN using a content migrator or rewrite tool 106 operated … at a participating content provider server," which "***rewrites embedded object URLs to point to the CDNSP domain***." Ex-1005 ¶25. Moreover, "[a] request for tagged content is resolved" by identifying "a 'best' region" and then identifying "an edge server within the region that is not overloaded" and "likely to host the requested content." Ex-1005 ¶25. Dilley further teaches that "[m]etadata is delivered to the CDN edge servers using a convenient transport mechanism" and "***[o]bject metadata may be specified by customer*** … or in any other convenient manner." Ex-1005 ¶30. An example of "representative" metadata may include: "<mdname='use−hierarchy'>OA</md>," where "OA indicates that the edge server is to go direct to the ***(O)rigin-server*** specified ***in the (A)RL),*** where the ARL is ***a modified URL (or portion thereof) that points an end user browser to attempt to retrieve the object from the CDN***." Ex-1005 ¶¶31-33; *see also id.*, ¶¶41 ("request

… may [be] of the form aSerial.rRegion.cdnsp.net"), 49-50 (describing edge server's process for retrieving content based on user request). A POSITA would thus have understood that the client request is in the form of a URL, which is a specific form of a universal resource indicator. Ex-1002 ¶182. This is also taught by Menon.

Ground 2: Menon teaches that edge servers "maintain a directory that organizes metadata for individual content items typically in the form of a" URL "for the item." Ex-1007 ¶47. For example, Menon teaches that "***[u]ser selection of particular video content*** whether ***by URL*** or by other designator or identifier ***may be recorded in the metadata database***." Ex-1007 ¶48. Moreover, "when ***a user makes a selection (such as by identifying a URL) for a video on an edge server (ES)***, the metadata (MD) corresponding to the selected URL is examined to see if the corresponding video object is in the cache." Ex-1007 ¶50; *see also id.*, ¶86 ("When a user selects a video title … the user essentially transmits a URL or other globally unique identification for the video … to the network."). In the Dilley-Menon combination, the client request for metadata in Dilley's system would include a URL, as taught by Menon. Ex-1002 ¶183. In addition the reasons described in Section XII.A.1, a POSITA would have been motivated to implement Dilley's client request as a URL, as taught by Menon, because client requests on a webpage over the Internet are typically in the form of a URL. Ex-1002 ¶¶183-184.

h. Claim 10: The cloud data persistence system of claim 5 wherein each of the first plurality of data objects comprise a universal resource locator and a title linked to a media asset of the plurality of media assets.

Dilley or Dilley-Menon teaches Claim 10. Ex-1002 ¶185.

Ground 1: Dilley teaches that the metadata stored at the first server comprises a URL linked to the media asset for the reasons described in the previous section and Sections XII.A.2.b and XII.A.2.d. Specifically, Dilley defines metadata as "the set of all control options and parameters for the object." Ex-1005 ¶25. Dilley also teaches that the metadata may include embedded URLs that point to the content (Ex-1005 ¶¶25, 31-40) and "an object's serial number." Ex-1005 ¶36. It would have been obvious to a POSITA that the metadata would also include some sort of title or identifier for the content. Ex-1002 ¶186. This is also taught by Menon. *Id*.

Ground 2: Menon teaches that metadata could include a URL for the reasons described in the previous section. Specifically, "when a user makes a selection (such as by identifying a URL) for a video … ***the metadata (MD) corresponding to the selected URL*** is examined to see if the corresponding video object is in the cache." Ex-1007 ¶50; *see also id.*, ¶¶47 (directory "***organizes metadata*** for individual content items typically ***in the form of a … (URL)*** for the item"). Menon further teaches that "the ***metadata may identify*** and describe ***the video object or asset***, such as its physical characteristics (formats, size, bit rate, or the like physical or logical

characteristics)." Ex-1007 ¶57. The metadata may also provide "***textual information about the video***." Ex-1007 ¶61. Moreover, Menon teaches that "[w]hen a ***user selects a video title displayed*** on his computer, TV set via a set-top box, … the user essentially transmits a URL or other globally unique identification for the video … to the network." Ex-1007 ¶86. A POSITA would have understood that the textual information about the video and/or the video title displayed correspond to the recited "title linked to a media asset." Ex-1002 ¶187. In the Dilley-Menon combination, Dilley's metadata would comprise a title that uniquely identifies the content, as taught by Menon. *Id*. In addition to the reasons described in Section XII.A.1, a POSITA would have been motivated to include a title in Dilley's metadata, as taught by Menon, because this is a typical parameter included in a metadata file. Ex-1002 ¶¶187-188.

i. Claim 11: The cloud data persistence system of claim 5, wherein data objects in the second plurality of data objects and the third plurality of data objects are at least partially determined based on a frequency of requests for those data objects received from clients.

Dilley or Dilley-Menon teaches Claim 11. *See* Section XII.A.4.b. Ex-1002 ¶189.

j. Claim 12: The cloud data persistence system of claim 5, wherein data objects in the second plurality of data objects and the third plurality of data objects are at least partially determined based on when requests for those data objects were last received from clients.

Dilley or Dilley-Menon teaches Claim 12. *See* Section XII.A.4.b. Ex-1002 ¶190.

k. Claim 13: The cloud data persistence system of claim 5, wherein the first plurality of data objects comprises all data objects in the second plurality of data objects, the third plurality of data objects, the fourth plurality of data objects, and the fifth plurality of data objects.

Dilley or Dilley-Menon teaches Claim 13. *See* Sections XII.A.4.c and XII.A.4.d. Ex-1002 ¶191.

B. Grounds 3-4: Claims 1-13 are obvious over Russell alone or Russell in view of Menon.

1. A POSITA would have been motivated to combine Russell's teachings with Menon's teachings and would have had a reasonable expectation of success.

A POSITA would have been motivated to combine the teachings of Russell and Menon and had a reasonable expectation of success in doing so because each relates to a content delivery network that uses a tiered server architecture to efficiently distribute media content to users. Ex-1006, Abstract, ¶6; Ex-1007, Abstract, ¶42, Fig. 3; Ex-1002 ¶¶192-194.

Russell teaches delivering content over a network. Ex-1006, Abstract. Russell's network architecture includes "a main server layer having at least one main

server system, a parent server layer having a plurality of parent server systems, and an edge server layer having a plurality of edge server systems." Ex-1006 ¶9. Russell further teaches that the main server "publishes instructions" to the parent and edge servers in the form of "an XML document containing a list of all content items" available on the main server with additional information such as whether a content item is "hot" and "geographic restrictions." Ex-1006 ¶81. Based on the instructions, the edge server determines whether it's "storing all of the appropriate content items and, if not," requests them "from a parent server." Ex-1006 ¶82. Russell also teaches that "the main server provides the user's UND with a" URL that allows "the user to connect to an edge server to download" a "file containing the selected content item." Ex-1006 ¶12.

Menon teaches a metadata enabled server for distributing content objects to users over a network in response to user requests. Ex-1007 ¶35. Menon further teaches that a directory "organizes metadata for individual content items typically in the form of a … (URL) for the item." Ex-1007 ¶47. Menon also teaches that the metadata is distributed "to a plurality of locations (e.g to the origin server and edge servers, or to the origin server, edge servers, and directory servers[])]." Ex-1007 ¶84.

A POSITA would have been motivated to implement Russell's instructions to include metadata because it was known that metadata may be "used as a vehicle and mechanism to enable intelligent decisions to be made on content distribution system

operation." Ex-1007, Abstract; Ex-1002 ¶195. A POSITA would have also been motivated to implement Russell's instructions with metadata in the form of a URL that links to the content, as taught by Menon, because URLs were a well-known mechanism for easily locating and accessing web resources and simplifying communication between applications. Ex-1002 ¶195. In the Russell-Menon combination, the instructions stored at Russell's main server and distributed to the other servers would include metadata in the form of a URL that links to the content, as taught by Menon. Ex-1002 ¶¶195-196.

A POSITA would have had a reasonable expectation of success in combining the teachings of Russell and Menon. Ex-1002 ¶197. Both describe methods for enabling efficient distribution of media content within a tiered server network infrastructure. Ex-1006, Abstract, ¶6; Ex-1007, Abstract, ¶42, Fig. 3. A POSITA would thus have understood that these references disclose interrelated teachings based on well-understood technologies that would have been amenable to various well-understood and predictable combinations. Ex-1002 ¶197.

2. Independent Claim 1

a. Element 1[pre]:

Russell alone or Russell in view of Menon ("Russell-Menon") teaches the preamble. Ex-1002 ¶¶198-200.

Russell teaches delivering content over a network. Ex-1006, Abstract. The

system's "network architecture includes three or more layers of servers, including a main server supporting an interface for recipient processors to request content items, a plurality of parent servers, and a plurality of edge servers." Ex-1006, Abstract. Russell further teaches that "[a] copy of each content item available through the service is distributed from the main server to each parent servers for storage" and "[p]arent servers distribute content to edges servers, pursuant to instructions from the main server or requests from the edge servers." Ex-1006, Abstract.

b. Element 1[a][1]:

Russell or Russell-Menon teaches Element 1[a][1]. Ex-1002 ¶¶201-202.

Ground 3: As shown in annotated Figures 1-2 below, Russell teaches a first server (i.e., main server (red)), which is communicatively coupled with a plurality of cache servers called parent servers (green, yellow). Ex-1006, Figs. 1-2.

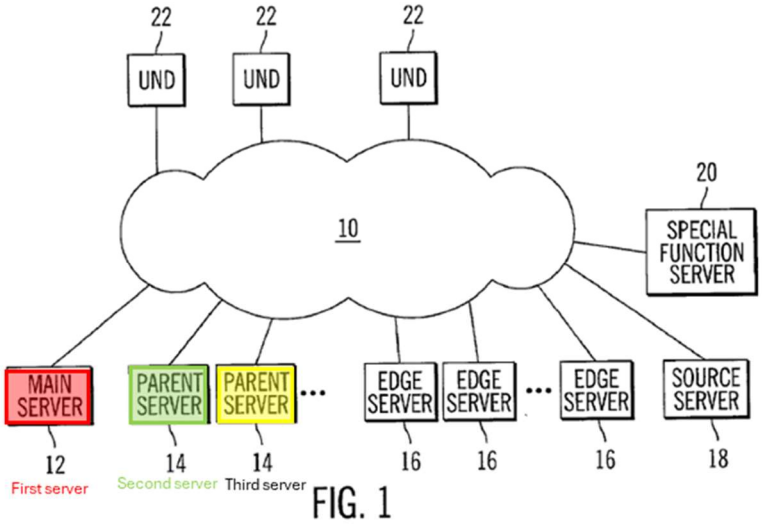


FIG. 1

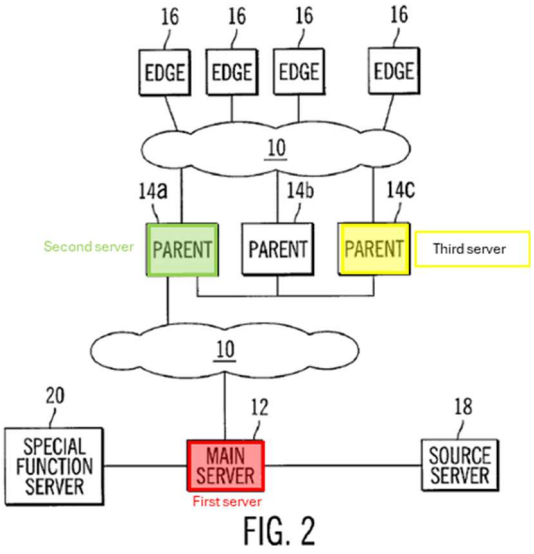


FIG. 2

Russell's network architecture includes "***a main server layer*** having at least one main server," "***a parent server layer*** having a plurality of parent server[s]," and "an edge server layer having a plurality of edge server[s]." Ex-1006 ¶9. Russell teaches that "***[a] copy of each content item*** available through the server ***may be*** stored by the main server and distributed to and ***stored by each parent server***." Ex-1006 ¶10. Russell further teaches that parent servers "provide three centralized locations for data storage" and are "operated as ***cache servers***, for cache storage and distribution of content items to the edge servers." Ex-1006 ¶¶64, 61.

Russell also teaches that the main server (i.e., first server) "stores a first plurality of data objects." As shown in Figure 3 below, Russell teaches that main server system 12 includes CMS server 38 "for controlling the distribution of content and ***instructions to parent servers 14***." Ex-1006 ¶63, Fig. 3; *see also id.*, ¶73. Russell further teaches that "main server 12 publishes an XML document containing a list

of all content items … available" on main server 12 with additional information such as, for example, whether a content item is marked "hot" and "geographic restrictions." Ex-1006 ¶81. The instructions stored at main server system 12 and distributed to the other servers, for example, as an XML document describing the content and how it should be distributed correspond to the recited "plurality of data objects" because they are essentially metadata that provide information about the content and point to its location. Ex-1002 ¶203. It would have been obvious that Russell's instructions could also include metadata, as taught by Menon. *Id*.

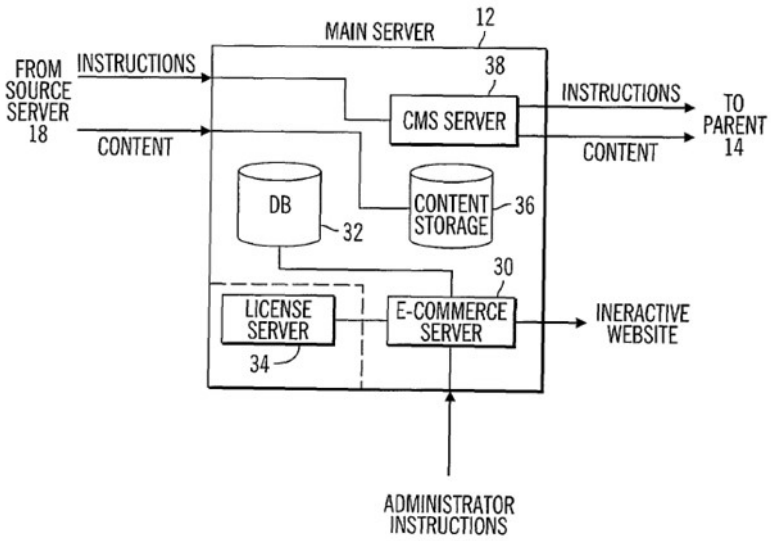


FIG. 3

Ground 4: Menon teaches a "***metadata enabled server*** for distributing content object to user over network in response to user request" which includes "a storage device coupled to server and ***storing metadata*** describing content objects accessible to the server ***including a location*** from where a content object is stored and may be

directed to the user; and a controller for distributing the content object to the user using the metadata." Ex-1007 ¶35. Russell or Russell-Menon thus teaches the "data objects" limitation under either parties' construction because it teaches "metadata about a particular media asset, distinct from the asset itself" and more broadly teaches a "data structure that contains information about a media asset." Ex-1002 ¶¶204-206.

In the Russell-Menon combination, the instructions stored at Russell's CMS server subsystem and distributed to the other servers would include metadata describing the content and a location from where the content object may be retrieved, as taught by Menon. A POSITA would have been motivated to combine Russell-Menon and had a reasonable expectation of success in doing so for the reasons described in Section XII.B.1.

c. Element 1[a][2]:

Russell or Russell-Menon teaches Element 1[a][2]. Ex-1002 ¶¶207-208.

Russell teaches that "[e]dge servers may be located in populated areas, such as in or near large cities," "[p]arent servers may be spaced across the service region to provide support for edge servers," and "content items are distributed to and stored on the parent and edge servers, from the main server." Ex-1006 ¶10. As shown in annotated Figure 2 below, the first server (i.e., main server (red)) is located at a first location relative to the other servers in the system. Ex-1006, Fig. 2.

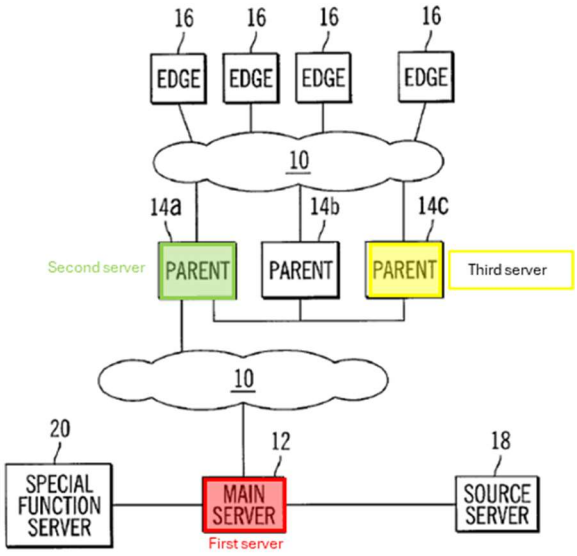


FIG. 2

d. Element 1[a][3]:

Russell or Russell-Menon teaches Element 1[a][3]. Ex-1002 ¶209.

Ground 3: Russell teaches that each of the first plurality of data objects (i.e., instructions) comprise a link to one of a plurality of media assets (i.e., content) because, as explained in Section XII.B.2.b, they are essentially metadata that point to the location of the content. Ex-1002 ¶210. Moreover, Russell teaches that "[w]hen a user purchases a license for a selected content item ***the main server provides the user's UND with a URL*** … that will allow the user ***to connect to an edge server to download*** an encrypted electronic file containing the selected content item." Ex-1006 ¶12. A POSITA would have also understood that using links such as URLs to identify and fetch content was well-known, as taught by Menon. Ex-1002 ¶210.

Ground 4: Menon teaches that the "metadata consists of (i) a globally unique identifier that identifies and optionally describes the content associated with the metadata, and (ii) a location or locations at which the content may be found" such as "the origin server identifier." Ex-1007 ¶63. For example, "when a user makes a selection (such as by identifying a URL) for a video … ***the metadata (MD) corresponding to the selected URL*** is examined to see if the corresponding video object is in the cache." Ex-1007 ¶50; *see also id.*, ¶¶47 (directory "***organizes metadata*** for individual content items typically ***in the form of a … (URL)*** for the item"), 86 ("user essentially transmits a URL … for the video … to the network"). The metadata is distributed "to a plurality of locations (e.g to the origin server and edge servers, or to the origin server, edge servers, and directory servers[)]." Ex-1007 ¶84. In the Russell-Menon combination, Russell's first plurality of data objects (i.e., Russell's instructions and/or Menon's metadata) would include a URL that links to the media asset. Ex-1002 ¶¶211-212.

e. Element 1[a][4]:

Russell or Russell-Menon teaches Element 1[a][4]. Ex-1002 ¶¶213-216.

Ground 3: As shown in annotated Figure 2 below, Russell teaches that the plurality of media assets may be stored at a separate source server (maroon) location separate from the main server (red) location. Ex-1006, Fig. 2.

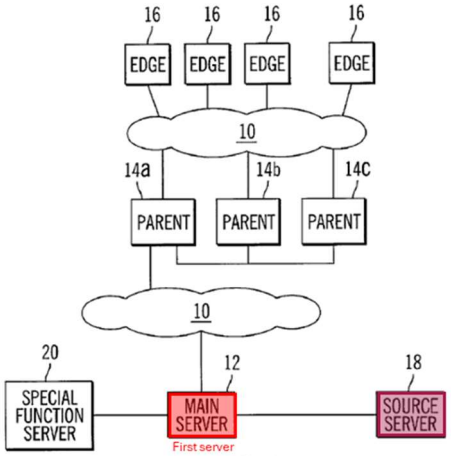


FIG. 2

Russell teaches that "[t]he ***content items*** (such as, movies) ***may be supplied to the main server 12*** by content owners or holders (such as movie studios or other suitable sources) … ***from a source server 18***." Ex-1006 ¶32. Specifically, "main server system 12" connects to source server 18 to receive content items "and/or instructions relating to distribution of content items from the source server(s) … through the network 10 or through any other suitable means." Ex-1006 ¶57. Additionally, Russell's parent servers are located at a different location from the main server. Therefore, the plurality of media assets are stored at a second location separate from the first location.

Ground 4: Menon also teaches that the plurality of media assets are stored at a second location separate from the first location for the reasons described in Section XII.A.2.e.

f. Element 1[b][1]:

Russell or Russell-Menon teaches Element 1[b][1]. Ex-1002 ¶¶217-219.

Ground 3: As shown in annotated Figures 1-2 below, Russell teaches a second server (green). Ex-1006, Figs. 1-2.

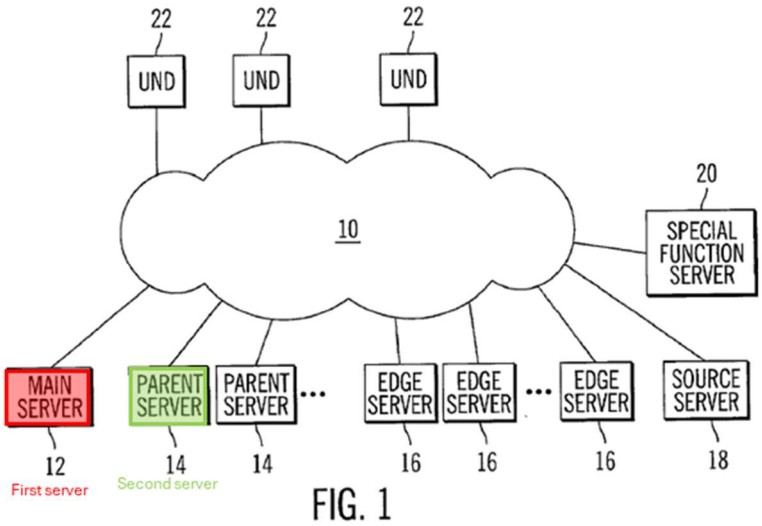


FIG. 1

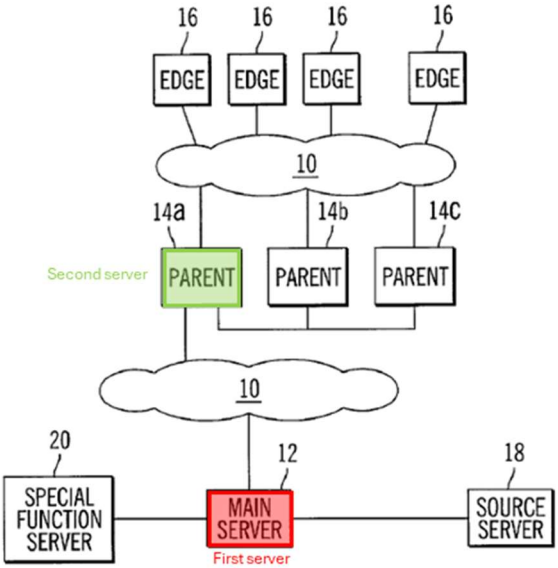


FIG. 2

Russell teaches that the second server stores a second plurality of data objects (i.e., instructions) and is configured to request a data object from the first server if the data object is not present at the second server. Specifically, Russell teaches that

"[a] copy of each content item available through the server may be stored by the main server and distributed to and stored by each parent server." Ex-1006 ¶10. Russell further teaches that main server system 12 includes CMS server 38 "for controlling the distribution of content and ***instructions to parent servers 14***." Ex-1006 ¶¶63, 73. Moreover, Russell teaches that parent servers 14 "determine which content items (such as movies) to store … using a combination of instructions originating from the main server 12 and/or a least recently used ('LRU') algorithm." Ex-1006 ¶68.

Ground 4: It would have been obvious to implement Russell's instructions to include metadata, as taught by Menon. *See* Section XII.B.2.b; Ex-1002 ¶¶220-221.

g. Element 1[b][2]:

Russell or Russell-Menon teaches Element 1[b][2]. Ex-1002 ¶¶222-223.

Russell teaches that the second server is one of the plurality of cache servers. Specifically, Russell teaches that "***parent servers 14*** may be operated as ***cache servers***, for cache storage and distribution of content items to the edge servers 16." Ex-1006 ¶64, Fig. 2. Russell further teaches that "one parent cache server may be located near the west coast, another parent cache server may be located near the east coast and a further parent cache server may be located in the central portion of the country." Ex-1006 ¶64.

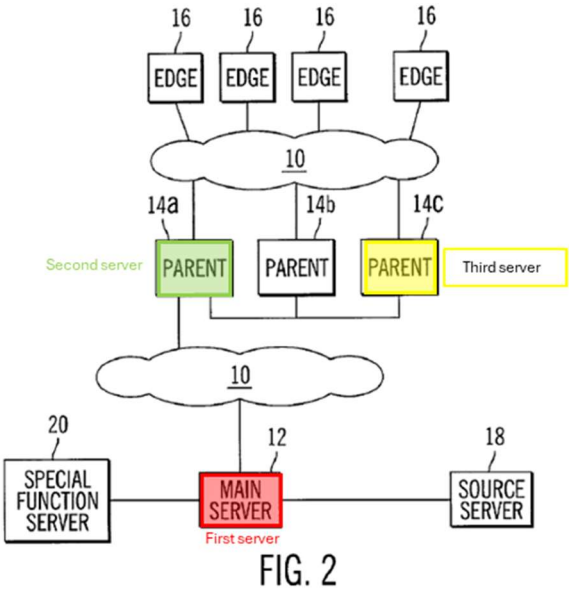


FIG. 2

h. Element 1[b][3]:

Russell or Russell-Menon teaches Element 1[b][3]. Ex-1002 ¶¶224-225.

As shown in annotated Figures 1-2 below, Russell's second server (green) is communicatively coupled to a plurality of edge servers such as a fourth server (purple) and fifth server (orange). Ex-1006, Figs. 1-2. Russell teaches that its network of servers are "***connected for communication*** on a wide area network, such as the Internet, ***with recipient processors***, for example, network enabled user network devices (UNDs)." Ex-1006 ¶9. The server architecture includes "a main server layer having at least one main server," "***a parent server layer*** having a plurality of parent server[s]," and "***an edge server layer*** having a plurality of edge server[s]." Ex-1006 ¶9, Cl. 1.

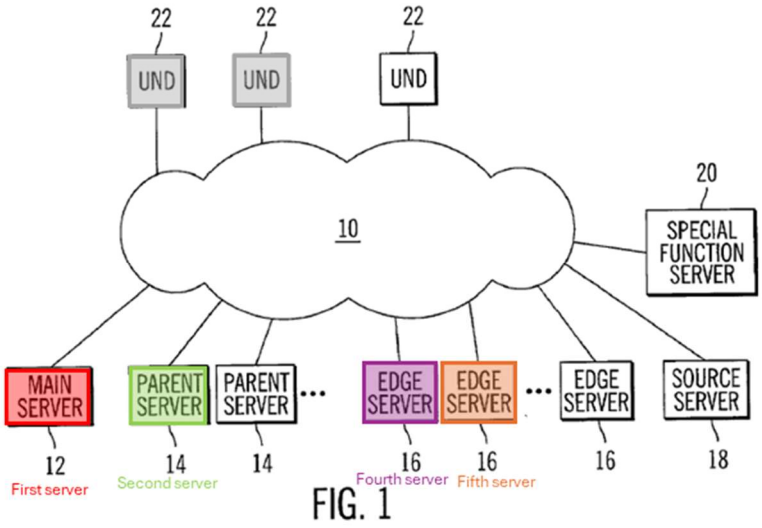


FIG. 1

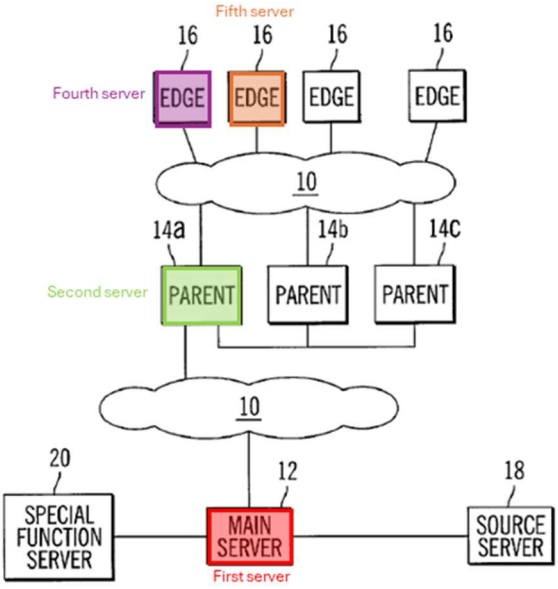


FIG. 2

Russell's edge servers are application servers. Russell teaches that "[t]he ***edge servers*** are distributed throughout a region in which the system ***provides content delivery services to users*** on UNDs." Ex-1006 ¶10. Moreover, Russell teaches that "[a] user of a UND interacts with the main server for browsing and conducting commercial transactions" but "the main server redirects the UNDs … to edge servers

16 for downloading content items." Ex-1006 ¶33; *see also id.*, ¶¶30 ("functions and operations of the UNDs and servers described herein may be implemented in any suitable manner, including … software running on the associated server or UND"), 55 ("network system implements a division of functions of business logic and storage" where "downloads to user's are handled by the edge servers"). Each edge server receives instructions from the parent and/or main servers and "determine[s] whether or not its associated storage facility is storing all of the appropriate content items and, if not," it requests "appropriate content items from a parent server." Ex-1006 ¶82. Russell further teaches that "[o]nce the content items are sufficiently distributed to edge servers 16, users may access the system through the interface" to "search and select content items and submit a request to download content items, and purchase (or otherwise obtain) a license for content items." Ex-1006 ¶87. A POSITA would have understood that the edge servers are application servers because they are implemented by software and act as a middle layer between the client interface and the cache servers to respond to client requests for content. Ex-1002 ¶¶226-227.

i. Element 1[c][1]:

Russell or Russell-Menon teaches Element 1[c][1]. Ex-1002 ¶¶228-230.

Ground 3: As shown in annotated Figures 1-2 below, Russell teaches a third server (yellow), which is a server in the parent region. Ex-1006, Figs. 1-2.

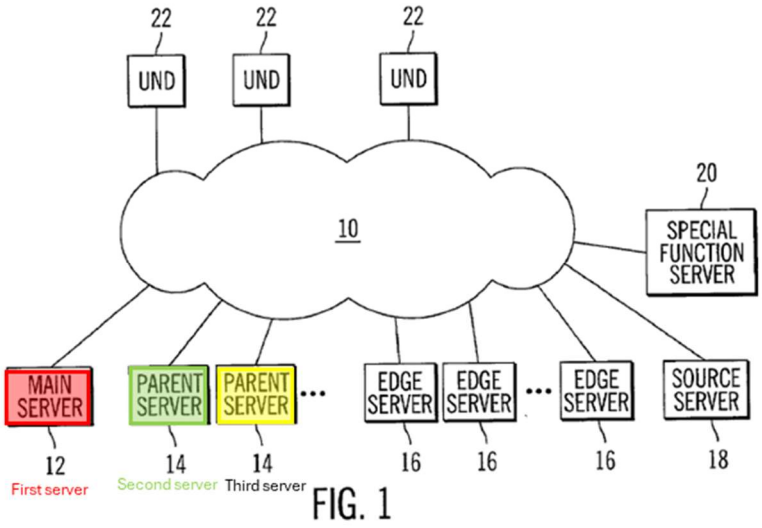


FIG. 1

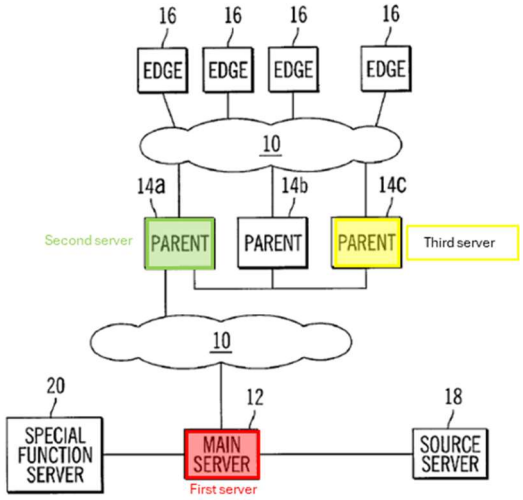


FIG. 2

Russell teaches that the third server stores a third plurality of data objects (i.e., instructions) and is configured to request a data object from the first server if the data object is not present at the third server for the reasons described in Section XII.B.2.f.

Ground 4: It would have been obvious to implement Russell's instructions to include metadata, as taught by Menon. *See* Section XII.B.2.b; Ex-1002 ¶¶231-232.

j. Element 1[c][2]:

Russell or Russell-Menon teaches Element 1[c][2]. Ex-1002 ¶¶233-234.

Russell teaches that the third server is one of the plurality of cache servers for the reasons described in Section XII.B.2.g.

k. Element 1[c][3]:

Russell or Russell-Menon teaches Element 1[c][3]. Ex-1002 ¶235.

As shown in annotated Figures 1-2 below, Russell's third server (yellow) is communicatively coupled to a plurality of edge servers such as a sixth server (blue) and seventh server (pink). Ex-1006, Figs. 1-2 (brown dashed boxes added). As explained in Section XII.B.2.h, the edge servers are application servers. Ex-1002 ¶¶236-237.

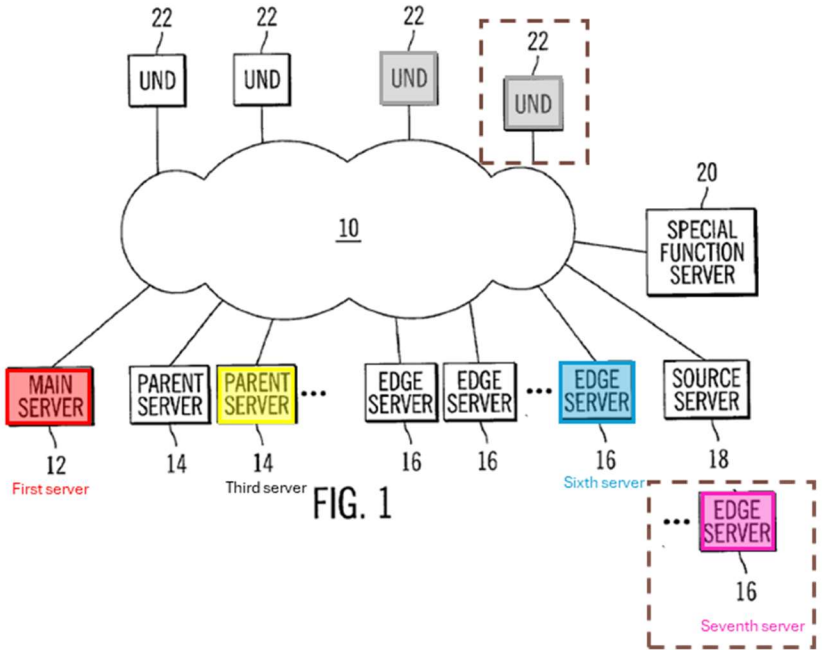


FIG. 1

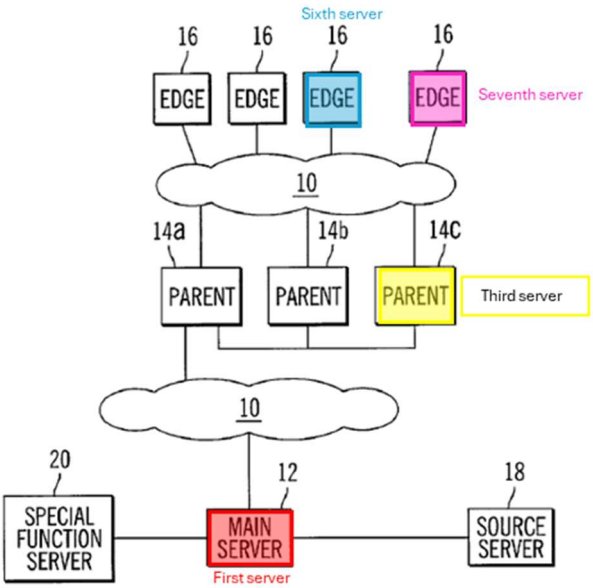


FIG. 2

l. Element 1[d][1]:

Russell or Russell-Menon teaches Element 1[d][1]. Ex-1002 ¶¶238-240.

Ground 3: As shown in annotated Figures 1-2 below, Russell teaches a fourth server (purple). Ex-1006, Figs. 1-2. Russell teaches that "edge servers are distributed throughout a region in which the system provides content delivery services to users on UNDs" and "content items are distributed to and stored on the parent and edge servers, from the main server." Ex-1006 ¶10.

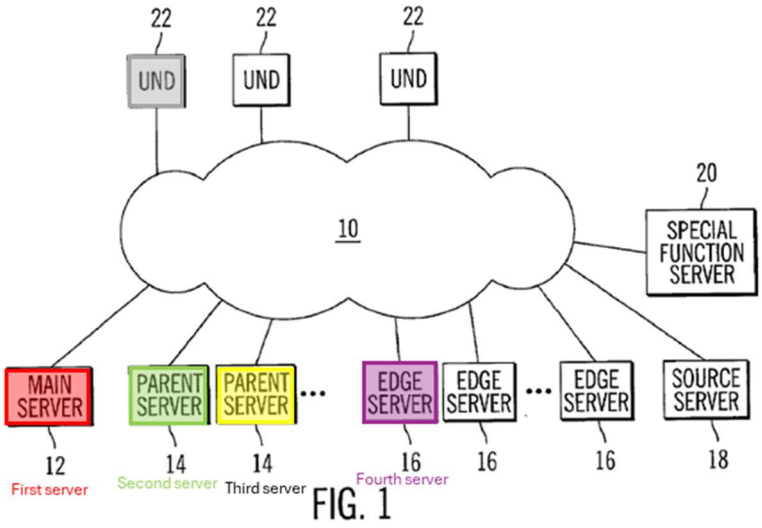


FIG. 1

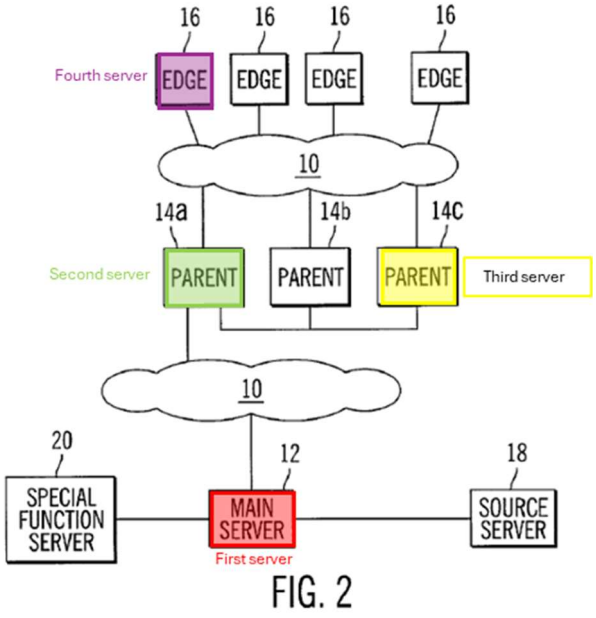


FIG. 2

Russell teaches that the fourth server stores a fourth plurality of data objects (i.e., instructions) and is configured to request the data object from the second server if the data object is not present at the fourth server. Specifically, Russell teaches that edge servers 16 "determine which content items (such as movies) to store … ***using*** a combination of ***instructions*** originating from the main server 12 ***and/or*** a least

recently used ***('LRU') algorithm***." Ex-1006 ¶68. Specifically, "***main server 12 publishes instructions to*** the parent servers 14 and the ***edge servers 16*** and the parent servers republish instructions to edge servers." Ex-1006 ¶81. Russell further teaches "[b]ased on such instructions, each edge server 16 may determine whether or not its associated storage facility is storing all of the appropriate content items and, if not, … ***request appropriate content items from a parent server***." Ex-1006 ¶82.

Ground 4: It would have been obvious to implement Russell's instructions to include metadata, as taught by Menon. *See* Section XII.B.2.b; Ex-1002 ¶¶241-242.

m. Element 1[d][2]:

Russell or Russell-Menon teaches Element 1[d][2]. Ex-1002 ¶243.

Russell teaches that the fourth server is one of the first plurality of application servers for the reasons described in the previous section and Section XII.B.2.h. Ex-1002 ¶244.

n. Element 1[d][3]:

Russell or Russell-Menon teaches Element 1[d][3]. Ex-1002 ¶¶245-247.

Ground 3: Russell teaches that the fourth server is configured to receive a request from a first client for the data object. As shown in annotated Figure 1 below, the fourth server (purple) communicates with the client (grey) to receive requests for data objects and provide the corresponding content. Ex-1006, Fig. 1.

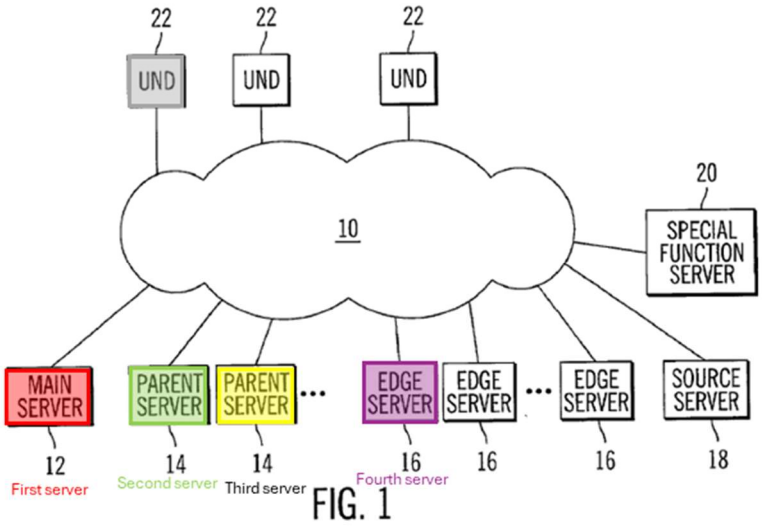


FIG. 1

Russell teaches that "edge servers 16 provide distributed storage which, preferably, is comparatively local to users" and "strategically located near areas in which a high volume of usage is expected, such as on or near a college campus or associated with a college server." Ex-1006 ¶67. Russell further teaches that "when the user attempts to access the content item, the URL provided to the user will be resolved by a DNS (domain name server) to connect the user to the appropriate edge server 16 … for the download request." Ex-1006 ¶89. For example, "the URL may include address information for a specific edge server 16 to which the user's request is to be sent." Ex-1006 ¶89; *see also id.*, ¶¶33.

Ground 4: It would have been obvious to implement Russell's instructions to include metadata, as taught by Menon. *See* Section XII.B.2.b; Ex-1002 ¶¶248-249.

o. Element 1[e][1]:

Russell or Russell-Menon teaches Element 1[e][1]. Ex-1002 ¶¶250-252.

Ground 3: As shown in annotated Figures 1-2 below, Russell teaches a fifth server (orange). Ex-1006, Figs. 1-2.

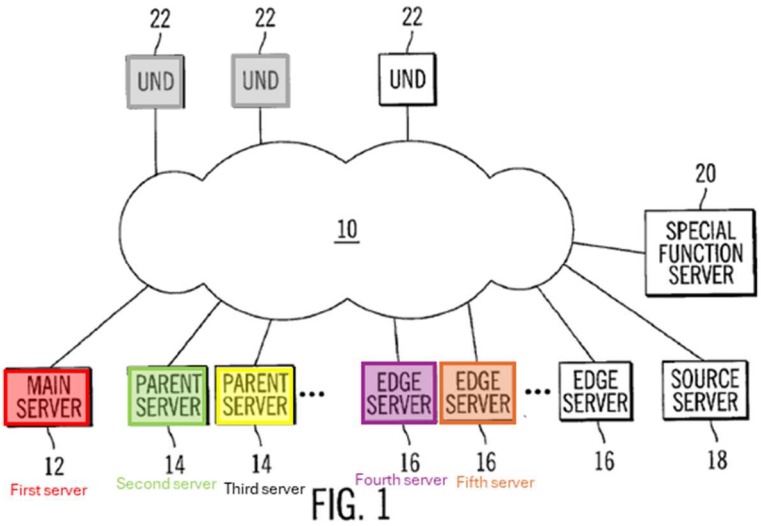


FIG. 1

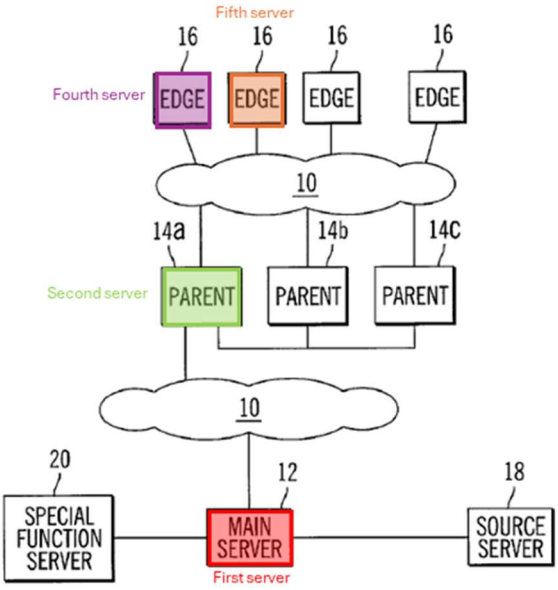


FIG. 2

Russell teaches that the fifth server stores a fifth plurality of data objects (i.e., instructions) and is configured to request the data object from the second server if

the data object is not present at the fifth server for the reasons described in Section XII.B.2.l.

Ground 4: It would have been obvious to implement Russell's instructions to include metadata, as taught by Menon. *See* Section XII.B.2.b; Ex-1002 ¶¶253-254.

p. Element 1[e][2]:

Russell or Russell-Menon teaches Element 1[e][2]. Ex-1002 ¶255.

Russell teaches that the fifth server is one of the first plurality of application servers for the reasons described in the previous section and Section XII.B.2.h. Ex-1002 ¶256.

q. Element 1[e][3]:

Russell or Russell-Menon teaches Element 1[e][3]. Ex-1002 ¶¶257-258.

Ground 3: Russell teaches that the fifth server is configured to receive a request from a second client for the data object. As shown in annotated Figure 1 below, the fifth server (orange) communicates with the client (grey) to receive requests for data objects and provide the corresponding content. Ex-1006, Fig. 1. *See also* Section XII.B.2.n.

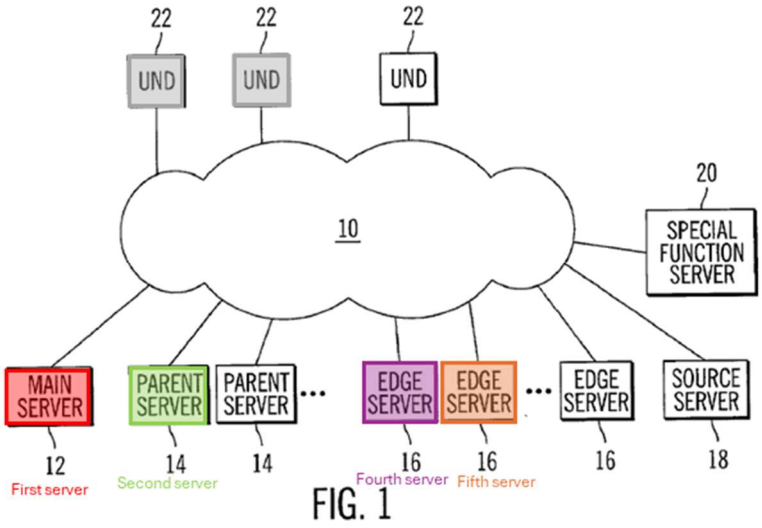


FIG. 1

Ground 4: It would have been obvious to implement Russell's instructions to include metadata, as taught by Menon. *See* Section XII.B.2.b; Ex-1002 ¶¶259-260.

r. Element 1[f][1]:

Russell or Russell-Menon teaches Element 1[f][1]. Ex-1002 ¶¶261-263.

Ground 3: As shown in annotated Figures 1-2 below, Russell teaches a sixth server (blue). Ex-1006, Figs. 1-2.

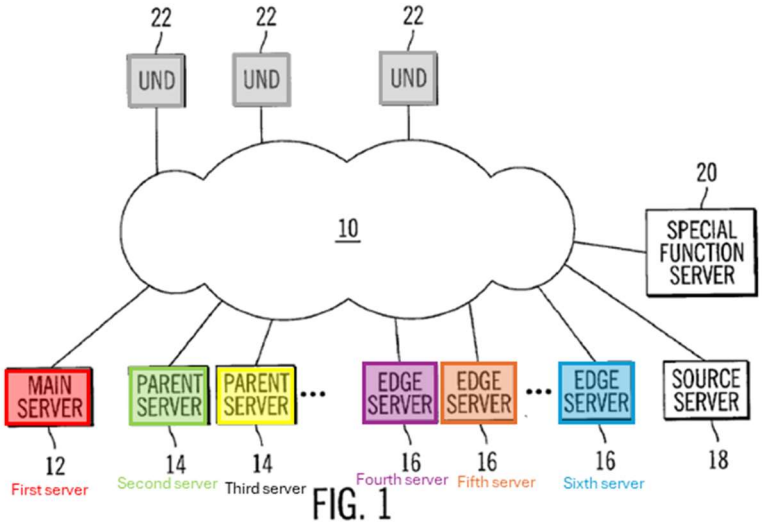


FIG. 1

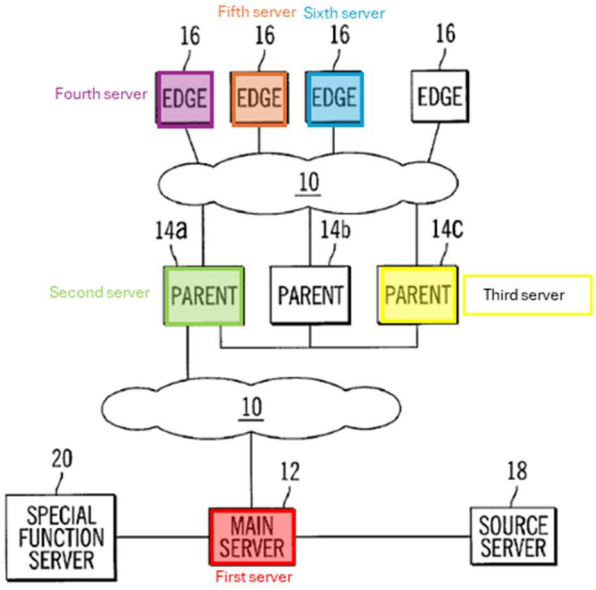


FIG. 2

Russell teaches that the sixth server stores a sixth plurality of data objects (i.e., instructions) and is configured to request the data object from the third server if the data object is not present at the sixth server for the reasons described in Section XII.B.2.l.

Ground 4: It would have been obvious to implement Russell's instructions to include metadata, as taught by Menon. *See* Section XII.B.2.b; Ex-1002 ¶¶264-265.

s. Element 1[f][2]:

Russell or Russell-Menon teaches Element 1[f][2]. Ex-1002 ¶266.

Russell teaches that the sixth server is one of the second plurality of application servers for the reasons described in the previous section and Sections XII.B.2.h and XII.B.2.k. Ex-1002 ¶267.

t. Element 1[f][3]:

Russell or Russell-Menon teaches Element 1[f][3]. Ex-1002 ¶¶268-269.

Ground 3: Russell teaches that the sixth server is configured to receive a request from a third client for the data object. As shown in annotated Figure 1 below, the sixth server (blue) communicates with the client (grey) to receive requests for data objects and provide the corresponding content. Ex-1006, Fig. 1. *See also* Section XII.B.2.n.

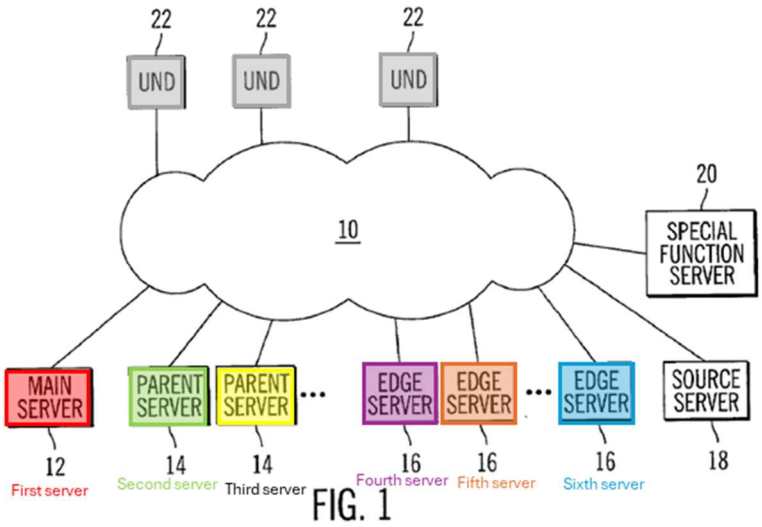


FIG. 1

Ground 4: It would have been obvious to implement Russell's instructions to include metadata, as taught by Menon. *See* Section XII.B.2.b; Ex-1002 ¶¶270-271.

u. Element 1[g][1]:

Russell or Russell-Menon teaches Element 1[g][1]. Ex-1002 ¶¶272-274.

Ground 3: As shown in annotated Figures 1-2 below, Russell teaches a seventh server (pink). Ex-1006, Figs. 1-2 (brown dashed boxes added).

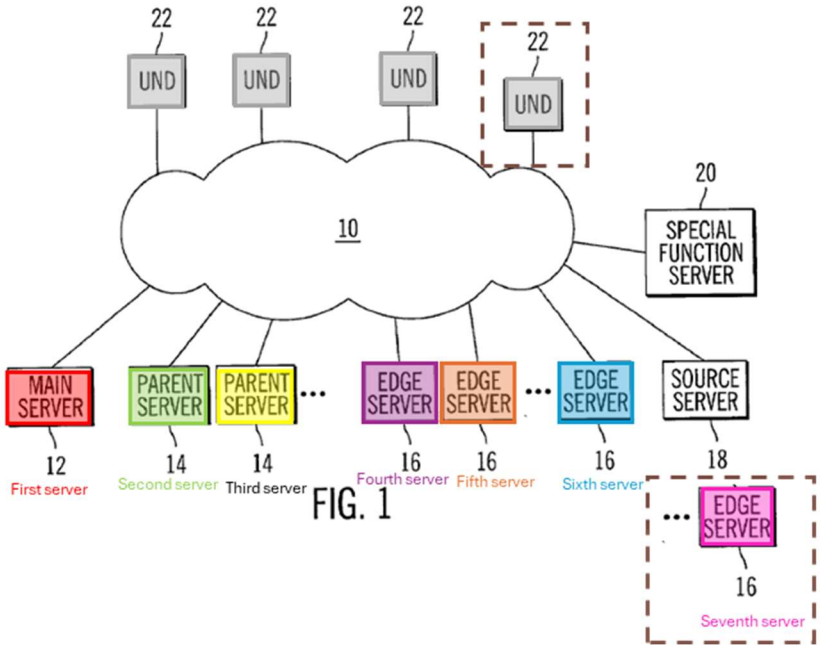


FIG. 1

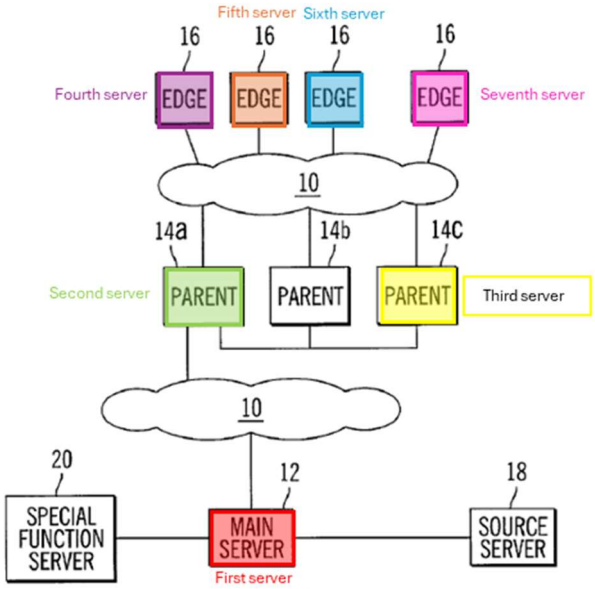


FIG. 2

Russell teaches that the seventh server stores a seventh plurality of data objects (i.e., instruction) and is configured to request the data object from the third server if the data object is not present at the seventh server for the reasons described in Section XII.B.2.l.

Ground 4: It would have been obvious to implement Russell's instructions to include metadata, as taught by Menon. *See* Section XII.B.2.b; Ex-1002 ¶¶275-276.

v. Element 1[g][2]:

Russell or Russell-Menon teaches Element 1[g][2]. Ex-1002 ¶277.

Russell teaches that the seventh server is one of the second plurality of application servers for the reasons described in the previous section and Sections XII.B.2.h and XII.B.2.k. Ex-1002 ¶278.

w. Element 1[g][3]:

Russell or Russell-Menon teaches Element 1[g][3]. Ex-1002 ¶¶279-280.

Ground 3: Russell teaches that the seventh server is configured to receive a request from a fourth client for the data object. As shown in annotated Figure 1 below, the seventh server (pink) communicates with the client (grey) to receive requests for data objects and provide the corresponding content. Ex-1006, Fig. 1 (brown dashed boxes added). *See also* Section XII.B.2.n.

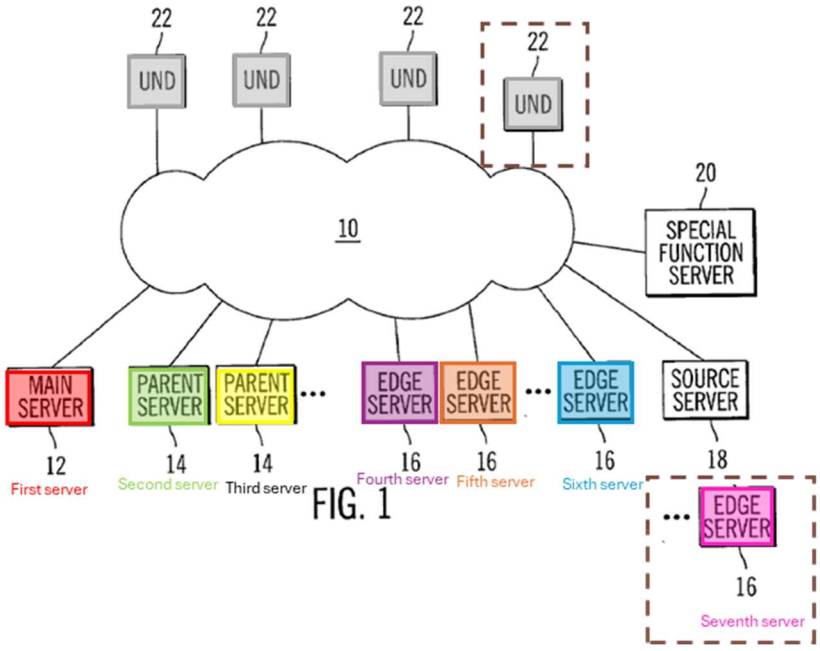


FIG. 1

Ground 4: It would have been obvious to implement Russell's instructions to include metadata, as taught by Menon. *See* Section XII.B.2.b; Ex-1002 ¶¶281-283.

Thus, Russell alone or Russell-Menon renders obvious Claim 1.

3. Independent Claim 5

a. Element 5[pre]:

Russell or Russell-Menon teaches the preamble. *See* Section XII.B.2.a. Ex-1002 ¶284.

b. Element 5[a][1]:

Russell or Russell-Menon teaches Element 5[a][1] *See* Sections XII.B.2.b and XII.B.2.f-XII.B.2.j; Ex-1006, Figs. 1-2; Ex-1002 ¶285.

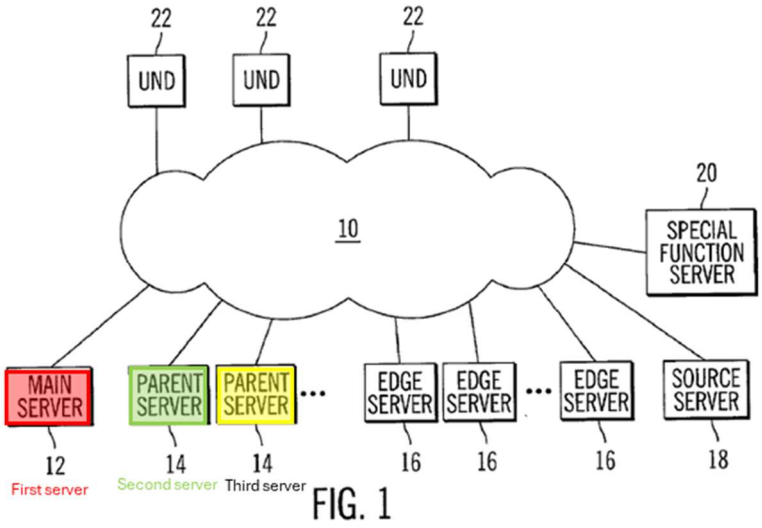


FIG. 1

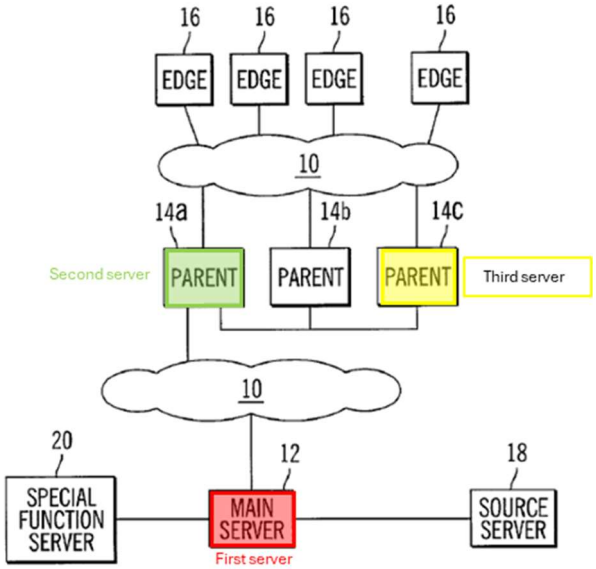


FIG. 2

c. Element 5[a][2]:

Russell or Russell-Menon teaches Element 5[a][2]. *See* Section XII.B.2.c. Ex-1002 ¶286.

d. Element 5[a][3]:

Russell or Russell-Menon teaches Element 5[a][3]. *See* Section XII.B.2.d. Ex-1002 ¶287.

e. Element 5[a][4]:

Russell or Russell-Menon teaches Element 5[a][4]. *See* Section XII.B.2.e. Ex-1002 ¶288.

f. Element 5[b][1]:

Russell or Russell-Menon teaches Element 5[b][1]. *See* Section XII.B.2.f. Ex-1002 ¶289.

g. Element 5[b][2]:

Russell or Russell-Menon teaches Element 5[b][2]. *See* Sections XII.B.2.h and XII.B.2.l-XII.B.2.q; Ex-1006, Figs. 1-2; Ex-1002 ¶290.

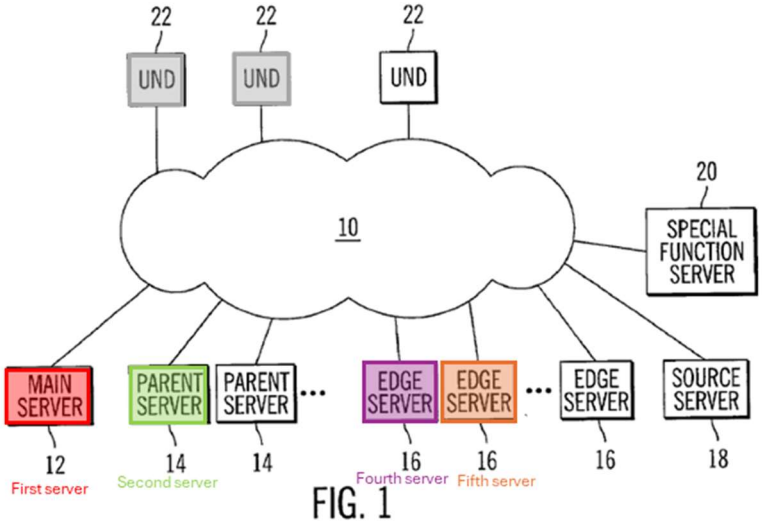


FIG. 1

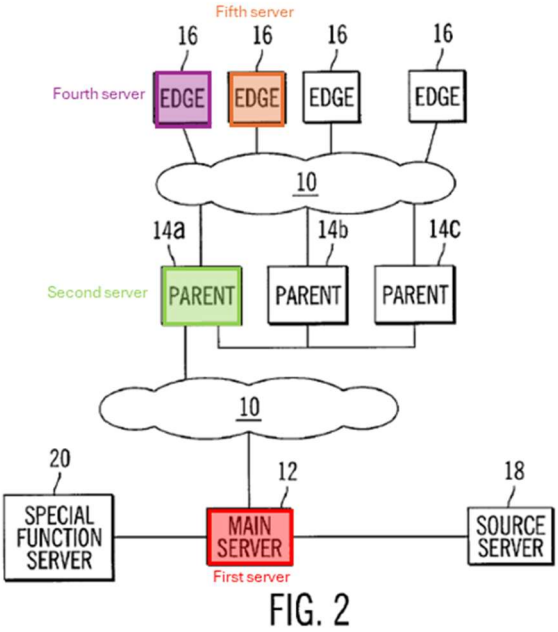


FIG. 2

h. Element 5[c][1]:

Russell or Russell-Menon teaches Element 5[c][1]. *See* Section XII.B.2.l. Ex-1002 ¶291.

i. Element 5[c][2]:

Russell or Russell-Menon teaches Element 5[c][2]. *See* Section XII.B.2.n. Ex-1002 ¶¶292-293.

Thus, Russell alone or Russell-Menon renders obvious Claim 5.

4. Dependent Claims 2-4 and 6-13

a. Claim 2:

Russell or Russell-Menon teaches Claim 2. Ex-1002 ¶¶294-296.

Russell teaches Claim 2 for the reasons described in Section XII.B.2.e, namely, because the media assets (i.e., content) are stored at a source server

communicatively connected to but at a separate location from the main server. Ex-1006 ¶¶32, 57. Russell also teaches that the content is stored at parent and edge servers in the network, at locations separate from the main server. Specifically, "downloads to user's are handled by the edge servers" and "distribution to the edge servers is handled by the parent servers." Ex-1006 ¶55. Moreover, CMS server 38 at the main server controls "the distribution of content and instructions to parent servers … based on instructions received from" the source server. Ex-1006 ¶63; *see also id.*, ¶9.

b. Claim 3

(1) Element 3[pre]:

Russell or Russell-Menon teaches Element 3[pre]. *See* Section XII.B.2.a. Ex-1002 ¶297.

(2) Element 3[a]:

Russell or Russell-Menon teaches Element 3[a]. Ex-1002 ¶298.

Ground 3: Russell teaches that the edge servers, parent servers, and/or main server "determine which content items (such as movies) to store … using a ***combination of instructions*** originating from the main server 12 ***and/or a least recently used ('LRU') algorithm***." Ex-1006 ¶68. For example, "parent cache servers 14 communicate … content items to various edge servers 16, initially based on instructions provided from the main server 12" and later "***based on a combination***

of such instructions and other information" such as "information obtained ***from an LRU algorithm***." Ex-1006 ¶85; *see also id.*, ¶¶82 ("Algorithms or other suitable means, such as LRU analysis, may be used in the determination of which content items to store at the various edge servers."), 83 ("[c]aching by edge servers 16 … follows LRU analysis"). Thus, Russell's data objects in the second plurality of data objects (i.e., instructions) are partially determined based on when requests for those data objects were last received at the second server. Ex-1002 ¶299.

Ground 4: It would have been obvious to implement Russell's instructions to include metadata, as taught by Menon. *See* Section XII.B.2.b; Ex-1002 ¶¶300-301.

(3) Element 3[b]:

Russell or Russell-Menon teaches Element 3[b]. *See* Section XII.B.4.b.2. Ex-1002 ¶302.

(4) Element 3[c]:

Russell or Russell-Menon teaches Element 3[c]. *See* Section XII.B.4.b.2. Ex-1002 ¶303.

(5) Element 3[d]:

Russell or Russell-Menon teaches Element 3[d]. *See* Section XII.B.4.b.2. Ex-1002 ¶304.

(6) Element 3[e]:

Russell or Russell-Menon teaches Element 3[e]. *See* Section XII.B.4.b.2. Ex-1002 ¶305.

(7) Element 3[f]:

Russell or Russell-Menon teaches Element 3[f]. *See* Section XII.B.4.b.2. Ex-1002 ¶306.

c. Claim 4:

Russell or Russell-Menon teaches Claim 4. Ex-1002 ¶¶307-308.

Ground 3: Russell teaches that the first plurality of data objects (i.e., instructions) comprises all data objects in the second, third, fourth, fifth, sixth, and seventh plurality of data objects because the main server is the central hub that transmits the instructions that control content distribution to all of the other servers. For example, Russell teaches that "[a] copy of each content item available through the server may be stored by the main server and distributed to and stored by each parent server," which "in turn, distribute content items to edge servers, ***pursuant to instructions from the main server*** or requests from the edge servers." Ex-1006 ¶10; *see also id.*, ¶¶66, 73, 81 (main server "publishes instructions" to parent and edge servers and "parent servers republish instructions to edge servers"). Russell also teaches that main server "store[s] all of the content accessible through the main

website" (Ex-1006 ¶55) and each edge server "stores less than all of the content items stored by the parent servers." Ex-1006 ¶78.

Ground 4: It would have been obvious to implement Russell's instructions to include metadata, as taught by Menon. *See* Section XII.B.2.b; Ex-1002 ¶¶309-310.

d. Claim 6:

Russell or Russell-Menon teaches Claim 6. *See* Section XII.B.4.c. Ex-1002 ¶311.

e. Claim 7

(1) Element 7[pre]:

Russell or Russell-Menon teaches Element 7[pre]. *See* Section XII.B.2.a. Ex-1002 ¶312.

(2) Element 7[a]:

Russell or Russell-Menon teaches Element 7[a]. *See* Section XII.B.2.i. Ex-1002 ¶313.

(3) Element 7[b]:

Russell or Russell-Menon teaches Element 7[b]. *See* Sections XII.B.2.g and XII.B.2.j. Ex-1002 ¶314.

(4) Element 7[c]:

Russell or Russell-Menon teaches Element 7[c]. *See* Sections XII.B.2.k and XII.B.2.r-XII.B.2.w. Ex-1006, Figs. 1-2 (brown dashed boxes added); Ex-1002 ¶315.

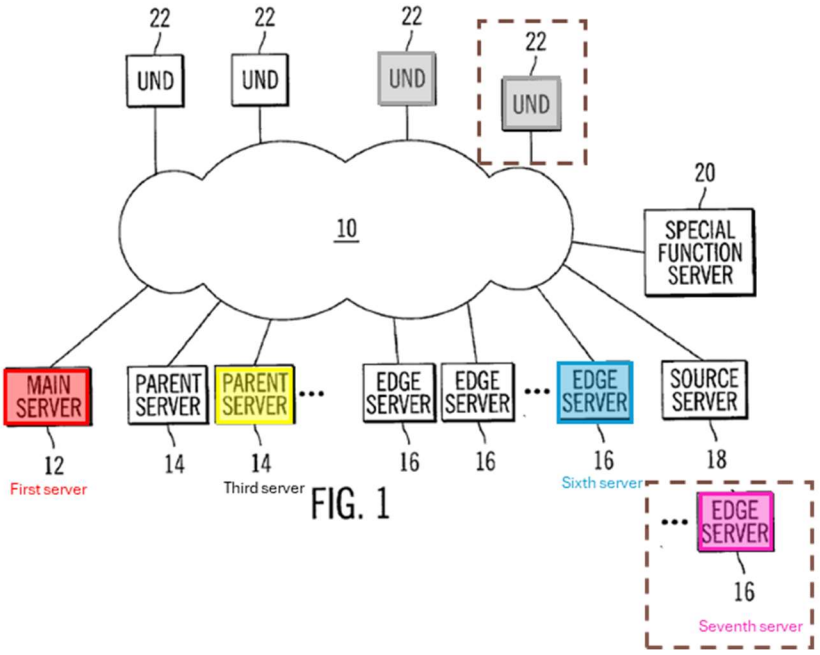


FIG. 1

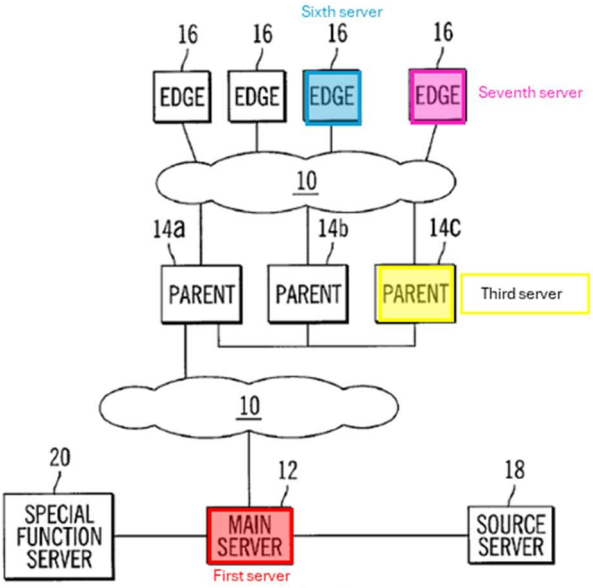


FIG. 2

f. Claim 8

(1) Element 8[pre]:

Russell or Russell-Menon teaches Element 8[pre]. *See* Section XII.B.2.a. Ex-1002 ¶316.

(2) Element 8[a]:

Russell or Russell-Menon teaches Element 8[a]. *See* Section XII.B.2.o. Ex-1002 ¶317.

(3) Element 8[b]:

Russell or Russell-Menon teaches Element 8[b]. *See* Sections XII.B.2.m and XII.B.2.p. Ex-1002 ¶318.

(4) Element 8[c]:

Russell or Russell-Menon teaches Element 8[c]. *See* Sections XII.B.2.q. Ex-1002 ¶319.

(5) Element 8[d]:

Russell or Russell-Menon teaches Element 8[d]. Ex-1002 ¶320.

Ground 3: Russell teaches that "one parent cache server may be located near the west coast, another parent cache server may be located near the east coast and a further parent cache server may be located in the central portion of the country." Ex-1006 ¶64. Russell further teaches that "***edge servers 16*** provide distributed storage … local to users" and "***may be physically spread throughout the service region***" with "[a]bout twenty to twenty-five" edge servers "located at selected locations across the region." Ex-1006 ¶67. Moreover, Russell teaches that edge servers "may be ***strategically located near areas in which a high volume of usage is expected***, such as on or near a college campus or associated with a college server." Ex-1006

¶67; *see also id.*, ¶10. As shown in annotated Figure 2 below, if the second server is located on the west coast, the fourth and fifth servers could be geographically separated in large cities in one or multiple states in the region. Ex-1006, Fig. 2; Ex-1002 ¶321.

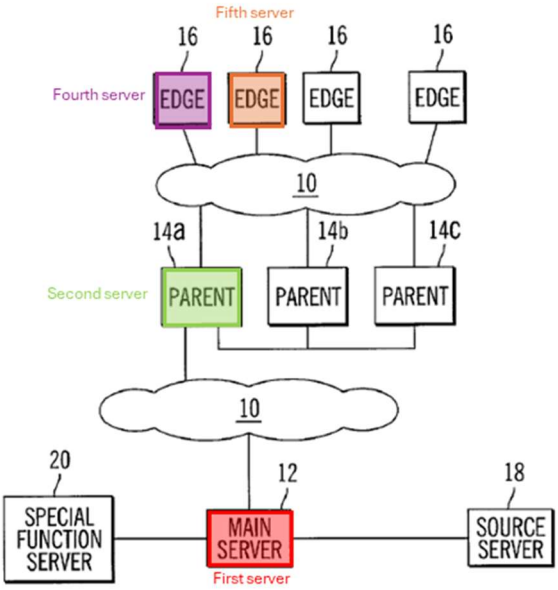


FIG. 2

Ground 4: Menon also teaches this claim for the reasons described in Section XII.A.4.f. Ex-1002 ¶322. In addition to the reasons described in Section XII.B.1, a POSITA would have been motivated to implement Menon's teachings in Russell because "[s]erving content from a cache closer to the end user [] improves performance." Ex-1007 ¶18; Ex-1002 ¶¶322-323.

g. Claim 9:

Russell or Russell-Menon teaches Claim 9. Ex-1002 ¶¶324-325.

Ground 3: Russell teaches that the request from the first client for the data object comprises a URL. Specifically, Russell teaches that "[w]hen a user purchases a license for a selected content item the main server provides the user's UND with ***a URL (uniform resource locator) that will allow the user to connect to an edge server to download*** an encrypted electronic file containing ***the selected content item***." Ex-1006 ¶12. The user inputs "the URL to the user's web browser immediately or wait[s] and download[s] the content item at a later time." Ex-1006 ¶12; *see also id.*, ¶88, Cl. 8. Russell further teaches that "when the user attempts to access the content item, ***the URL provided to the user will be resolved by a DNS (domain name server) to connect the user to the appropriate edge server 16*** … for the download request." Ex-1006 ¶89. "Alternatively, ***the URL may include address information for a specific edge server 16*** to which the user's request is to be sent." Ex-1006 ¶89

Ground 4: Menon also teaches this claim for the reasons described in Sections XII.B.2.b and XII.A.4.g. Ex-1002 ¶¶326-327.

h. Claim 10:

Russell or Russell-Menon teaches Claim 10. Ex-1002 ¶328.

Ground 3: Russell teaches that the instructions stored at the first server comprise a URL linked to the media asset for the reasons described in the previous section and Sections XII.B.2.b and XII.B.2.d. Moreover, Russell teaches that "the

user may browse through ***website text and images describing content items***, such as movies, available for downloading." Ex-1006 ¶35. And "[t]he website may provide the user with ***search and other functions to assist the user in locating*** and selecting content items." Ex-1006 ¶35; *see also id.*, ¶87. Russell further teaches that after the user selects a content item and pays a fee "the user may obtain a license and receive a" URL "from the main website," which "provides the user's UND with an address or the like, to direct the user to an edge server 16 from which the user may download the selected movie." Ex-1006 ¶36; *see also id.*, ¶¶88-89. The edge server then sends a query to the main server to authenticate the request, which includes "***information identifying the requested content item (for example, movie)***, the requesting user, and the user's current IP address." Ex-1006 ¶91. A POSITA would have understood that information identifying the requested content would include, for example, a title of the movie. Ex-1002 ¶329. Indeed, it would have been obvious to a POSITA that the instructions would include some sort of title or identifier for the content because the most obvious way to search for a movie is by its "title." Ex-1002 ¶329. This is also taught by Menon. Ex-1002 ¶329.

Ground 4: Menon teaches this claim for the reasons described in Sections XII.B.2.b and XII.A.4.h. Ex-1002 ¶¶330-331.

i. Claim 11:

Russell or Russell-Menon teaches Claim 11. *See* Section XII.B.4.b. Ex-1002 ¶332.

j. Claim 12:

Russell or Russell-Menon teaches Claim 12. *See* Section XII.B.4.b. Ex-1002 ¶333.

k. Claim 13:

Russell or Russell-Menon teaches Claim 13. *See* Sections XII.B.4.c and XII.B.4.d. Ex-1002 ¶¶334-336.

XIII. CONCLUSION

Petitioner requests institution of IPR for Claims 1-13 of the '987 Patent based on each of the grounds in this Petition.

Respectfully Submitted,

/s/ *Benjamin M. Haber*
Benjamin M. Haber (Reg. No. 67,129)

CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. §42.24(d), Petitioner certifies that this petition includes 13,947 words, as measured by Microsoft Word, exclusive of the table of contents, mandatory notices under §42.8, certificates of service, word count, and exhibits.

CERTIFICATE OF SERVICE (37 C.F.R. §42.6(e)(1))

The undersigned hereby certifies that the above document was served on October 31, 2025, by filing this document through the Patent Trial and Appeal Board P-TACTS System, as well as delivering a copy via express mail upon the following attorneys of record for the Patent Owner:

Haley Guiliano LLP
75 Broad Street
Suite 510
New York, NY 10004-3222

A courtesy copy was sent to the below counsel via electronic mail:

Bradley W. Caldwell
Jason D. Cassady
John Austin Curry
Brian D. Johnston
Caldwell Cassady & Curry PC
2121 N Pearl St., Suite 1200
Dallas, TX 75201
Telephone: (214) 888-4848
bcaldwell@caldwellcc.com
jcassady@caldwellcc.com
acurry@caldwellcc.com
bjohnston@caldwellcc.com

Brian E. Farnan
Michael J. Farnan
Farnan LLP
919 N. Market St., 12th Floor
Wilmington, Delaware 19801
Telephone: (302) 777-0300
bfarnan@farnanlaw.com
mfarnan@farnanlaw.com

Dated: October 31, 2025

Respectfully submitted,

/s/ Benjamin M. Haber

Benjamin M. Haber (Reg. No. 67,129)
O'Melveny & Myers LLP
400 South Hope Street, 18th Floor
Los Angeles, CA 90071
Telephone: (213) 430-6000
Fax: (213) 430-6407
Email: bhaber@omm.com
Attorney for Petitioner