

Google LLC
v.
Sandpiper CDN, LLC

IPR2025-00826
U.S. Patent No. 9,021,112



Patent Owner's Demonstratives

August 6, 2026

Sandpiper EX2024
Google v. Sandpiper
IPR2025-00826

Sandpiper CDN – History

History



Sandpiper Networks built and launched the world's first CDN in the 1990s. The company's early customers included the L.A. Times, which used Sandpiper's CDN to host the report of Independent Counsel Ken Starr on his investigation of President Bill Clinton.

In December 1999, Sandpiper Networks was acquired by Digital Island in a deal that valued Sandpiper Networks at over \$1 billion.

Following a series of additional mergers and acquisitions, the Sandpiper CDN business was acquired by Level 3 Communications.

The Sandpiper team continued developing Sandpiper's networking technology with significant investments by Level 3. Eventually rebranded as Lumen, its customers included Netflix and Disney, which used Sandpiper's networking technology to support their large video streaming platforms.

In late 2023 Lumen began to spin off its content delivery business, and Sandpiper's technology, software, and intellectual property is now owned and managed by Sandpiper CDN. Sandpiper CDN is co-owned by Andrew Swart, who was the CEO and co-founder of Sandpiper Networks.

Instituted Grounds

Claims	Ground #	References	Ground #	References
1-8, 10-23	1A	Glines	1B	Glines, Gupta
4	2A	Glines, Chung	2B	Glines, Gupta, Chung
7-9, 19-20	3A	Glines, Chiou	3B	Glines, Gupta, Chiou
10-22	4A	Glines, Colby	4B	Glines, Gupta, Colby
19-20	5A	Glines, Chiou, Colby	5B	Glines, Gupta, Chiou, Colby

Agenda

- ▶ **The '112 Patent**
- ▶ Independent Claim 1 (Grounds 1A/1B)
 - ▶ “causing said hostname to be resolved to said common anycast address by an Internet Service Provider (ISP) DNS server”
- ▶ Independent Claim 23 (Grounds 1A/1B)
 - ▶ “a second request for second content associated with a second content provider”
- ▶ Independent Claims 13, 18, 22, and 23 (Grounds 1A/1B and 4A/4B)
 - ▶ “a plurality of content providers”
- ▶ Independent Claims 13, 18, 19, 21, 22, and dependent claim 11 (Grounds 1A/1B, 3A/3B, 4A/4B, and 5A/5B)
 - ▶ “a switch” / “at least one switch”
- ▶ Motivation to Combine Glines and Gupta (All B Grounds)

The '112 Patent discloses a content delivery network that routes users to content sites near requesters using existing infrastructure.

'112 Patent

As the Web server content provided by World Wide Web has continued to grow over time, so too has the number of users demanding access to such content. Unfortunately, the ever-increasing number of end users requesting Web content from Web sites has resulted in serious bandwidth and latency issues, which manifest themselves in delay to the end user.

EX1001, '112 patent, 1:36-41.

A performance benefit is gained because a content requestor can generally retrieve content from a content site closer than the origin server of the content provider. In addition, because there are multiple sites serving the content, the load from many end users is distributed among multiple systems and across different parts of the network. Also, an end user's DNS request can be routed to a content site nearest the requestor using pre-existing routing infrastructure. Because DNS uses a stateless protocol (UDP) for routing, the solution can handle anycast addressable caching without the problems associated with anycast service, namely, the potential packet-by packet load balancing site effects of protocols like TCP which maintain state information.

EX1001, 2:11-23.

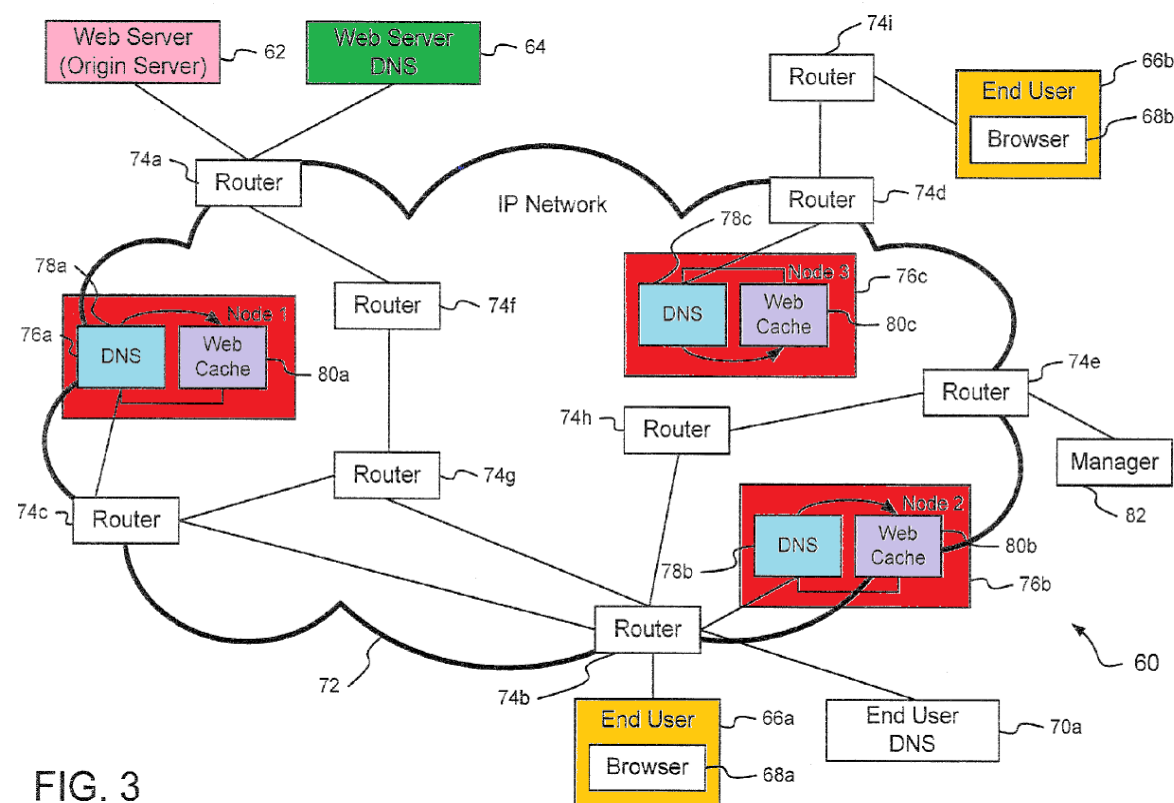


FIG. 3

EX1001, FIG. 3 (annotated).

The '112 Patent discloses a content delivery network that routes users to content sites near requesters using existing infrastructure.

'112 Patent

“CDN 60 includes at least one Web server, shown as a **Web server 62**, a **DNS system 64** for **Web server 62**, and **end-user stations 66a and 66b**, all connected to a network 72.” EX1001, 4:19-21. “Also connected to the network 72 are multiple **content distribution nodes 76a, 76b and 76c**, which support distributed content delivery services for one or more Web sites on the network 72.” *Id.*, 4:27-30; EX2018, ¶¶37-38.

“Each of the CDN nodes 76 includes a **DNS system 78** coupled to and associated with a **Web content server system or site 80**.” EX1001, 4:34-36. Nodes 76 are “geographically dispersed . . . so as to be as close as possible to various network entry points, exchanges or both.” *Id.*, 5:11-13. “The **caching servers 80** have unique IP addresses,” and “[t]he **DNS systems 78** share a common IP address as well as have unique IP addresses.” *Id.*, 5:19-21; EX2018, ¶39.

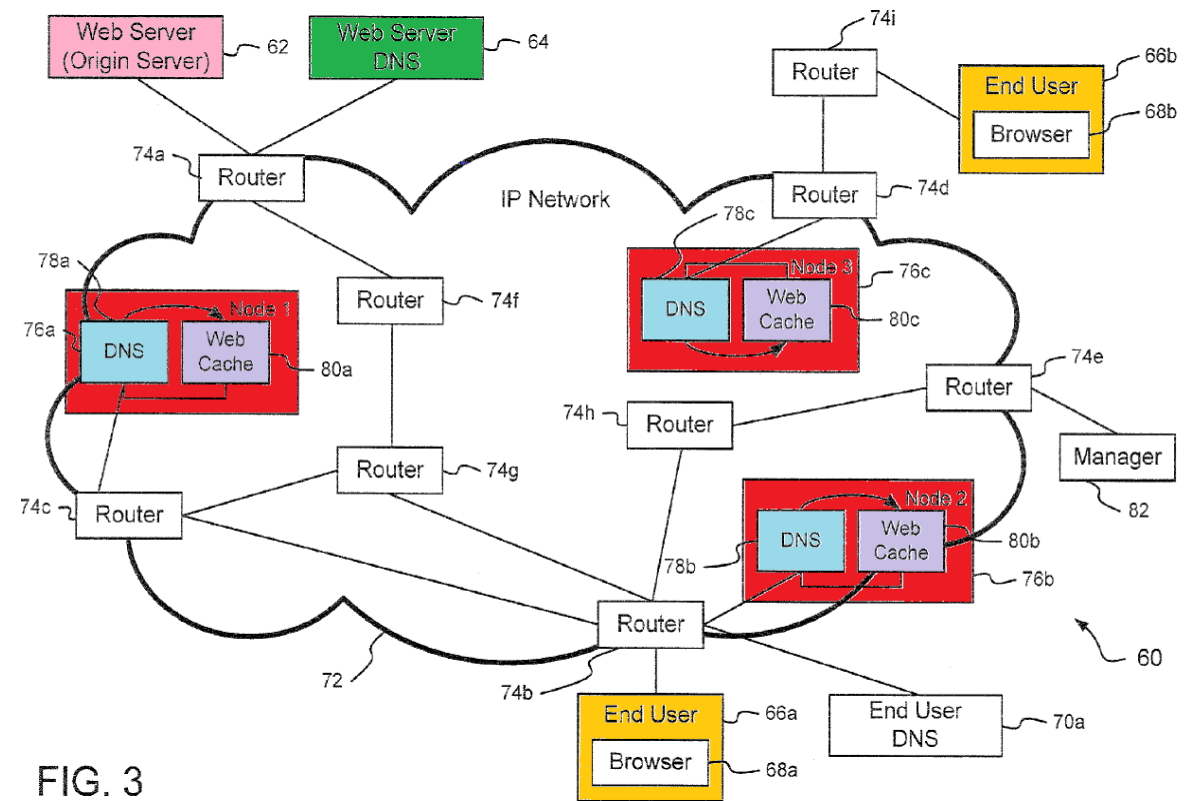


FIG. 3

EX1001, FIG. 3 (annotated).

POR, 7 (citing EX1001, 4:19-21, 4:34-36, 4:27-30, 5:11-13, 5:19-21).

Agenda

- ▶ The '112 Patent
- ▶ **Independent Claim 1 (Grounds 1A/1B)**
 - ▶ “causing said hostname to be resolved to said common anycast address by an Internet Service Provider (ISP) DNS server”
- ▶ Independent Claim 23 (Grounds 1A/1B)
 - ▶ “a second request for second content associated with a second content provider”
- ▶ Independent Claims 13, 18, 22, and 23 (Grounds 1A/1B and 4A/4B)
 - ▶ “a plurality of content providers”
- ▶ Independent Claims 13, 18, 19, 21, 22, and dependent claim 11 (Grounds 1A/1B, 3A/3B, 4A/4B, and 5A/5B)
 - ▶ “a switch” / “at least one switch”
- ▶ Motivation to Combine Glines and Gupta (All B Grounds)

The '112 Patent, Claim 1

1. A method of content delivery in a network, the method comprising:

- (A) providing a plurality of Domain Name System (DNS) servers associated with a Content Delivery Network (CDN), said plurality of CDN DNS servers sharing a common anycast address, wherein each CDN DNS server is associated with a respective plurality of content servers;
- (B) causing said plurality of CDN DNS servers to be authoritative for a hostname associated with a content provider by causing said common anycast address to be associated with said hostname;
- (C) responsive to a request for content associated with the content provider and issued by a client, said request including at least said hostname,
 - (c1) causing said hostname to be resolved to said common anycast address by an Internet Service Provider (ISP) DNS server; and then
 - (c2) by one of said plurality of CDN DNS servers, resolving said hostname to identify an IP address for use by the client to retrieve the content from a content server.

EX1001, Claim 1.

The '112 Patent, Claim 1

'112 Prosecution History

Listing of Claims:

1. (Currently Amended) A method of content delivery in a network, the method comprising:
 - (A) providing a plurality of Domain Name System (DNS) servers associated with a Content Delivery Network (CDN), said plurality of CDN DNS servers sharing a common anycast address, wherein each CDN DNS server is associated with a respective plurality of content servers;
 - (B) causing said plurality of CDN DNS servers to be authoritative for a hostname associated with a content provider by causing said common anycast address to be associated with said hostname;
 - (C) responsive to a request for content associated with the content provider and issued by a client, said request including at least said hostname,
 - (c1) causing said hostname to be resolved to said common anycast address by an Internet Service Provider (ISP) DNS server ~~associated with an Internet Service Provider (ISP)~~; and then
 - (c2) by one of said plurality of CDN DNS servers, resolving said hostname to identify an IP address for use by the client to retrieve the content from a content server.

EX1007, 132.

Thus, using the invention of claim 1, in response to a request associated with a content provider (the request including a hostname), the hostname is resolved to the common anycast address by an ISP DNS and then to an IP address for one of the content servers by one of the *CDN DNS servers*. McCanne, however, does not anticipate both claim 1 steps (c1) and (c2). For at least these reasons, claim 1 and its dependents are patentable over McCanne. Similarly, as claim 23 contains the same or similar limitations as claim 1, claim 23 is also patentable over McCanne.

EX1007, 140.

Glines teaches resolution performed by a root DNS server.

Glines

As a next step 102, as is typical and as is well known in the art, the browser program makes an initial attempt to resolve an address for the specified domain “example.com.” For example, the browser program issues a DNS request message as a UDP datagram to a name server. In the case where the user is associated with an Internet Service Provider (ISP) operating the local area network 20, this first name request is made to a local DNS resolver 18, to determine the location of the domain “example.com”. The DNS resolver 18 determines whether or not the requested content file is available locally. For example, it determines if “example.com” is located in the local web server 20. In other configurations, the resolver 18 may even reside at the client 12.

From step 104, if the content is available locally, then the local IP address is returned to the browser program in step 106.

EX1002, 13:21-14:5.

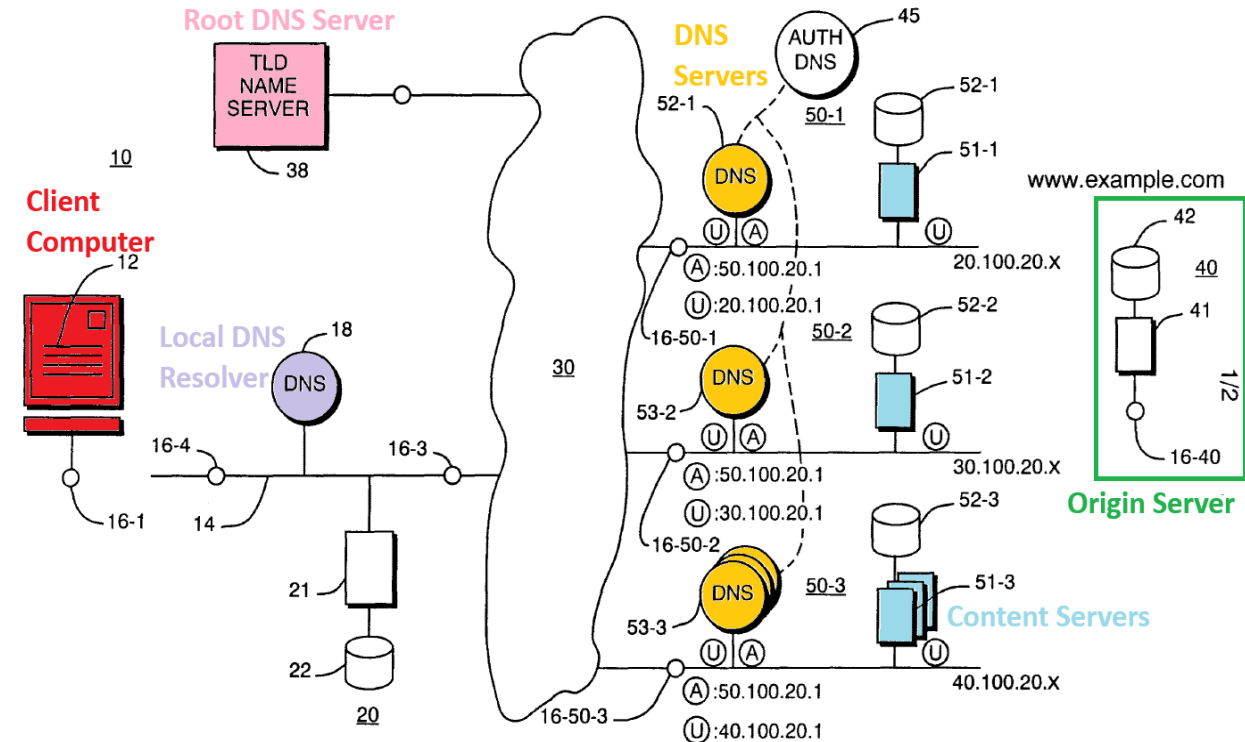


FIG. 1

EX1002, FIG. 1 (annotated).

Glines teaches resolution performed by a root DNS server.

Glines

Having failed to resolve the requested name locally, a request to resolve the location of “example.com” is then sent to a root DNS server 38 in step 108. In this case, the request to the root DNS server 38 will be recursively worked through multiple root servers associated with the Internet 30 (not shown in Fig. 1) to resolve the IP address for a DNS server authoritative for the requested domain name.

EX1002, 14:8-12.

However, in accordance with the invention, the root DNS name server 38 has been programmed to instead return the anycast address 50.100.20.1.

EX1002, 14:17-18.

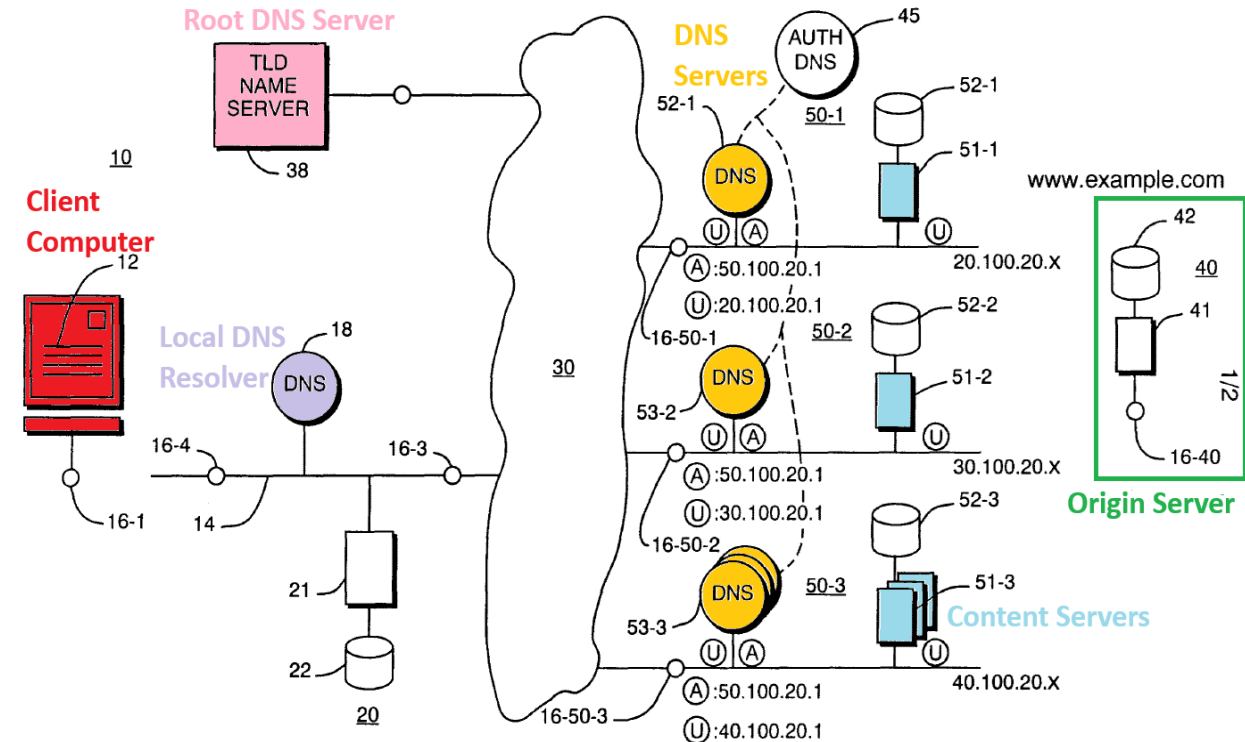


FIG. 1

EX1002, FIG. 1 (annotated).

Glines teaches resolution performed by a root DNS server.

POR

Petitioner does not explain how Glines's "local DNS resolver 18"—which Petitioner equates to the claimed "*Internet Service Provider (ISP) DNS server*"—resolves "*said hostname . . . to said common anycast address,*" as element [1d] requires. EX2018, ¶54. Nor does Petitioner assert that root DNS server 38 is an "*Internet Service Provider (ISP) DNS Server*" (because it is not). *Id.* Glines's root DNS server 38 performs DNS resolution in the root domain. EX2018, ¶¶54-55; *see also* EX1002, 7:6-8 ("The root domain name servers defined, for example, by the Internic, may be programmed to return the common address of the group of name server/content server peers that share a common anycast address."), FIG. 1 (labelling 38 as the top-level domain name server). *Such a root server is not an*

POR, 26.

Patent Owner's Expert

the ISP DNS server to resolve the hostname to an anycast address, and nowhere does Dr. Mowry explain how Glines's "local DNS resolver 18" performs that resolution. EX1008, ¶¶154-155. Indeed, Dr. Mowry relies on "root DNS server 38" for that purpose—not Glines's "local DNS resolver 18." EX1008, ¶¶154-155 ("[R]oot DNS name server 38 is 'programmed to . . . return the anycast address . . .'" (emphasis added)). I agree in this respect—This understanding is consistent with Glines's disclosure, which explains that root DNS server 38 receives "a request to resolve the location of 'example.com'" and "resolve[s] the IP address for a DNS server authoritative for the requested domain name." EX1002, 14:8-12 (emphasis added).

EX2018, ¶54.

Glines teaches resolution performed by a root DNS server.

Institution Decision

We agree with Patent Owner that Petitioner has identified Glines's root server 38, not its local resolver 18, as performing the step of "*causing said hostname to be resolved to said common anycast address.*" Petitioner points to the description in Glines that "root DNS name server 38 is 'programmed to . . . return the anycast address 50.100.200.1' of name servers 53[]." Pet. 20 (citing Ex. 1002, 14:4–15:4). Petitioner's declarant, Dr. Mowry, attests that the root server 38 performs the resolution of the hostname to the anycast address, stating, "in response to the user's request, the root DNS name server 38 is 'programmed to . . . return the anycast address 50.100.20.1' of name servers 53-1, 53-2, 53-3 that 'have been designated as being the authoritative name servers for 'example.com.'"" Ex. 1008 ¶ 138.

DI, 11-12.

Petitioner does not assert that Glines's DNS server 38 is an ISP DNS server, and does not assert that DNS server 38 meets limitation [1d]. Pet. 20–22. Because Glines's local resolver 18 does not resolve a hostname to a common anycast address, it does not teach limitation [1d] regardless of whether it is an ISP DNS server, or if it would have been obvious for it to be an ISP DNS server that "perform[s] the same functions as Glines ascribes to local DNS resolver 18." Pet. 22–23. Therefore, Petitioner has not shown an entity in Glines that is an ISP DNS server that resolves a hostname to a common anycast address.

DI, 12.

Petitioner's Reply fails to cure the Petition's deficiencies.

Petitioner Reply

By its plain language, the claim recites “*causing* said hostname to be resolved” by the ISP DNS server. Claim 1 does not require, as Patent Owner asserts, the ISP DNS server to “perform the resolution” or to “resolve[] ‘said hostname’” itself, see POR 25-26, but instead requires the ISP DNS server to “caus[e] the hostname to be resolved.” Claim 1’s “causing” resolution thus encompasses Glines’s local DNS resolver 18 receiving a request to resolve a hostname and sending a request to another server—root DNS server 38—to perform the resolution to the anycast address. Pet. 19-22; Glines, 7:1-8, 13:15-14:5; Mowry ¶¶141-146, 154-156.

Pet. Reply, 3.

1

Glines’s local resolver does not resolve a hostname to a common anycast address, as recited by claim 1.

POR, 24-27; EX2018, ¶54.

2

Even under Petitioner’s new theory, nowhere does the Petition tie this functionality to Glines’s local resolver.

PO Sur-reply, 6-9.

Petitioner's Reply fails to cure the Petition's deficiencies.

Glines's local resolver 18 plays no role in resolving a hostname to an anycast address.

Glines – Local Resolver 18

As a next step 102, as is typical and as is well known in the art, the browser program makes an initial attempt to resolve an address for the specified domain “example.com.” For example, the browser program issues a DNS request message as a UDP datagram to a name server. In the case where the user is associated with an Internet Service Provider (ISP) operating the local area network 20, this first name request is made to a local DNS resolver 18, to determine the location of the domain “example.com”. The DNS resolver 18 determines whether or not the requested content file is available locally. For example, it determines if “example.com” is located in the local web server 20. In other configurations, the resolver 18 may even reside at the client 12.

From step 104, if the content is available locally, then the local IP address is returned to the browser program in step 106.

EX1002, 13:21-14:5.

Glines – DNS Server 38

Having failed to resolve the requested name locally, a request to resolve the location of “example.com” is then sent to a root DNS server 38 in step 108. In this case, the request to the root DNS server 38 will be recursively worked through multiple root servers associated with the Internet 30 (not shown in Fig. 1) to resolve the IP address for a DNS server authoritative for the requested domain name.

EX1002, 14:8-12.

However, in accordance with the invention, the root DNS name server 38 has been programmed to instead return the anycast address 50.100.20.1.

EX1002, 14:17-18.

Glines expressly assigns the relevant function to a different component (root server 38), and not its local resolver 18.

Gupta does not cure the deficiencies of Glines.

Petition

The modified Glines's ISP DNS server would perform the same functions as Glines ascribes to local DNS resolver 18, and would thus cause the hostname to be resolved to the common anycast address by an ISP DNS server, as claimed. *Id.* ¶163.

Pet., 23.

Institution Decision

As discussed *supra*, local DNS resolver 18 does not resolve a hostname into an anycast address. *Supra* § II.D.2. Petitioner's proposal to substitute Gupta's ISP resolver "to perform the same function as Glines ascribes to local DNS resolver 18," does not cure this deficiency because the function of Glines's DNS resolver 18 is not to resolve a hostname into an anycast address. Nor does Gupta teach anycast, so its DNS server, like Glines's, does not resolve a hostname to an anycast address. *See* Ex. 2013 ¶¶ 60 ("rather than sending an anycast UDP message like Glines, Gupta's DNS servers are directly contacted via unicast."), 64 ("Gupta teaches away from the use of anycast addressing, relying instead on load monitoring and load balancing."). Consequently, Petitioner's asserted combination does not teach limitation [1d].

DI, 21.

Gupta does not cure the deficiencies of Glines.

Petitioner Reply

Contrary to Patent Owner's arguments, Petitioner does not rely on Gupta to cure any deficiencies in Glines's anycast resolution process. *See* POR 27-29; Pet. 22-25. Therefore, Patent Owner's contention that "Gupta does not teach use of anycast addressing" and that "Gupta's client DNS server does not resolve a hostname to an anycast address" are irrelevant to the Glines-Gupta combination. *See* POR 27-28. Instead, Glines retains its anycast resolution functionality in the proposed combination. *See* Pet. 23-25.

Pet. Reply, 11.

As explained, if Glines's local DNS resolver 18 is found not to teach or render obvious an "ISP" DNS "server," it would have been obvious to implement Glines's local DNS resolver 18 as an ISP DNS server based on the teachings of Gupta. Pet. 20-25; Mowry ¶¶147-169. The combined system would otherwise implement the functionality of Glines's local DNS resolver 18, which, as explained above, causes resolution of the hostname to the anycast address. *See* Pet. 23 ("The modified Glines's ISP DNS server would perform the same functions as Glines ascribes to local DNS resolver 18"), 25 ("Combining Glines with Gupta in this way would not alter the features of Glines discussed elsewhere in this petition.").

Pet. Reply, 11-12.

Agenda

- ▶ The '112 Patent
- ▶ Independent Claim 1 (Grounds 1A/1B)
 - ▶ “causing said hostname to be resolved to said common anycast address by an Internet Service Provider (ISP) DNS server”
- ▶ **Independent Claim 23 (Grounds 1A/1B)**
 - ▶ “a second request for second content associated with a second content provider”
- ▶ Independent Claims 13, 18, 22, and 23 (Grounds 1A/1B and 4A/4B)
 - ▶ “a plurality of content providers”
- ▶ Independent Claims 13, 18, 19, 21, 22, and dependent claim 11 (Grounds 1A/1B, 3A/3B, 4A/4B, and 5A/5B)
 - ▶ “a switch” / “at least one switch”
- ▶ Motivation to Combine Glines and Gupta (All B Grounds)

The '112 Patent, Claim 23

23. A method comprising:

- (A) providing a plurality of Domain Name System (DNS) servers, said plurality of DNS servers sharing a common anycast address, wherein each DNS server is associated with a respective plurality of content servers, wherein each DNS server and respective plurality of content servers is configured to support content delivery for a plurality of content providers;
- (B) responsive to a first request for first content associated with a first content provider of said plurality of content providers, said first request including at least a first hostname associated with the first content provider, by a first DNS server of said plurality of DNS servers, resolving said first hostname to identify a first IP address of a content server of the plurality of content servers associated with said first DNS server; and
- (C) responsive to a second request for second content associated with a second content provider of said plurality of content providers, said second request including at least said first hostname associated with the first content provider, by a second DNS server of said plurality of DNS servers, resolving said first hostname to identify a second IP address associated with a content server of the plurality of content servers associated with the second DNS server.

EX1001, Claim 23.

Petitioner does not identify a “second content provider” different from the “first content provider”

Petition

News aggregator websites, such as Yahoo! News, were known in the art. EX-1008 ¶449. In EX-1024, for example, the first story is associated with the URL http://dailynews.yahoo.com/h/nm/20010201/ts/congress_ashcroft_dc_71.html, where the hostname is “http://dailynews.yahoo.com,” and the path is “h/nm/20010201/ts/congress_ashcroft_dc_71.html.” See EX-1024; EX-1025. The hostname is associated with Yahoo! News, while the path is associated with news content from Reuters. See *id.*; EX-1008 ¶449.

Applying Glines, alone or combined with Gupta, to respond to a first request for the URL <http://dailynews.yahoo.com> would have been an obvious application of Glines’s system. EX-1008 ¶¶449-450. The first content would have been the Yahoo! News webpage (e.g., a first content provider of said plurality of content providers), and the first request would have included a first hostname associated with the first content provider (e.g. <http://dailynews.yahoo.com>). *Id.*

Exhibit 1024

The screenshot shows the Yahoo! News homepage. At the top, there's a navigation bar with links like Home, Yahoo!, My Yahoo!, News Alerts, and Help. Below this, the main header includes the Yahoo! News logo and the date Friday, February 2, 2001. The page is divided into several sections: Search News, Top Story, Full Coverage, News Topics, Business, World, Entertainment, and Politics. The Top Story section highlights 'U.S. Senate Approves Ashcroft' with a sub-headline '58-42'. The Business section features 'Blue-Chip Stocks Hit Four-Month High'. The World section mentions 'Congo-Rwanda Leaders Meet, Open Door to Peace'. The Entertainment section has 'Viewers Continue to Flock to 'Temptation Island''. The Politics section includes 'Clinton May Be Called to Testify About Pardon'. On the right side, there's a Photo Highlight section with a photo of a baby gorilla and an Audio/Video section with a video of the Lockerbie Families.

Petitioner does not identify a “second content provider” different from the “first content provider”

Petition

It would have been obvious for Glines’s name servers, alone or combined with Gupta, to respond to an anycast message based on a second request that includes a request for a particular news article via a news aggregator website, such as Yahoo! News. *See* EX-1024; *see* Limitation [23c]; EX-1008 ¶¶459-461. This includes, as shown in EX-1025, a request for the article “U.S. Senate Approves Ashcroft, 58-42” at http://dailynews.yahoo.com/h/nm/20010201/ts/congress_ashcroft_dc_71.html, where the hostname is “http://dailynews.yahoo.com,” and the second content is a news article. *See* EX-1025. The hostname is associated with the first content provider (Yahoo! News), and the second content is associated with a second content provider (e.g., Reuters). *See id.*; EX-1008 ¶461.

Pet., 56.

Exhibit 1025

YAHOO! NEWS Home - Yahoo! - My Yahoo! - News Alerts - Help **REUTERS**

Home Top Stories Business Tech Politics World Local Entertainment Sports Science Health Full Coverage

Top Stories News - updated 2:07 AM ET Feb 2 Add to My Yahoo!

Reuters | AP | AP U.S. | ABCNEWS.com | Photos | Videos

Thursday February 1 6:12 MET

U.S. Senate Approves Ashcroft, 58-42

By Thomas Ferraro

WASHINGTON (Reuters) - A sharply divided Senate confirmed John Ashcroft ([news - web sites](#)) as attorney general on a 58-42 vote on Thursday with an overwhelming majority of Democrats sending President George W. Bush ([news - web sites](#)) a "shot across the bow" by voting no.

All 50 Senate Republicans, plus eight Democrats, backed Ashcroft, an ardent conservative and hero to the religious right, which helped Bush win the White House last year.

Democrats said their nearly united front against Ashcroft -- 42 of 50 Senate Democrats -- should be read as a warning by Bush that he can expect an even tougher fight if he ever offers another such conservative nominee.

There were enough Democrats opposed to Ashcroft to block the nomination with a filibuster, a procedural delay. But Democrats said they wanted to give the new president an up-or-down vote, at least on putting together his Cabinet.

Sen. Charles Schumer ([news - bio - voting record](#)), a New York Democrat, called the vote "a shot across the bow" of the Bush White House. "I think we have helped set the tone for many of the upcoming issues that will face us," he said.

Forty-one is the number of senators needed to continue a filibuster and thereby tie up legislation or even a presidential nominee.

Shortly after the vote, Ashcroft, who during confirmation hearings promised to enforce all of the nation's laws, even ones he has opposed -- like abortion rights, gay rights and gun control -- went to the U.S. Supreme Court ([news - web sites](#)) to take the oath of office in private as the nation's 79th attorney general.

"Let me send a clear message today," Ashcroft said in a statement. "I will confront injustice by leading a professional Justice Department

Full Coverage

1 -depth coverage about [Bush Administration](#)

Related News Stories

- Senate Majority Votes for Ashcroft - AP (Feb 1, 2001)
- Critics Question Bush Charity Plan - AP (Feb 1, 2001)
- Bush, Kennedy Watch Movie at White House - Reuters (Feb 1, 2001)
- US Senate approves Ashcroft nomination as attorney general - AFP (Feb 1, 2001)
- Senate confirms Ashcroft nomination - MSNBC (Feb 1, 2001)

More...

Related Web Sites

- The White House - includes a profile page of George W. Bush, and the text of his inaugural address
- President-Elect Bush's Transition - includes profiles of Cabinet nominees and White House advisers, and audio of confirmation hearings. From PBS Online NewsHour.
- Oppose Ashcroft - from People for the American Way. Also: [ROLYBUSH.com](#) from Planned Parenthood, [DefeatAshcroft.com](#) from Act for Change, and [StopAshcroft.com](#) from the Million Mom March.
- BackBush.com - in support of Bush cabinet nominees, including Ashcroft and Norton. Includes online petitions and polls. Also: [ConfirmAshcroft.com](#).

EX1025, 1.

Petitioner does not identify a “second content provider” different from the “first content provider”

Claim 23

(B) responsive to a first request for first content associated with a first content provider of said plurality of content providers, said first request including at least a first hostname associated with the first content provider, by a first DNS server of said plurality of DNS servers, resolving said first hostname to identify a first IP address of a content server of the plurality of content servers associated with said first DNS server; and

(C) responsive to a second request for second content associated with a second content provider of said plurality of content providers, said second request including at least said first hostname associated with the first content provider, by a second DNS server of said plurality of DNS servers, resolving said first hostname to identify a second IP address associated with a content server of the plurality of content servers associated with the second DNS server.



Where a claim lists elements separately, “the clear implication of the claim language” is that those elements are “distinct component[s]” of the patented invention.

Becton, Dickinson & Co. v. Tyco Healthcare Grp., LP, 616 F.3d 1249, 1254 (Fed. Cir. 2010)
(quoting *Gaus v. Conair Corp.*, 363 F.3d 1284, 1288 (Fed. Cir. 2004)).

Petitioner does not identify a “second content provider” different from the “first content provider”

Petitioner maps both the first and second content providers to the same content provider:
Yahoo News!

'112 Patent

“Content provider” refers to an entity having a Web site on a network. Generally, the entity produces the content for the Web site. The entity may operate a Web server system or may use the services of a hosting provider.

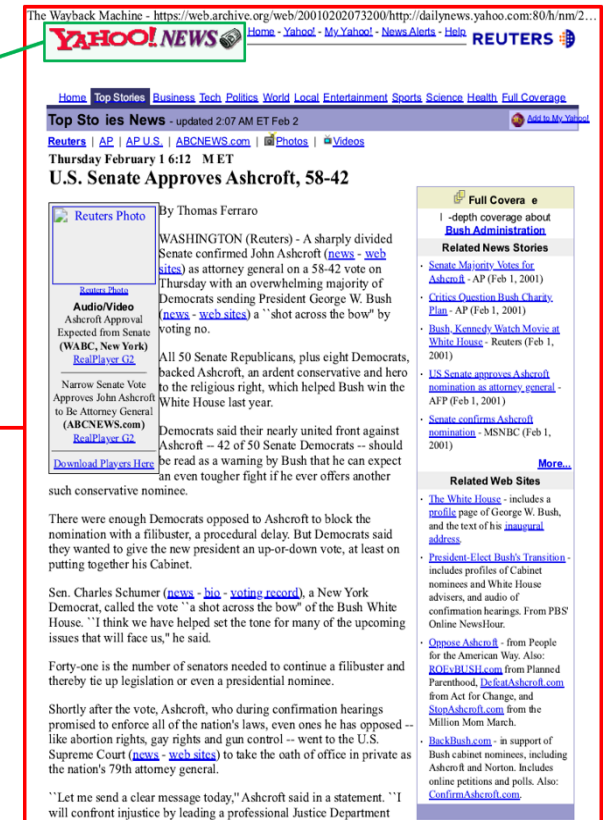
EX1001, 2:60-63.



EX1024

Content
Provider

Content



EX1025

EX1024, 1; EX1025, 1.

Petitioner does not identify a “second content provider” different from the “first content provider”

As Petitioner’s expert clarified, the alleged “second content” is the Web page, not simply the article within the page

Petitioner’s Expert

Q. And the second content that is requested is that a URL around the middle of the paragraph, starting with "http://dailynews.yahoo.com/h/nm," and it continues to the rest of the article URL.

Correct?

A. That's right. Yes.

Q. Okay. And that's the second content you are equating to in claim 23. Correct?

A. Yes.

EX2021, 93:1-15.

Patent Owner’s Expert

66. As shown above, a POSITA would have understood that the two URLs provided by Dr. Mowry are provided by the same content provider: Yahoo News!. In particular, a POSITA would have understood that while the second URL provided by Dr. Mowry appears to display an article written by Reuters, it is stored and provided by Yahoo! News, which is the same “content provider” that provides the first URL described by Dr. Mowry. Therefore, it is my understanding that Yahoo! News is the “content provider” of both Web pages, even if the article may have been written by Reuters. Such an interpretation is consistent with the

EX2018, ¶66.

Petitioner improperly relies on supposed general knowledge in the art to supply a missing claim element

Petition

Applying Glines, alone or combined with Gupta, to respond to a first request for the URL `http://dailynews.yahoo.com` would have been an obvious application of Glines’s system. EX-1008 ¶¶449-450. The first content would have been the Yahoo! News webpage (e.g., a first content provider of said plurality of content providers), and the first request would have included a first hostname associated with the first content provider (e.g. `http://dailynews.yahoo.com`). *Id.*

Pet., 55.

It would have been obvious for Glines’s name servers, alone or combined with Gupta, to respond to an anycast message based on a second request that includes a request for a particular news article via a news aggregator website, such as Yahoo! News. See EX-1024; see Limitation [23c]; EX-1008 ¶¶459-461. This includes, as

Pet., 56.

Petitioner concedes that “Exhibits 1024 and 1025 do not form the basis of Petitioner’s patentability challenge.”

Pet. Reply, 21.

III. RELIEF REQUESTED

Ground	Art	Basis	Claims
1A	Glines	§103	1-8, 10-23
1B	Glines-Gupta	§103	1-8, 10-23

Pet., 1.

Petitioner improperly relies on supposed general knowledge in the art to supply a missing claim element

Institution Decision

With respect to claim 23, we determine that Petitioner has shown the teaching of limitations [23p]–[23b], [23d], and [23f]. Pet. 54–58. We question, however, Petitioner’s reliance on the knowledge in the art to teach limitations [23c] and [23e]. For those limitations, Petitioner relies on a specific example of the “Yahoo! News” website, as an “obvious application of Glines’s system,” pointing to a first request to the website and a second request to a particular article via that website. Pet. 55–57. Petitioner does not explain how this example indicates that such teachings of first and second requests were “within the common knowledge of those skilled in the art.” See *K/S Himpp v. Hear-Wear Techs., LLC*, 751 F.3d 1362, 1365–66 (Fed. Cir. 2014); *Randall Mfg. v. Rea*, 733 F.3d 1355, 1362–1363 (Fed. Cir. 2013) (finding persuasive “a party’s claim about what one of ordinary skill in the relevant art would have known” when the party “established [it as] a prevalent, perhaps even predominant method” by “citing to extensive references of record”). Petitioner has not provided sufficient support or

DI, 24.

references of record”). Petitioner has not provided sufficient support or explanation as to why this particular example represents the general knowledge in the art, rather than a singular feature of an individual website, such that it would have been considered to be “a known prior art technique” that would be applied with “predictable results.” Pet. 55. Nor has Petitioner included any particular prior art describing this example as part of the asserted ground.

DI, 24.

Petitioner improperly relies on supposed general knowledge in the art to supply a missing claim element

Petitioner does not identify any disclosure in Glines or Gupta that meets both claim elements [23c] and [23e]

35 U.S.C. § 311(b):

“A petitioner in an inter partes review may request to cancel as unpatentable 1 or more claims of a patent only on a ground that could be raised under section 102 or 103 and only on the basis of prior art consisting of patents or printed publications.”

37 C.F.R. § 42.104(b)(4):

“The petition must specify ***where each element of the claim is found in the prior art patents or printed publications relied upon.***”

Agenda

- ▶ The '112 Patent
- ▶ Independent Claim 1 (Grounds 1A/1B)
 - ▶ “causing said hostname to be resolved to said common anycast address by an Internet Service Provider (ISP) DNS server”
- ▶ Independent Claim 23 (Grounds 1A/1B)
 - ▶ “a second request for second content associated with a second content provider”
- ▶ **Independent Claims 13, 18, 22, and 23 (Grounds 1A/1B and 4A/4B)**
 - ▶ “a plurality of content providers”
- ▶ Independent Claims 13, 18, 19, 21, 22, and dependent claim 11 (Grounds 1A/1B, 3A/3B, 4A/4B, and 5A/5B)
 - ▶ “a switch” / “at least one switch”
- ▶ Motivation to Combine Glines and Gupta (All B Grounds)

The '112 Patent, Claim 13

EX1001, Claim 13.

[13p]	A method of content delivery for delivering content on behalf of a plurality of content providers, the method comprising:	
[13a]	(A) providing a plurality of Domain Name System (DNS) servers, said plurality of DNS servers sharing a common anycast address, wherein each DNS server is associated with a respective plurality of content servers;	
[13b]	(B) configuring each DNS server and respective plurality of content servers to support content delivery for a plurality of content providers, wherein each of the plurality of content providers has a respective hostname associated therewith;	
[13c]	(C1) responsive to a first request for first content associated with a first content provider of said plurality of content providers, said first request including at least a first hostname associated with the first content provider,	
[13d]	(c11) by a first DNS server of said plurality of DNS servers, resolving said first hostname to identify a first IP address to be used for retrieval of the first content from a first content server of said content servers associated with said first DNS server;	
[13e]	(c12) by a switch associated with said resolving DNS server of step (c11), selecting the first content server from said respective plurality of content servers associated with the DNS server of step (c11); and	[13h] (c21) by a second DNS server of said plurality of DNS servers, resolving said first hostname to identify a second IP address for retrieval of the first content from a content server associated with the second DNS server;
[13f]	(c13) attempting to serve said first content from the first content server; and	[13i] (c22) by a switch associated with said resolving DNS server of step (c21), selecting the second content server from said respective plurality of content servers associated with the DNS server of step (c21); and
[13g]	(C2) responsive to a second request for said first content associated with said first content provider of said plurality of content providers, said second request including at least the first hostname associated with the first content provider,	[13j] (c23) attempting to serve said second content from the second content server.

The '112 Patent, Claim 18

[18p]	A content delivery system for delivering content on behalf of a plurality of content providers, each of said plurality of content providers having a hostname associated therewith, the system comprising:
[18a]	(A) a plurality of Domain Name System (DNS) servers, said plurality of DNS servers sharing a common anycast address,
[18b]	said plurality of DNS servers being authoritative for said hostnames associated with said plurality of content providers;
[18c]	(B) a set of content servers associated with each DNS server, each set comprising at least a plurality of content servers; and
[18d]	(C) at least one switch associated with each set of content servers, wherein
[18e]	(D) responsive to a request to resolve a hostname associated with a particular content provider of said plurality of content providers, said request being associated with an end-user request for content of said
	particular content provider, one of said plurality of DNS servers is operable to resolve said hostname to identify an IP address for use by the end-user to retrieve the content from a content server,
[18f]	(E) the at least one switch associated with the set of content servers of the resolving DNS server is operable to perform load balancing to select the content server from the set of content servers associated with the resolving DNS server, and
[18g]	(F) the content server is operable to serve the content to the end-user.

EX1001, Claim 18.

The '112 Patent, Claims 22 and 23

Independent claims 22 and 23 similarly recite a “plurality of content providers”

Claim 22

[22b]	wherein the DNS server is authoritative for hostnames associated with a plurality of content providers;
[22e]	responsive to a request by a client for content associated with a particular content provider of the plurality of content providers, the request including at least a hostname associated with the particular content provider,

EX1001, Claim 22.

Claim 23

[23b]	wherein each DNS server and respective plurality of content servers is configured to support content delivery for a plurality of content providers;
[23c]	(B) responsive to a first request for first content associated with a first content provider of said plurality of content providers, said first request including at least a first hostname associated with the first content provider,

EX1001, Claim 23.

Petitioner fails to establish that Glines teaches the claimed “plurality of content providers”

Petition

Glines further discloses a method of content delivery for delivering content on behalf of a plurality of content providers because Glines expressly discloses that its system may be used with either a “single provider” or “multiple providers,” and thus discloses content delivery on behalf of a *plurality* of content providers, as claimed. Glines, 17:3-9; EX-1008 ¶¶258-261.

Pet., 40.

Petitioner fails to establish that Glines teaches the claimed “plurality of content providers”

Petitioner’s alleged support in Glines does not refer to the claimed “content providers” but rather network providers.

Glines

The selection of routing protocol may have profound effects on the propagation and convergence of group membership changes. “Membership” in the group is contingent upon distributed routing state. In the case of deployment within a single provider, where the anycast routing is internal to that network (and transparent to the outside – the Internet), and an internal routing protocol like iBGP or OSPF is used, propagation of changes should be fast. In the case of deployment across multiple providers, full fledged external BGP (“eBGP”) preferably would be used. Membership changes would be effected in such a scenario when the state change propagates at least half the way towards each other member in the anycast group, and that should cover all of external routers which would tag a particular anycast advertisement as “closest.” State changes would possibly take longer, but would not require flooding over the entire Internet.

EX1002, 17:3-14.

Patent Owner’s Expert

69. Here, a POSITA would have understood that Glines’s “provider” refers to a network provider, not the claimed “content provider.” That is clear because the passage discloses, for example: (1) “deployment within a single provider, where the anycast routing is internal to that network” (e.g., deployment on a network); (2) “deployment across multiple providers,” (e.g., deployment across multiple networks; and (3) routing protocols (e.g., how messages are communicated within and across networks). EX1002, 17:3-14 (emphasis added). In other words, Glines specifically refers to “that network” of a particular network “provider.” EX1002, 17:3-14. Therefore, a POSITA would have understood that this passage of Glines does not in any way teach support for “a plurality of content providers,” but rather is discussing multiple network providers.

EX2018, ¶69.

Petitioner fails to establish that Glines teaches the claimed “plurality of content providers”

Petitioner’s alleged support in Glines does not refer to the claimed “content providers” but rather network providers.

Institution Decision

Ex. 1002, 17:3–14. Petitioner’s declarant Mowry attests that the “multiple providers” refers to “content providers,” providing no reasoning or evidence in support. Ex. 1008 ¶¶ 260–61. We agree with Patent Owner that it is not sufficiently established that Glines refers to content providers or network providers, because Glines discusses the actions of a network rather than content in that paragraph. Prelim. Resp. 24–25.

DI, 13-14.

Petitioner fails to establish that Glines teaches the claimed “plurality of content providers”

The Petition’s remaining citations contain no discussion of multiple content providers

Glines

The replica content servers 50-1, 50-2, 50-3 store replicas of one or more of the content files that originate at the origin server 40. Each content server 50 consists therefore also of a file server 51 and associated mass storage device 52. Through mechanisms that are not particularly relevant to the present invention, replicas of content files that originate at the origin server 40 are distributed and stored in the replica content servers 50. Content files may be propagated through any number of schemes to push content out to various locations in the network 10 and/or move content closer to requesting client computers 12 upon demand. The connections to accomplish this are indicated by the dashed lines shown in Fig. 1. It should be understood that these are typical network connections between the origin server 40, and replica content servers 51-1, 51-2, 51-3; however, these connections are only shown here as logical connections from the perspective of the browser user client computer 12.

EX1002, 12:11-23.

Institution Decision

Dr. Mowry further attests that “A POSITA would have understood Glines’s disclosure of providing content from an origin source would have included supporting more than one origin source (e.g., more than one website or content provider[]).” Ex. 1008 ¶ 262 (citing Ex. 1002, 12:11–22 (storing replica files that originate at an origin server 40), 13:21–14:3 (requesting “example.com”)). That statement, however, goes only to what Glines might be capable of doing, not to whether one would have modified Glines to do so. *See Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073

DI, 14.

Petitioner fails to establish that Glines teaches the claimed “plurality of content providers”

The Petition’s remaining citations contain no discussion of multiple content providers

Glines

The replica content servers 50-1, 50-2, 50-3 store replicas of one or more of the content files that originate at the origin server 40. Each content server 50 consists therefore also of a file server 51 and associated mass storage device 52. Through mechanisms that are not particularly relevant to the present invention, replicas of content files that originate at the origin server 40 are distributed and stored in the replica content servers 50. Content files may be propagated through any number of schemes to push content out to various locations in the network 10 and/or move content closer to requesting client computers 12 upon demand. The connections to accomplish this are indicated by the dashed lines shown in Fig. 1. It should be understood that these are typical network connections between the origin server 40, and replica content servers 51-1, 51-2, 51-3; however, these connections are only shown here as logical connections from the perspective of the browser user client computer 12.

EX1002, 12:11-23.

Institution Decision

Mowry relies solely on the knowledge in the art to teach the missing “content providers” limitation, stating that it “would have been nothing more than replicating Glines’s teaching of storing and providing content associated with one origin server, with expected results.” Ex. 1008 ¶ 263. That statement, however, is unsupported, and moreover, does not explain how such replication would occur or what results would be expected. Prelim. Resp. 25–26. At this stage in the proceeding, Dr. Mowry’s testimony amounts to a “conclusory generalization” that does not provide the “reasoned explanation” sufficient to show that a limitation missing in the cited art was taught by the knowledge in the art. *Arendi S.A.R.L v. Apple, Inc.*, 832 F.3d 1355, 1365 (Fed. Cir. 2016).

DI, 15.

Petitioner does not establish that a POSITA would have combined Glines and Gupta to support a “plurality of content providers”

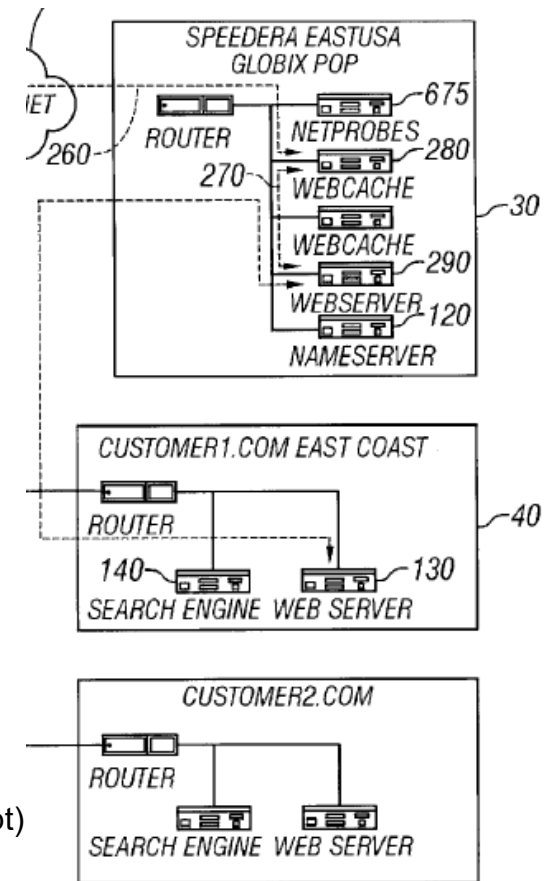
Petitioner does not provide sufficient explanation as to why a skilled artisan would have combined Glines and Gupta or how the combination would operate

Petition

Gupta likewise discloses content delivery on behalf of a plurality of content providers, and for this additional reason, it would have been obvious to provide content delivery on behalf of a plurality of content providers in a combined Glines-Gupta system. *Id.* ¶¶264-265. For example, Gupta teaches that its POP server network provides “traffic management, as well as content hosting to more than one specific customer,” including “customer1 and customer2” that share the server network.” Gupta, 7:8-20, Fig. 1 (depicting customer1 and customer2 web servers); *also id.*, 8:53-59 (“customer1.com.”); EX-1008 ¶¶264-266.

It would have been obvious to apply these teachings to Glines’s system. EX-1008 ¶267. The combined system would have stored and provided content from multiple content providers (e.g., multiple websites, etc.). *Id.* This would have been

Pet., 40-41.



EX1003, FIG. 1 (excerpt)

Petitioner does not establish that a POSITA would have combined Glines and Gupta to support a “plurality of content providers”

Petitioner does not provide sufficient explanation as to *why* a skilled artisan would have combined Glines and Gupta or *how* the combination would operate

Petition

A. Motivation to Combine Glines with Gupta

The combination would have involved, for example, applying Gupta’s use of multiple WebCache servers with each name server to Glines to yield a system with multiple content servers for each name server. *Id.* ¶¶73-74 The combination also would have applied Gupta’s use of an ISP DNS server to Glines to resolve URLs or hostnames for residential Internet users. *Id.*

Pet., 8.

Patent Owner’s Expert

74. I do not see any support for Dr. Mowry’s assertions that the combined system of Glines and Gupta establishes support for multiple content providers. For example, in his section discussing the motivation to combine Glines and Gupta, Dr. Mowry asserts that “applying Gupta’s use of multiple WebCache servers with each name server to Glines’s system to yield multiple content servers associated with *each* name server in Glines,” and that “doing so would have allowed more content to be stored in association with each name server, improving Glines’s ability to deliver content to a user via the closest name server.” EX1008, ¶73 (emphasis in original). However, Dr. Mowry does not explain how Glines’s system would support multiple content providers simply by increasing storage capacity.

EX2018, ¶74.

Petitioner does not establish that a POSITA would have combined Glines and Gupta to support a “plurality of content providers”

Petitioner does not provide sufficient explanation as to *why* a skilled artisan would have combined Glines and Gupta or *how* the combination would operate

Petition

A. Motivation to Combine Glines with Gupta

The combination would have involved, for example, applying Gupta’s use of multiple WebCache servers with each name server to Glines to yield a system with multiple content servers for each name server. *Id.* ¶¶73-74 The combination also would have applied Gupta’s use of an ISP DNS server to Glines to resolve URLs or hostnames for residential Internet users. *Id.*

Pet., 8.

Patent Owner’s Expert

75. A POSITA would have understood that Glines already discloses the use of multiple file servers with each name server, for example as illustrated by file servers 51-3 of Figure 1. EX1002, 12:11-23; FIG. 1. Glines explains that the file servers of Glines contain “replicas of content files that originate at the origin server 40 [and] are distributed and stored in the replica content servers 50.” EX1002, 12:14-16; EX1001, 2:60-61. Considering this already existing architecture of Glines, Dr. Mowry does not explain how merely adding more storage capacity facilitates support for multiple content providers, as required by claims 13, 18, 22, and 23, nor does he even contend that it does.

EX2018, ¶75.

Agenda

- ▶ The '112 Patent
- ▶ Independent Claim 1 (Grounds 1A/1B)
 - ▶ “causing said hostname to be resolved to said common anycast address by an Internet Service Provider (ISP) DNS server”
- ▶ Independent Claim 23 (Grounds 1A/1B)
 - ▶ “a second request for second content associated with a second content provider”
- ▶ Independent Claims 13, 18, 22, and 23 (Grounds 1A/1B and 4A/4B)
 - ▶ “a plurality of content providers”
- ▶ **Independent Claims 13, 18, 19, 21, 22, and dependent claim 11 (Grounds 1A/1B, 3A/3B, 4A/4B, and 5A/5B)**
 - ▶ “a switch” / “at least one switch”
- ▶ Motivation to Combine Glines and Gupta (All B Grounds)

The '112 Patent, 11, 13, 18, 19, 21, and 22

Claim 11

11	The method of claim 1 further comprising: (c3) by at least one switch, selecting the content server from said respective plurality of content servers associated with said resolving CDN DNS.
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Claim 13

[13e]	(c12) by a switch associated with said resolving DNS server of step (c11), selecting the first content server from said respective plurality of content servers associated with the DNS server of step (c11); and
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Claim 18

[18f]	(E) the at least one switch associated with the set of content servers of the resolving DNS server is operable to perform load balancing to select the content server from the set of content servers associated with the resolving DNS server, and
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Claim 19

[19f]	(c2) by at least one switch, selecting the content server from said respective plurality of content servers associated with said resolving DNS server,
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Claim 21

[21e]	(c2) by at least one switch associated with the set of content servers of the resolving DNS server, selecting the content server from the set of content servers associated with the resolving DNS server.
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Claim 22

[22g]	the at least one switch is operable to select the content server from the plurality of content servers, and
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Petitioner fails to establish that Glines teaches the claimed “switch” limitations

Petitioner’s entire analysis:

Petition

As explained in claim 10, Glines describes a Layer 4 switch used for “standard load balancing” among multiple content servers to apply a load balancing policy and select a content server. *Supra* Claim 10. For the same reasons, Glines discloses selecting the content server by at least one switch—Glines’s switch is used for the load balancing that determines which content server should be selected. EX-1008 ¶¶247-253.

Pet., 39.

Glines

However, within the service group, standard load balancing and replication techniques can also apply, such as multiple content servers (returning multiple local IP addresses to a name lookup), layer 4 switches, etc. Multiple DNS servers within the group all listening to the anycast address would also be possible.

EX1002, 19:13-16.

Petitioner fails to establish that Glines teaches the claimed “switch” limitations

Patent Owner's Expert

81. Glines instead discloses that “standard load balancing” can be accomplished by “returning multiple local IP addresses to a name lookup” that correspond to “multiple content servers,” rather than the switch selecting the appropriate content server as described in the ‘112 patent. EX1002, 19:13-16. In Glines, the DNS server returns the IP addresses for the content servers to the browser, which then requests content from one of the servers. *Id.*, 15:26-16:8 (“[T]he name server 53 associated with this closest rate will then respond by reporting the unique IP address of its associated replica content server 51.”). With such a technique in place, it is my opinion that Glines has no need to cause the disclosed Layer 4 switch to “select” the content server, as the claims require.

EX2018, ¶81.

82. Additionally, Dr. Mowry does not state how or why it would have been obvious to a POSITA to have Glines’s layer 4 switch perform this function. Indeed, Dr. Mowry simply asserts that “Glines’s applying ‘standard load balancing’ techniques within a service group, including use of ‘layer 4 switches,’ discloses or at least renders obvious using a Layer 4 switch to load balance across the content servers in a service group.” EX1008, ¶252. But, as I just discussed, this overreads the passage of Glines excerpted above, which does not state the role of the Layer 4 switch in performing the “standard load balancing and replication techniques.” EX1002, 19:13-15.

EX2018, ¶82.

Petitioner fails to establish that Glines in combination with Colby teaches the claimed “switch” limitations

Petition

Colby discloses a switch 100 for selecting a server from a plurality of servers to provide content to a user using, e.g., a load-balancing algorithm. Colby, Abstract, 6:7-28, 20:1-33, Fig. 1c. Colby also discloses rules that identify a load balance algorithm to use when accessing particular content. *Id.*, 6:35-67, Fig. 2. A POSITA would have been motivated to combine Colby’s switch and load-balancing algorithm (a policy) to select a content server as claimed for the reasons explained in §X.A. EX-1008 ¶¶577-581.

Pet., 69.

POR

The secondary references do not fill the gaps in Glines. First, Petitioner does not rely on Gupta for these limitations. *See, e.g.*, Pet., 38-39 (discussing the “switch” limitation of claim 11), 42, 38, 50, 52, 53 (referring back to claim 11). Second, Petitioner’s argument that Colby also allegedly discloses “a content-aware flow switch,” Pet., 68-69, 72, ignores that Glines already discloses load balancing techniques that do not require the use of an additional switch, as noted above. As the Federal Circuit has held, “[i]t does not suffice to meet the motivation to combine requirement to recognize that two alternative arrangements . . . were both known in the art.” *Virtek Vision Int’l ULC v. Assembly Guidance Sys., Inc.*, 97 F.4th 882, 886 (Fed. Cir. 2024).

EX2018, ¶82.



It does not suffice to meet the motivation to combine requirement to recognize that two alternative arrangements . . . were both known in the art

Virtek Vision Int'l ULC v. Assembly Guidance Sys., Inc., 97 F.4th 882, 886 (Fed. Cir. 2024)

Agenda

- ▶ The '112 Patent
- ▶ Independent Claim 1 (Grounds 1A/1B)
 - ▶ “causing said hostname to be resolved to said common anycast address by an Internet Service Provider (ISP) DNS server”
- ▶ Independent Claim 23 (Grounds 1A/1B)
 - ▶ “a second request for second content associated with a second content provider”
- ▶ Independent Claims 13, 18, 22, and 23 (Grounds 1A/1B and 4A/4B)
 - ▶ “a plurality of content providers”
- ▶ Independent Claims 13, 18, 19, 21, 22, and dependent claim 11 (Grounds 1A/1B, 3A/3B, 4A/4B, and 5A/5B)
 - ▶ “a switch” / “at least one switch”
- ▶ **Motivation to Combine Glines and Gupta (All B Grounds)**

Petitioner fails to establish a motivation to combine Glines and Gupta

Absent from Petitioner’s “Motivation to Combine” section is any articulated motivation as to why a POSITA would have plucked the “WebCache servers” and the “ISP DNS Server” from Gupta’s disclosure and modified Glines with these cherry-picked features.

A. Motivation to Combine Glines with Gupta

Glines and Gupta share a similar architecture to one another—both disclose DNS servers and associated content servers that are connected to a network and function together to resolve hostnames and deliver content. EX-1008 ¶¶68-71. Given their similarities and shared desire to increase content delivery performance, a POSITA would have understood that Glines and Gupta were analogous art. *Id.* ¶72. And given both teach well-known methods, a POSITA would have had a reasonable expectation of success in the combination. *Id.*

Pet., 7-8.

The combination would have involved, for example, applying Gupta’s use of multiple WebCache servers with each name server to Glines to yield a system with multiple content servers for each name server. *Id.* ¶¶73-74 The combination also would have applied Gupta’s use of an ISP DNS server to Glines to resolve URLs or hostnames for residential Internet users. *Id.*

Pet., 8.

Petitioner fails to establish a motivation to combine Glines and Gupta

Patent Owner's Expert

in an attempt to establish a motivation to combine. A POSITA would have recognized, in fact, that Glines and Gupta disclose fundamentally disparate architectures and techniques for accomplishing content delivery. For example, Glines uses anycast addressing to direct requests to one of multiple “alternative or replica name servers 53-1, 53-2, 53-3” that “are peered with content file servers 51-1, 51-2, 51-3 that contain replica copies of files stored at the origin server 40,” as illustrated in Figure 1 below. EX1002, 10:19-25, 13:3-8.

EX2018, ¶185.

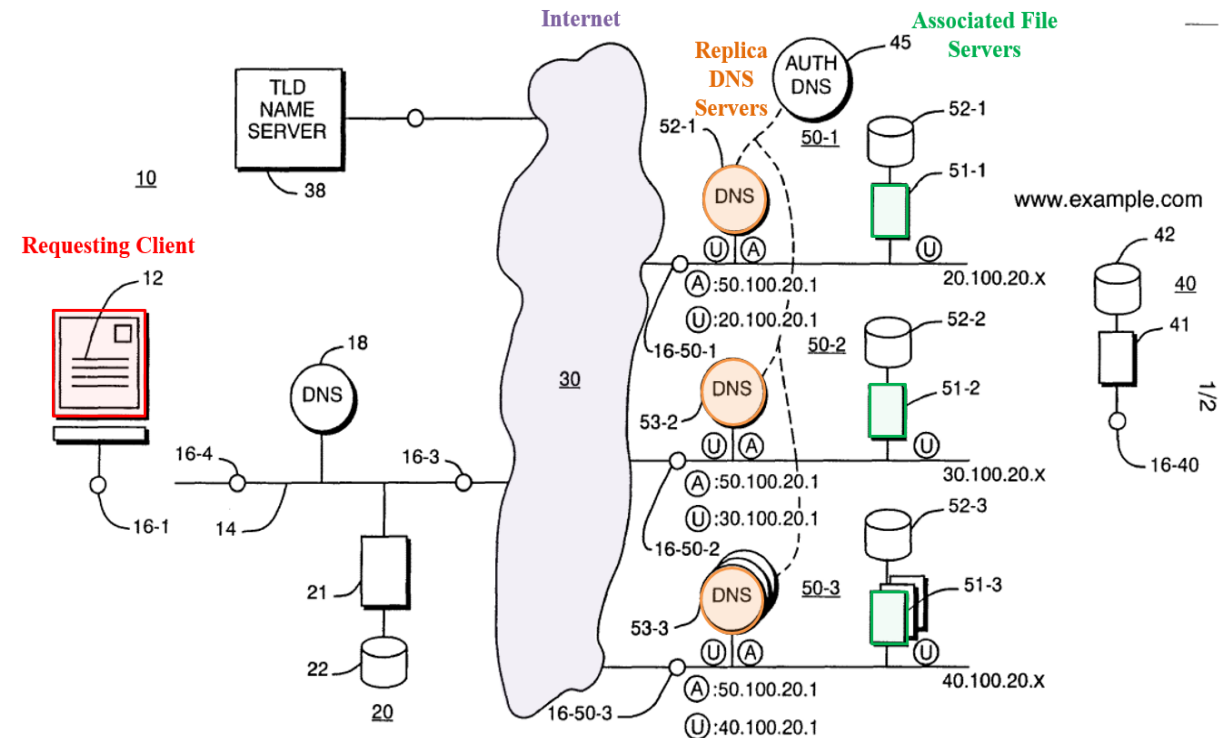


FIG. 1

EX1002, FIG. 1 (annotated).

Petitioner fails to establish a motivation to combine Glines and Gupta

Patent Owner's Expert

87. In contrast to Glines's anycast addressing and peering arrangement between DNS servers and file servers, Gupta uses only unicast addressing schemes, offloading its content server selection to a separate "network probe server" coupled to the DNS server. EX1003, Abstract. Gupta discloses a "client DNS server 170 [blue below] ... used to resolve a host name into an IP address." EX1003, 6:4-6. "If client DNS server 170 does not know the IP address, client DNS server 170 may pass the request to other DNS servers, such as DNS servers 110-120 [red below], or the like." EX1003, 6:6-9. That is, rather than sending an anycast UDP message like Glines, Gupta's DNS servers are directly contacted via unicast.

EX2018, ¶187.

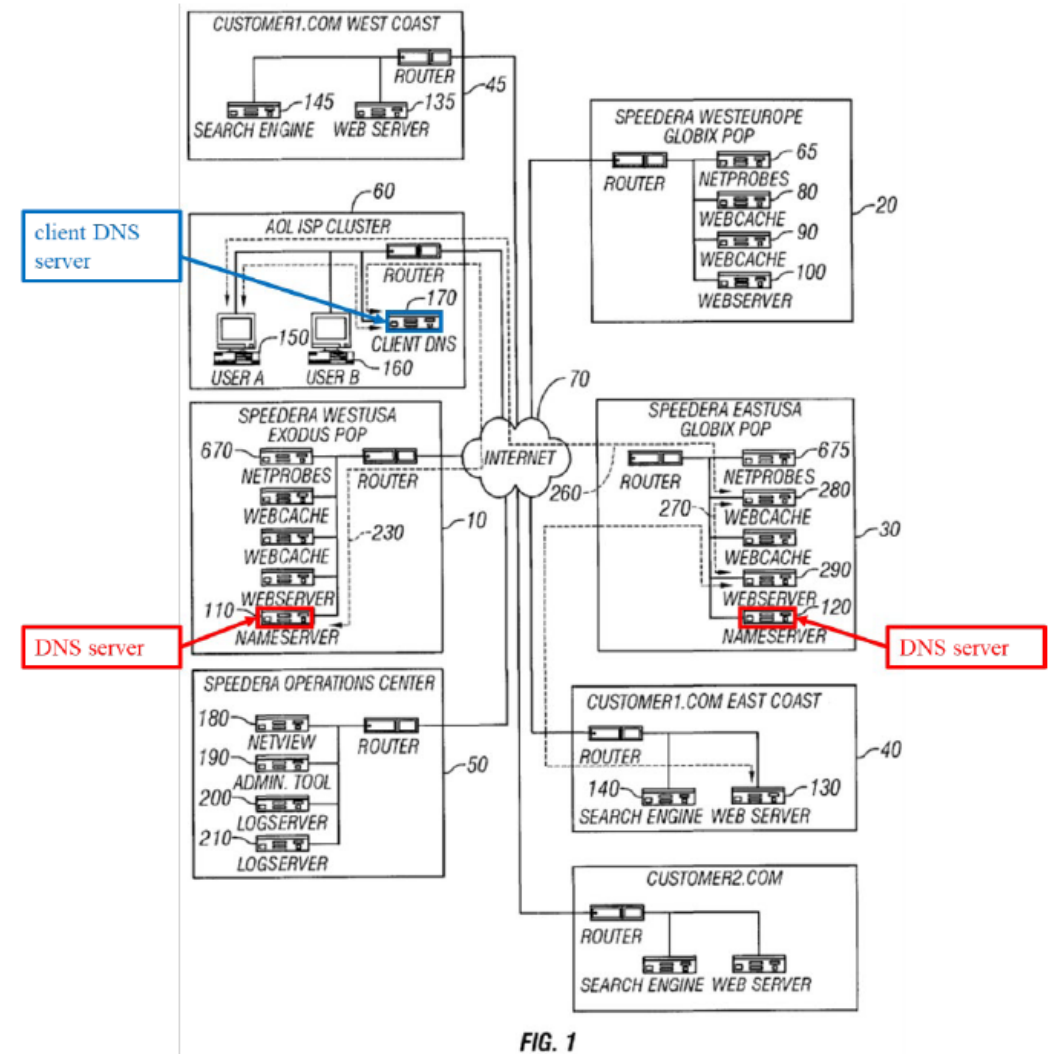


FIG. 1

EX1003, FIG. 1 (annotated).

Petitioner fails to establish a motivation to combine Glines and Gupta

Patent Owner's Expert

90. Put simply, Glines uses anycast addressing to select an appropriate replica DNS server and peered file server based on proximity to the user, while Gupta uses a different technique that offloads the selection of a web server to a network probe server coupled to the DNS server and selects the web server using standard load-balancing techniques. Glines discloses that its stated goal is to provide “a solution to the problem of route discovery by avoiding it altogether.” EX1002, 8:14-15. Gupta, in contrast, “uses the latency and traffic load information associated with the customer’s web site[] ... to select an appropriate customer web server to return to the user.” EX1003, 9:1-5. Gupta’s use of latency and traffic information directly contravenes Glines’s stated goal because it involves route discovery—leveraging latency and traffic information to route a network packet requires knowledge of the route because it routes the packet to a server with low latency. Thus, if Glines were modified to account for Gupta’s latency and load

EX2018, ¶90.

latency. Thus, if Glines were modified to account for Gupta’s latency and load information, any efficiencies gained by using anycast addressing would be diminished because the routing system would need to have awareness of latency and load information at each DNS server, and route DNS requests based on the latency and load information. Conversely, Gupta teaches away from the use of anycast addressing, relying instead on load monitoring and load balancing. A POSITA implementing Glines may well have regarded Gupta’s abandonment of anycast addressing as an improvement over Glines’s architecture, supporting load leveling across a network of servers rather than relying on network proximity.

EX2018, ¶90.

Petitioner fails to establish a motivation to combine Glines and Gupta

Gupta's alleged ISP DNS server

Patent Owner's Expert

57. Indeed, Gupta's "ISP 60" (and its included "client DNS server 170") would not be "an obvious substitute for Glines's local resolver 18" because Glines relies on a fundamentally different architecture than Gupta. Pet., 24. Glines's "local resolver 18" functions as a cache, rather than DNS server. Specifically, Glines states that when "local resolver 18" receives a request from a browser, it "determines **whether or not the requested content file is available locally.**" EX1002, 13:24-14:1 (emphasis added). "For example, it determines if 'example.com' is located in the **local** web server 20." EX1002, 14:1-2 (emphasis added). That is the purpose of Glines's local resolver—to determine if the content is already stored locally, and if not, to reach out to a different root DNS server to perform DNS resolution. EX1002, 13:24-14:1.

EX2018, ¶57.

Petition

Gupta's ISP 60 thus performs the same functions as Glines's local DNS resolver 18 (e.g., resolving a host name into an IP address). In view of Glines's teaching that local DNS resolver 18 is used "where the user is associated with an Internet Service Provider (ISP)," Glines, 13:24-27, a POSITA would have understood Gupta's ISP 60 to be an obvious substitute for Glines's local resolver 18.

Pet., 24.

Petitioner fails to establish a motivation to combine Glines and Gupta

Gupta's WebCache servers

Petition

A. Motivation to Combine Glines with Gupta

The combination would have involved, for example, applying Gupta's use of multiple WebCache servers with each name server to Glines to yield a system with multiple content servers for each name server. *Id.* ¶¶73-74 The combination also would have applied Gupta's use of an ISP DNS server to Glines to resolve URLs or hostnames for residential Internet users. *Id.*

Pet., 8.

Patent Owner's Expert

74. I do not see any support for Dr. Mowry's assertions that the combined system of Glines and Gupta establishes support for multiple content providers. For example, in his section discussing the motivation to combine Glines and Gupta, Dr. Mowry asserts that "applying Gupta's use of multiple WebCache servers with each name server to Glines's system to yield multiple content servers associated with *each* name server in Glines," and that "doing so would have allowed more content to be stored in association with each name server, improving Glines's ability to deliver content to a user via the closest name server." EX1008, ¶73 (emphasis in original). However, Dr. Mowry does not explain how Glines's system would support multiple content providers simply by increasing storage capacity.

EX2018, ¶74.

Claims Appendix

The '112 Patent, Claim 11

11. The method of claim 1 further comprising:
(c3) by at least one switch, selecting the content server from said respective plurality of content servers associated with said resolving CDN DNS.

EX1001, Claim 11.

The '112 Patent, Claim 13

13. A method of content delivery for delivering content on behalf of a plurality of content providers, the method comprising:

- (A) providing a plurality of Domain Name System (DNS) servers, said plurality of DNS servers sharing a common anycast address, wherein each DNS server is associated with a respective plurality of content servers;
- (B) configuring each DNS server and respective plurality of content servers to support content delivery for a plurality of content providers, wherein each of the plurality of content providers has a respective hostname associated therewith;
- (C1) responsive to a first request for first content associated with a first content provider of said plurality of content providers, said first request including at least a first hostname associated with the first content provider,
 - (c11) by a first DNS server of said plurality of DNS servers, resolving said first hostname to identify a first IP address to be used for retrieval of the first content from a first content server of said content servers associated with said first DNS server;
 - (c12) by a switch associated with said resolving DNS server of step (c11), selecting the first content server from said respective plurality of content servers associated with the DNS server of step (c11); and
 - (c13) attempting to serve said first content from the first content server; and

- (C2) responsive to a second request for said first content associated with said first content provider of said plurality of content providers, said second request including at least the first hostname associated with the first content provider,
 - (c21) by a second DNS server of said plurality of DNS servers, resolving said first hostname to identify a second IP address for retrieval of the first content from a content server associated with the second DNS server;
 - (c22) by a switch associated with said resolving DNS server of step (c21), selecting the second content server from said respective plurality of content servers associated with the DNS server of step (c21); and
 - (c23) attempting to serve said second content from the second content server.

EX1001, Claim 13.

The '112 Patent, Claim 18

18. A content delivery system for delivering content on behalf of a plurality of content providers, each of said plurality of content providers having a hostname associated therewith, the system comprising:

- (A) a plurality of Domain Name System (DNS) servers, said plurality of DNS servers sharing a common anycast address, said plurality of DNS servers being authoritative for said hostnames associated with said plurality of content providers;
- (B) a set of content servers associated with each DNS server, each set comprising at least a plurality of content servers; and
- (C) at least one switch associated with each set of content servers, wherein
- (D) responsive to a request to resolve a hostname associated with a particular content provider of said plurality of content providers, said request being associated with an end-user request for content of said particular content provider, one of said plurality of DNS servers is operable to resolve said hostname to identify an IP address for use by the end-user to retrieve the content from a content server,
- (E) the at least one switch associated with the set of content servers of the resolving DNS server is operable to perform load balancing to select the content server from the set of content servers associated with the resolving DNS server, and
- (F) the content server is operable to serve the content to the end-user.

EX1001, Claim 18.

The '112 Patent, Claim 19

19. A method of content delivery, the method comprising:

- (A) providing a plurality of CDN Domain Name System (DNS) servers, said plurality of DNS servers sharing a common anycast address, each DNS server being associated with a respective plurality of content servers, wherein at least some of said plurality of content servers are located at network Points of Presence (POPs);
- (B) causing said plurality of DNS servers to be authoritative for a hostname associated with a content provider by causing said common anycast address to be associated with said hostname;
- (C) responsive to a request for content associated with the content provider by a client, said request including at least said,
 - (c1) by one of said plurality of DNS servers, resolving said hostname to identify an IP address for use by the client to retrieve the content from a content server; and
 - (c2) by at least one switch, selecting the content server from said respective plurality of content servers associated with said resolving DNS server,
- (D) by the content server,
 - (d1) attempting to serve the content by:
 - (d11) if a valid version of the content is available on the content server, serving the content; otherwise
 - (d12) obtaining the content from a content source and then serving the content.

EX1001, Claim 19.

The '112 Patent, Claim 21

21. A method of content delivery in a network, the method comprising:

- (A) providing a plurality of Domain Name System (DNS) servers associated with a Content Delivery Network (CDN), the plurality of DNS servers sharing a common anycast address, wherein each DNS server is associated with a set of content servers, each set comprising at least a plurality of content servers;
- (B) causing the plurality of DNS servers to be authoritative for a hostname associated with a content provider by causing the common anycast address to be associated with the hostname;
- (C) responsive to a request for content associated with the content provider and issued by a client, the request including at least the hostname,
 - (c1) by one of the plurality of DNS servers, resolving the hostname to identify an IP address for use by the client to retrieve the content from a content server; and
 - (c2) by at least one switch associated with the set of content servers of the resolving DNS server, selecting the content server from the set of content servers associated with the resolving DNS server.

EX1001, Claim 21.

The '112 Patent, Claim 22

22. A content delivery system comprising a plurality of nodes, wherein each node comprises:
a Domain Name System (DNS) server sharing an anycast address with DNS servers in other nodes of the content delivery system, wherein the DNS server is authoritative for hostnames associated with a plurality of content providers;
a plurality of content servers; and
at least one switch, wherein
responsive to a request by a client for content associated with a particular content provider of the plurality of content providers, the request including at least a host-name associated with the particular content provider, the DNS server is operable to resolve the hostname to identify an IP address for use by the client to retrieve the content from a content server,
the at least one switch is operable to select the content server from the plurality of content servers, and
the content server is operable to serve the content to the client.

EX1001, Claim 22.

The '112 Patent, Claim 23

23. A method comprising:

- (A) providing a plurality of Domain Name System (DNS) servers, said plurality of DNS servers sharing a common anycast address, wherein each DNS server is associated with a respective plurality of content servers, wherein each DNS server and respective plurality of content servers is configured to support content delivery for a plurality of content providers;
- (B) responsive to a first request for first content associated with a first content provider of said plurality of content providers, said first request including at least a first host-name associated with the first content provider, by a first DNS server of said plurality of DNS servers, resolving said first hostname to identify a first IP address of a content server of the plurality of content servers associated with said first DNS server; and
- (C) responsive to a second request for second content associated with a second content provider of said plurality of content providers, said second request including at least said first hostname associated with the first content provider, by a second DNS server of said plurality of DNS servers, resolving said first hostname to identify a second IP address associated with a content server of the plurality of content servers associated with the second DNS server.

EX1001, Claim 23.