2021-1998

United States Court of Appeals for the Federal Circuit

SOUND VIEW INNOVATIONS, LLC,

Plaintiff-Appellant,

v.

HULU, LLC,

Defendant-Appellee.

APPEAL FROM THE UNITED STATES DISTRICT COURT
FOR THE CENTRAL DISTRICT OF CALIFORNIA
NO. 2:17-CV-04146-JAK-PLA, HON. JOHN A. KRONSTADT

CORRECTED NONCONFIDENTIAL OPENING BRIEF OF APPELLANT SOUND VIEW INNOVATIONS, LLC

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September 16, 2021

U.S. PATENT NO. 6,708,213
CLAIM 16

16. A method of reducing latency in a network having a content server which hosts streaming media (SM) objects which comprise a plurality of time-ordered segments for distribution over said network through a plurality of helpers (HSs) to a plurality of clients, said method comprising:

receiving a request for an SM object from one of said plurality of clients at one of said plurality of helper servers;

allocating a buffer at one of said plurality of HSs to cache at least a portion of said requested SM object;

downloading said portion of said requested SM object to said requesting client, while concurrently retrieving a remaining portion of said requested SM object from one of another HS and said content server; and

adjusting a data transfer rate at said one of said plurality of HSs for transferring data from said one of said plurality of helper servers to said one of said plurality of clients.

CERTIFICATE OF INTEREST

Pursuant to Federal Circuit Rules 26.1, 28(a)(1), and 47.4, counsel for appellant certifies the following:

1. The full name of every entity represented in this case by me is:

   Sound View Innovations, LLC

2. The name of every real party in interest, if that entity is not the real party in interest, is:

   N/A

3. All parent corporations and every publicly held corporation that owns 10 percent or more of the stock of the entity represented by me are:

   Sound View Innovation Holdings, LLC

4. The names of all law firms, partners, and associates that have not entered an appearance in this appeal, and appeared for the entity in the trial court or are expected to appear for the entity in this court are:

   Desmarais LLP: Steven Balcof, Kathryn E. Bi (former), Richard M. Cowell (former), Charles Austin Ginnings (former), Kerri-Ann Limbeek, Ameet A. Modi, Jennifer Przybylski

   Hankin Patent Law APC: Marc E. Hankin

   Russ August and Kabat: Marc A. Fenster, Kent N. Shum, Benjamin T. Wang

5. The title and number of any case known to counsel to be pending in this or any other court or agency that will directly affect or be directly affected by this court's decision in the pending appeal include:

   Sound View Innovations, LLC v. DISH Network, LLC et al., No. 19-cv-3707 (D. Colo.), consolidated with *Sound View Innovations, LLC v. Sling TV LLC*, No. 19-cv-3709 (D. Colo.)

6. Provide any information required under Fed. R. App. P. 26.1(b) (organizational victims in criminal cases) and 26.1(c) (bankruptcy case debtors and trustees):

N/A

Dated: September 16, 2021 /s/ *Frederick J. Ding*

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CERTIFICATE OF SERVICE

CERTIFICATE OF COMPLIANCE

CERTIFICATE OF CONFIDENTIAL MATERIAL

CONFIDENTIAL MATERIAL OMITTED (Fed. Cir. R. 25.1)

The material omitted on page 11 describes a programming data structure in an accused edge server; the material omitted on page 52 describes a party's internal comparison of users' watch time; the material omitted on page 58 describes a party's internal comparison of users' watch time; the material in the first omission on page 59 describes a party's internal comparison of users' watch time; the material in the second omission on page 59 estimates the percentage reduction in viewership from switching to a noninfringing alternative; the material omitted on page 60 and page 61–62 describes a party's internal comparison of users' watch time. Further, Appx0054 et seq. includes the district court's redacted order instead of the sealed order.

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STATEMENT OF RELATED CASES

No other appeal in or from Civil Action No. 2:17-cv-04146-JAK-PLA in the United States District Court for the Central District of California was previously before this or any other appellate court.

Plaintiff-Appellant Sound View Innovations, LLC ("SVI") is asserting U.S. Patent No. 6,708,213, the patent at issue in this appeal, in a pending litigation in the United States District Court for the District of Colorado before the Hon. Christine M. Arguello: *Sound View Innovations, LLC v. DISH Network, LLC*, No. 19-cv-3707 (D. Colo.), consolidated with *Sound View Innovations, LLC v. Sling TV LLC*, No. 19-cv-3709 (D. Colo.).

Counsel for SVI are not aware of any other case in this Court, in any other court, or before the PTAB that is related to this appeal under Fed. Cir. R. 47.5.

JURISDICTIONAL STATEMENT

The district court had jurisdiction over this action for patent infringement under 28 U.S.C. §§ 1331 and § 1338(a). On April 30, 2021, the district court entered final judgment in favor of Hulu, disposing of all claims and defenses. Appx0001-0002. SVI filed a notice of appeal from the final judgment on May 27, 2021. Appx4106-4109. Under 28 U.S.C. § 2107(a) and Fed. R. App. P. 4(a), SVI's appeal is timely. This Court has jurisdiction under 28 U.S.C. § 1295(a)(1).

INTRODUCTION

Sound View Innovations ("SVI") brought this lawsuit to defend its industry recognized and award-winning video-streaming patented technology against Hulu's infringement. But SVI's infringement case was improperly cut short on the eve of trial when the district court *twice* engaged in supplemental claim construction that disregarded this Court's well-established rules of construction.

The district court first found a prosecution disclaimer, not based on the actual prior-art distinction explicitly argued by the applicants, but rather on a distinction that the court—on its own—believed would have been required to overcome the prior art. In doing so, the district court added requirements that data be downloaded "from" and retrieved "into" a ***single*** "buffer," to a claim limitation ***that makes no mention of specific storage or retrieval locations, much less a buffer***. But the applicants added the claim step to stress an entirely different distinction over the prior art: that the claimed downloading and retrieving be done "concurrently"—a term that appears explicitly in the added claim language—rather than serially. The applicants stressed the importance of the timing distinction over the prior art by repeatedly underlining the words "concurrently" and "after" in its accompanying remarks. Indeed, the applicants' remarks—including the underlining—were so clear that another judge in another district looking at the same record and with the benefit of the California court's disclaimer decision nevertheless rejected the disclaimer,

concluding that "[i]t seems ***pretty obvious*** (as can be seen from the underscoring the patentee liberally used)" that the applicants were distinguishing their invention based on the term "concurrently." The applicants did not contrast their invention to the art with regard to the number of buffers. By substituting its own judgment regarding what would have been required to overcome the prior art in place of the ***applicants'*** argued distinction, the district court employed the wrong claim construction analysis and therefore erred in finding disclaimer.

Compounding that error, the district court went on to grant summary judgment of noninfringement by finding that the "cache" of the accused product could not meet the newly added "buffer" limitation as a matter of law. In doing so, the court introduced another claim-construction error by failing even to state what construction of "buffer" it applied. Moreover, the court also erred by misreading the specification, reasoning that terms used differently in the specification had to be mutually exclusive, rather than have any overlapping scope. But in ordinary usage, both terms refer to temporary storage, and both a buffer and a cache can hold data being sent or received. Absent express disclaimer or lexicography, the court's effective construction—a negative limitation to exclude any "cache"—is foreclosed as a matter of law. The court found no express disclaimer or lexicography of "buffer," and none exists in the asserted patent. Accordingly, the grant of summary judgment requires reversal.

The district court also overstepped its role as a gatekeeper of expert testimony. In exercising its discretion under *Daubert*, a trial court must focus on the reliability of methods, not question the correctness of conclusions or decide disputes about the underlying facts. Expert testimony is not inadmissible just because it is impeachable. Here, relying on unchallenged opinions of a technical expert that the invention reduces buffering interruptions to multimedia playback (re-buffering) and allows multimedia to start playing more rapidly (reduced startup latency), SVI's damages expert estimated damages using two publications that had quantified and linked those technical benefits to increased viewership. The district court twice excluded those damages opinions based on disputed factual distinctions between the benchmarks and Hulu's accused products and infringing acts. But those distinctions are the sort that should be presented through cross-examination—*e.g.*, whether Hulu's users stream multimedia over wireless or wired connections, while stationary or moving, on cell phones or televisions. Nothing in *Daubert* requires perfect data exactly matching the infringer's product; this Court and the Ninth Circuit have both upheld similar extrapolations from comparable products and benchmarks to assess damages. It was therefore an abuse of discretion to exclude this testimony under *Daubert*.

The judgment of the district court should be vacated and remanded.

STATEMENT OF THE ISSUES

1. Whether the applicants' June 2003 remarks during prosecution effected a clear and unmistakable disclaimer in the "downloading… while concurrently retrieving" step of Claim 16 of the '213 Patent.

2. Whether the district court erred in granting summary judgment of noninfringement of Claim 16 of the '213 Patent based on the term "buffer."

3. Whether the district court erred in (a) excluding damages opinions of Mr. Yurkerwich that relied on the Yao study, and (b) excluding damages opinions of Mr. Yurkerwich that relied on the Conviva statistics.

STATEMENT OF THE CASE

I. TECHNOLOGY OVERVIEW

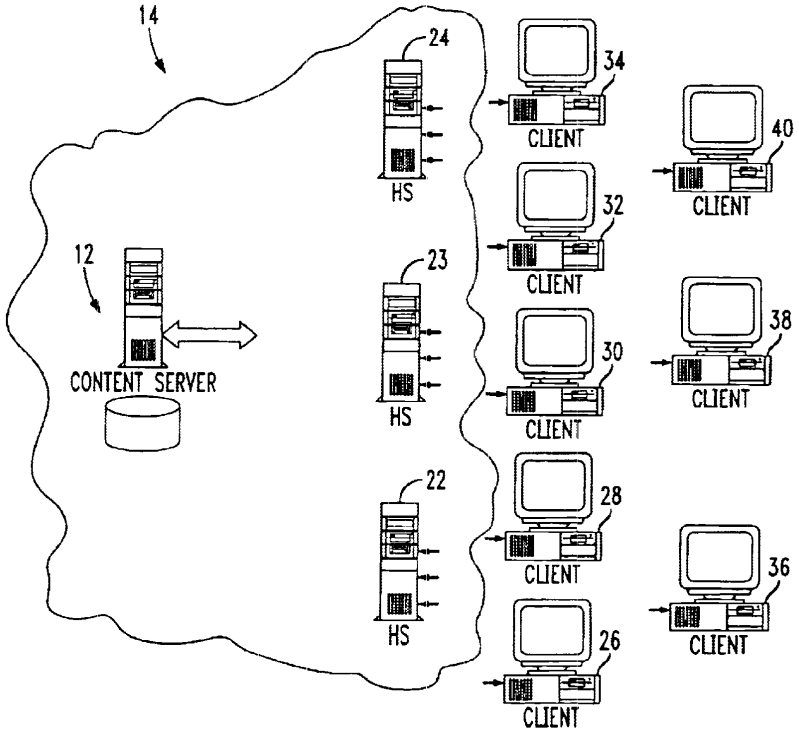
A. The '213 Patent

In the late 1990s, researchers at Bell Laboratories had a vision that one day the Internet would not only be used to transfer text and images, but would also become the way that we watch television, movies, and other multimedia content. Their work—described in a December 6, 1999 provisional application and March 29, 2000 utility application—is claimed in U.S. Patent No. 6,708,213 (the "'213 Patent"). Appx0163-0180. Years later, as household video streaming became a reality, the '213 Patent received the 2013 Edison Patent Award recognizing its "fundamental concepts and techniques to design content distribution networks (CDNs) and caching systems originally built for text and images to better support streaming media over the Internet." *DISH Network L.L.C. v. Sound View Innovations, LLC*, IPR2020-00969, 2020 WL 6951823, at *9-12 (P.T.A.B. Nov. 25, 2020). And despite multiple challenges to its validity, the Patent Trial and Appeal Board has twice rejected petitions challenging the '213 Patent—including Hulu's own—citing novel aspects of the claims and powerful objective indicia. *See DISH*, 2020 WL 6951823, at *3, 9-12, 13-14; *Hulu, LLC v. Sound View Innovations, LLC*, IPR2018-01023, 2018 WL 6318113, at *9 (P.T.A.B. Dec. 3, 2018).

At the time of the invention, simple methods for delivering multimedia—such as downloading all of the data from a server ("content server") to the client—suffered from considerable delay before the client could start playing the media. Appx0173 1:19-27. "Streaming" methods of that time enabled clients to start playing back partially received data, "rather than waiting for the entire data set to arrive." Appx0173 1:28-39. But then-existing streaming systems scaled poorly with increasing demand. Large numbers of clients burdened the underlying architecture, causing network congestion, long delays between when a client requests a video and when the video actually begins playing ("high start-up latency"), and "unpredictable playback quality due to network congestion." Appx0173 1:56-2:3. Those perceivable shortcomings negatively affect the user's viewing experience. *Id.*

The invention uses "helper servers" that cache content, coordinate amongst each other to deliver content, and adjust data transfer rates, thereby reducing the time it takes for clients to receive playable content and "improving the quality perceived by end users." Appx0173-0174 2:64-3:10. Figure 2 (Appx0164) depicts a public network comprising helper servers:

FIG. 2



The content server is a source of content (*e.g.*, a complete copy of a movie). Appx0174-0175 4:65-5:4. The helper servers are intermediary servers that may be geographically dispersed, more numerous than content servers, and in closer physical proximity to the clients. Appx0175 5:8-13; Appx0164 fig.2. The clients are the ultimate recipients of the streamed content. Helper servers have CPU and storage, including temporary storage for data to be received and transmitted. Appx0175 5:9-11.

The invention of the ’213 Patent is based on the idea that intermediary servers along the path from the content server to the client could be enhanced to especially accommodate streaming multimedia objects (“SM objects”). Every claim recites the

use of ***helper servers***—each, "one of a plurality of servers in the network that provide certain value-added services" by "***caching… and/or prefetching***" (Appx0174 4:16-19). They can "cooperate… between and among each other," and between content providers and clients. Appx0174 4:19-22.

The patent illustrates how the helper servers can prefetch and cooperate. Because a client must first receive K seconds of data in its playout buffer before it can begin playing the media, Appx0176 8:11-15, a helper server can reduce "startup latency" by shortening the time for the client to receive that initial K seconds. The specification describes a technique for the helper server to ***prefetch*** the next portion of data (including by coordinating with another helper server that has the data) while the client is downloading an initial portion of data from the helper server. When an exemplary helper server receives a request for an SM object where it already has an initial portion in its temporary storage (*e.g.*, the portion from 0 to K_1 seconds, where $K_1 \leq K$), "two processes are started ***concurrently***." Appx0176 8:46-51. "***A first process is to download*** the existing K_1 seconds of data stored in the playout buffer B1 79… to the client C 73 as fast as the bandwidth allows." Appx0176 8:51-54. "***The second concurrent process*** is for the HS 75 to ***request*** $K-K_1$ seconds of data from either its local disk, ***or another HS***, or the content server…." Appx0176 8:58-60. In this way, playout can begin while data is still being fetched. And the ability to fetch the data from another helper server facilitates serving clients more quickly

because the closest source of content to the helper server directly serving a client may be another helper server, rather than a content server.

The only asserted claim is Claim 16, which reflects the concurrent processes at the helper server, its ability to retrieve data from other helper servers, as well as the helper server's ability to adjust the data transfer rate:

> A method of reducing latency in a network having a content server which hosts streaming media (SM) objects which comprise a plurality of time-ordered segments for distribution over said network through a plurality of helpers (HSs) to a plurality of clients, said method comprising:
>
> receiving a request for an SM object from one of said plurality of clients at one of said plurality of helper servers;
>
> allocating a buffer at one of said plurality of HSs to cache at least a portion of said requested SM object;
>
> ***downloading said portion of said requested SM object to said requesting client, while concurrently retrieving a remaining portion of said requested SM object from one of another HS and said content server;*** and
>
> ***adjusting a data transfer rate*** at said one of said plurality of HSs for transferring data from said one of said plurality of helper servers to said one of said plurality of clients.

Appx0179.

B. The Accused Products

Defendant-Appellee Hulu, LLC ("Hulu") operates a streaming video-on-demand ("SVOD") platform that delivers multimedia content to subscribers. Appx3777. Hulu's SVOD platform uses content distribution networks ("CDNs"), which consist of hundreds or thousands of "edge servers" that act as intermediaries between content sources and clients, to enable fast and coordinated distribution of streaming content to clients. Appx3758; Appx2341-2348. The CDNs in Hulu's SVOD platform are operated by third parties Akamai and Level 3. Appx2321. Hulu configures the operation of Akamai's and Level 3's edge servers. *E.g.*, Appx2343-2344, Appx2347-2349.

Akamai and Level 3's edge servers receive and service requests from Hulu's client software applications. Appx3761. Those requests identify the video content being requested (*e.g.*, a 30-minute episode of a TV show) and a particular range of bytes within that content. *Id.*; Appx3779; Appx3820; Appx3903-3904. When an Akamai or Level 3 edge server receives a byte range request for a portion of a video, the server first determines if it already has the requested portion stored. Appx3761, Appx3766.

With Akamai, if the requested byte range is greater than a configured size increment, the edge server will download a first portion of the byte range to the client while it concurrently retrieves the remaining portions. Appx 3781-3782; Appx3927,

CONFIDENTIAL MATERIAL OMITTED ON THIS PAGE

Appx3930-3933. Each Akamai edge server contains temporary storage for streaming content. Appx2907. Akamai's servers also contain a memory buffer comprising a [redacted] of [redacted] buffers to cache content. Appx3782.

With Level 3, if the server does not have the data in temporary storage, it will retrieve the entire asset (*e.g.*, 30-minute TV episode) from another edge server or the Hulu origin server. Appx3782; Appx3928; Appx3808. The Level 3 edge server downloads the requested byte range to the client as soon as it has that range, while it continues to retrieve the remainder of the entire asset. Appx3783. Each Level 3 edge server contains a cache that temporarily stores streaming content. Appx2927-2928; Appx3807-3808.

II. DISTRICT COURT PROCEEDINGS

A. Prior Procedural History

SVI filed suit against Hulu for patent infringement on June 2, 2017. Appx0064. SVI filed a First Amended Complaint on August 15, 2017, asserting that Hulu infringes, among others, the '213 Patent. Appx0203-0270.

The district court held a claim construction hearing in April 2018 and issued its first *Markman* order on September 4, 2018. Appx0364. It adopted the following constructions of terms in the '213 Patent, which are not at issue in this appeal:

Term	Court's Construction
"helper server" / "helper" / "HS"	"one of a plurality of servers in the network that provide certain value-added services and selectively cooperate and communicate SM objects

(1), (2): programming data structure

(Claims 1, 7, 13-16)	(or segments of such objects) between and among each other and between content servers and clients"
"streaming multimedia object(s)" / "streaming media object(s)" / "SM object" (Claims 1, 8, 13, 15, 16)	"a multimedia data file whose transmission has temporal characteristics such that the data may become useless unless the transmission rate is regulated in accordance with predetermined criteria (e.g., audio and video files)"
"ring buffer" (Claims 1, 8, 9, 13)	"a type of short term storage to service multiple requests for the same SM object within a certain fixed time interval, which advances and stores successive portions of the SM object"
"adjusting a data transfer rate at said one of said plurality of HSs" (Claim 16)	No construction.

Appx0389; *see also* Appx0372-0374, Appx0376-0380, Appx0382-0385.

Following fact and expert discovery, the district court denied Hulu's first motion for summary judgment of noninfringement of the '213 Patent, which was based on the "receiving…" and "adjusting…" steps of Claim 16. Appx4606-4607. The court also denied Hulu's motion for summary judgment based on divided infringement. Appx4617-4619.

B. Supplemental Claim Construction

In the lead-up to trial, Sound View filed Motion *In Limine* 6 to preclude Hulu's technical expert, Dr. Chase, from presenting claim construction arguments to the jury that contradicted the court's rulings or were based on alleged disclaimers during prosecution (which is a matter of law). Appx3272. The parties submitted supplemental briefs addressing the claim phrase "downloading… while concurrently

retrieving…." Appx0017. While SVI contended that plain and ordinary meaning governed, Hulu sought to add words to the claim by construing the step as "downloading said portion of said requested SM object ***from said allocated buffer*** to said requesting client, while concurrently retrieving ***into the same buffer*** a remaining portion of said requested SM object from one of another HS and said content server." Appx0018; Appx4377.

During prosecution, the applicants had amended Claim 16 to insert the entirety of the "downloading… while concurrently retrieving…" step in response to a rejection over U.S. Patent No. 6,438,630 ("DeMoney"). Appx4406, Appx4410. The accompanying remarks quoted DeMoney's abstract, with one phrase underlined: "Each media stream manager may be configured so that once one of its buffers is consumed by the associated media stream client, the media stream manager submits a buffer request and deadline for that buffer to the appropriate deadline queue." Appx4411 (underlining in original). The remarks then distinguished the applicants' invention, again underlining particular phrases:

> By contrast, the applicants' invention allocates a buffer at one of the plurality of helpers to cache at least a portion of the requested SM object, and downloads the portion of the SM object to the requesting client, while concurrently retrieving a remaining portion of the requested SM object from another HS or a content server. That is, the applicants' invention concurrently empties and fills the buffer, while the DeMoney reference teaches filling the buffer only after the buffer is empty. (See DeMoney, col. 12, lines 28-40). Furthermore, the buffer of the applicants' invention may be filled by information stored in another HS, which is also not taught by the DeMoney reference.

Appx4411.

Based on the applicants' choice of added claim language ("concurrently") and underlining ("concurrently" / "after"), SVI explained that applicants made only one clear distinction, which was about timing. Appx0020. The claimed invention downloaded and retrieved concurrently, while the prior art performed one "after" the other. *Id.* But the court rejected that interpretation, because in its view, despite the language chosen by the applicants, "Plaintiff's interpretation of the prosecution history would not be sufficient to distinguish DeMoney from Claim 16." *Id.*

Instead, the district court agreed with Hulu that, based on the above statements, Claim 16 requires downloading and filling "of a ***single*** buffer." Appx0019-0021. The court stated: "These statements do not refer to Claim 16 as covering the concurrent emptying of one buffer while a different buffer or set of buffers is being filled." Appx0020. Rather, "applicant specifically referred to 'the buffer,' as a singular term," whereas DeMoney had a "'ring of buffers,' which is a

plural usage." *Id.* The court found that the applicants "clearly and unequivocally disclaimed the full claim scope of Claim 16." Appx0021.

After the supplemental claim construction order below issued, other defendants accused of infringing the '213 Patent presented precisely the same evidence and argument in the District of Delaware. *Sound View Innovations, LLC v. Walmart Inc.*, No. 19-660-CFC-CJB, 2020 WL 2507688, at *10 (D. Del. May 15, 2020); *see also* Appx4573, Appx4576-4605 (copy of *Walmart* R&R). That court agreed with SVI that the statements did not rise to the level of clear and unmistakable disclaimer as to the number of buffers. Appx4595-4596. It found that the most reasonable interpretation of applicants' distinction was what they had intentionally emphasized—the ***concurrency*** of "downloading" and "retrieving"—not which buffers are used or the number of buffers. Appx4594-4595.

The California court subsequently denied reconsideration of its finding of disclaimer. Appx0011. It dismissed the import of the District of Delaware's interpretation of the prosecution remarks. Appx0016.

C. Summary Judgment of Noninfringement

Following supplemental claim construction, Hulu moved for summary judgment of noninfringement of Claim 16 of the '213 Patent. Appx3574-3590. Hulu argued that it was entitled to summary judgment because there was no dispute that the Akamai and Level 3 servers do not retrieve into the "same buffer," as required

by the new construction. Appx3578. Hulu asserted that SVI would not be able to identify any evidence of such retrieval into the same buffer. *Id.*

In opposition, SVI highlighted evidence that even a same-buffer requirement "would be met by the fact that an edge server downloads a portion of an SM object from its ***cache*** while concurrently retrieving into its ***cache*** a remaining portion of the SM object." Appx3741. SVI explained that "[t]he ordinary meaning of buffer is 'temporary storage for data being sent or received.'" Appx3959. Under that meaning, the cache in Akamai and Level 3 edge servers, is the claimed "buffer." Appx3962.

The district court viewed the dispute as "whether a cache can constitute the claimed buffer." Appx0006. The court concluded that the patent uses the terms "buffer" and "cache" differently, and from that reasoned a buffer ***cannot*** be a cache and a cache ***cannot*** be a buffer. Appx0006-0010. Because the accused product called its temporary storage a "cache," the court held that SVI's infringement theory fails as a matter of law. Appx0010. The court did not address the ordinary meaning of "buffer" or whether the accused cache would fall within that meaning.

D. *Daubert* Rulings Regarding Damages Opinions

The district court made several evidentiary rulings under *Daubert*. Its November 18, 2019 Order excluded part of the opinions of SVI's damages expert, Mr. Yurkerwich, that had relied on an academic paper by Yao. Appx0047-0048. The

Yao study attempted to simulate and derive quantitative estimates of how much adaptive bitrate streaming (ABR)—a key part of the infringing feature—could help avoid user-perceivable glitches. Appx3175. The district court found several "differences [that] affect the appropriateness of relying on the Yao Study"—differences like whether Hulu's users might connect through a cellular connection, through a computer, or while moving or stationary. Appx0047.

In response to the exclusion of the Yao study, and with permission of the district court, Mr. Yurkerwich created an amended report that removed the Yao study and carried out revised calculations supported by other data, including a press release from analytics firm Conviva summarizing a study Conviva conducted regarding the effects of ABR on user behavior. Appx4446-4571. The court accepted the report as a procedural matter, but deferred ruling on admissibility of the amended opinions. Appx3321.

On June 18, 2020, the district court excluded the amended calculations and opinions. Appx0054. The court found that the Conviva press release did not disclose all the details of the underlying study such that it could be probed for comparability to the accused system, and did not break down its data by the location of users or by each video-streaming website. Appx0057. It also found that Mr. Yurkerwich had made an unsupported leap to connect the Conviva press release to the benefits of the

invention according to the technical expert. Appx0057. The court struck the amended report. Appx0058.

E. Final Judgment

The parties stipulated to dismissal of other patents that had been stayed. Appx4027-4032. The district court entered final judgment of noninfringement of Claim 16 of the '213 Patent on April 30, 2021. Appx0001-0002. SVI filed a timely notice of appeal on May 27, 2021. Appx4106-4109.

SUMMARY OF THE ARGUMENT

The district court erred in three ways.

First, the court found a disclaimer limiting Claim 16 to a single buffer from a statement in prosecution that another court held had an entirely different meaning—suggesting that the statement was at least amenable to that other interpretation. And the court reached its conclusion notwithstanding that the applicants literally emphasized a distinction based on the concurrent downloading and retrieving of data, not a distinction based on the number of buffers. The applicants' statement cannot support a clear and unmistakable disclaimer regarding the number of buffers used in the claim because the statement is "subject to more than one reasonable interpretation." *01 Communique Lab., Inc. v. LogMeIn, Inc.*, 687 F.3d 1292, 1297 (Fed. Cir. 2012).

Second, working from its disclaimer construction, the court entered summary judgment of noninfringement on the erroneous basis that the word "buffer" (which the court had added to the limitation in question) could not encompass an accused "cache." But buffer and cache are technical terms that normally overlap (*e.g.*, they are both storage, including for data being sent or received), and the court identified no lexicography or explicit deviation from the ordinary scope of "buffer" by the applicants such that it would exclude a cache. Indeed, the court did not even provide a construction of "buffer" before deciding all caches are outside the scope of that

term. Absent lexicography or disclaimer, this was error. *Ethicon LLC v. Intuitive Surgical, Inc.*, 847 F. App'x 901, 907-08 (Fed. Cir. 2021) (nonprecedential); *Omega Eng'g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1323 (Fed. Cir. 2003).

Third, the court excluded the damages opinion of SVI's expert on the basis that the underlying studies on which he relied for quantification of the benefits of the invention were too factually different from Hulu's accused products. But questioning the factual similarity of studies facially directed to the same benefits the invention provides is not the role of a court under *Daubert*. *Apple Inc. v. Motorola, Inc.*, 757 F.3d 1286, 1319-20 (Fed. Cir. 2014), *overruled on other grounds by Williamson v. Citrix Online, LLC*, 792 F.3d 1339 (Fed. Cir. 2015) (en banc).

ARGUMENT

I. Standards of Review

This Court reviews a district court's grant of summary judgment under the law of the regional circuit. *Edgewell Personal Care Brands, LLC v. Munchkin, Inc.*, 998 F.3d 917, 919 (Fed. Cir. 2021). The Ninth Circuit reviews a grant of summary judgment *de novo*. *Greater Yellowstone Coal. v. Lewis*, 628 F.3d 1143, 1148 (9th Cir. 2010). Summary judgment of noninfringement based on an erroneous claim construction must be vacated and remanded. *Edgewell*, 998 F.3d at 925; *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999).

This Court reviews claim construction *de novo*, except for underlying factual findings based on extrinsic evidence, which the Court reviews for clear error. *Edgewell*, 998 F.3d at 920 (citing *Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 574 U.S. 318, 321-22, 332 (2015)). "[W]hen the district court reviews only evidence intrinsic to the patent," its construction is a pure determination of law, which receives *de novo* review. *Teva*, 574 U.S. at 331. Thus, this Court reviews the application of prosecution disclaimer *de novo*. *Shire Dev., LLC v. Watson Pharms., Inc.*, 787 F.3d 1359, 1365 (Fed. Cir. 2015).

This Court reviews exclusion of expert testimony for abuse of discretion, applying the law of the regional circuit. *Sundance, Inc. v. DeMonte Fabricating Ltd.*, 550 F.3d 1356, 1360 (Fed. Cir. 2008); *Ethicon, Inc. v. U.S. Surgical Corp.*, 135

F.3d 1456, 1465 (Fed. Cir. 1998). A district court abuses its discretion when it excludes expert testimony based on the weight to be given to the evidence or the "factual underpinnings and correctness" of the testimony, rather than the reliability of principles and methods. *Apple*, 757 F.3d at 1319-20. The judge is "supposed to screen the jury from unreliable nonsense opinions, but not exclude opinions merely because they are impeachable." *Alaska Rent-A-Car, Inc. v. Avis Budget Grp.*, 738 F.3d 960, 969 (9th Cir. 2013).

II. Summary Judgment of Noninfringement Must Be Vacated Because the District Court Relied on Incorrect Claim Constructions.

Summary judgment was premised on two missteps. The first was the district court's finding of prosecution disclaimer. The second was the court's holding at summary judgment that the "buffer," added by the court's prior construction, cannot be a "cache." Both were legal errors, and either alone requires reversal. *Pitney Bowes*, 182 F.3d at 1305.

A. The Court Incorrectly Construed "Downloading… While Concurrently Retrieving" to Require a Single Buffer Because Ambiguous Prosecution History Statements Cannot Give Rise to Disclaimer.

The inventors did not disclaim the use of more than one buffer in their June 2003 Amendment (Appx4410-4412), and therefore the district court erred when it construed Claim 16 of the '213 Patent to require "downloading… ***from said allocated buffer***… while concurrently retrieving... ***into the same buffer***."

Prosecution disclaimer requires clear and unmistakable disavowals of scope. *Comput. Docking Station Corp. v. Dell, Inc.*, 519 F.3d 1366, 1374 (Fed. Cir. 2008). "If the challenged statements are ambiguous or amenable to multiple reasonable interpretations, prosecution disclaimer is not established." *Tech. Properties Ltd. LLC v. Huawei Techs. Co.*, 849 F.3d 1349, 1358 (Fed. Cir. 2017). "When the prosecution history is used solely to support a conclusion of patentee disclaimer, the standard for justifying the conclusion is a high one." *Avid Tech., Inc. v. Harmonic, Inc.*, 812 F.3d 1040, 1045 (Fed. Cir. 2016). In this case, the district court failed to apply that high bar for disclaimer. It not only rejected the express distinction that the applicants ***actually*** made about timing (reflected both in the amended claim language and the underlined arguments)—a distinction another district court credited as the "obvious" intended meaning—but also dismissed that timing distinction out of hand based on the court's own view of what would be needed for patentability. This is wrong as a matter of law. The question is what the applicants ***did*** disclaim by their chosen words, not what they would have needed to disclaim. *Tech. Properties*, 849 F.3d at 1359; *Generation II Orthotics Inc. v. Med. Tech. Inc.*, 263 F.3d 1356, 1365-66 (Fed. Cir. 2001) (rejecting argument that patentee "really" meant a different disclaimer that would have been needed to avoid "ensnaring the prior art" cited during prosecution).

Here, the district court looked at the applicants' addition of a claim limitation that did not mention buffers, and the applicants' statement regarding the significance of the new limitation in which the applicants underlined words regarding ***concurrent*** versus ***serial*** data operations—not the number of buffers—and concluded the only reasonable interpretation was that the applicants expressed clear and unmistakable intent to distinguish their invention over the prior art based on how many buffers the invention used. Fairly read, the applicants' June 2003 remarks did not disavow using different or multiple buffers.

1. The applicants' statements distinguishing DeMoney were agnostic, and ambiguous at most, as to the number of buffers, and SVI's reading is a reasonable interpretation.

The district court's finding of disclaimer can only be sustained if there is no other reasonable interpretation of the prosecution statements. *01 Communique Lab., Inc. v. LogMeIn, Inc.*, 687 F.3d 1292, 1297 (Fed. Cir. 2012). Here, the record shows one: the reasonable interpretation is precisely what the applicants emphasized, what SVI argued below, and what another district court adopted when viewing the very same evidence and arguments.

First, prosecution disclaimer gives effect to the point of "'contrast' that applicants were trying to make over the cited reference." *Cadence Pharms. Inc. v. Exela PharmSci Inc.*, 780 F.3d 1364, 1372-73 (Fed. Cir. 2015). Where "there is no clear indication" that the subject matter of the alleged disclaimer ***was*** the intended

contrast, the statements do not amount to disclaimer of that subject matter. *Id.* Here, the applicants' choice to literally underscore certain phrases shows that ***the timing of two processes***—not the number of buffers involved in those processes—was the point of contrast. The applicants never contrasted the invention from the prior-art DeMoney reference on the basis of the number of buffers, which buffer is used, or whether the concurrent retrieval even requires using the "same buffer."

In four instances, the applicants chose to underline specific words and phrases to contrast the ***concurrent*** prefetching process in the '213 Patent from the ***serial*** (i.e., one after the other) process in DeMoney:

> By contrast, the applicants' invention allocates a buffer at one of the plurality of helpers to cache at least a portion of the requested SM object, and downloads the portion of the SM object to the requesting client, while concurrently retrieving a remaining portion of the requested SM object from another HS or a content server. That is, the applicants' invention concurrently empties and fills the buffer, while the DeMoney reference teaches filling the buffer only after the buffer is empty. (See DeMoney, col. 12, lines 28-40).

Appx4411.

> Thus, the DeMoney reference fails to teach, or even suggest, the limitations "downloading said portion of said requested SM object to said requesting client, while concurrently retrieving a remaining portion of said request SM object from one of another HS and said content server," and "adjusting a

Appx4412.

In quoting DeMoney's abstract, the applicants underlined only one phrase, which established that in DeMoney, the process was not concurrent: "***once*** one of its buffers

is consumed by the associated media stream client, the media stream manager submits a buffer request and deadline for that buffer to the appropriate deadline queue." Appx4411 (underlining in original, emphasis added). The applicants thus pointed out an issue of timing.

The applicants did not contrast the number of buffers. On the face of the remarks, the applicants did not express a clear and unmistakable intention to disclaim implementations of the invention that involve "retrieving" a subsequent portion of an SM object into a different buffer than that used to store the first portion it is "downloading" to the client. *See SanDisk Corp. v. Memorex Prods., Inc.*, 415 F.3d 1278, 1286-87 (Fed. Cir. 2005) ("An ambiguous disclaimer… does not advance the patent's notice function or justify public reliance, and the court will not use it to limit a claim term's ordinary meaning."). Though buffers were mentioned in passing, the identity or number of buffers was not the basis for the applicants' argument to distinguish the prior art. *Cf. Cadence Pharms.*, 780 F.3d at 1373 (finding that patentee did not make an unambiguous disclaimer requiring a "vacuum stoppering step" because, while it "was mentioned in applicants' argument," there was "no clear indication that the vacuum stoppering step was the 'contrast' that applicants were trying to make"). Rather, references to a buffer were included only to "explicat[e] the claimed invention," and not intended to "exclude" more buffers in response to a rejection. *See SanDisk*, 415 F.3d at 1288-89. The district court erred

in reading past the explicit distinction that the applicants went out of their way to emphasize, to instead find the applicants clearly intended to make a different point about the number of buffers used in the invention compared to the prior art.

Second, the district court incorrectly relied on the syntax of the applicants' remarks to conclude that Hulu's purported disclaimer was the only reasonable interpretation. Textually, the court relied on passing references to "the buffer." Its order noted: "The patent applicant specifically referred to 'the buffer,' as a singular term, in discussing Claim 16 compared to DeMoney.… DeMoney describes using a 'ring of buffers,' which is a plural usage." Appx0020. But this places far too much weight on grammatical articles such as "a" and "the." As this Court found in *01 Communique*, words such as "a," "its," and "the" are insufficient to limit the meaning to a singular item. 687 F.3d at 1297. It is axiomatic in patent law that a singular article also includes the plural. *Baldwin Graphics Sys., Inc. v. Siebert, Inc.*, 512 F.3d 1338, 1342 (Fed. Cir. 2008) ("That 'a' or 'an' can mean 'one or more' is best described as a rule, rather than merely as a presumption or even a convention."); *id.* ("The subsequent use of definite articles 'the' or 'said'… does not change the general plural rule, but simply reinvokes that non-singular meaning."). The court identified no reason to depart from that rule here. *See* Appx0019-0021.

Moreover, where the applicants wanted to limit the claims to a singular usage, to exclude the plural and refer to a singular antecedent, they knew how to do so.

Claim 16 itself recites: "one of said plurality of clients" and "one of said plurality of helper servers." That applicants did not do so in the passing references to a buffer makes the district court's textual basis for disclaimer even more tenuous. ***"The,"*** alone, cannot be a clear and unambiguous disclaimer of using multiple buffers, particularly where the applicants went out of their way to draw a different contrast over the prior art.

Third, the reasonableness of SVI's timing interpretation is bolstered by another court's finding that applicants were making an "obvious" timing distinction. *Sound View Innovations, LLC v. Walmart Inc.*, No. 19-660-CFC-CJB, 2020 WL 2507688, at *10 (D. Del. May 15, 2020) (Burke, M.J.); Appx4595. In the District of Delaware, Walmart Inc. and Vudu, Inc. ("Walmart")—advanced precisely the same disclaimer argument and cited precisely the same evidence. Appx4594-4596. Viewing the same prosecution statements, and having heard argument on the Central District of California's construction in this case, the *Walmart* court rejected a "same-buffer" disclaimer. *See id.*; *see also* Tr. of Markman Hearing at 88:5-90:10, 103:8-18, *Walmart*, No. 19-660-CFC-CJB (D. Del. Apr. 22, 2020), DI 116, 2020 WL 9424366. It wrote:

> It seems pretty obvious (as can be seen from the underscoring the patentee liberally used), that the patentee was distinguishing itself from DeMoney in two ways—with the principal way being that DeMoney did not teach *concurrent* downloading and retrieving (and the other way

> being that DeMoney did not teach filling a buffer with information stored in another helper server).

Appx4595 (emphasis in original). The *Walmart* court noted that though it is "*possible*" applicants were trying to state a same-buffer requirement, "it is also very possible that the patentee was just making reference to *one embodiment* of the invention that used one buffer—all in order to make *different, essential points* about why the invention should be distinguished from DeMoney." Appx4595-4596 (emphases in original). "Given these competing reasonable interpretations," the *Walmart* court found no clear and unmistakable disclaimer. *Id.* (citing *Cadence Pharms.*, 780 F.3d at 1373).[1]

The *Walmart* court considered the construction of the California district court before reaching its contrary decision. *See* Tr. of Markman Hearing at 88:5-90:10, 103:8-18, 2020 WL 9424366 (discussing the proceedings below in C.D. Cal.). That another judge having extensive experience in patent cases, and the full record before him, found SVI's interpretation to be the "pretty obvious" one strongly indicates that the statements at issue are at least amenable to multiple reasonable interpretations. *SanDisk*, 415 F.3d at 1287.[2] The necessary implication of those multiple reasonable

[1] Walmart objected to this construction, but the case settled while its objection was pending.

[2] This case is distinguishable from *SpeedTrack, Inc. v. Amazon.com*, where this Court was unpersuaded by the fact that an earlier court and the patent office did not expressly find disclaimer. *See* 998 F.3d 1373, 1381 (Fed. Cir. 2021). In *SpeedTrack*, the alleged disclaimer had never been considered by the other court or the patent

interpretations is that the Central District of California erred in finding a "clear and unmistakable" disclaimer requiring the use of the same buffer for downloading and retrieving. *See Cordis Corp. v. Medtronic AVE, Inc.*, 339 F.3d 1352, 1359 (Fed. Cir. 2003) (reversing finding of disclaimer based on a statement amenable to multiple reasonable interpretations, and reversing grant of summary judgment).

2. The district court applied a legally incorrect standard by relying on what it believed was necessary to distinguish the art.

To reject SVI's proffered interpretation as a reasonable reading, the district court had to make an error of law. Specifically, the court believed that the timing distinction "would not be sufficient to distinguish DeMoney from Claim 16." Appx0020. But the question of disclaimer is "***not*** what a person of ordinary skill would think the patentee needed to disclaim during prosecution." *Tech. Properties*, 849 F.3d at 1359; *Generation II Orthotics*, 263 F.3d at 1365-66. "[W]e hold patentees to the actual arguments made, not the arguments that could have been made." *Tech. Properties*, 849 F.3d at 1359.

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office. *Id.* The patentee there relied on the argument that defendants in prior litigation "had the same incentive" to argue disclaimer but never even made the argument. Appellant Br. at 76, *SpeedTrack*, 998 F.3d 1373 (Fed. Cir. filed June 19, 2020) (No. 20-1573).

By contrast, here, Walmart presented the same disclaimer argument to the District of Delaware, cited the same evidence, and argued before that court based on the Central District of California's April 13, 2020 order. *See, e.g.*, Tr. of Markman Hearing at 103:8-18, *Walmart*, 2020 WL 9424366.

An entire section of the district court's opinion is devoted to this improper analysis of what would have been needed to overcome the rejection based on DeMoney. Appx0020. Citing only DeMoney's abstract and applicants' prosecution statements, the court concluded that "DeMoney contemplated downloading content from one buffer while other buffers are filled concurrently." *Id.* It thus found that a concurrent distinction "would not be sufficient," because DeMoney also showed concurrent downloading and retrieval. *Id.*

Not only is it wrong as a matter of law to entertain this argument, but the district court's technical analysis of DeMoney is incorrect. It is improper, without clear and convincing evidence of a validity issue, to give a claim term a narrower reading out of concern for its validity. *Abbott Labs. v. Baxter Pharm. Prods., Inc.*, 334 F.3d 1274, 1282 (Fed. Cir. 2003); *Generation II Orthotics*, 263 F.3d at 1365. Although the abstract demonstrates that DeMoney had multiple buffers, DeMoney does ***not*** say anything explicitly about processes occurring concurrently. *See* Appx4411.[3] Rather than searching for clear and convincing evidence of anticipation, the district court ***inferred*** from DeMoney's plural buffers that DeMoney had to

[3] Nor did the examiner reject Claim 16 over DeMoney for this reason; the rejection based on DeMoney occurred before applicants added the "downloading… while concurrently retrieving" step. Appx4395 (rejection); Appx406 (claim amendment).

"contemplate[]" downloading and retrieving concurrently. *See* Appx0020 (quoting DeMoney abstract).

But DeMoney never expressly discloses any such parallel process. *See* Appx4430.[4] And the district court does not cite anything in DeMoney, or rely on any expert opinion, that says other buffers are being filled with another portion of the requested SM object, concurrent with downloading of a first portion. Appx0020. Indeed, even if separate buffers were being used in parallel in DeMoney by media stream managers to serve data to multiple "data stream client[s]," that would still not anticipate Claim 16, because Claim 16 plainly requires concurrent retrieval of "a remaining portion of said requested SM object," on which DeMoney is silent. *See* Appx4430. DeMoney simply lacks the specificity to establish anticipation of Claim 16 under either interpretation of the applicants' statements.

Nor does DeMoney describe "retrieving" a different portion of the same SM object ***from a helper server***, as recited in Claim 16—which the applicants pointed out also distinguishes Claim 16. *See* Appx4411 ("Furthermore, the buffer of the applicants' invention may be filled by information stored in another HS, which is

[4] For example, DeMoney describes a serial process: "[E]ach buffer is consumed… ***one after another***… Streaming multimedia data may include consuming one of the buffers in the ring of buffers and ***then*** generating a request… The streaming ***then*** includes issuing the request and deadline for the ***just*** consumed buffer to a deadline queue.… The next buffer in the ring of buffers may ***then*** be consumed and the process repeated." Appx4430 6:11-13, 6:52-61 (emphases added).

also not taught by the DeMoney reference."); Appx4430 (describing DeMoney's retrieval from its own storage system). Thus, the amended claim language itself, presented in the June 2003 amendment and remarks, would have been sufficient to establish patentability.

The district court's rejection of other reasonable interpretations therefore rests on a shaky premise. Had it not relied on this improper and incorrect argument about what it thought was needed to overcome DeMoney, the court would have had to acknowledge multiple reasonable interpretations of the June 2003 remarks existed, precluding a finding of disclaimer.

3. The district court's construction is inconsistent with the embodiment that the applicants cited as support for "downloading… while concurrently retrieving."

Notably, the plain language of the claim step never even mentions a buffer, let alone how many buffers there must be, or which buffers need to be downloaded from or retrieved into. That is no surprise, because "downloading… while concurrently retrieving" is a separate process from putting the retrieved data into a particular buffer, as shown by the written-description support that applicants cited to explain their distinction in the June 2003 remarks. *See* Appx4412; *see also* Appx0176-0177 8:50-9:11.

The specification describes the Figure 7B (Appx0169) embodiment of a helper server 75 that has a buffer 79. In this embodiment, the helper server

concurrently retrieves, or prefetches, so that it can deliver several seconds of data of a streaming multimedia (SM) object to the client's playout buffer 77, enabling the client to quickly begin playing back that data as multimedia. Appx0176-0177 8:8-14, 8:46-9:4. The specification explains that "two processes are started ***concurrently***." Appx0176 8:50-51. Process 1 is ***downloading*** an initial portion, which the helper server already has, to the client. Appx0176 8:51-53. Process 2 is "request[ing]" (***retrieving***) a remaining portion of the SM object that the helper server does not already have. Appx0176 8:58-61. The focus of process 2 is fetching the data, particularly (a) what is retrieved and (b) from where. *See* Appx0176 8:58-60 (enumerating three possible sources, including another helper server and the content server). It is only later, "[u]pon completion of processes 1 and 2"—*i.e.*, after concurrently downloading and retrieving are done—that the retrieved data can be filled into buffer 79 at the helper server 75. Appx0177 9:8-9.[5]

In other words, filling buffer 79 is ***not*** part of the two concurrent processes corresponding to "downloading… while concurrently retrieving" in Claim 16. It is

[5] There is no dispute that the specification discloses a figure that depicts a single buffer at the helper server, buffer 79, in which portions of the SM object are stored at various times (*see* Appx0169 fig.7b). But claims are not limited to the preferred embodiment. *See Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004). And the patentee's decision not to describe additional, multi- or different-buffer embodiments does not change this analysis. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1323 (Fed. Cir. 2005) (en banc). Where the number of buffers is not the point of novelty of the patent, it is especially inappropriate to construe the claim as being limited to a single buffer.

a separate, unclaimed process. Requiring retrieval "into the same buffer" that is used for downloading contradicts the specification's description that this aspect (optionally) happens later. This provides yet another reason that the district court's construction is incorrect as a matter of law.

* * *

Where reasonable minds can read the applicants' statements to mean different things, the statements lack the clarity and unambiguity required to establish disclaimer of multiple buffers for the process of downloading while concurrently retrieving. The '213 applicants did not unambiguously disavow the use of multiple buffers in the "downloading… while concurrently retrieving" step, because at a minimum the distinction they actually drew for an entirely different point (concurrency) provides a different reasonable interpretation of the statements. The Central District of California's construction of this term to require downloading from and retrieving into the "same buffer" was wrong as a matter of law.[6] On *de novo* review, this Court should hold that applicants' June 2003 statements did not effect a disclaimer as to what buffers (if any) are used, and that "downloading… while concurrently retrieving" should be given its plain and ordinary meaning

[6] The construction was not harmless. As explained below, summary judgment was premised on whether SVI's evidence could suffice to prove "retrieving ***into the same buffer***"—the very limitation added by the incorrect finding of disclaimer.

because it is written in plain language that is readily understandable without construction. The judgment should be vacated, and the case remanded.

B. The Court Incorrectly Interpreted "Buffer" to Exclude All "Caches" Without Adopting Any Particular Construction of "Buffer," and Without Finding Disclaimer or Lexicography.

The district court's judgment must also be vacated, because the court failed to set forth a construction of "buffer" to which the accused products could be compared, and incorrectly read the intrinsic record in arriving at its negative limitation of what a "buffer" cannot be. It granted summary judgment on the basis that a cache (which is a type of storage) cannot be a "buffer," yet never stated what a buffer is, or even an explicit construction that a buffer excludes a cache. Appx0010. In normal usage (from which the patent here did not deviate), a buffer is temporary storage for data being sent or received, *infra* pp. 44-49, and a cache is simply a region on the computer disk that holds a subset of a larger collection of data. These concepts overlap—a cache can be used for buffering, and patent even explicitly says so. The court's unsupported conclusion that the patent excludes caches from the scope of buffer, and its failure to compare a particular construction of "buffer" to the facts regarding the accused cache (*e.g.*, determine whether the accused cache serves as temporary storage for data being sent or received), is error.

1. The district court failed to set forth any construction of "buffer" and thereby failed to conduct the required two-step analysis.

The foremost error is that the district court articulated no construction of what "buffer" means, in holding that an accused cache "cannot" be the "buffer." The court's opinion is unclear as to what construction (if any) the court applied because it collapsed the inquiry into a single question: whether a buffer can encompass a cache. *See* Appx0006.

"Summary judgment of non-infringement requires a ***two-step*** analytical approach. First, the claims of the patent must be construed to determine their scope. Second, a determination must be made as to whether the properly construed claims read on the accused device." *Pitney Bowes*, 182 F.3d at 1304 (citation omitted). "[C]laims are not construed 'to cover' or 'not to cover' the accused device." *SRI Int'l v. Matsushita Elec. Corp. of Am.*, 775 F.2d 1107, 1118 (Fed. Cir. 1985) (en banc). It is improper to consider the question of infringement "without actually construing the claim terms at issue." *Ormco Corp. v. Align Tech., Inc.*, 498 F.3d 1307, 1321 (Fed. Cir. 2007) (O'Malley, J., concurring in part and dissenting in part); *Nazomi Commc'ns, Inc. v. Arm Holdings, PLC*, 403 F.3d 1364, 1366-68, 1371 (Fed. Cir. 2005) (vacating summary judgment and remanding because district court "did not construe the disputed claim term in sufficient detail for appellate review").

Here, the district court recited these legal standards but failed to follow them. *See* Appx0005-0006 (citing *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1454 (Fed. Cir. 1998)). Rather than treating the operative question as what "buffer" ***means*** and comparing that construction to the accused systems, the court short-circuited the analysis by determining only whether a "buffer" can encompass anything called a "cache." It devoted over three pages to the question whether the '213 Patent intrinsically uses "buffers" and "caches" differently, and repeatedly concluded that "there is a distinction between … buffers and the cache of the helper server" within the patent. Appx0006-0009. This was also an error of logic, because two terms can be distinct and refer to different concepts, without being mutually exclusive. After determining that a buffer and a cache are "distinct" in the patent, the district court then identified one sentence showing that caches in the accused systems were "consistent[] with" the patent's caches.[7] Appx0010. It did not compare any facts about the accused caches to any definition of a buffer. This deficient analysis led to the conclusion that the accused cache cannot satisfy the claimed buffer limitations. Appx0010.

Nowhere in its opinion did the district court articulate what a buffer is. *See generally* Appx0003-0010. It did not state any location requirement for what

[7] There is no language in Claim 16 requiring "a cache," so there is no affirmative issue hinging on whether the accused caches meet a "cache" limitation.

physical component a buffer must be in (*e.g.*, memory or disk); SVI agrees no location requirement exists. It did not state what attributes reveal that something constitutes a buffer. Its entire ruling was based on what a buffer is not—*i.e.*, anything called a "cache" is not a buffer. But without an affirmative construction of what "buffer" is (beyond what it is not), the court's ruling provides no basis for a factfinder to determine whether facts suffice to place an accused system within or without the scope of the claims. It leaves unclear what evidence or expert testimony would suffice to show that the claimed "buffer" is met by an accused system.

A case-dispositive ruling hinging on the term "buffer" cannot rely on an unstated construction of "buffer." *See Graco, Inc. v. Binks Mfg. Co.*, 60 F.3d 785, 791 (Fed. Cir. 1995) (remanding from summary judgment because "[w]e simply do not know what claim construction the trial judge gave the terms in the claims"); *Johansson v. Rose Displays Ltd.*, 121 F.3d 727, 1997 WL 437016, at *2 (Fed. Cir. 1997) (unpublished table decision); *Anchor Wall Sys., Inc. v. Rockwood Retaining Walls, Inc.*, 340 F.3d 1298, 1311 (Fed. Cir. 2003) ("In order to review the court's finding of noninfringement, we must know what meaning and scope the district court gave to the asserted claims."). In *Johansson*, the district court did not explicitly define the term "deformation" in granting summary judgment, instead addressing only whether "deformation" encompasses wear and tear, which was accused. 1997 WL 437016, at *2. This Court found error, because that district court's analysis

"does not indicate that the court formulated a claim construction before looking to the accused" products. *Id.* Similarly, in *Graco*, this Court remanded because "we need to know what meaning and scope the district court gave the asserted claims"—yet the district court had not provided its construction of the limitations on which it premised summary judgment. 60 F.3d at 791. This makes sense because without that two-step analysis—first, determining the scope, and second, comparing the product—it would not be possible to separate out issues of law (claim construction) from issues of fact (infringement).

In footnote 1, the district court asserted that "it is unnecessary to provide any further construction of the term 'buffer,' because this could be deemed an advisory opinion." Appx0010 (citing *Summit 6, LLC v. Samsung Elecs. Co.*, 802 F.3d 1283, 1291 (Fed. Cir. 2015)). This misapplies the law. In *Summit 6*, the district court had ***rejected*** a party's proposed construction at the heart of the dispute and found that the term "required no construction." 802 F.3d at 1291. This Court held that because the plain and ordinary meaning was clear, the district court properly declined to construe the term and allowed the case to proceed to trial. *Id.*[8] By contrast, the district court

[8] Other cases approving of a district court's refusal to further construe a term had similar procedural postures, where the court had rejected a proposed limitation. *See, e.g.*, *Bayer Healthcare LLC v. Baxalta Inc.*, 989 F.3d 964, 978 (Fed. Cir. 2021) (affirming refusal to state a construction after district court denied motion for summary judgment of noninfringement by rejecting defendants' proposed constructions).

here did not find that the term should be given its plain meaning—it did not articulate such a plain meaning, nor did it conclude that a cache cannot be temporary storage. Instead, it effectively carved out precisely what was accused to grant summary judgment. Principles of summary judgment require the district court to explain what construction it was applying. *Johansson*, 1997 WL 437016, at *2.

The district court's error in methodology also requires reversal because it led to the wrong (effective) claim construction. Had the court applied the proper analytical approach, the court could not have reached its conclusion that a "buffer" can never include a "cache," for the reasons below.

2. The district court contravened the rule that exclusions of a particular scope from the plain meaning require express disclaimer or lexicography.

The district court determined that the terms "buffer" and "cache" are mutually exclusive (*i.e.*, one cannot serve the role of the other) because they are distinct words in the specification. But the court erred in doing so, because it did not find express disclaimer or lexicography of "buffer," which would normally encompass any cache used as temporary storage for data sent or received (*infra* pp. 44-49).

The district court's ruling that "buffer" carries a negative limitation of "not a cache" is barred by case law. This Court has specifically held that ordinary meaning of a claim term cannot support introducing negative limitations as a matter of law. *Ethicon*, 847 F. App'x at 907-08. There, this Court stated: "We have identified claim

constructions that exclude a particular element as including a 'negative limitation' and held that such exclusions must find support either in 'the words of the claim' or through an 'express disclaimer or independent lexicography in the written description that would justify adding that negative limitation.'" *Id.* at 907 (quoting *Omega Eng'g*, 334 F.3d at 1323). Without express disclaimer or independent lexicography that justifies the negative limitation, alleged plain and ordinary meaning alone cannot support a negative construction such as "not a cache." *Id.*; *Vehicle IP, LLC v. AT&T Mobility, LLC*, 594 F. App'x 636, 642 (Fed. Cir. 2014) (nonprecedential) (rejecting "not remaining travel time" in the construction of "expected time of arrival").

The intrinsic evidence necessary to support disclaimer or lexicography of "buffer" is not present here. As an initial matter, the court did not identify disclaimer or lexicography supporting the negative limitation. Although the district court relied on embodiments' descriptions and figures for the purported distinction between buffers and caches, Appx0009 (showing fig.9), the court identified ***no express statement*** that a cache cannot be a buffer or that a buffer cannot be a cache. As for lexicography, it is true that the '213 Patent includes a definition for "cache"—"a region on the computer disk that holds a subset of a larger collection of data." Appx0174 4:7-8. But that definition says nothing about excluding a cache from being a buffer.

Moreover, the '213 Patent recognizes that a buffer may be a cache in several ways. First, it notes that a buffer "operates as ***a type of*** short term ***cache***," indicating that a buffer can also be a cache. Appx0176 7:20-21. Second, Claim 16 states "allocating a ***buffer*** at one of said plurality of HSs ***to cache***…." Third, the patent sometimes uses "cache" as a verb in connection with a buffer: "portions of an SM object are initially ***cached*** in the ring ***buffer***." Appx0176 7:24-25. And Hulu's own expert referred to a "cache buffer" that satisfies the concept of short term storage. Appx3795 ¶101.

To be sure, certain embodiments, like the RTP/RTSP embodiment in column 10 of the '213 Patent (corresponding to Claim 17), have both a "buffer management module" and "cache management module." Appx0177 10:33-49. The district court's extrapolation from this example (Appx0009), however, is an incorrect application of law. Just because embodiments have both a buffer and a cache does not imply that, in a real-world system, a component labelled a "cache" is never within the claim scope of the term "buffer"—there is no reason that "a region on the computer disk that holds a subset of a larger collection of data" (*i.e.*, cache) cannot also be "temporary storage for data being sent or received" (*i.e.*, buffer).

Just because terms are used non-identically does not mean that they exclude each other. *Ethicon*, 847 F. App'x at 907 (rejecting argument that descriptions of rotary drive as separate and distinct from a trigger means that a rotary drive cannot

include a trigger). Many words can describe distinct yet overlapping concepts—*e.g.*, computer and smartphone, fluid and liquid, television and monitor—that would be overlapping (or even concentric) circles in a Venn diagram. Just because a specification uses terms to refer to non-identical concepts does not establish that one concept is ***excluded from*** the scope of another term. The '213 patent uses "buffer" and "cache" in ways that overlap, and does not redefine "buffer" to exclude "cache."

Given the absence of disclaimer or lexicography, the district court committed an error of law by effectively construing "buffer" as "not a cache."

3. The proper construction of "buffer" is temporary storage for data being sent or received.

The proper construction of "buffer" is its plain and ordinary meaning. Intrinsic evidence, confirmed by extrinsic evidence, shows that a "buffer" is temporary storage for data being sent or received.[9] Under the correct construction, summary judgment is not warranted because SVI had more than sufficient evidence to raise a triable issue whether an accused cache in Akamai and Level 3 edge servers satisfies the limitation.[10]

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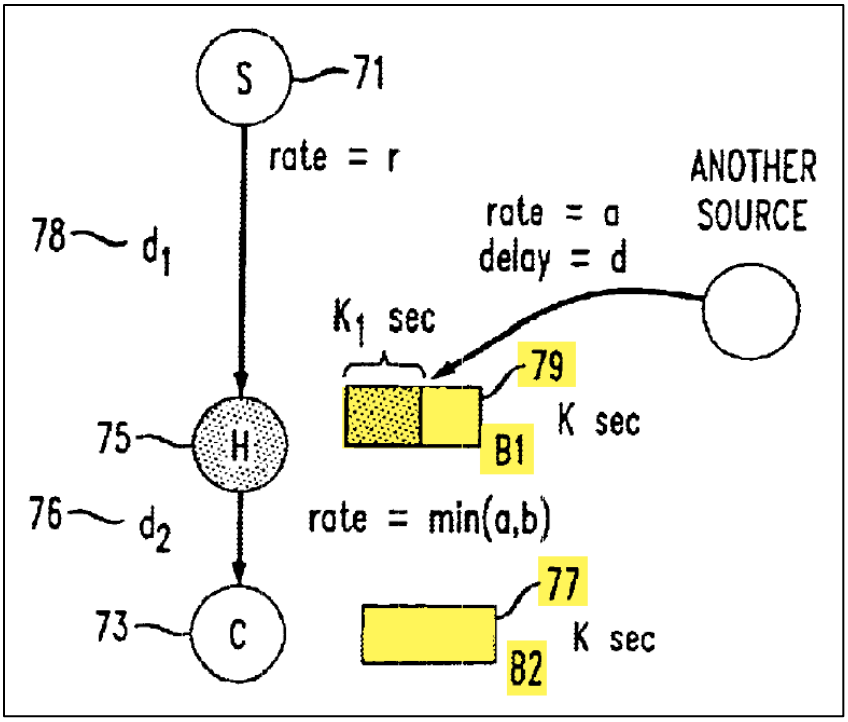
[9] In the parallel litigation, the *Walmart* court recommended this construction of "buffer," slightly clarified: "temporary (i.e., non-permanent) storage for data being sent or received." Appx4587-4588.

[10] The district court did not address summary judgment under SVI's construction of the term. Therefore, if this Court adopts the plain meaning of the term, the grant of summary judgment must be reversed. *Pitney Bowes*, 182 F.3d at 1305.

"There is a heavy presumption that claim terms are to be given their ordinary and customary meaning." *Mass. Inst. of Tech. v. Shire Pharms., Inc.*, 839 F.3d 1111, 1118 (Fed. Cir. 2016). The ordinary meaning is the term's meaning to the person of ordinary skill in the art after reading the entire patent. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1321 (Fed. Cir. 2005) (en banc).

Claim 16 recites "buffer" alone. Other claims recite "ring buffer," and the specification describes particular types of buffers, such as "ring buffers," "memory buffer," and "playout buffer." *E.g.*, Appx0165 fig.4, Appx0176 8:14. Throughout the intrinsic record, the term "buffer"—whether used generically on its own, or to specify a particular type of buffer—uniformly refers to temporary storage for data that is being sent or received.

For example, in the embodiment of Figure 7B, a content server streams data to a helper server, which in turn streams the data to a client. Appx0176 8:9-14, 8:51-54. Both the helper server and the client have buffers. Appx0169 fig.7B (showing buffer 79 and buffer 77). The helper server receives content, temporarily stores that data in a buffer, and then streams the content to the client. Appx0176 8:46-9:18. The client's playout buffer, in turn, temporarily stores the data received from the helper server, including while waiting to play the streaming media. Appx0176 8:10-28. Each buffer stores data as it is being sent or received.



Appx0169 fig.7B (highlighted to show buffer 79 and buffer 77).

Other descriptions of particular types of buffers reflect that they are temporary storage for data being sent or received. For example, in a preferred embodiment that uses a "ring buffer," the specification explains that "portions of an SM object are initially cached in the ring buffer… and then deleted to store successive portions." Appx0176 7:22-26. Ring buffers "represent a type of short term storage," again illustrating that data in those buffers is stored temporarily. Appx0175 5:57-58.

Neither the specification nor Claim 16 narrows the plain and ordinary meaning to a particular size, storage location, or function. True, there are instances where particular embodiments of buffers are described as residing in the memory of the helper server. For example, the specification refers to "***ring*** buffers in the ***memory*** of the HS" and a "***memory*** buffer **45**." Appx0175 5:57, 6:38-40. The fact

that these buffer embodiments needed to be qualified with another adjective, however, indicates that being in memory is not already inherent to a generic "buffer." *Cf. Johnson Worldwide Assocs., Inc. v. Zebco Corp.*, 175 F.3d 985, 991 (Fed. Cir. 1999) (observing that varied uses of the term "heading" supported a broader definition). If a "buffer" were already required to be in memory, it would be redundant to specify a "memory buffer" or a ring buffer "in the memory." And while the specification explicitly defines "cache" to be on disk, Appx0174, the specification contains no similar lexicography of "buffer" that defines it as being in memory.

The plain meaning of "buffer" is bolstered by consistent extrinsic sources. *See Mass. Inst. of Tech & Elecs. for Imaging, Inc. v. Abacus Software*, 462 F.3d 1344, 1351 (Fed. Cir. 2006) ("In this case... the specification does not define the term 'scanner' either explicitly or implicitly. … Under such circumstances it is appropriate for us to look to dictionary definitions of the terms."). Newton's Telecom Dictionary (15th ed. 1999), published months before the provisional application for the '213 Patent, explains:

> In data transmission, a buffer is a ***temporary storage location for information being sent or received***. Usually located between two different devices that have different abilities or speeds for handling the data. The buffer acts like a dam, capturing the data and then trickling it out at speeds the lower river can handle without, hopefully, flooding or overflowing the banks. A buffer can be located in the sending or receiving device.

Appx3977 (emphasis added); Appx3974-3975. This definition aligns with the written description of the '213 Patent and reveals that the commonly understood meaning of "buffer" was agnostic as to its location (*e.g.*, memory or disk) within a device. Consistently, the IBM Dictionary of Computing (George McDaniel ed., 10th ed. 1993) defines the noun as "(4) A portion of storage used to hold input or output data temporarily." Appx3984; Appx3979-3981. None of these definitions requires that a buffer be in random-access memory or that a buffer be distinct from a cache.

Testimony from both sides confirms this construction. Dr. Richardson, SVI's technical expert, testified that "it is my opinion that a buffer is temporary storage for data being sent or received," "not limited to only non-persistent storage (such as RAM) as opposed to persistent storage (such as disk storage)." Appx3990 ¶5; *id.* ("I am familiar with, and have personally designed and implemented, buffers of various sizes and natures, using both disk-based and RAM-based physical storage, in my work with designing and implementing communications systems and video coding systems."). Hulu's expert, Dr. Chase, stated that "One of skill in the art would recognize that the purpose of any ***cache buffer*** is ***as a short term storage*** allowing a computer to service a later request so long as the object is still retained within the buffer… Such structures are ubiquitous in computer systems … including in conventional prior-art Web proxy caches." Appx3795-3796 ¶101.

Properly construed, therefore, a buffer can exist in memory or disk (or something else), and can be implemented in various ways. It need only be "temporary storage for data being sent or received." This plain meaning is not wholly coextensive with the concept of a cache; their meanings overlap.

SVI argued at summary judgment that the accused products can still satisfy the "allocating a buffer" and "downloading... while concurrently retrieving into the same buffer" limitations under a theory of infringement based on a CDN edge server's cache. Appx0006; Appx3743-3744. Fact witness testimony established that each edge server includes a cache that is temporary storage, and is for content being sent or received. Appx3961-3962 (citing and quoting testimony). Under the correct construction of "buffer," absent the negative limitation that the district court effectively imposed, it would not be possible to hold as a matter of law that no cache—let alone the accused system—can ever constitute the claimed "buffer." With the correct construction, fact issues over whether the accused systems satisfy the construction would have precluded summary judgment of noninfringement.

In summary, on plenary review, this Court should construe "buffer" as carrying its ordinary meaning of "temporary storage for data being sent or received," reverse the grant of summary judgment premised on legal errors and an incorrect effective negative construction, and remand the case.

III. The Orders Excluding Damages Opinions Based on Benchmark Data Should Be Reversed.

The opinions of Sound View's damages expert, Mr. Yurkerwich, are the product of reliable principles: he analyzed studies regarding the effect that the same benefits provided by the invention had on the behavior of viewers of streaming video, and used those quantified effects along with explanations from SVI's technical expert to arrive at a quantification of the benefit Hulu would receive from using the invention. This meets the standard imposed by the Federal Rules of Evidence and *Daubert*. The district court's exclusion of parts of Mr. Yurkerwich's opinions did not really take issue with his expertise or the reliability of his principles. Instead, the court repeatedly waded into disputed ***factual distinctions*** between studies that Mr. Yurkerwich had used to derive quantitative estimates for the benefits Hulu accrued from infringing acts, and the specific scenarios of Hulu's infringement. That oversteps the district court's role under *Daubert*.

The premises underlying Mr. Yurkerwich's damages model are unchallenged. Buffering interruptions to video streaming ("re-buffering") are bad. When re-buffering occurs, video playback may freeze or stall while a client waits to retrieve the required amount of data to continue playing. Appx2288 ¶75. Because re-buffering has an "extremely negative effect" on users' experience, users will "quit" a stream if they encounter too much buffering. Appx2637-2639 ¶¶844-848; Appx3238. A similar effect is observed from increased "join time" (i.e., startup

latency), where users will begin to abandon a stream after 2 seconds of delay when starting a stream. Appx3237-3238. Conversely, reducing re-buffering and startup latency reduces users' abandonment, boosting the amount of content that those users watch and the resulting advertising and subscription revenue to Hulu. *See* Appx3238-3239 ¶¶265-268.

To connect these benefits to the patent, Mr. Yurkerwich relied on Dr. Richardson's opinions that the '213 Patent improves startup latency and re-buffering. Appx3237 ¶263; *accord* Appx0174 3:5, 3:9-10, Appx0173 2:65-2:3. Mr. Yurkerwich considered these benefits of the invention to Hulu's bottom line under *Georgia-Pacific* factors relating to the advantage provided by the invention and apportionment. *See* Appx3231 ¶226.

Turning this chain of reasoning into numbers requires estimating how much the claimed technology affects re-buffering events. So, Mr. Yurkerwich relied on information from Hulu, industry research, and academic papers. As is often the case with damages calculations, data showing precisely how much re-buffering, or how much viewership loss, Hulu would have observed—in a counterfactual world without using the '213 Patent—is not knowable. So Mr. Yurkerwich turned to comparable benchmarks. Among other sources, in his initial report he relied on a study published by Yao et al. in 2011 (Appx3175-3178) to derive an estimate of how much re-buffering occurs with adaptive streaming versus non-adaptive streaming

methods. Appx2825 ¶238, Appx3250. In his supplemental report, he noted a Hulu internal document stating that, when Hulu commissioned analytics company Conviva, Conviva reported that viewers using adaptive streaming watched [redacted] content than those not using adaptive streaming, and he noted a Conviva public summary of its Viewer Experience Report concerning the amount by which the use of adaptive bitrate streaming technology increases viewership. Appx4524.

By seizing on factual distinctions between these sources and the acts of infringement that could be presented in cross-examination, the district court required more than controlling law requires for evidence of patent damages. *Daubert* does not require an expert seeking to rely on a comparator to proactively and affirmatively address every factual distinction the other party might argue, so long as there is a sufficient foundation for that comparator having some "valid connection to the pertinent inquiry." *See Alaska Rent-A-Car*, 738 F.3d at 969. Studies that quantified the effects of the benefits of the invention have such a connection to the pertinent inquiry. The court's orders should be reversed.

A. The Court Abused Its Discretion in Excluding Damages Opinions Based on the Yao Study That Quantified the Benefits of Adaptive Streaming for Reducing Re-Buffering.

Mr. Yurkerwich's analysis based on the Yao study is based on "sufficient facts or data" under Fed. R. Evid. 702 and applies reliable principles and methods. This Court has upheld the methodology of using data about the value of comparable

(3): internal comparison of users' watch time

products or systems that provide features "similar to the asserted features" to estimate the value of what is accused and claimed. *Apple*, 757 F.3d at 1318 (Fed. Cir. 2014) (approving of damages methodology extrapolating value of touchscreen from value of trackpad, where both offered similar gesture benefits). And damages experts are allowed to rely on the expertise of other experts. *Carnegie Mellon Univ. v. Marvell Tech. Grp.*, 807 F.3d 1283, 1303 (Fed. Cir. 2015). Mr. Yurkerwich had a sufficient foundation of comparability to use Yao's results, especially from the unchallenged opinions of SVI's technical expert, Dr. Richardson.

Dr. Richardson's opening report specifically discussed the Yao study, "which tested the effect of adaptive bit rate (ABR) on quality metrics in environments similar to Hulu's." Appx2640 ¶856. Hulu's systems use ABR and are designed to change bitrates based on available bandwidth; Dr. Richardson personally observed those bitrate changes in his testing. Appx2321-2340 ¶¶162-89, Appx2359-2360 ¶224, Appx2365-2366 ¶235, Appx2447-2448 ¶414. Just as in Hulu's systems, Yao performed tests of bitrate changes where bandwidth varied. Appx2640-2642 ¶¶857, 861-863. Dr. Richardson considered whether factual distinctions about the parameters of the Yao study affected its comparability, and concluded they do not. *See* Appx2641 ¶¶858-859. Dr. Richardson opined that "Yao's experimental results are a reasonable approximation of the effect of adaptive and non-adaptive streaming behavior in Hulu's systems." Appx2640-2642 ¶¶856-864. And Dr. Richardson

noted that Yao's finding—ABR reduces buffering events by 80%—works out to a hypothetical increase in re-buffering for Hulu's systems of 5 times without using ABR.[11] Appx2642 ¶863.

Mr. Yurkerwich simply carried through that 5-times figure in his math, relying on Dr. Richardson's technical analysis regarding comparability. *See* Appx3237 ¶263; Appx3250 ("The Yao study indicates that, using adaptive bitrate techniques, the number of buffering occasions was reduced by 80% (an increase of 5x)."). At oral argument, SVI explained precisely that: "Mr. Yurkerwich didn't rely on… the Yao paper by itself—he relied on Dr. Richardson's opinion that the Yao paper provides a similar—a useful benchmark, a similar estimate of the improvement…." Appx4228 17:1-11. Mr. Yurkerwich's math combined the findings of the Yao study with Hulu's data about actual re-buffering events. Appx3237-3238 ¶¶264-265; Appx3250 (multiplying Hulu's internal estimate of buffering events by 5x to estimate buffering events that Hulu would have observed if it did not use ABR).

[11] Dr. Richardson considered the baseline comparison for Hulu to be the closest possible noninfringing alternative, *i.e.*, not using ABR, just as previous, unaccused, versions of Hulu's products did. *See* Appx3186-3187 (stating that Hulu considered non-ABR protocols to be a noninfringing alternative). Dr. Richardson and Mr. Yurkerwich's comparisons of the benefit of the patent against Hulu's own older versions is a reliable methodology endorsed by courts. *See, e.g.*, *Kaist IP US LLC v. Samsung Elecs. Co.*, No. 2:16-CV-01314-JRG-RSP, 2018 WL 2688185, at *3 (E.D. Tex. June 5, 2018).

The district court's order was internally inconsistent. On the one hand, it recognized that Mr. Yurkerwich is allowed to rely on a technical expert's (Dr. Richardson's) opinions and that Hulu's motion did not challenge Dr. Richardson's opinions. Appx0047 (citing *DataQuill Ltd. v. High Tech Comput. Corp.*, 887 F.Supp.2d 999, 1026 (S.D. Cal. 2011)). On the other hand, the district court took issue with ***Mr. Yurkerwich's*** reliance on the Yao study based on an insufficient factual basis to rely on the Yao study—overlooking the basis of comparability that the technical expert had supplied. This inconsistency is an artifact of Hulu's *Daubert* motion: Hulu identified no flaw in Dr. Richardson's opinions that Yao was a comparable benchmark for Hulu's own systems, leaving those opinions unchallenged. Hulu attacked only Mr. Yurkerwich's damages opinions.

All of the reasons why the district court took issue with the Yao study were factual arguments that go to the weight of the comparison, and bear on the unchallenged opinions of SVI's technical expert, not the reliability of Mr. Yurkerwich's methods. *Apple*, 757 F.3d at 1319-20 (cautioning courts not to decide exclusions on the "factual underpinnings and correctness" of the testimony). For example, whether Hulu users use a desktop or television; whether they stream video while moving or stationary; whether they stream while on WiFi or wired cable connection (Appx0047-0048)—all of those distinctions could affect the weight a jury gives to the Yao numbers, but do not reflect an inherent flaw in methodology.

Moreover, real-world usage of Hulu's SVOD platform may represent all manners of use, corresponding to certain parameters of Yao's simulation. Some Hulu users stream using cellular phones; some stream while moving; some stream while on a wireless connection. These types of distinctions are not heavily technical and can easily be understood by the jury if presented through cross-examination.[12]

The court's background assumptions about the Yao study were also factually incorrect, which may have colored its analysis. For example, at oral argument, the court characterized the Yao study as one that was performed by "a vehicle driving in Australia." Appx4320 19:17-22. In its order, the court inaccurately stated that the Yao study "analyzed a moving mobile device user connected through a wireless wide area network" and referred to "the Australian WWAN coverage studied." Appx0047. In reality, Yao carried out its simulation in a laboratory using a server connected by a wired 100 Mbps link to a bandwidth shaper "to represent the wired Internet," and client "physically connected with a 100 Mbps Ethernet link." Appx3177. Although it gathered traces of real-world bandwidth fluctuations from

[12] In *Alaska Rent-A-Car*, the Ninth Circuit rejected a *Daubert* challenge to a damages expert who had used a national market share instead of the Alaska market and who had extrapolated from a small local market to the state. 738 F.3d at 969-70. For these aspects of an expert's assumptions and comparisons, "comparing the unknown to an analogous known experience" is a valid methodology. *See id.* Attacks on the closeness of the comparators "all go to the weight of the testimony and its credibility, not its admissibility," even if they could give the jury "good arguments for rejecting the testimony." *Id.* at 970.

driving a "daily commuting route[]" in the Sydney, Australia metropolitan area, Appx3176, there are no grounds to find that Sydney is somehow so different from parts of the United States such that using the Yao study presents a *Daubert* issue.

Damages do not have to be proven to a certainty. *Summit 6*, 802 F.3d at 1296 ("[E]stimating a reasonable royalty is not an exact science."); *cf. Gaylord v. United States*, 777 F.3d 1363, 1368 (Fed. Cir. 2015). While the Yao study may not be a perfect match for Hulu, a plaintiff is not required to have that perfect data. Given the impossibility of producing direct data probative of how much additional re-buffering Hulu would have without using the '213 Patent, it is hard to imagine what data could ever address the district court's concerns that factual distinctions (*e.g.*, desktop versus mobile, stationary versus moving) may exist between a study and Hulu's users. The proper way to address the import of those distinctions is cross-examination, not exclusion. *See Alaska Rent-A-Car*, 738 F.3d at 970.

Therefore, this Court should reverse the portion of the district court's November 18, 2019 Order that excluded Mr. Yurkerwich's opinions relying on the Yao study.[13]

[13] If the Court reverses this evidentiary ruling, the district court's later exclusion of the Conviva analysis should be moot, as Mr. Yurkerwich added that analysis (with the district court's permission, Appx3321) in a later supplemental report only because of the exclusion of the Yao study.

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B. The Court Abused Its Discretion in Excluding Damages Opinions Based on the Conviva Analysis of Increased Viewership Associated with Adaptive Bit Rate.

Mr. Yurkerwich's supplemental analysis based on the Conviva press release (Appx4523-4529) also satisfies Fed. R. Evid. 702 and applies reliable principles and methods: a quantification of the benefits of the invention, which Mr. Yurkerwich used as one input to his damages calculation. Mr. Yurkerwich's amended report calculates damages by connecting the stated advantages of the invention to a revenue impact for Hulu, using a comparable benchmark. Like his original report, Mr. Yurkerwich's amended report estimates the quantitative benefit of the invention by applying specific findings from Conviva (and Hulu's own internal admissions) to Hulu's own statistics about re-buffering events. Appx4523-4526 ¶¶263-273.

Two initial data points were relevant: Hulu's own ([redacted (4)] viewership), and the Conviva press release (250% more). A Hulu internal document from 2013 noted that its video streaming optimization consultant, Conviva, estimated that Hulu users using ABR watched "[redacted (5)]" than users not using ABR. Appx3504; Appx3455 ¶267. Conviva then published a 2013 press release, describing its aggregate analysis of data from "22.6 billion worldwide video streams analyzed throughout 2012." Appx3326-3328. That Conviva press release noted: "***Viewers watch 250% more*** when they have an optimal experience with fast startup, little to no buffering and a high-sustained bitrate for high resolution and visual

(4), (5): internal comparison of users' watch time

clarity." Appx3327. Mr. Yurkerwich did not go with the [redacted] (6) number—Hulu's own—but picked the Conviva average for his damages calculation. Mr. Yurkerwich then converted this 250% number to its inverse (1 ÷ 250% = **40%**), which matched several other data points, to estimate how much less users would watch if they had to suffer inferior streaming quality without the benefits of ABR. Appx3457 ¶¶272-273 (comparing seconds per hour of re-buffering for users without ABR, versus Hulu's actual data for users with ABR). His calculations translated the ratios to conclude that Hulu would have had about [redacted] (7) additional audience loss without the invention. Appx3457 ¶273.

That Mr. Yurkerwich used a press release prepared by the video streaming optimization firm that conducted the study does not undermine the reliability of his method or the sufficiency of the data. The Conviva press release details the relationship between viewer behavior and video streaming metrics, as analyzed by an analytics company focused on conducting such studies. Appx3326-3327; Appx3507-3508 24:19-25:11, Appx3509 28:11-25; Appx3540-3543. Mr. Yurkerwich knew where the press release came from, when it was published, and that it was based off a study Conviva conducted. Appx3453-3454 ¶¶41, Appx3455 ¶267. There was no issue over where the document came from, nor any basis to claim that Conviva engaged in self-interested exaggeration of the data.

(6): internal comparison of users' watch time
(7): percentage reduction in viewership from switching to a noninfringing alternative

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The probative value of Conviva's statistics is bolstered, not weakened, by their aggregate nature. Conviva analyzed data from billions of streams, and 150 of the top video sites, across 190 countries. Appx3327. That average is useful exactly because it is an average, accounting for the natural distribution of users and devices. *See* Appx3354-3355 86:24-87:7. Although Hulu argued that the Conviva statistics could be skewed significantly away from actual rebuffering in Hulu's products, that argument is a challenge to the factual underpinnings which should be presented at trial. *Cf. Alaska Rent-A-Car*, 738 F.3d at 970. If Hulu wants to distinguish the Conviva metrics as being too different from the behavior of Hulu's actual users, the proper recourse is to present contrary facts or attack the testimony on cross-examination rather than for the district court to exclude it. *DataQuill*, 887 F.Supp.2d at 1026; *In re Citimortgage, Inc. Home Affordable Modification Program ("HAMP") Litig.*, No. ML 11-2274 DSF (PLAX), 2013 WL 8844095, at *2 (C.D. Cal. Oct. 7, 2013) ("[N]o data set is perfect. The question under *Daubert* is not whether an expert's report relies on and analyzes perfect data—if that were the inquiry, there would be no data-based expert testimony in federal court—but rather whether an expert's report is sufficiently reliable to warrant consideration."). And though Hulu argued below that there was no other evidence corroborating or explicating Hulu's own estimate that users watch "[redacted (8)]" when they get the benefits of ABR, Hulu cannot profit from the absence of more detailed

(8): internal comparison of users' watch time

information, leaving the Conviva published analysis as the most detailed data Mr. Yurkerwich had available to estimate effects on content-viewing time. *See TWM Mfg. Co. v. Dura Corp.*, 789 F.2d 895, 900 (Fed. Cir. 1986) ("The special master properly resolved difficulty in determining the royalty figure against Dura as an infringer which had lost its records."); *Westinghouse Elec. & Mfg. Co. v. Wagner Elec. & Mfg. Co.*, 225 U.S. 604, 621-22 (1912).

Further, Mr. Yurkerwich reasonably connected the benefits of ABR to the benefits of the '213 Patent, establishing a factual basis for relying on the Conviva data. The district court disagreed that any technical nexus existed because Mr. Yurkerwich did not again "consult with Richardson as to whether the benefits identified... actually correlate to those of the '213 Patent" and Yurkerwich does not "have the technical expertise." Appx0057. But this overlooks the close, facially obvious correspondence between those benefits Dr. Richardson had already attributed to the '213 Patent in his prior reports and the benefits listed in the Conviva publication. In other words, Dr. Richardson's reports already provided the technical link to the benefits articulated in the Conviva press release.

Dr. Richardson had already opined that "the '213 patent's incremental value to Hulu can be measured by examining the effect on streaming quality of experience Hulu would experience if it were to revert to a non-adaptive bitrate protocol" and taken note of Conviva's internal analysis for Hulu that had found [redacted (9)]

(9): internal comparison of users' watch time

[redacted] watch time due to ABR. Appx2640 ¶¶853-855. Dr. Richardson also opined that Hulu achieved benefits from the '213 Patent such as (1) reducing "video startup time," Appx2638 ¶847, Appx2642 ¶864; (2) reducing re-buffering and initial buffering, Appx2642 ¶864, Appx2288-2289 ¶75, Appx2637-2638 ¶¶844-846; and (3) delivering the highest-bitrate, highest-quality representation that the client can support, Appx2327-2328 ¶169, Appx2331 ¶174, Appx2672-2673 ¶74. The Conviva press release tied its 250% statistic to those very same benefits. Conviva specifically attributed that 250% increase in viewing time to three specific benefits of ABR: "fast startup," "little to no buffering," and "high-sustained bitrate." Appx3327.

Because the Conviva study attributed its 250% data point to the same benefits as the claimed invention provides (laid out in Dr. Richardson's opinions), that is all the basis Mr. Yurkerwich needed to use it as a benchmark. This is the same sort of benchmark methodology this Court has approved. *See Apple*, 757 F.3d at 1318 (approving extrapolation from data about the value of a trackpad to approximate the value of a touch screen because they shared similar touch gesture benefits).

For all these reasons, the district court's exclusion of Mr. Yurkerwich's amended damages report that included calculations based on the Conviva press release should be reversed.

(9): internal comparison of users' watch time

CONCLUSION

For the foregoing reasons, SVI respectfully requests that this Court **VACATE** summary judgment of noninfringement of Claim 16 of the '213 Patent; **REVERSE** the district court's exclusions of Yurkerwich's opinions relating to damages; and remand the case.

September 16, 2021

Respectfully submitted,

/s/ *Frederick J. Ding*

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Addendum

Nonconfidential Version

UNITED STATES DISTRICT COURT

CENTRAL DISTRICT OF CALIFORNIA

SOUND VIEW INNOVATIONS, LLC, Plaintiff, v. HULU, LLC, Defendant.	No. LACV17-04146 JAK (PLAx) **FINAL JUDGMENT**

The Court hereby enters its Final Judgment as follows:

1. Claim 14 of U.S. Patent No. 5,806,062 is invalid under 35 U.S.C. § 101 for lack of patentable subject matter.

2. Hulu does not infringe Claim 16 of U.S. Patent No. 6,708,213.

3. Count One of Sound View's First Amended Complaint and Hulu's First and Sixth Counterclaims are hereby dismissed as moot without prejudice to each party requesting to revive its claim or counterclaim(s) and defenses after appeal.

4. Because no claims remain in this action, the Clerk shall enter judgment in favor of Hulu.

IT IS SO ORDERED AND ADJUDGED.

Dated: April 30, 2021

John A. Kronstadt
United States District Judge

UNITED STATES DISTRICT COURT
CENTRAL DISTRICT OF CALIFORNIA

CIVIL MINUTES – GENERAL

Case No.	LA CV17-04146 JAK (PLAx)	Date	October 20, 2020
Title	Sound View Innovations, LLC v. Hulu, LLC		

Present: The Honorable	JOHN A. KRONSTADT, UNITED STATES DISTRICT JUDGE
V.R. Vallery	Not Reported
Deputy Clerk	Court Reporter / Recorder
Attorneys Present for Plaintiffs:	Attorneys Present for Defendants:
Not Present	Not Present

Proceedings: **(IN CHAMBERS) ORDER RE MOTION FOR SUMMARY JUDGMENT OF NON-INFRINGEMENT OF CLAIM 16 OF U.S. PATENT NO. 6,708,213 (DKTS. 847, 854)**

I. Introduction

Sound View Innovations, LLC ("Plaintiff") brought this patent infringement action against Hulu, LLC ("Defendant"). Complaint, Dkt. 1. Three patents remain at issue, but the proceedings have been stayed as to two of them. See Dkt. 441 (Order Granting Joint Stipulation to Dismiss Certain Asserted Patents and Related Claims); Dkt. 451 (Order Finding '062 Patent Asserted Claims Invalid); Dkt. 475 (Order Maintaining Stay as to '371 Patent Pending Appeal of *Inter Partes* Review Proceedings); Dkt. 581 (Order, *inter alia*, Staying Proceedings as to '074 Patent). Presently at issue are Plaintiff's claims of infringement and Defendant's affirmative defenses and counterclaims of non-infringement and invalidity of Claim 16 of U.S. Patent No. 6,708,213 ("the '213 Patent") based on Defendant's Streaming Video on Demand ("SVOD") product.

Defendant moved for summary judgment of non-infringement of Claim 16 of the '213 Patent. Dkts. 847 (public), 854 (sealed). Plaintiff filed an opposition. Dkts. 856 (public), 878-1 (sealed). Defendant filed a reply. Dkts. 870 (public), 901 (sealed).

A hearing on the motion was held on August 13, 2020. Dkt. 889. The parties were permitted to file supplemental briefing on certain issues that had been raised at the hearing. Each did so. "Plaintiff's Supplemental Brief," Dkts. 891 (public), 905-1 (sealed); "Defendant's Supplemental Brief," Dkt. 899.

For the reasons stated in this Order, Defendant's motion for summary judgment is **GRANTED**.

UNITED STATES DISTRICT COURT
CENTRAL DISTRICT OF CALIFORNIA

CIVIL MINUTES – GENERAL

Case No.	LA CV17-04146 JAK (PLAx)	Date	November 2, 2020
Title	Sound View Innovations, LLC v. Hulu, LLC		

II. Background

A. Procedural History

During pretrial proceedings, the parties disputed the meaning of the claim phrase "downloading . . . while concurrently retrieving." *See* Dkts. 659, 667. They were permitted to file supplemental claim construction briefs as to this issue. *Id.* An Order was issued April 13, 2020 (the "Supplemental Claim Construction Order" (Dkt. 830)) that determined the patent applicant clearly and unequivocally disavowed the full scope of the phrase. *See, e.g.*, *id.* at 5. The Supplemental Claim Construction Order stated that, in distinguishing the proposed patent claims over a prior art reference to "DeMoney," the patent applicant characterized the claims as only covering concurrent downloading from and retrieving to the same buffer. *Id.* at 3-4. It construed the phrase "downloading . . . while concurrently retrieving" as "downloading said portion of said requested SM object from said allocated buffer to said requesting client, while concurrently retrieving into the same buffer a remaining portion of said requested SM object from one of another HS and said content server." *Id.* at 5. Thereafter, on June 18, 2020, another Order issued that denied Plaintiff's motion for reconsideration of the determination in the Supplemental Claim Construction Order. Dkt. 837. Defendant subsequently moved for summary judgment of non-infringement of Claim 16 of the '213 Patent based on the argument that the accused products did not satisfy the "downloading . . . while concurrently retrieving" limitation. Dkts. 847, 854.

B. Asserted Patent

A brief summary of the '213 Patent was provided in the Claim Construction Order that was issued on September 4, 2018. *See* Dkt. 148 at 2–3. It is repeated here.

The '213 Patent is titled "Method for Streaming Multimedia Information over Public Networks." It generally discloses and claims "methods which improve the caching of streaming multimedia data (e.g., audio and video data) from a content provider over a network to a client's computer." '213 Patent at 1:10–15. To do so, the '213 Patent describes, among other features, using "ring buffers" to cache data at helper servers and "implement[ing] several methods specifically designed to support streaming media, including proxy caching, client request aggregation . . . and data transfer rate control to reduce start-up latency." *Id.* at 2:64–3:5; *see also id.* at 4:41–62, 5:55–65, 8:3–8.

Claim 16 of the '213 Patent recites:

> 16. A method of reducing latency in a network having a content server which hosts streaming media (SM) objects which comprise a plurality of time-ordered segments for distribution over said network through a plurality of helpers (HSs) to a plurality of clients, said method comprising:
>
> receiving a request for an SM object from one of said plurality of clients at one of said plurality of helper servers;
>
> allocating a buffer at one of said plurality of HSs to cache at least a portion of said requested SM object;
>
> downloading said portion of said requested SM object to said requesting client, while concurrently retrieving a remaining portion of said requested SM object from one of another HS and said content server; and

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adjusting a data transfer rate at said one of said plurality of HSs for transferring data from said one of said plurality of helper servers to said one of said plurality of clients.

'213 Patent at Claim 16.

III. Analysis

A. Legal Standards

1. Summary Judgment

Summary judgment is appropriate when, viewing the evidence and drawing all reasonable inferences in the light most favorable to the nonmoving party, there are no genuine issues of material fact, and the movant is entitled to judgment as a matter of law. Fed. R. Civ. P. 56(a); *Celotex Corp. v. Catrett*, 477 U.S. 317, 322–23 (1986). In considering a motion for summary judgment, a court "does not assess credibility or weigh the evidence, but simply determines whether there is a genuine factual issue for trial." *House v. Bell*, 547 U.S. 518, 559–60 (2006). A fact is "material" if it "might affect the outcome of the suit under the governing law," such as those necessary to the proof of a defense or a claim; a dispute as to a material fact is "genuine" if there is sufficient evidence for a reasonable trier of fact to decide in favor of the nonmoving party. *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 248 (1986). "If the evidence is merely colorable, or is not significantly probative, summary judgment may be granted." *Id.* at 249–50 (internal citations omitted).

"Summary judgment is as appropriate in a patent case as in any other." *Barmag Barmer Maschinenfabrik AG v. Murata Mach., Ltd.*, 731 F.2d 831, 835 (Fed. Cir. 1984). The moving party bears the initial burden of identifying those portions of the pleadings, discovery, and affidavits that demonstrate the absence of a genuine issue of material fact. *Celotex Corp.*, 477 U.S. at 323. Once the moving party meets its initial burden, the nonmoving party must set forth, by affidavit or as otherwise provided in Fed. R. Civ. P. 56, "specific facts showing that there is a genuine issue for trial." *Anderson*, 477 U.S. at 250 (internal quotation marks omitted). If the non-moving party fails to produce evidence sufficient to show a genuine issue of material fact, "the moving party is entitled to a judgment as a matter of law." *Celotex Corp.*, 477 U.S. at 322–23.

Mere allegations or denials do not defeat a moving party's assertions. *Gasaway v. Nw. Mut. Life Ins. Co.*, 26 F.3d 957, 959–60 (9th Cir. 1994). Thus, a nonmoving party cannot defeat a motion for summary judgment simply by proffering a conclusory opinion from an expert. *See, e.g.*, *Soremekun v. Thrifty Payless, Inc.*, 509 F.3d 978, 984 (9th Cir. 2007) ("Conclusory, speculative testimony in affidavits and moving papers is insufficient to raise genuine issues of fact to defeat summary judgment."); *Arthur A Collins, Inc. v. Northern Telecom Ltd.*, 216 F.3d 1042, 1047–48 (Fed. Cir. 2000).

2. Patent Infringement

Determining patent infringement is a two-step process. *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1454 (Fed. Cir. 1998). "First, the court determines the scope and meaning of the patent claims asserted, and then the properly construed claims are compared to the allegedly infringing device." *Id.* (citations

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omitted). "Whether an accused device or method infringes a claim either literally or under the doctrine of equivalents is a question of fact." *Schoell v. Regal Marine Indus., Inc.*, 247 F.3d 1202, 1207 (Fed. Cir. 2001). Because the ultimate burden of proving infringement rests with the patentee, an accused infringer may establish that summary judgment is proper "either by providing evidence that would preclude a finding of infringement, or by showing that the evidence on file fails to establish a material issue of fact essential to the patentee's case." *Novartis Corp. v. Ben Venue Labs., Inc.*, 271 F.3d 1043, 1046 (Fed. Cir. 2001). Once again, if the moving party meets this initial requirement, the burden shifts to the party asserting infringement to set forth, by declaration or as otherwise permitted under Fed. R. Civ. P. 56, "specific facts showing that there is a genuine issue for trial." *Anderson*, 477 U.S. at 248.

3. Claim Construction

The legal standards relevant to claim construction were stated in the Claim Construction Order issued September 4, 2018. *See* Dkt. 148 at 4–6. That portion of the Claim Construction Order is incorporated here by this reference. *Id.*

B. Application

As noted, Defendant argues that the accused products do not infringe Claim 16 of the '213 Patent because they do not meet the "downloading . . . while concurrently retrieving" limitation. In response, Plaintiff argues that the accused products can still satisfy this limitation under an alternative theory of infringement that it previously presented through its expert before the Supplemental Claim Construction Order was issued. Specifically, Plaintiff argues that there is a question of fact as to whether this limitation is met where each of the accused products includes a cache, and portions of a requested SM object are downloaded to a client from the cache at the same time that remaining portions are concurrently retrieved from other sources into the cache. Defendant argues that this alternative infringement theory fails because a cache cannot constitute the claimed "buffer at one of said plurality of HSs." Both parties rely on the patent intrinsic record in presenting their respective arguments as to whether a cache can constitute the claimed buffer. This shows, in effect, that the parties have a fully-briefed claim construction dispute over the meaning of the term "buffer" as used in Claim 16 of the '213 Patent.

The '213 Patent refers to both buffers and caches as physical components. It also uses versions of the verb "to cache" in describing the collection and storage of relevant data, including into buffers. For example, Claim 16 requires "allocating ***a buffer*** at one of said plurality of HSs ***to cache*** at least a portion of said requested SM object." '713 Patent at Claim 16 (emphasis added). The specification similarly refers to Helper Servers ("HSs") as providing "***caching*** services and/or prefetching services." *Id.* at 4:19–20 (emphasis added).

The specification lexicographically defines a cache as "***a*** region ***on the computer disk*** that holds a subset of a larger collection of data." *Id.* at 4:7–8 (emphasis added). As it explains in one paragraph:

> [W]hen an SM object request arrives at a cache, the request will most likely result in a partial hit in the sense that one part of the requested SM object will typically be stored in the local cache, while the remainder of the SM object will be stored in part at the various HSs **22**–**24** throughout the network. This is different from conventional web caching where entire objects are stored in a local cache. Given that an HS will typically store only a portion

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> of an SM object, upon receiving a request for an SM object from a client, the HS is required to retrieve the non-stored portions of the SM object from the other HSs in the network **22–24**. This practice has the effect of increasing signaling costs and also increases the probability of losing synchronization. Therefore, at a given HS, it is preferable to cache successive segments rather than cache a sequence of segments with multiple gaps in it. This is achieved by prefix caching, where segments of an SM object are ejected from the end by replacing the last segment first. In prefix caching, the last access time of each SM object stored in the local cache is recorded, and when space is required in the local cache to store another SM object, the least recently used SM object is replaced from its end.

Id. at 5:19–40.

In a section titled "Client Request Aggregation," the specification proceeds separately to describe, "[i]n accordance with the teachings of the present invention, ***the*** buffering scheme for implementing client request aggregation utilizes ***ring buffers*** in the ***memory*** of the HS." *Id.* at 5:56–60 (emphasis added). The specification states that the

> ring buffers represent a type of short term storage to service multiple requests for the same object which occur within a certain time range. ***The allocation*** of ring buffers is advantageous in that multiple requests may be serviced from a single stream from the server, thereby reducing latency and network congestion. That is, ring buffers ***are allocated*** in anticipation of other clients requesting the same SM object from an HS within a certain time range.

Id. at 5:57–65 (emphasis added).

The concept of "allocating" a buffer reappears throughout the specification. *See, e.g.*, *id.* at 6:48–51; 6:52–56; 6:59–62; 6:52–67; 7:31–34. The specification explains that a buffer effectively

> operates as a ***type of short term cache*** which stores a portion of an SM object for a fixed time interval. It is also convenient to view ring buffer **57** as a sliding window in the sense that portions of an SM object are initially cached in the ring buffer **57** and then deleted to store successive portions of the SM object.

Id. at 7:20–26 (emphasis added).

Through this language and other, related passages, the specification shows that there is a distinction between allocated buffers and the cache of the helper server. For example, the specification refers to embodiments where a helper server can have multiple buffers allocated for servicing client requests. *Id.* at 7:40–42. In contrast, the specification discusses only one "local cache" per helper server. *See, e.g.*, *id.* at 5:32–40. The specification also distinguishes between the cache as it exists as a region on the computer disk and a buffer that exists in the memory of the Helper Server. *Compare, e.g.*, *id.* at 4:7–8, *with id.* at 5:56–60. Elsewhere in the specification, the same comparison between storage on the disk and the buffer in memory of a helper server is presented:

> It is further noted, that whenever a ring buffer is allocated in memory in response to a

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> client request, as the ring buffer is filled, the data is simultaneously streamed to the requesting client . . . . [I]n general, the number of ring buffers which may be allocated is practically limited by the size of the local memory which is small in comparison to disk space which is also limited at a HS . . . . ***[W]hen client requests cannot be fully satisfied through the deployment of ring buffers, an HS can serve a client's request from any combination of sources including: the memory ring buffer, cache on the disk, the memory or disk of other HSs in the network, and the content server***.

Id. at 7:55–67 (emphasis added).

As Defendant notes, Claim 16 itself requires "***allocating*** a buffer at one of said plurality of HSs to cache at least a portion of said requested SM object." '213 Patent at Claim 16 (emphasis added). Thus, the claim uses the same "allocating" phrase as in the patent specification to describe the allocation of ring buffers. The specification describes a helper server as having a single cache. Thus, the cache could not necessarily be "allocated" in the same manner as a buffer. Understanding the buffer as a cache would also undermine the proper construction of "downloading . . . while concurrently retrieving," including by failing sufficiently to differentiate the claimed invention from DeMoney in the manner explained by the patent applicant during prosecution. If the claimed buffer could be met by a cache, both of these claim phrases would be without meaning. *See also id.* at Claim 17 (differentiating between "means for managing available memory in the form of a buffer pool" and "means for recording data onto [a] cache and reading data from said cache.").

At the hearing, Plaintiff argued that the issue of whether a buffer "is a memory or disk storage" was not addressed in the briefing of the parties. *E.g.*, Dkt. 896 at 15:2–4. In its supplemental brief, Plaintiff argues that the plain and ordinary meaning of "buffer" "as determined by dictionaries" is "temporary storage for data being sent or received." Dkt. 905-1 at 1. Plaintiff asserts that extrinsic evidence also supports "[t]his broad understanding of buffers—and, relatedly, the understanding that a cache may be used to perform the function of a buffer . . . ." *Id.* at 3.

A claim term should be construed "not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005 (en banc). The specification is "the single best guide to the meaning of a disputed term," and the court should "rely heavily" on it for guidance. *Id.* at 1315, 1317. As noted, the specification of the '213 Patent distinguishes between the allocated buffers and the cache of a helper server. *E.g.*, '213 Patent at 7:40–42, 5:32–40 (disclosing multiple buffers and a single "local cache" in a helper server); *id.* at 4:7–8, 5:56–60 (disclosing a cache on a computer disk, and ring buffers in the memory of a helper server).

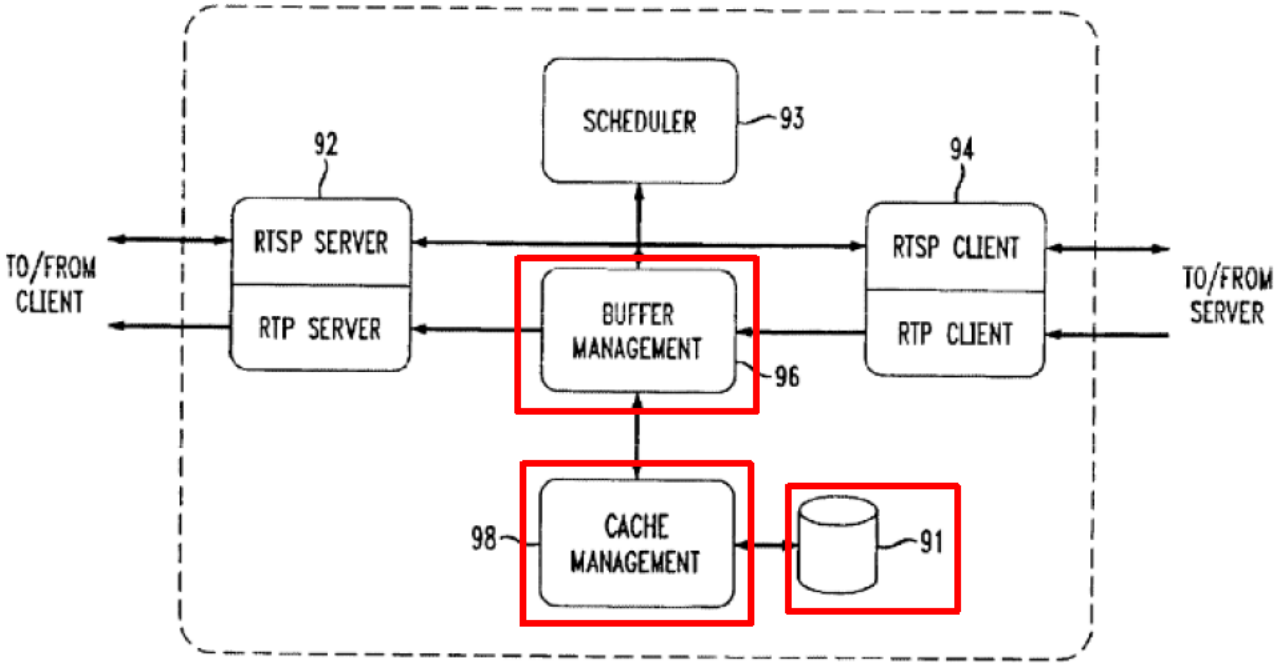
The specification also distinguishes storage in the disk cache and storage in the memory ring buffer. *E.g.*, 7:64–66 ("an HS can serve a client's request from any combination of sources including: the memory ring buffer, cache on the disk . . ."); *id.* at 11:24-26 ("a ring buffer may be made up of multiple data segments, where each data segment represents data obtained from a separate data source (e.g., local disk, remote disk)"). Moreover, the specification discloses two "concurrent[]" processes of "download[ing] the existing K_1 seconds of data stored in the playout buffer B1 79" while "request[ing] K-K1 seconds of data from either its local disk, or another HS, or the content server S 71 so that the client's C 73 playout buffer B2 77 may be completely filled" in the context of a buffer. *Id.* at 50–61. The specification does not disclose

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this process of concurrently downloading performed by a cache. As another example, the real-time streaming protocol ("RTSP") embodiment disclosed in Figure 9 distinguishes a buffer from a cache. Figure 9 shows both a "buffer management" module and a "cache management" module:



'213 Patent, Fig. 9 (annotations added).

The specification discloses that the buffer management module 96 "manages the available memory in the form of a pool of buffers." *Id.* at 10:31-32. The buffer management module 96 "interacts with the cache management module 98 for recording data onto the cache 91 and reading data from the cache 91." *Id.* at 10:54-56. This disclosure is illustrative and provides further support for a determination that the buffer and cache are distinct.

Plaintiff has submitted extrinsic evidence to support its supplemental briefing. "[E]xtrinsic evidence may be useful to the court, but it is unlikely to result in a reliable interpretation of patent claim scope unless considered in the context of the intrinsic evidence." *Phillips*, 415 F.3d at 1319. Richardson opines that "a cache that temporarily stores data being sent or received is a buffer under Claim 16." Dkt. 905-3 at ¶ 6. In light of the disclosures in the intrinsic record described above, Richardson's opinion does not warrant a different outcome on this issue. Nor do the dictionary definitions warrant a different determination; indeed, portions of those definitions align with the disclosures in the specification about buffers, not a cache. *E.g.*, Dkt. 905-5 at 5 (stating a "buffer acts like a dam, capturing the data and then trickling it out at speeds the lower river can handle without, hopefully, flooding or overflowing the banks"); '213 Patent at 11:15–19 ("This minimum amount of data may be viewed as a sliding or moving window in the sense that as incrementally higher ordered time packets are inserted into the buffer, the right edge of the sliding window moves to the right . . . ."). Finally, it is noted that the Fed. R. Civ. P. 30(b)(6) witness for third-

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party Level 3 testified consistently with the specification, "Well, the cache is always backed by the disk storage." Dkt. 905-4 at 2. Because the parties' remaining arguments do not warrant a different outcome, they are not addressed.[1]

Plaintiff's sole remaining infringement theory rests on the assumption that a cache can satisfy the claimed buffer limitations in Claim 16 of the '213 Patent. For all of the reasons stated in this Order, it is determined that it cannot. Because Plaintiff's infringement theory fails as a matter of law, summary judgment of non-infringement is warranted.

IV. Conclusion

For the reasons stated in this Order, Defendant's motion for summary judgment (Dkts. 847, 854) is **GRANTED**. In light of this determination, the pending motions at Dkts. 506, 512, 761, 764, 765, 771, and 772 are **DENIED AS MOOT**. Because there are remaining claims at issue in this action, no judgment will be entered at this time. However, in light of the pendency of those claims, within seven days after the issuance of this Order, the parties shall file an updated joint report regarding the status of the IPR proceedings for each of the '371 and '074 Patents.

IT IS SO ORDERED.

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[1] Having resolved the claim construction dispute to address "the heart of the parties' disagreement," it is unnecessary to provide any further construction of the term "buffer," because this could be deemed an advisory opinion. *Summit 6, LLC v. Samsung Elecs. Co., Ltd.*, 802 F.3d 1283, 1291 (Fed. Cir. 2015).

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Case No.	LA CV17-04146 JAK (PLAx)	Date	June 18, 2020
Title	Sound View Innovations, LLC v. Hulu, LLC		

Present: The Honorable	JOHN A. KRONSTADT, UNITED STATES DISTRICT JUDGE

Cheryl Wynn	Not Reported
Deputy Clerk	Court Reporter / Recorder
Attorneys Present for Plaintiffs:	Attorneys Present for Defendants:
Not Present	Not Present

Proceedings: **(IN CHAMBERS) ORDER RE DEFENDANT'S MOTION FOR RECONSIDERATION (DKT. 669) AND PLAINTIFF'S MOTION FOR RECONSIDERATION (DKT. 832)**

I. Introduction

Sound View Innovations, LLC ("Plaintiff") brought this patent infringement action against Hulu, LLC ("Defendant"). Complaint, Dkt. 1. Three patents remain at issue, but proceedings are stayed as to two of them. *See* Dkt. 441 (Order Granting Joint Stipulation to Dismiss Certain Asserted Patents and Related Claims); Dkt. 451 (Order Finding '062 Patent Asserted Claims Invalid); Dkt. 475 (Order Maintaining Stay as to '371 Patent Pending Appeal of *Inter Partes* Review Proceedings); Dkt. 581 (Order, *inter alia*, Staying Proceedings as to '074 Patent). What remains active and at issue are Plaintiff's claims of infringement and Defendant's affirmative defenses and counterclaims of non-infringement and invalidity of Claim 16 of U.S. Patent No. 6,708,213 ("the '213 Patent") based on Defendant's Streaming Video on Demand ("SVOD") product.

An Order was issued November 18, 2019 (the "November 2019 Order" (Dkt. 620)) that resolved certain matters. Defendant has moved for reconsideration of certain determinations in the November 2019 Order (the "First Reconsideration Motion" (Dkt. 669)). Plaintiff has opposed the First Reconsideration Motion (Dkt. 706), and Defendant has filed a reply. Dkt. 724.

An Order was issued April 13, 2020 (the "Supplemental Claim Construction Order" (Dkt. 830)) that considered the ongoing dispute between the parties regarding the construction of the claim phrase "downloading . . . while concurrently retrieving . . ." Plaintiff has moved for reconsideration of the determinations in the Supplemental Claim Construction Order (the "Second Reconsideration Motion" (Dkt. 832)). Defendant has opposed the Second Reconsideration Motion (Dkt. 834), and Plaintiff has filed a reply. Dkt. 835. Both parties also filed notices of supplemental authority, in which they submitted certain filings made in a proceeding in the District of Delaware involving the same asserted patent. Dkts. 833, 836.

It was previously determined that the First Reconsideration Motion was one that could be decided without oral argument pursuant to Local Rule 7-15. *See* Dkt. 757; *see also* Dkt. 793. The same finding has been made as to the Second Reconsideration Motion. Therefore, the hearing currently scheduled for August

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31, 2020 is **VACATED**. *See* Local Rule 7-15. For the reasons stated in this Order, the First and Second Reconsideration Motions are **DENIED**.

II. Background

A. The November 2019 Order

The November 2019 Order considered, *inter alia*, Plaintiff's request for partial summary judgment of no invalidity due to "Footprint CDN" (Dkt. 246), Plaintiff's Motion to Exclude in-part the testimony of Defendant's technical expert, Dr. Jeffrey Chase, (Dkt. 245), and motions *in limine* related to those determinations. *See* Dkt. 620. The November 2019 Order excluded the opinions of Chase regarding Footprint CDN. *Id.* at 4-5. It determined that the invalidity chart Chase presented as to Footprint CDN was deficient. *Id.* ("Citing to excerpts in various documents and further reserving the right to rely on an even broader collection of documents and testimony, without stating his invalidity opinions in his own words, does not provide a fair disclosure of those opinions or the underlying methodology."). It also concluded that Defendant would not be permitted to present evidence from a percipient witness, Christopher Newton, related to the same chart. *Id.* at 5. The November 2019 Order then stated that, "Defendant has not offered any other basis to show that documents related to Footprint CDN would be relevant and admissible," and granted Plaintiff's motion *in limine* to exclude them. *Id.* Based on these determinations, summary judgment of no invalidity was granted as to Footprint CDN. *Id.*

The November 2019 Order also considered, *inter alia*, Plaintiff's motion to exclude certain opinions of Michael Jeffords, who is Defendant's expert on damages. Dkt. 620 at 15-17. The November 2019 Order granted Plaintiff's request to exclude Jeffords' opinions related to non-infringing alternatives. *Id.*

B. The Supplemental Claim Construction Order

The Supplemental Claim Construction Order determined that the patent applicant clearly and unequivocally disavowed the full scope of the claim phrase "downloading . . . while concurrently retrieving . . ." in Claim 16 of the '213 Patent through arguments made during patent prosecution. *See, e.g.* Dkt. 830 at 5. The Supplemental Claim Construction Order stated that, in distinguishing the proposed patent claims over a prior art reference to "DeMoney," the patent applicant characterized the claims as only covering concurrent downloading and retrieving from/to the same buffer. *Id.* at 3-4. It construed the phrase "downloading . . . while concurrently retrieving" as "downloading said portion of said requested SM object from said allocated buffer to said requesting client, while concurrently retrieving into the same buffer a remaining portion of said requested SM object from one of another HS and said content server." *Id.* at 5.

III. Analysis

A. Legal Standards

Under the Local Rules, to warrant a reconsideration of a decision, a movant must show:

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(a) a material difference in fact or law from that presented to the Court before such decision that in the exercise of reasonable diligence could not have been known to the party moving for reconsideration at the time of such decision, or

(b) the emergence of new material facts or a change of law occurring after the time of such decision, or

(c) a manifest showing of a failure to consider material facts presented to the Court before such decision. No motion for reconsideration shall in any manner repeat any oral or written argument made in support of or in opposition to the original motion.

C.D. Cal. L.R. 7-18.

Moreover, "[r]eargument should not be used as a means to argue new facts or issues that inexcusably were not presented to the court in the matter previously decided." *Ernest Paper Products, Inc. v. Mobil Chemical Co.,* Inc., 1997 WL 33483520, at * 1 (C.D. Cal. Dec. 2, 1997) (quoting *Bhatnagar v. Surrendra Overseas Ltd.,* 52 F.3d 1220, 1231 (3d Cir. 1995)); *see also Marlyn Nutraceuticals, Inc. v. Mucos Pharma GmbH & Co.*, 571 F.3d 873, 880 (9th Cir. 2009) (A motion for reconsideration "may *not* be used to raise arguments or present evidence for the first time when they could reasonably have been raised earlier in the litigation."(emphasis in original)), *Kona Enters., Inc. v. Estate of Bishop,* 229 F.3d 877, 890 (9th Cir. 2000), *Power Analytics Corp. v. Operation Tech., Inc.*, SACV 16-01955 JAK (FFMx), Dkt. 362, at *3 (C.D. Cal. Dec. 7, 2017). Reconsideration is an "extraordinary remedy, to be used sparingly in the interests of finality and conservation of judicial resources." *Carroll v. Nakatani*, 342 F.3d 934, 945 (9th Cir. 2003).

B. Application

1. First Reconsideration Motion

a. Footprint CDN Determinations

Defendant requests reconsideration of the order granting summary judgment as to no invalidity and to exclude Chase's opinions regarding Footprint CDN. *See generally* Dkt. 669. It also requests reconsideration of the exclusion of other evidence regarding Footprint CDN, including the testimony of Christopher Newton. These requests are unpersuasive for three primary reasons.

First, in the First Reconsideration Motion, Defendant asserts that "the accused product ***is*** the purported 'Footprint' system." *See, e.g.* Dkt. 669 at 5 (emphasis added). It notes that the November 2019 Order treated the accused Level 3 CDNs and Footprint CDN as separate systems. *Id.* Defendant then contends that in doing so, the November 2019 Order made improper determinations that "result in manifest injustice to Hulu's ability to defend against Sound View's infringement allegations, including by foreclosing Hulu's ability to explain the details and history of the very system that Sound View accuses of infringing the '213 Patent." *Id.*

Defendant argues that it previously stated in this proceeding its position that Footprint CDN is itself the accused product. To support this position, Defendant refers to its opposition to a motion to strike its final invalidity contentions and expert reports. That motion was filed months before the relevant motions addressed by the November 2019 Order. Dkt. 669 at 5 (citing Dkt. 176 at 2). There are no citations to the

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briefing on Plaintiff's summary judgment motion of no invalidity, Plaintiff's motion to exclude Chase's opinions, or the motions *in limine* to support the assertion that this prior position was renewed in connection with any of them. Nor are there citations to any such "fact,", *e.g.*, "the accused product is the Footprint CDN" in the statement of disputed facts with respect to Plaintiff's summary judgment motion of no invalidity by Footprint CDN. *See generally* Dkt. 307-1. Further, a review of the statements in the relevant briefing shows that Defendant referred to the accused system and Footprint CDN as separate systems. *See, e.g.* Dkt. 550 at 3 (Defendant's opposition to Plaintiff's MIL no. 5, stating Newton "is intimately familiar with ***both*** the prior art Footprint CDN and the accused Level 3 CDN." (emphasis in original)). Similarly, in presenting his opinions regarding Footprint CDN, Chase treated it as a system separate from the accused system. *See* Excerpts of Expert Report of Dr. Jeffrey Chase ("Chase Report"), Dkt. 245-2 ¶ 435 n.12 ("the Footprint CDN functions in substantially the same way as the Accused products with respect to the claimed features of the Asserted Patents.").

Defendant has not explained its failure to raise the contention that "the accused product is the purported 'Footprint' system" in the relevant briefing -- including on Plaintiff's motion for summary judgment as to no invalidity, Plaintiff's motion to exclude Chase's opinions and the motions *in limine*. The contention could have been raised in connection with those matters if Defendant planned to rely on it. The reference to this contention in an earlier opposition to a motion to strike is insufficient. It did not provide notice that it was being renewed in connection with the later motions. Therefore, the motion to reconsider based on a claim of manifest injustice, which implies that the Court erred because it did not identify and consider this earlier position, is not warranted. *See Ernest Paper*, 1997 WL 33483520, at * 1.

Second, in support of the First Reconsideration Motion, Defendant argues that the November 2019 Order erred in excluding the testimony of Newton regarding Footprint CDN. In support of this position, Defendant cites cases in which the Federal Circuit found that testimony of a percipient witness can be considered as part of an invalidity analysis when a case involves "simple technology." However, there are no corresponding arguments that seek to show that the requirements of Local Rule 7-18 have been satisfied on this issue. Moreover, the Federal Circuit decisions that are cited presented facts different from those presented here. The issues here are not about a simple technology. Therefore, because there has been no showing of a manifest error in the application of the law, it has not been shown that reconsideration of the exclusion of Newton's testimony is warranted.

Third, in support of the First Reconsideration Motion Defendant argues that Footprint CDN evidence should not be excluded because it is relevant to other issues that will be considered at trial, including induced infringement. Again, there is no showing that this basis for renewed review satisfies the requirements of Local Rule 7-18. New factual arguments are raised, but there is insufficient explanation as to why they could not have been presented prior to when the November 2019 Order issued. The nature of the arguments supports a determination that Defendant could have done just that. Once again, reconsideration is not warranted.

For the foregoing reasons, the First Reconsideration Motion is **DENIED** as to the Footprint CDN Determinations in the November 2019 Order.

b. The Exclusion of the Non-infringing Alternative Opinions of Mr. Jeffords

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Defendant also argues that the determination in the November 2019 Order to exclude Jeffords' non-infringing alternative opinions reflects a factual error. Dkt. 669 at 13. The November 2019 Order states that Jeffords' opinions regarding non-infringing alternatives relied on discussions he had with Chase that were not described in Chase's expert reports. Dkt. 620 at 16. In support of the First Reconsideration Motion, Defendant notes that Chase did disclose opinions regarding non-infringing alternatives. Dkt. 669 at 13. On this basis, it argues that reconsideration is warranted.

To the extent there was an error in November 2019 Order as to the characterization of Chase's opinions, it was harmless. The November 2019 Order concluded independently that there was "no sufficient additional explanation as to the basis for the assumption that a non-accused CDN or group of non-accused CDNs were available, i.e., ***had the bandwidth to replace the use of the accused system***." Dkt. 620 at 16 (emphasis added). Defendant has not identified any material factual disputes that relate to this determination that were raised in the original briefs and were not considered in the November 2019 Order. Nor has Defendant shown that any material facts that were not known before the November 2019 Order issued now warrant reconsideration. Because the requirements for reconsideration have not been met with respect to the ultimate determination reached by the November 2019 Order, the requested relief is not warranted.

For these reasons, the First Reconsideration Motion is **DENIED** as to the exclusion of Jeffords' Non-infringing Alternative Opinions.

c. Request to Amend Reports

The First Reconsideration Motion included requests to amend the reports of Chase and Jeffords "to satisfy the Court's requirements." Dkt. 669 at 9; *see also id.* at 3-4, 12. These requests are not repeated in the reply. Given the circumstances presented and the nature of the excluded opinions, the request for a second opportunity to present them would be futile or prejudicial by allowing the introduction of new opinions insufficiently supported by these experts' earlier theories and analyses. Therefore, the request to amend the reports is denied.

2. Second Reconsideration Motion

In support of the Second Reconsideration Motion, Plaintiff argues that "the Court manifestly failed to consider the actual disclosure of DeMoney and the applicant's actual statements in support of its claim amendment." Dkt. 835 at 2. It argues that the Supplemental Claim Construction Order relies on two assumptions. One is about the disclosure in DeMoney's abstract, and the other concerns "the only way to distinguish DeMoney." *Id.* at 1. It states, "[i]f either of those assumptions fails, the prosecution disclaimer fails with it." *Id.* It also argues that a Delaware district court report and recommendation reached a different outcome regarding the meaning of the claim term, and determined there was not prosecution history disclaimer. *Id.*

Some of these arguments are new. Except for its identification of the claim construction report and recommendation within the Delaware district court, which issued after the Supplemental Claim Construction Order, Plaintiff's other newly-raised arguments are based on the prosecution history and patent. They could have been made in its original briefing. Plaintiff has not provided a sufficient basis to warrant them being considered at this point in the proceedings. *See, e.g. Marlyn Nutraceuticals, Inc. v.*

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Mucos Pharma GmbH & Co., 571 F.3d 873, 880 (9th Cir. 2009) (A motion for reconsideration "may *not* be used to raise arguments or present evidence for the first time when they could reasonably have been raised earlier in the litigation."(emphasis in original)),

Some of these arguments were made in Plaintiff's previous briefing. As reflected in the Supplemental Claim Construction Order, which cites the applicable legal standard and the same portions of the prosecution history for the '213 Patent that Plaintiff has raised again, those repeated arguments were considered in the Order and rejected. Thus, there is no showing that they were somehow overlooked. *PegasusSatellite Television, Inc. v. DirecTV, Inc.*, 318 F. Supp. 2d 968, 981 (C.D. Cal. 2004) ("[A] motion for reconsideration may not be made on the grounds that a party disagrees with the Court's application of legal precedent.").

That a Delaware district court subsequently reached a different determination in its claim construction does not affect the outcome here. Different district courts often reach different outcomes on the same or similar circumstances. The decision by this Court was based on the reasons stated in the Supplemental Claim Construction Order and on the statements made by the patent applicant during prosecution history to distinguish DeMoney. *See generally* Dkt. 830; *see also McRO, Inc. v. Bandai Namco Games Am. Inc.*, No. 2019-1557, 2020 WL 2549542, at *6 (Fed. Cir. May 20, 2020) ("McRO misreads *KCJ Corp.*, which explains that 'an indefinite article 'a' or 'an' in patent parlance carries the meaning of 'one or more' in *open-ended claims* containing the *transitional phrase 'comprising*.' ' [*KCJ Corp. v. Kinetic Concepts, Inc.*, 223 F.3d 1351, 1356 (Fed. Cir. 2000)] (emphasis added). This specific canon of claim construction has no bearing [in considering the meaning of a sentence in the specification]."); *Tech. Properties Ltd. LLC v. Huawei Techs. Co.*, 849 F.3d 1349, 1359 (Fed. Cir. 2017) ("the scope of surrender is not limited to what is absolutely necessary to avoid a prior art reference; patentees may surrender more than necessary . . . . The question is what a person of ordinary skill would understand the patentee to have disclaimed during prosecution, not what a person of ordinary skill would think the patentee needed to disclaim during prosecution."). The Second Reconsideration Motion is **DENIED**.

IV. Conclusion

For the reasons stated in this Order, the First and Second Reconsideration Motions are **DENIED**.

IT IS SO ORDERED.

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Present: The Honorable	JOHN A. KRONSTADT, UNITED STATES DISTRICT JUDGE

Andrea Keifer	Not Reported
Deputy Clerk	Court Reporter / Recorder
Attorneys Present for Plaintiffs:	Attorneys Present for Defendants:
Not Present	Not Present

Proceedings: **(IN CHAMBERS) ORDER RE SUPPLEMENTAL CLAIM CONSTRUCTION**

I. Introduction

Sound View Innovations, LLC ("Plaintiff") brought this patent infringement action against Hulu, LLC ("Defendant"). Complaint, Dkt. 1. Three patents remain at issue, but proceedings are stayed as to two of them. *See* Dkt. 441 (Order Granting Joint Stipulation to Dismiss Certain Asserted Patents and Related Claims); Dkt. 451 (Order Finding '062 Patent Asserted Claims Invalid); Dkt. 475 (Order Maintaining Stay as to '371 Patent Pending Appeal of *Inter Partes* Review Proceedings); Dkt. 581 (Order, *inter alia*, Staying Proceedings as to '074 Patent). What remains active and at issue are Plaintiff's claims of infringement and Defendant's affirmative defenses and counterclaims of non-infringement and invalidity of Claim 16 of U.S. Patent No. 6,708,213 ("the '213 Patent") based on Defendant's Streaming Video on Demand ("SVOD") product.

At a trial readiness conference held November 25, 2019, a ruling on Plaintiff's MIL No. 6 was deferred pending simultaneous supplemental claim construction briefing with respect to the claim phrase "downloading . . . while concurrently retrieving . . ." *See* Dkt. 659; *see also* Dkt. 667. The parties timely filed their opening supplemental claim construction briefs (Dkt. 670, 671) and responsive supplemental claim construction briefs (Dkt. 681 (redacted), 711-1 (sealed), 694 (redacted), 720 (sealed)).

The disputed claim term is construed in this Order.

II. Background

A brief summary of the '213 Patent was previously provided in the Claim Construction Order issued September 4, 2018. *See* Dkt. 148 at 2-3.

The '213 Patent is titled "Method for Streaming Multimedia Information over Public Networks." It generally discloses and claims "methods which improve the caching of streaming multimedia data (e.g., audio and video data) from a content provider over a network to a client's computer." '213 Patent at 1:10-15. To do so, the '213 Patent describes, for example, using "ring buffers" to cache data at helper servers and "implement[ing] several methods specifically designed to support streaming media, including proxy

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caching, client request aggregation . . . and data transfer rate control to reduce start-up latency." *Id.* at 2:64-3:5; *see also id.* at 4:41-62, 5:55-65, 8:3-8.

Claim 16 of the '213 Patent recites:

> 16. A method of reducing latency in a network having a content server which hosts streaming media (SM) objects which comprise a plurality of time-ordered segments for distribution over said network through a plurality of helpers (HSs) to a plurality of clients, said method comprising:
>
> receiving a request for an SM object from one of said plurality of clients at one of said plurality of helper servers;
>
> allocating a buffer at one of said plurality of HSs to cache at least a portion of said requested SM object;
>
> downloading said portion of said requested SM object to said requesting client, while concurrently retrieving a remaining portion of said requested SM object from one of another HS and said content server; and
>
> adjusting a data transfer rate at said one of said plurality of HSs for transferring data from said one of said plurality of helper servers to said one of said plurality of clients.

'213 Patent, Claim 16.

III. Analysis

A. Legal Standards

The legal standards relevant to claim construction were previously set forth in the Claim Construction Order issued September 4, 2018. *See* Dkt. 148 at 4-6. Rather than repeating those standards in this Order, that portion of the Claim Construction Order is incorporated here by this reference. *Id.*

B. Application

The parties dispute the appropriate construction of the phrase "downloading . . . while concurrently retrieving . . ." in Claim 16 of the '213 Patent. Their positions regarding the proper construction are provided below:

Plaintiff's Proposed Construction	Defendant's Proposed Construction
Plain and ordinary meaning (Dkt. 670 at 1)	"downloading said portion of said requested SM object from said allocated buffer to said requesting client, while concurrently retrieving into the same buffer a remaining portion of said requested SM object from one of another HS and said content server" (Dkt. 671 at 2)

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Defendant's primary argument is that the patent applicant limited the meaning of the claim phrase "downloading . . . while concurrently retrieving . . ." during patent prosecution. *See, e.g.* Dkt. 671 at 1; *see also id.* at 3.

During prosecution, the Examiner rejected proposed Claim 16 of the application that issued as the '213 Patent as anticipated by U.S. Patent No. 6,438,630 to DeMoney ("DeMoney"). *See* '213 Patent Prosecution History, Office Action, March 26, 2003, Dkt. 671-3 at 5. In response, the patent applicant amended proposed Claim 16 to add the full "downloading . . . while concurrently retrieving . . ." limitation. '213 Patent Prosecution History, Response to Non-Final Office Action, June 26, 2003, Dkt. 671-4 at 9. In its remarks, the patent applicant discussed DeMoney. *Id.* at 13-14. There, the applicant quoted DeMoney's Abstract, including the following portion of it:

> A system for scheduling storage accesses of multiple continuous media streams may include a plurality of media stream clients. Associated with each media stream client is one of a plurality of media stream managers. Each media stream manager maintains a ring of buffers configured to buffer media stream data between its associated media stream client and one or more storage systems. A different deadline queue may be associated with each one of the storage systems. Each deadline queue may be configured to queue buffer requests from the media stream managers. Each buffer request may include a deadline by which the buffer request must be fulfilled by the corresponding storage system. Each media stream manager may be configured so that once one of its buffers is consumed by the associated media stream client, the media stream manager submits a buffer request and deadline for that buffer to the appropriate deadline queue. Buffer requests may be ordered in each deadline queue from the earliest to the latest deadline. Each media stream manager may be configured to provide a guaranteed maximum media stream rate to its associated media stream client.

Id. (emphasis in original) (quoting DeMoney at Abstract).

The patent applicant then stated:

> By contrast, the applicants' invention allocates a buffer at one of the plurality of helpers to cache at least a portion of the requested SM object, and downloads the portion of the SM object to the requesting client, while concurrently retrieving a remaining portion of the requested SM object from another [helper server ("HS")] or a content server. That is, the applicants' invention concurrently empties and fills the buffer, while the DeMoney reference teaches filling the buffer only after the buffer is empty. Furthermore, the buffer of the applicants' invention may be filled by information stored in another HS, which is also not taught by the DeMoney reference.

Id. at 14 (emphasis in original).

Defendant argues that these excerpts from the prosecution history show that Claim 16 requires the concurrent downloading from, and filling, of a single buffer. Defendant relies on the statement by the patent applicant that "the applicants' invention concurrently empties and fills the buffer, while the

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DeMoney reference teaches filling the buffer only after the buffer is empty." *See* Dkt. 671 at 4 (quoting Dkt. 671-4 at 14 (emphasis in original)). Defendant also argues that "[i]n DeMoney there *are* multiple buffers and while one buffer is emptied, another buffer is concurrently filled." *Id.* at 4 (emphasis in original) (citing DeMoney at 6:52-62, 12:36-43; Fig. 6). Defendant contends that the sentence in the office action response that refers to "the buffer," singular, shows that the patent applicant intended the phrase "downloading . . . while concurrently retrieving . . ." to refer to the filling and emptying of a single buffer, and that this distinction was necessary to distinguish Claim 16 from DeMoney. *Id.* at 4-5.

Plaintiff argues that nothing in the prosecution history precludes the claim language from being interpreted as covering the downloading from one buffer, while another one or more buffers are concurrently being filled. Thus, Plaintiff argues that the concurrent downloading from, and filling of a single buffer is not required by the applicant's statements made during prosecution. Plaintiff states that "[t]he patentee's point based on the patentee's own choice of which words to emphasize via underlining was that the invention ***concurrently*** downloads one portion of an SM object to the client while retrieving another portion, whereas the prior art did those two things ***serially*** (one after the other)." Dkt. 670 at 4 (emphasis in original); *see also* Dkt. 711-1 at 3 ("the applicant literally underscored 'concurrent' and 'after' (i.e. serially) as the contrast."). Plaintiff states, "[t]he applicant could have easily contrasted concurrency using a single buffer against concurrency using multiple buffers, but the applicant made no such contrast." Dkt. 711-1 at 3.

The prosecution history does not support Plaintiff's position. The patent applicant specifically referred to "the buffer," as a singular term, in discussing Claim 16 compared to DeMoney. *See* Dkt. 671-4 at 14 ("the applicants' invention concurrently empties and fills the buffer, while the DeMoney reference teaches filling the buffer only after the buffer is empty." (emphasis in original)). These statements do not refer to Claim 16 as covering the concurrent emptying of one buffer while a different buffer or set of buffers is being filled.

Plaintiff's interpretation of the applicant's prosecution statements would be, in effect, that, "the applicants' invention concurrently empties and fills [***one or more***] buffer[s], while the DeMoney reference teaches filling the buffer [or one or more buffers] only after the buffer is empty." However, DeMoney discloses emptying one buffer while other buffers are concurrently being filled. The patent applicant specifically quoted from DeMoney's abstract in the prosecution history. DeMoney describes using a "ring of buffers," which is a plural usage. DeMoney's abstract also states that,

> once one of its buffers is consumed by the associated media stream client, the media stream manager submits a buffer request and deadline for that buffer to the appropriate deadline queue . . . . Each media stream manager may be configured to provide a guaranteed maximum media stream rate to its associated media stream client.

These portions of DeMoney's abstract show that DeMoney contemplated downloading content from one buffer while other buffers are filled concurrently. Therefore, Plaintiff's interpretation of the prosecution history would not be sufficient to distinguish DeMoney from Claim 16, including the excerpts of DeMoney that the patent applicant quoted in the office action response. *Cf. Avid Tech., Inc. v. Harmonic, Inc.*, 812 F.3d 1040, 1045 (Fed. Cir. 2016) ("Where the alleged disavowal is ambiguous, or even 'amenable to multiple reasonable interpretations,' *Cordis Corp. v. Medtronic AVE, Inc.,* 339 F.3d 1352, 1359 (Fed. Cir. 2003), we have declined to find prosecution disclaimer.")

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The applicant clearly and unequivocally disclaimed the full claim scope of Claim 16 through its statements distinguishing Claim 16 from DeMoney. *See Omega Eng'g, Inc., v. Raytek Corp.*, 334 F.3d 1314, 1325-26 (Fed. Cir. 2003) ("our precedent requires that the alleged disavowing actions or statements made during prosecution be both clear and unmistakable."). Therefore, it is not necessary to consider the parties' disputes regarding the scope of the plain claim language or the specification itself under these circumstances.

Plaintiff makes other arguments in its responsive claim construction brief. These include that various patent counsel for Defendant have never previously identified a prosecution history disclaimer argument for the phrase "downloading . . . while concurrently retrieving . . ." Dkt. 711-1 at 1-2. Claim construction focuses on the intrinsic record and extrinsic evidence that would be relevant to the understanding of a person of skill in the art at the time of the invention. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005). Plaintiff has not shown that its arguments about the timing of Defendant's claim construction position warrant consideration under this framework.

Plaintiff's argument that Defendant waived its opportunity to raise this claim construction position, so that the term should not be construed, is not persuasive. *See also* Dkt. 638 at 3-5 (Joint Report submitted by parties regarding whether they had a claim construction dispute as to certain claim terms, with Plaintiff's portion presenting arguments regarding Defendant's waiver as to a prosecution disclaimer argument for the "downloading . . . while concurrently retrieving . . ." term). The dispute was placed at issue in the pretrial process, including through the statements made in the report of Defendant's expert. *Cf. Lazare Kaplan Int'l, Inc. v. Photoscribe Techs., Inc.*, 628 F.3d 1359, 1376 (Fed. Cir. 2010) ("litigants waive their right to present new claim construction disputes if they are raised for the first time after trial."). In light of the importance of the claim construction issue presented, it is appropriate to exercise discretion in determining that there is no sound basis to apply a procedural waiver as to Defendant's prosecution history disclaimer argument. *Cf. Harris Corp. v. Ericsson Inc.*, 417 F.3d 1241, 1251 (Fed. Cir. 2005) (addressing whether an argument raised for the first time on appeal had been waived, and stating "[a]n appellate court retains case-by-case discretion over whether to apply waiver.").

IV. Conclusion

The term "downloading . . . while concurrently retrieving" in Claim 16 of the '213 Patent is construed as "downloading said portion of said requested SM object from said allocated buffer to said requesting client, while concurrently retrieving into the same buffer a remaining portion of said requested SM object from one of another HS and said content server."

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UNITED STATES DISTRICT COURT
CENTRAL DISTRICT OF CALIFORNIA

CIVIL MINUTES – GENERAL

Case No.	LA CV17-04146 JAK (PLAx)	Date	April 13, 2020
Title	Sound View Innovations, LLC v. Hulu, LLC		

The parties are **ORDERED** to meet and confer and file a Joint Report by April 24, 2020 not to exceed six pages stating their respective and/or collective views regarding how the determination in this Order may affect the other pending disputes, including, but not limited to, those with respect to Plaintiff's MIL No. 6 and Plaintiff's arguments for infringement of Claim 16 of the '213 Patent by the accused system. This may serve both judicial and party efficiency with respect to the resolution of the other outstanding disputes.

IT IS SO ORDERED.

_____ : _____

Initials of Preparer cw

UNITED STATES DISTRICT COURT
CENTRAL DISTRICT OF CALIFORNIA

CIVIL MINUTES – GENERAL

Case No.	LA CV17-04146 JAK (PLAx)	Date	November 18, 2019
Title	Sound View Innovations, LLC v. Hulu, LLC		

Present: The Honorable	JOHN A. KRONSTADT, UNITED STATES DISTRICT JUDGE

Andrea Keifer	Not Reported
Deputy Clerk	Court Reporter / Recorder
Attorneys Present for Plaintiffs:	Attorneys Present for Defendants:
Not Present	Not Present

Proceedings: **(IN CHAMBERS) ORDER RE:**

1) **PLAINTIFF'S MOTION FOR SUMMARY JUDGMENT AS TO NO ANTICIPATION BASED ON THE FOOTPRINT CDN (DKT. 246);**
2) **PLAINTIFF'S MOTION TO EXCLUDE IN-PART THE TESTIMONY OF DR. JEFFREY CHASE (DKT. 245);**
3) **PARTIES' WILLFULNESS DISPUTE (DKTS. 494, 581);**
4) **DEFENDANT'S MOTION TO QUASH (DKT. 595);**
5) **DEFENDANT'S MOTION TO EXCLUDE THE TESTIMONY OF MR. DAVID YURKERWICH (DKTS. 252, 266, 340); AND**
6) **PLAINTIFF'S MOTION TO EXCLUDE IN PART THE TESTIMONY OF MICHAEL JEFFORDS (DKT. 247).**

I. Introduction

Sound View Innovations, LLC ("Plaintiff") brought this patent infringement action against Hulu, LLC ("Defendant"). Complaint, Dkt. 1. Plaintiff alleged that Defendant has infringed certain claims of three patents. *See* Dkt. 441 (Order Granting Joint Stipulation to Dismiss Certain Asserted Patents and Related Claims); Dkt. 442 (Joint Notice of Issues in Pending Motions Rendered Moot by Order Granting Joint Stipulation); Dkt. 475 (Order Maintaining Stay as to '371 Patent Pending Appel of *Inter Partes* Review Proceedings); Dkt. 451 (Order Finding '062 Patent Asserted Claims Invalid); Dkt. 581 (Order, *inter alia*, Staying Proceedings as to '074 Patent). At issue are Plaintiff's claims of infringement and Defendant's affirmative defenses and counterclaims of non-infringement and invalidity of Claim 16 of U.S. Patent No. 6,708,213 ("the '213 Patent") based on Defendant's Streaming Video on Demand ("SVOD") product.

Trial of this action is presently scheduled for December 3, 2019. Certain disputed matters were discussed and some were decided at the Final Pretrial Conference held on November 14, 2019. Decisions on other disputes were taken under submission. Those issues as well as other matters previously taken under submission are addressed in this Order. They are as follows: (i) Plaintiff's Motion for Summary Judgment as to No Anticipation Based on the Footprint CDN (Motion, Dkt. 246; Opposition, Dkt. 307; Reply: Dkt. 358); (ii) Plaintiff's Motion to Exclude in-part the testimony of Dr. Jeffrey Chase (Motion, Dkt. 245; Opposition, Dkt. 306; Reply, Dkt. 356); (iii) the parties' Willfulness Dispute (Plaintiff's Supp. Brief, Dkt.

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591; Defendant's Supp. Brief, Dkt. 592; *see also* Dkts. 494, 581 (related orders)); (iv) Defendant's Motion to Quash (Motion, Dkt. 595; Redacted Opposition, Dkt. 601; Sealed Opposition: Dkt. 603-1); (v) Defendant's Motion to Exclude the Testimony of Mr. David Yurkerwich (Redacted Motion, Dkts. 340, 377; Sealed Motion, Dkts. 252, 266, 380; Redacted Opposition, Dkt. 424; Sealed Opposition, Dkt. 425; Redacted Reply, Dkt. 371; Sealed Reply, Dkt. 415-3); and (vi) Plaintiff's Motion to Exclude in part the testimony of Michael Jeffords (Redacted Motion, Dkt. 247; Sealed Motion, Dkt. 343; Redacted Opposition, Dkt. 414; Sealed Opposition, Dkt. 413; Redacted Reply, Dkt. 430; Sealed Reply, Dkt. 431).

For the reasons stated in this Order,

- Plaintiff's Motion for Summary Judgment as to No Anticipation Based on the Footprint CDN (Dkt. 246) is **GRANTED**.
- Plaintiff's Motion to Exclude in-part the testimony of Dr. Jeffrey Chase (Dkt. 245) is **DEFERRED-IN-PART** and **GRANTED-IN-PART**. Within three days of this Order, the parties shall file a joint report not to exceed five pages with their respective and/or collective views as to whether additional claim construction proceedings are necessary as to certain claim terms.
- The willfulness determinations in the August 5, 2019 Order (Dkt. 494) are clarified, but the substantive outcomes are not changed.
- Defendant's Motion to Quash (Dkt. 595) is **DENIED**.
- Defendant's Motion to Exclude the Testimony of Mr. David Yurkerwich (Dkts. 252, 266, 340) is **GRANTED-IN-PART** and **DENIED-IN-PART**. Within five days of this Order, Plaintiff may file an amended Yurkerwich report that removes all calculations that rely on the Yao Study, together with a brief, not to exceed five pages, that supports the appropriateness of such revisions. Within five days of such a filing, Defendant may file a response, not to exceed five pages.
- Plaintiff's Motion to Exclude in part the testimony of Michael Jeffords (Dkt. 247) is **GRANTED**.

II. Analysis

A. Legal Standards

1. Summary Judgment

Summary judgment is appropriate when, viewing the evidence and drawing all reasonable inferences in the light most favorable to the nonmoving party, there are no genuine issues of material fact, and the movant is entitled to judgment as a matter of law. Fed. R. Civ. P. 56(a); *Celotex Corp. v. Catrett*, 477 U.S. 317, 322–23 (1986). At the summary judgment stage, a court "does not assess credibility or weigh the evidence, but simply determines whether there is a genuine factual issue for trial." *House v. Bell*, 547 U.S. 518, 559–60 (2006). A fact is "material" if it "might affect the outcome of the suit under the governing law," such as those necessary to the proof of a defense or a claim, and a dispute as to a material fact is "genuine" if there is sufficient evidence for a reasonable trier of fact to decide in favor of the nonmoving party. *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 248 (1986). "If the evidence is merely colorable, or is not significantly probative, summary judgment may be granted." *Id.* at 249–50 (internal citations omitted).

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"Summary judgment is as appropriate in a patent case as in any other." *Barmag Barmer Maschinenfabrik AG v. Murata Mach., Ltd.*, 731 F.2d 831, 835 (Fed. Cir. 1984). The moving party bears the initial burden of identifying those portions of the pleadings, discovery, and affidavits that demonstrate the absence of a genuine issue of material fact. *Celotex Corp.*, 477 U.S. at 323. Once the moving party meets its initial burden, the nonmoving party must set forth, by affidavit or as otherwise provided in Rule 56, "specific facts showing that there is a genuine issue for trial." *Anderson*, 477 U.S. at 250 (internal quotation marks omitted). If the non-moving party fails to produce evidence sufficient to show a genuine issue of material fact, "the moving party is entitled to a judgment as a matter of law." *Celotex Corp.*, 477 U.S. at 322–23.

Mere allegations or denials do not defeat a moving party's allegations. *Gasaway v. Nw. Mut. Life Ins. Co.*, 26 F.3d 957, 959–60 (9th Cir. 1994). The nonmoving party cannot defeat a motion for summary judgment simply by proffering a conclusory opinion from an expert. *See, e.g.*, *Soremekun v. Thrifty Payless, Inc.*, 509 F.3d 978, 984 (9th Cir. 2007) ("Conclusory, speculative testimony in affidavits and moving papers is insufficient to raise genuine issues of fact to defeat summary judgment."); *Arthur A Collins, Inc. v. Northern Telecom Ltd.*, 216 F.3d 1042, 1047–48 (Fed. Cir. 2000).

2. Daubert

"Rule 702's 'helpfulness' standard requires a valid scientific connection to the pertinent inquiry as a precondition to admissibility." *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 591–92 (1993). Trial courts must conduct a "preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue." *Id.* at 592–93. The gatekeeping obligation under *Daubert* applies to all expert testimony, not just "scientific" testimony. *Kumho Tire Co., Ltd. v. Carmichael,* 526 U.S. 137, 147 (1999). In making a reliability determination, courts "scrutinize not only the principles and methods used by the expert, but also whether those principles and methods have been properly applied to the facts of the case." Fed. R. Evid. 702 Advisory Committee's Note (2000 Amendment).

The patentee bears the burden of proving damages. *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1324 (Fed. Cir. 2009). "To properly carry this burden, the patentee must 'sufficiently [tie the expert testimony on damages] to the facts of the case.'" *Uniloc USA, Inc. v. Microsoft Corp.*, 632 F.3d 1292, 1315 (Fed. Cir. 2011) (quoting *Daubert,* 509 U.S. at 591). "When the methodology is sound, and the evidence relied upon sufficiently related to the case at hand, disputes about the degree of relevance or accuracy (above this minimum threshold) may go to the testimony's weight, but not its admissibility." *i4i Ltd. P'ship v. Microsoft Corp.*, 598 F.3d 831, 852–56 (Fed. Cir. 2010) (citations omitted), *aff'd,* 131 S.Ct. 2238 (2011) (affirming admission of survey evidence over *Daubert* challenge). "Vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence." *Daubert,* 509 U.S. at 596.

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B. Application

1. Footprint CDN Reference and Related Portions of Chase *Daubert* Issues

Plaintiff seeks partial summary judgment of no invalidity due to a reference the parties refer to as "Footprint CDN." Dkt. 246.[1] Plaintiff has moved separately to exclude the opinions of Defendant's expert, Dr. Jeffrey Chase, including, *inter alia*, those that the Footprint CDN invalidates Claim 16 of the '213 Patent. Dkt. 245.

Plaintiff argues that Chase's expert opinions as to invalidity must be excluded because Chase makes an improper comparison of Footprint CDN to the accused products, instead of a comparison to the patent claim itself. In a footnote in the expert report regarding invalidity, Chase states:

> I note that under the proper constructions and proper understandings of the claim limitations as discussed in this report and in my rebuttal report, the Accused Products do not infringe. It is further my opinion that the Footprint CDN functioned in substantially the same way as the Accused Products with respect to the claimed features of the Asserted Patents. Accordingly, since the Footprint CDN product practiced the same methods, it would not anticipate the Asserted Patents under a proper understanding of the claims. However, to the extent the Asserted Patents are infringed, the Footprint CDN product invalidates the patents under the same interpretation.

Excerpts of Expert Report of Dr. Jeffrey Chase ("Chase Report"), Dkt. 246-3 ¶ 435 n.12. Plaintiff argues that Chase is making a "practicing the prior art" argument, which is inconsistent with opinions by the Federal Circuit.

Chase also includes a chart comparing the claim language to excerpts of documents related to Footprint CDN. In introducing the chart, Chase states:

> I have prepared the charts below to reflect my understanding of how the footprint CDN product functions in substantially the same way as the Accused Products, with respect to the Asserted Claims. I reserve the right to rely on additional disclosures in the documents produced by Level 3 and the deposition testimony of Christopher Newton.

Chase Report ¶ 436. In addition to its "practicing the prior art" objection, Plaintiff challenges this portion of Chase's report because Chase uses excerpts that have been copied and pasted from cited documents, without providing statements using his own words as to why each claim limitation is met by Footprint CDN.

Chase's charts do not sufficiently disclose his invalidity opinions regarding Footprint CDN. Citing to excerpts in various documents and further reserving the right to rely on an even broader collection of documents and testimony, without stating his invalidity opinions in his own words, does not provide a fair

[1] "CDN" is an acronym for "content distribution network."

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disclosure of those opinions or the underlying methodology. Without an adequate disclosure, it is also not possible to make a preliminary assessment as to whether Chase appropriately applied the cited documents to the claim language, including as to how Chase believes those constructions have been interpreted broadly by Plaintiff. For these reasons, and without reaching a determination regarding whether Chase conducted an improper "practicing the prior art" analysis, these opinions must be excluded.

Defendant argues that even if Chase's opinions are excluded, it should still be permitted to present evidence through percipient witnesses to support an invalidity argument based on Footprint CDN. Defendant argues that Christopher Newton is one such witness and that he is familiar both with Footprint CDN, and with the accused systems. Defendant argues, "Mr. Newton will *not* testify as to whether Claim 16 of the '213 Patent is invalid or not infringed." Dkt. 550 at 4 (emphasis in original) (Defendant's opposition to Plaintiff's MIL no. 5 to preclude Defendant from comparing the asserted prior art "footprint" system to the accused product). However, Defendant argues that Newton should be "allowed to testify regarding the technical details and operation of both systems based on his personal knowledge." *Id.* at 3. This argument suggests, but does not expressly state, that Newton should be permitted to compare directly the accused systems to the Footprint CDN prior art.

Plaintiff responds that, "[w]ithout testimony connecting Mr. Newton's factual description of the Footprint CDN to the claim language, the Court could not sustain any verdict finding any asserted claim invalid in view of the Footprint CDN." Dkt. 358 at 9-10. In addition, the likelihood of prejudice and jury confusion would be increased if a lay witness compared and contrasted the accused products with prior art, but no expert then testified with the requisite direct analysis of the claim language to the prior art. This approach would increase the risk that a jury would rely on a "practicing the prior art" analysis to support a possible noninfringement or invalidity finding. For these reasons, Defendant is not permitted to rely solely on the testimony of Newton to support its invalidity argument related to Footprint CDN.

Because Defendant cannot identify admissible evidence to support an invalidity argument based on Footprint CDN, Plaintiff's summary judgment of no anticipation by the Footprint CDN is **GRANTED**.

In light of these determinations, Plaintiff's motion *in limine* no. 5 is also granted under Fed. R. Evid. 402, 403. Portions of Plaintiff's motion *in limine* no. 7 to exclude exhibits related to Footprint are also granted based on the determination on the motion for summary judgment. *See* Dkt. 507 at 1-2; *see also* Dkt. 552 at 3-5. Defendant has not offered any other basis to show that documents related to Footprint CDN would be relevant and admissible. Finally, the portions of Plaintiff's motion *in limine* no. 8 that relate to Newton's testimony about Footprint CDN are also granted. Dkt. 559-1 at 3 (Defendant's opposition to MIL no. 8, noting that Newton is expected to testify regarding "how the prior art Footprint CDN operated").

2. Other Portions of Chase *Daubert* Issues

a) Whether Chase Presents Improper Claim Construction Opinions

Chase offers the opinion that the claim phrase "downloading . . . while concurrently retrieving a remaining portion . . ." requires concurrent retrieval into the "same buffer." *See* Dkt. 306 at 8-9. This and related

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opinions are based on references to the prosecution history. As presently framed, these opinions improperly invoke claim construction testimony, which should not be presented to the jury.

In its opposition, Defendant proposes late claim construction proceedings if the Court is inclined to strike portions of Chase's report. Dkt. 306 at 11-12. In order to ensure that claim construction disputes are not presented to the jury, the parties are directed to file a joint report not to exceed six pages within three days of this Order, in which the pages are allocated equally between them if there are disputed matters. The report shall state their respective and/or collective views regarding whether further expedited, pre-trial claim construction proceedings should be conducted as to the "downloading . . . while concurrently retrieving a remaining portion . . ." term.[2] A determination as to this portion of Plaintiff's motion is **DEFERRED**.

Plaintiff's motion *in limine* no. 6 to exclude claim scope opinion testimony by Chase also requests, *inter alia*, that Chase be precluded from presenting claim construction opinions regarding the scope of the "downloading . . . while concurrently retrieving a remaining portion . . ." term. *See* Dkt. 506; *see also* Dkt. 551 at 5. A decision on that portion of Plaintiff's MIL no. 6 is also **DEFERRED**. The balance of Plaintiff's MIL no. 6 may be granted in light of the ruling on Defendant's motion for summary judgment of noninfringement. However, if the appropriateness of referring to the prosecution history of a patent to support an argument regarding the meaning of a claim term (*see, e.g.*, Dkt. 551 at 5-6), remains an issue, it is one better addressed through objections raised during the examination of the witness at trial. In connection with that process, as a general matter, significant and detailed references to the prosecution history of a patent to attempt to establish the "plain meaning" of a term are disfavored and will not be permitted to the extent that it is an offer of claim construction testimony.

Chase also opines that the "adjusting a data transfer rate . . ." step must be controlled by the claimed "helper server," be limited to a reduction from the "maximum network speed," and occur in response to the "receiving" step. Although this was not referenced in the Joint Report submitted by the parties regarding remaining disputes (Dkt. 590), the issue regarding control by a helper server has been resolved by the order on Defendant's motion for summary judgment of noninfringement. *See* Dkt. 453 at 10; *see also* Dkt. 551 at 3 (Defendant's opposition to Plaintiff's motion *in limine* no. 6 to exclude impermissible claim scope opinion testimony by Chase, acknowledging that the summary judgment order found "adjustment of the data transfer rate need not take place under the control of the helper server").

As to Chase's opinion that "adjusting a data transfer rate" would be understood as limited to a reduction from the "maximum network speed," such an interpretation was expressly rejected by the Claim Construction Order. *See* Dkt. 148 at 11. Defendant suggests that the determination in the Claim Construction Order is not controlling because it was not specifically reflected in a claim construction for this term. The parties agreed to the determination in the tentative order that no construction was

[2] The parties may, but are not required, to state their respective and/or collective positions in the joint report as to whether there is an ongoing claim construction dispute regarding the "adjusting the data transfer rate" limitation that should be resolved before trial, including whether there is a claim construction dispute, as opposed to a factual one, as to whether this claim term covers systems for "select[ing] different representations of a video." *See, e.g.*, Dkt. 550 at 2.

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necessary in light of the analysis presented there. Thus, this position is not persuasive. *See* Dkt. 306 at 9. The claim construction order issued in this case applies to all parties. Adopting Defendant's position would, in effect, be to grant a motion to reconsider, which is not warranted. Therefore, Chase's contrary opinions are excluded.

Finally, Defendant did not respond to Plaintiff's argument that Chase has provided a claim construction opinion that the "adjusting" step must occur in response to the "receiving" step. *See* Dkt. 356 at 4 n.4. Defendant has not shown that Chase's opinion to that effect is appropriate or has a basis other than as claim construction opinion. Therefore, it is also excluded.

b) Whether Chase's Comparisons of the Accused Products to the Prior Art to Support His Noninfringement Opinions Are Improper

Plaintiff challenges certain of Chase's opinions as to non-infringement as improperly referencing prior art. Defendant does not dispute that Chase does so, but argues that these opinions are appropriate because they relate to prior art in a "specific context." Dkt. 306 at 12. Defendant states, "the prior art is discussed *by the asserted patents themselves* and thus serve as express disclaimers of claim scope." *Id.* (emphasis in original). However, whether statements in a patent specification create a disclaimer of claim scope is an issue resolved by claim construction. For example, determining whether a patent specification disparages certain prior art solutions is addressed when determining whether the meaning of a particular claim term should be limited. *UltimatePointer, L.L.C. v. Nintendo Co.*, 816 F.3d 816, 823 (Fed. Cir. 2016) ("Taken together, the repeated description of the invention as a direct-pointing system, the repeated extolling of the virtues of direct pointing, and the repeated criticism of indirect pointing clearly point to the conclusion that the 'handheld device' in claims 1, 3, 5, 6, and 12 is limited to a direct-pointing device.").

Defendant has not cited any cases that support its contention that opinions regarding alleged disclaimer and disparagement of the prior art in a patent specification can be introduced at trial to support an opinion that the accused products do not infringe the asserted claims. Instead, an analysis attempting to draw parallels between the accused products and allegedly disparaged prior art in the asserted patent more closely aligns with an improper "practicing the prior art" defense to infringement. *01 Communique Lab., Inc. v. Citrix Sys., Inc.*, 889 F.3d 735, 742 (Fed. Cir. 2018) ("The problem with such a defense is that it can potentially allow a defendant to skirt evidentiary hurdles and conflate the infringement and invalidity inquiries. In essence, an accused infringer forsakes any comparison between the asserted claims and the accused product, relying instead upon purported similarities between the accused product and the prior art."). Although *01 Communique* permitted "a litigant [to] argu[e] that if a claim term must be broadly interpreted to read on an accused device, then this same broad construction will read on the prior art," *id.*, that is not what the Plaintiff has argued here. The challenged opinions of Chase in effect seek to provide claim constructions. They would also be confusing to the jury regarding the appropriate test to determine infringement. For these reasons, these opinions are excluded.

c) Conclusion

For the reasons stated, Plaintiff's motion to exclude certain opinions of Chase is **DEFERRED-IN-PART** and **GRANTED-IN-PART**.

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3. Willful Infringement Dispute

As directed by an Order issued on October 1, 2019 (Dkt. 581), the parties have submitted supplemental briefing regarding whether the determinations regarding willful infringement in an order issued on August 5, 2019 ("the August 5, 2019 Order," (Dkt. 494)) should be reconsidered. Dkts. 591, 592. The parties were directed to address the application of *SRI International, Inc. v. Cisco Systems, Inc.*, 930 F.3d 1295 (Fed. Cir. 2019). Dkt. 581.

SRI stated, "[e]ven accepting [the evidence presented at trial] as true and weighing all inferences in SRI's favor, we conclude that the record is insufficient to establish that Cisco's conduct rose to the level of wanton, malicious, and bad-faith behavior ***required*** for willful infringement." *Id.* at 1309 (emphasis added). This language and other related statements in *SRI* resolve any previous ambiguity in decisions by the Federal Circuit following *Halo Elecs., Inc. v. Pulse Elecs., Inc.*, 136 S. Ct. 1923, 1932 (2016). To the extent the analysis in the August 5, 2019 Order regarding the standard for willful infringement could be seen as one that is not entirely consistent with *Halo* and *SRI*, it is **CLARIFIED** by the preceding discussion.

Applying the clarified standard, there is no basis to change the ultimate outcome of the August 5, 2019 Order regarding Defendant's motion for summary judgment of no willful infringement. Dkts. 254, 267. Factual questions remain as to whether Defendant engaged in willful infringement after October 10, 2016, which is when Plaintiff sent a letter to Defendant providing notice of the alleged infringement of the '213 Patent.

As to Defendant's motion to exclude testimony by Plaintiff's expert, Dr. Iain Richardson, Richardson has been precluded from providing opinions related to the ultimate question that "Hulu willfully infringes the asserted claims of the [asserted] patent." *See* Dkt. 494 at 6-7. For this reason, it is not material that Richardson may have applied a legal standard more lenient than the one stated in *Halo* and *SRI* as to willful infringement. Richardson's opinions as to willful infringement remain limited to those about technical evidence that provide context regarding the information available to Defendant during the relevant timeframe. *See id.*

4. Motion to Quash

Previously, in response to Plaintiff's allegation of willful infringement, Defendant asserted an advice of counsel defense and produced several non-infringement legal opinions from its outside counsel, David Yang. Plaintiff then moved to compel the deposition of Defendant's in-house counsel Erin Mehta. In support of that motion, Plaintiff argues that, by disclosing Yang's opinions as to non-infringement, Defendant waived attorney-client and work-product privileges involving the subject matter of his opinions. Magistrate Judge Abrams granted Plaintiff's motion to compel, finding Mehta's personal knowledge was relevant to the advice of counsel defense and proportional to the needs of the case. Dkt. 296. The deposition that was ordered was limited to Mehta's knowledge concerning the subject matter of Yang's non-infringement opinions. Dkt. 296. Plaintiff deposed Mehta.

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Plaintiff's witness list for trial shows that it intends to call Mehta to testify regarding "Defendant's response to Plaintiff's infringement allegations." Dkt. 515 at 2. Defendant has moved to quash Plaintiff's trial subpoena and instead offers Karen Huoth, head of litigation and intellectual property as a trial witness.

The parties disagree as to the legal standards that apply in determining whether an attorney may be subpoenaed by a party who is adverse to the one the attorney represents. Defendant contends that to overcome the general presumption that a party's lawyer should not be called to testify, the moving party must show: "(1) no other means exists to obtain the information, (2) the information sought is relevant and non-privileged, and (3) the information is crucial to the case." *Mustang Mktg., Inc. v. Chevron Prods. Co.*, No. 2-cv-485-DOC (MLGx), 2006 WL 5105559, at *3 (C.D. Cal. Feb. 28, 2006).

Plaintiff argues that "there is no Ninth Circuit precedent addressing the proper standards for the Court to consider in this situation." *See Boeing Co. v. KB Yuzhnoye*, No. cv-1300730-AB (AJWx), 2015 WL 12803452, at *9 (C.D. Cal. Nov. 3, 2015). Plaintiff then contends that courts should weigh various factors to determine whether a lawyer may be called to testify, including "the need to depose the lawyer, the lawyer's role in connection with the matter on which discovery is sought and in relation to the pending litigation, the risk of encountering privilege and work-product issues, and the extent of discovery already conducted." *Id.* (citing *Subpoena Issued to Dennis Friedman*, 350 F.3d 65, 72 (2d Cir. 2003)).

In light of the concerns that arise when a party's lawyer is subpoenaed to testify, the more stringent test of *Mustang Marketing* is persuasive and is applied. However, even if the standards of *Boeing* were applied, the outcome would be the same.

a) No Other Means

Defendant does not dispute the second and third prongs of the *Mustang Marketing* test. Dkt. 595 at 5 ("For purposes of this Motion (only), Defendant will not dispute Plaintiff's likely contention that any and all relevant and non-privileged information it could obtain from Ms. Mehta at trial is 'crucial' to its willfulness case."). Thus, Plaintiff must only show that no other means exist to obtain the information.

Defendant argues that Plaintiff cannot show "no other means exist to obtain the information" for two reasons. *First*, Plaintiff can introduce Mehta's deposition testimony, and in fact has already designated substantial portions of it to be introduced at trial. Dkt. 595 at 5-6. *Second*, Huoth, who is the head of the litigation and intellectual property group of Defendant, has the same scope and depth of knowledge as Mehta. Dkt. 595 at 6.

Plaintiff disagrees with these positions. *First*, Plaintiff argues that it should not be required to present video deposition testimony because Mehta is available to testify live before a jury. Plaintiff argues precluding her from doing so would be unduly prejudicial. *See Sec. & Exch. Comm'n v. Mozilo*, No. 09-cv-982-JFW (MANx), 2010 WL 11468959, at *4 (C.D. Cal. Oct. 7, 2010). *Second*, Plaintiff responds that Huoth does not have precisely the same knowledge as Mehta, and that this was a basis on which Judge Abrams required her deposition. Dkt. 601 at 6. Plaintiff argues that the depositions of these witnesses confirmed that Mehta was the percipient witness, and Huoth had to refresh her recollection by conferring with Mehta. Dkt. 601 at 6-7.

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Based on the foregoing, Plaintiff is not limited to presenting only the deposition testimony of Mehta. Fed. R. Civ. P. 32(a)(4) permits use of deposition testimony at trial where a witness is unavailable. Here, Defendant does not claim that Mehta is unavailable. To the contrary, Defendant asserts Mehta will be overseeing trial preparation. Additionally, live testimony can provide a better basis for a juror to assess the weight and the credibility of the witness. It is also easier to follow because it is offered live in a setting in which counsel can assess what questions are appropriate in light of the evidence previously produced, or expected to be produced, at trial. *Sec. & Exch. Comm'n*, 2010 WL 11468959, at *4 (citation omitted).

Further, Mehta has unique knowledge regarding Yang's non-infringement positions. Even before the deposition of Mehta, questions were raised as to whether Huoth's testimony would be "entirely redundant" of that provided by Mehta. Dkt. 296 at 5. Huoth spoke with Mehta to "refresh" Huoth's recollection before the deposition. Dkt. 601 at 3 n.3. Mehta, not Huoth, was the point of contact with Yang both as to his retention and communications. Dkt. 601 at 3.

The cases cited by Defendant do not warrant a different outcome. *See Teksystems, Inc. v. Siminipour*, No. 07-cv-4129-VBF(CTx), 2008 WL 11343027 (C.D. Cal. July 1, 2008) (means of discovery were available that were less intrusive than testimony by an attorney); *see also LA Printex Indus., Inc. v. VF Corp., et al.*, No. CV 13-0949-PSG (SSx), 2014 WL 12587037 (C.D. Cal. Jan. 14, 2014) (granting motion to quash where moving party failed to show information sought from an attorney could not be obtained by other means, and where moving party failed to show communications were not privileged); *Boeing Co. v. KB Yuzhnoye*, No. CV 13-00730-AB (AJWx), 2015 WL 12803452 (C.D. Cal. Nov. 3, 2015) (precluding defendant's counsel from testifying about negotiations where plaintiff's counsel had also participated in the negotiations and could testify). None of the circumstances that were present in these cases exist here. Therefore, Plaintiff may call Mehta as a trial witness.

b) Unfair Prejudice

Defendant also asserts it will suffer unfair prejudice if Mehta is called as a witness. It contends that this will interfere with her ability to supervise Defendant's trial preparations and will present a risk of the disclosure of privileged information. Dkt. 595 at 7-8.

Plaintiff responds that Defendant's decision to allocate trial preparation responsibility to Mehta does not justify excusing her as a witness. It argues that she has relevant and non-privileged information. Dkt. 601 at 8-9. Plaintiff disputes that there is any realistic danger that Mehta would inadvertently disclose privileged information. Plaintiff intends only to question Mehta regarding non-privileged information about willful infringement. *Id.* at 9.

Plaintiff's arguments are persuasive. Any burden to Mehta's trial responsibilities does not outweigh the value of having her appear as a live witness. Further, any burden would be the product of Defendant's decision to have her fill this role. Moreover, that she will be involved in the trial will permit her to be prepared to testify. Finally, the cases cited by Defendant as to the risk that Mehta could inadvertently disclose privileged information are distinguishable. *Yue v. Chordiant Software, Inc.* precluded plaintiffs from presenting evidence of defendant's assertion of attorney client privilege, because such evidence

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was not relevant and would unduly prejudice defendant. No. C 08-00019 JW, 2010 WL 11575579, at *4 (N.D. Cal. Apr. 22, 2010). Here, Plaintiff represents that it "does not intend to question Ms. Mehta regarding privileged communications with trial counsel." Dkt. 601 at 9. Thus, because Defendant has waived the privilege with respect to its advice of counsel defense, the facts in *Yue* are not present here.

c) Conclusion

For the foregoing reasons, Defendant's motion is **DENIED**. Plaintiff may call Mehta to testify at trial; provided however, the scope of the testimony is limited to Yang's non-infringement opinions.

5. *Daubert* Motions as to Damages Experts

a) Yurkerwich

Plaintiff has identified David Yurkerwich as an expert witness to provide opinions and analyses to support its damages claim. Defendant argues that certain portions of Yurkerwich's opinions should be excluded. *See, e.g.*, Dkt. 252 (sealed version of motion at Dkt. 380). The parties' Joint Report identifies three parts of Defendant's motion to exclude that remain in dispute. Dkt. 590 at 1-2. Those disputes are as follows:

- § IV.C ("Mr. Yurkerwich Purports To Calculate The Value Of "Adaptive Streaming" In Moving Cars With No Helper Servers, But Ignores Any Alleged Value Of The Patented Technology Of The '213 Patent") (Dkt. 252 at 13:3-15:28);
- § IV.D ("Mr. Yurkerwich Makes Baseless And Speculative Assumptions About Alcatel-Lucent's Role In The 2010 Hypothetical Negotiation") (Dkt. 252 at 16:1-17:22); and
- § IV.G ("Mr. Yurkerwich Relies On a Flawed And Irrelevant 2018 Survey Of Hulu Users To Attempt To Determine The Value Of The '213 Patent To Hulu In A 2010 Hypothetical Negotiation") (Dkt. 252 at 21:1-22:19).

(1) Adaptive Streaming

Defendant challenges Yurkerwich's analysis of "adaptive streaming" as a benefit of the '213 Patent, in reliance on technical expert Richardson's opinion. The basis for this position is that Richardson actually analyzed "adaptive bitrate protocols." Dkt. 380 at 13. Defendant adds that Yurkerwich improperly analyzed the incremental value of the '213 Patent by using a non-adaptive bitrate protocol as a baseline. Dkt. 380 at 13-14. Defendant next argues that Yurkerwich improperly relied on the Yao Study, which focused on benefits of adaptive bit rate technology in the context of vehicular mobility. Defendant contends that this technology does not apply under the circumstances in which the alleged infringing technology is used by Defendant. Dkt. 380 at 14.

Plaintiff responds that there is no evidence Richardson and Yurkerwich referenced different technologies, even if each used a different nomenclature. Dkt. 424 at 11. Plaintiff adds that Yurkerwich studied a non-adaptive bitrate protocol because it represents the closest possible noninfringing alternative. Dkt. 424 at 11. Plaintiff then argues that Defendant's complaints regarding the Yao Study are fact-based, which go to the weight, not admissibility of the opinion. Plaintiff also contends that there is sufficient evidence

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demonstrating similarity between the Yao Study and the asserted technology to support its use. Dkt. 424 at 12.

Defendant replies that because prior art to the '213 Patent described adaptive bitrate protocol, adaptive bitrate protocol cannot be a benefit of the '213 Patent. Dkt. 371 at 5-6.

As a preliminary matter, Yurkerwich's reliance on Richardson's opinions is proper. "It is routine and proper for a damages expert in a patent case to rely on a technical expert for background." *DataQuill Ltd. v. High Tech Computer Corp.*, 887 F. Supp. 2d 999, 1026 (S.D. Cal. 2011). As to whether Richardson's citation of "adaptive bit rate streaming" is a reference to the same technology as Yurkerwich's reference to "adaptive streaming," such an argument goes to the weight, not admissibility of this aspect of the proffered opinions.

Whether Richardson properly analyzed bit rate streaming as a benefit of the '213 Patent concerns a challenge to the testimony of Richardson, not Yurkerwich. Yurkerwich relied on Richardson's technical opinion. If Richardson's technical opinion is admissible, Yurkerwich may rely on it in assessing damages. Even if the motion as to Yurkerwich were a proper procedural vehicle to challenge Richardson's opinion, Defendant can challenge the alleged benefit of the '213 Patent being bit rate streaming by cross-examining Richardson, including as to bit rate streaming in prior art to the '213 Patent. This also weighs against excluding this aspect of the proffered opinions. *Kaist IP US LLC v. Samsung Elecs. Co., Ltd.*, No. 2:16-cv-1314, 2018 WL 2688185, at *3 (E.D. Tex. June 5, 2018). This portion of Defendant's motion is **DENIED**.

Whether Richardson properly relied on the Yao Study raises different issues. Richardson states that the Yao Study used a "bandwidth shaper processor to emulate bandwidth changes in a mobile streaming environment," where "[b]andwidth shaping was applied based on sets of measured mobile bandwidth data . . . collected during 75 car journeys in the metropolitan area of Sydney, Australia." Dkt. 272-17 ¶ 857. Yao concludes that utilizing adaptive bit rate streaming reduces the number of buffering events by 80%, and duration of buffering by 70%. Dkt. 272-17 ¶ 862. Relying on and adopting wholesale Richardson's calculations, Yurkerwich then calculates an amount for Defendant's hypothetical loss of advertising and subscription revenue. Dkt. 272-27 ¶ 279.

Defendant's alleged use of adaptive bitrate streaming is not limited to the one assessed in the Yao Study. That study analyzed a moving mobile device user connected through a wireless wide area network ("WWAN"). In contrast, many of Defendant's customers may use a stationary device, e.g., a desktop computer or television. Dkt. 380-1 at 14. Although some of Defendant's users may also connect through a WWAN comparable to the one that was used in the Yao Study, these users may remain in one spot while using the streaming. Defendant's users may also utilize a WiFi or wired cable connection to receive content. Dkt. 380-1 at 14-15. Further, Defendant's users in the United States may experience different WWAN coverage than the Australian WWAN coverage studied in the Yao Study. Plaintiff has not offered any explanations whether these differences affect the appropriateness of relying on the Yao Study for purposes of a calculation of damages.

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Plaintiff's position at the Final Pretrial Conference confirmed that these differences may be material. Plaintiff's counsel noted that the results of the Yao Study would be "even closer" to Defendant's alleged use of the patented technology if a user was on a mobile device connected through WWAN. Counsel then stated that he was uncertain whether Plaintiff has calculated the number of Defendant's users who connect through a mobile device over WWAN, and not through a stationary device. Nor was there any offer as to what portion of streaming is to such devices. Although some additional information could be provided on these matters, at this point, these statements coupled with the foregoing matters, shows that Yurkerwich's opinion does not provide a sufficient basis to rely on the Yao Study in seeking to measure damages due to Defendant's alleged use of the patented technology. Without this, Yurkerwich's opinion is unreliable, and is not proper to present to the jury. *See Apple, Inc. v. Wi-LAN Inc.*, Case No. 14-cv-2235, Dkt. No. 548 (S.D. Cal. Jan. 3, 2019) (excluding damage expert testimony relying on technical opinion, where technical opinion was excluded because it lacked a factual basis that the patented technology was equivalent to the technology studied). The complexity of the technical issues presented as to the reliability of the application of the Yao Study, also show that they are not ones that would be appropriate to present to a jury through cross-examination of Yurkerwich.

For these reasons, this aspect of Defendant's motion is **GRANTED**. Plaintiff is precluded from presenting damages calculations that rely on the Yao Study.

(2) Alcatel-Lucent License Agreement

Defendant argues that Yurkerwich's opinion should be excluded because he improperly adopted a royalty percentage from a different agreement, without accounting for differences between that agreement and the hypothetical negotiation. Dkt. 380 at 16. Yurkerwich relies on the agreement between Plaintiff and Alcatel Lucent pursuant to which Plaintiff acquired Plaintiff's current patent portfolio from Alcatel Lucent. As part of that analysis, he uses the same 32% licensing rate from that agreement without accounting for the facts that led to its entry. They include that it incorporated an additional up-front lump sum payment, it was executed at a different time, it covers an entire portfolio, and it reflects a licensing rate that accounts for the unique interests of those parties. Dkt. 380 at 16-17.

Plaintiff responds that Yurkerwich relied on a "real-world, arms-length agreement" to determine the acceptable royalty to Alcatel-Lucent. Dkt. 424 at 14-15. Defendant replies that the underlying licensing rate accounts for the parties' preferences, i.e., Alcatel Lucent preferred a larger up-front payment in exchange for a lower licensing rate, and that because Yurkerwich did not account for those elements of the agreement when he adopted the rate, his methodology is not reliable. Dkt. 371 at 6-7.

Exclusion on this issue is not warranted. Defendant has identified matters that go to the weight, not the admissibility of the opinions. Yurkerwich's decision to adopt a licensing rate from an agreement as to a portfolio that includes the asserted patent, where one of the parties to the licensing agreement is a party to the hypothetical negotiation, has some indicia of reliability. Defendant's reliance on *Power Integrations, Inc. v. Fairchild Semiconductor Int'l, Inc.*, does not warrant a different outcome. 711 F.3d 1348, 1373 (Fed. Cir. 2013). *Power Integrations* held that a district court abused its discretion by admitting testimony by a damages expert where the witness had relied on a document whose source was unclear, and did so to support several assumptions that underlay the opinion. They included the number of phones

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shipped during a time period, the assumption that each such phone was shipped with a charger -- although the document did not so state, and that each charger contained an infringing power circuit, notwithstanding data that only some chargers had infringing power circuits. Here, Yurkerwich relies on a document produced during discovery from a known source. Further, the terms of the agreement, including the date it was entered, the parties who signed it, the material that was licensed and the licensing fee are clear. That Yurkerwich made no adjustments for the hypothetical negotiation is a basis for cross-examination, not exclusion.

For these reasons, this aspect of Defendant's motion is **DENIED**.

(3) Survey of Hulu Users

Defendant seeks to exclude Yurkerwich's opinion because it relies on a 2018 survey of Hulu users that studied their willingness to pay for various streaming services -- Hulu Plus, Netflix, Amazon Prime. Dkt. 380 at 21. Defendant asserts that the survey is unreliable because it asked users to assume the same content exists on each service when each of the services offered unique content, and because the survey was conducted in 2018 while the hypothetical negotiation would have been in 2010. Dkt. 380 at 21-22.

Plaintiff responds that the survey described each service as including its "exclusive content, original services, and on-demand video offerings." Dkt. 424 at 20. Plaintiff further responds that surveys conducted after the date of infringement are admissible, and that Yurkerwich explained how the survey results were incorporated. Dkt. 424 at 20-21.

Defendant replies that Yurkerwich's use of the survey as a "check"[3] to his calculations was improper and also identified other claimed flaws in the survey. These include that there is little relevance of the 2018 survey to the 2010 hypothetical negotiation, the survey presented very limited descriptions of content for each service, and the survey failed to consider the impact of unique content on the user's survey responses. Dkt. 371 at 9-10.

Defendant's arguments go to the propriety of the manner in which the survey was created and administered by Stec, who is an expert proffered by Plaintiff. This is not an appropriate basis to challenge the propriety of Yurkerwich's reliance on the survey. And, even were the challenge procedurally sound, Defendant does not dispute that the survey, which included a conjoint analysis, was conducted according to accepted principles. *Odyssey Wireless, Inc. v. Apple, Inc.*, No. 15-cv-01735 (N.D. Cal. Feb. 25, 2014) ("Further, a conjoint analysis is a generally accepted method for valuing the individual characteristics of a product.").

Defendant's arguments as to the lack of disclosure of unique content for each server, and the failure to consider this factor in the survey results, go to weight, not admissibility. The same applies to the time gap between the survey and the hypothetical negotiation. *TV Interactive Data Corp v. Sony Corp.*, 929 F. Supp. 2d 1006, 1029 (N.D. Cal. 2013) (admitting survey conducted 15 years after hypothetical

[3] Defendant also argued for the admissibility of Plaintiff's license amounts as a reasonableness "check" supporting expert testimony. Dkt. 565 at 5.

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negotiation). Further, *Uniloc USA, Inc. v. Microsoft Corp.* held that admission of the entire market value of the accused product, where the "patented component does not create the basis for consumer demand," was improper. 632 F.3d 1292 (Fed. Cir. 2011). Here, Defendant has not argued that the patented component does not create the basis for consumer demand.

For these reasons, this portion of Defendant's motion is **DENIED**.

(4) Conclusion

For the foregoing reasons, Defendant's motion to exclude certain testimony of Yurkerwich is **GRANTED-IN-PART** and **DENIED-IN-PART**. Within five days of entry of this Order, Plaintiff may file an amended Yurkerwich report that removes all calculations that rely on the Yao Study, together with a brief, not to exceed five pages that supports the appropriateness of such revisions. Doing so will not result in a waiver of Plaintiff's objection to the ruling in this Order. The revised report shall not present new theories for the calculation of damages, i.e., ones that are not already presented in the current Yurkerwich report. Within five days of such a filing, Defendant may file a response, not to exceed five pages. If these materials are filed by the parties, it will be determined whether the open issues can be addressed in a further order, or if a hearing will be scheduled.

b) Jeffords

Defendant presents expert opinions of Michael Jeffords to support its positions as to damages. Plaintiff argues that certain portions of Jeffords' opinions should be excluded. *See, e.g.*, Dkt. 343-1 (sealed version of motion). The parties' Joint Report identified six portions of Plaintiff's motion to exclude Jeffords' opinions that remain in dispute at this time. Dkt. 590 at 2. They are as follows:

- § III.B.i.(b) ("There Is No Evidence that Any Alternate CDN For The '213, '796, or '074 Patents Was Available and Acceptable") (Dkt. 343-1 at 9:1-10:18);
- § III.B.i(c) ("There Is No Evidence To Support Mr. Jeffords's NIA For Claim 16 Of The '213 Patent Being Available in 2010 or Acceptable") (Dkt. 343-1 at 10:19-11:16);
- § III.B.ii ("The Court Should Exclude Mr. Jeffords's Reasonable Royalty Opinions Because There Is No Evidence That The Hourly Rates He Uses Are Related To Hulu's Costs") (Dkt. 343-1 at 12:20-13:19);
- § III.C ("Mr. Jeffords's Opinion Is Unreliable Because It Merely Parrots The Opinions Of Hulu Employees As To The Costs Of Implementing The NIAs") (Dkt. 343-1 at 13:20-14:2);
- § III.D ("The Court Should Exclude Mr. Jeffords's Testimony That The Patents-In-Suit Provide No Benefits To Hulu") (Dkt. 343-1 at 15:3-20); and
- § III.E ("The Court Should Exclude Mr. Jeffords's Testimony On Hulu's Patent Agreements") (Dkt. 343-1 at 15:21-17:17).

First, with respect to four of these disputes, Plaintiff argues that Jeffords' opinions related to non-infringing alternatives must be excluded. Plaintiff contends that there is no evidence that non-infringing alternatives were available in 2010, or that they were acceptable replacements for the infringing conduct. In particular, Plaintiff argues that there is no evidence that Defendant would have been able to use non-infringing CDN

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systems to carry the large amount of streaming traffic handled by the accused system. Plaintiff also argues that it was improper for Jeffords to calculate the cost to implement a non-infringing alternative based on time estimates he received in undisclosed conversations with fact witnesses and multiplying them by the hourly billing rate of Defendant's infringement expert.

In presenting his opinions regarding design arounds for Claim 16 of the '213 Patent, Jeffords first states:

> Both Dr. Chase and Mr. Darnault confirmed that . . . a change [from the accused system to a noninfringing alternative] would have been available to Hulu in July 2010 and that switching to one of the non-accused CDNs would have been technically feasible and with appropriate testing would not adversely impact the quality of service of Hulu's products. [footnote 141: Discussion with Dr. Chase; Discussion with Andres Rangel.].

Rebuttal Jeffords Report at 11.

Jeffords later adds:

> I understand from Dr. Chase that at the time of the July 2010 hypothetical negotiation, Hulu would have had readily available design-around option for claim 16 of the'213 patent. [footnote 144: Discussion with Dr. Chase.] Dr. Chase explained that this option would have been readily available in July 2010, would have required no more than one to two weeks of engineering time for a single engineer to implement and another one to two weeks for testing. [footnote 145: Discussion with Dr. Chase.] This understanding was confirmed by Mr. Darnault. Dr. Chase also explained that these changes would not impact quality of service for Hulu's customers, an understanding that was also confirmed by Mr. Darnault. Accordingly, the total cost of implementing this design-around would be no more than $80,000. [footnote 146: I have assumed that Hulu would pay its video engineers no more than the hourly amount of $500 that Dr. Chase charged in 2010 for similar work. For the purposes of this analysis, I have assumed that the time spent would be no more than 160 hours.]

Id. at 11-12.

In presenting his opinions, Jeffords relies on discussions with Chase that are not described in any of Chase's expert reports. Because Chase did not disclose all of his relevant expert opinions on which Jeffords relies, it is inappropriate for Jeffords to make corresponding assumptions. As discussed above, in forming an opinion, one expert may rely on opinions or analyses of an another. The reliability of the opinions of that other expert can be tested in a direct challenge to them. However, without a disclosure of those opinions and their basis, such a direct challenge cannot be made. There also is no sufficient additional explanation as to the basis for the assumption that a non-accused CDN or group of non-accused CDNs were available, i.e., had the bandwidth to replace the use of the accused system. Jeffords also states that he relies on Darnault, who is a percipient witness, to support this assumption. However, as Plaintiff notes, Darnault was not employed by Hulu until 2014. There is no evidence that Darnault had personal knowledge about an available noninfringing alternative for Hulu products in 2010. Moreover,

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Jeffords' decision to rely on "the hourly amount of $500 that Dr. Chase charged in 2010 for similar work" in calculating the cost of a noninfringing alternative is not sufficiently tied to the facts here. There is no evidence that Defendant would pay its engineers more, less, or about the same amount as Defendant's expert in this case would be paid. Because Jeffords' opinions are based on speculative data, they must be excluded.

Second, Plaintiff argues that Jeffords' opinion that the patented technology provides a "lack of benefit" must be excluded. To support his opinion that there is a lack of benefit provided by the technology of the patents-in-suit, Jeffords states, "I understand that it is the opinion of Hulu's technical expert Dr. Jeffrey Chase that there is no benefit to Hulu to implementing the technology of the Helper Server Patents as compared to methods that are available in the prior art." Excerpts of Rebuttal Expert Report of Michael J. Jeffords ("Rebuttal Jeffords Report"), Dkt. 249-3 at 7. Jeffords again cites a "Discussion with Dr. Chase," to support this opinion, not to a portion of Chase's expert report. *Id.* Defendant argues that this opinion is "supported throughout Dr. Chase's report," Dkt. 412 at 21, citing to portions of it in which Chase asserts that one non-infringing alternative to the Asserted Claims of the '213 Patent is "to employ traditional Web caching techniques." Chase Report, Dkt. 249-4 ¶ 163. Defendant has not shown that Chase offered an opinion in his expert report that the technology of the patents-in-suit provides no benefit, and such an opinion is not a necessary inference from the cited paragraphs of Chase's expert report. Because Jeffords cannot rely on the undisclosed opinion of another expert to support his analysis, his lack of benefit opinion is excluded.

Third, Plaintiff argues that Jeffords' opinions regarding Defendant's licensing history must be excluded. The basis for this position is the claim that there is no evidence that the patents at issue in those agreements are comparable to the asserted patent and the technical comparability of the licensed patents has not been analyzed. *See* Dkt. 431-1 at 10. A review of Jeffords' opinions shows that Jeffords does not adequately provide any opinions regarding the comparability of the technology at issue in the identified agreements and what is provided by the asserted patent. *See* Other Excerpts of Rebuttal Jeffords Report, Dkt. 413-5 at 40-58. As Jeffords recognizes, however, *Georgia-Pacific* factor 2 relates to an analysis of the rates paid by the licensee for the use of other patents *comparable to the patent-in-suit*. Because Jeffords failed to conduct such an analysis or rely on the opinions of another expert who had done so, Jeffords' opinions regarding comparable agreements do not rest on a sound methodology.

For the foregoing reasons, Plaintiff's motion to exclude certain of Jeffords' damages opinions is **GRANTED**.

III. Conclusion

For the reasons stated in this Order:

- Plaintiff's Motion for Summary Judgment as to No Anticipation Based on the Footprint CDN (Dkt. 246) is **GRANTED**.
- Plaintiff's Motion to Exclude in-part the testimony of Dr. Jeffrey Chase (Dkt. 245) is **DEFERRED-IN-PART** and **GRANTED-IN-PART**. Within three days of this Order, the parties shall file a joint report not to exceed five pages with their respective and/or collective

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position(s) as to whether additional claim construction proceedings are necessary as to any claim term and a proposed schedule for the completion of such discovery on an expedited basis.

- The previous willfulness determinations at Dkt. 494 are clarified, but the outcomes reached in the previous August 5, 2019 Order are not changed.
- Defendant's Motion to Quash (Dkt. 595) is **DENIED**.
- Defendant's Motion to Exclude the Testimony of Mr. David Yurkerwich (Dkts. 252, 266, 340) is **GRANTED-IN-PART** and **DENIED-IN-PART**. Within five days of this Order, Plaintiff may file an amended Yurkerwich report that removes all calculations that rely on the Yao Study, together with a brief, not to exceed five pages, that supports the appropriateness of such revisions. Within five days of such a filing, Defendant may file a response, not to exceed five pages.
- Plaintiff's Motion to Exclude in part the testimony of Michael Jeffords (Dkt. 247) is **GRANTED**.

IT IS SO ORDERED.

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Initials of Preparer ak

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(Sealed version at Dkt. 838)

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Present: The Honorable	JOHN A. KRONSTADT, UNITED STATES DISTRICT JUDGE

Cheryl Wynn	Not Reported
Deputy Clerk	Court Reporter / Recorder
Attorneys Present for Plaintiffs:	Attorneys Present for Defendants:
Not Present	Not Present

Proceedings: **(IN CHAMBERS) ORDER RE DEFENDANT'S SUPPLEMENTAL MOTION TO EXCLUDE TESTIMONY OF MR. DAVID YURKERWICH (DKT. 760)**

I. Introduction

Sound View Innovations, LLC ("Plaintiff") brought this patent infringement action against Hulu, LLC ("Defendant"). Complaint, Dkt. 1. Three patents remain at issue, but proceedings are stayed as to two of them. *See* Dkt. 441 (Order Granting Joint Stipulation to Dismiss Certain Asserted Patents and Related Claims); Dkt. 451 (Order Finding '062 Patent Asserted Claims Invalid); Dkt. 475 (Order Maintaining Stay as to '371 Patent Pending Appeal of *Inter Partes* Review Proceedings); Dkt. 581 (Order, *inter alia*, Staying Proceedings as to '074 Patent). What remains active and at issue are Plaintiff's claims of infringement and Defendant's affirmative defenses and counterclaims of non-infringement and invalidity of Claim 16 of U.S. Patent No. 6,708,213 ("the '213 Patent") based on Defendant's Streaming Video on Demand ("SVOD") product.

On March 16, 2020, Defendant filed a Supplemental Motion to Exclude the Testimony of Mr. David Yurkerwich. Dkt. 760. In light of the scheduling order in this action, Defendant had sought and received leave to file the motion. Dkt. 741. Plaintiff filed an opposition (Dkt. 828-1) and Defendant filed a reply (Dkt. 814). For the reasons stated in this Order, Defendant's Supplemental Motion to Exclude Testimony of Mr. David Yurkerwich is **GRANTED**.[1] In light of this determination, the parties are directed to meet and confer as explained in the analysis section of this Order with respect to further proceedings in this action.

II. Background

A. Procedural History

Defendant previously sought to exclude certain opinions by David Yurkerwich, whom Plaintiff designated

[1] Portions of the briefing in connection with the matters addressed in this Order were filed under seal. Within seven days of the issuance of this Order, the parties shall file a joint statement as to whether any matter stated in this Order is information that one or more contend should remain under seal. Thereafter, upon a determination by the Court that some or all of the portions of the briefing should be sealed, a redacted version of this Order will be placed on the publicly available docket.

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as its expert witness on damages. An Order issued on November 18, 2019 that, *inter alia*, precluded Plaintiff from presenting any calculations from Yurkerwich that relied on a study of adaptive bit rate technology ("ABR") in the context of vehicular mobility ("Yao Study"). Dkt. 620 at 12-13. As that Order explained, the calculations relying on the Yao Study were excluded because the Yao Study "analyzed a moving mobile device user connected through a wireless wide area network" in Australia. This was significant because some of Defendant's users were stationary, used WiFi or a wired cable connection, and were located in the United States. *Id.* Plaintiff was permitted to "file an amended Yurkerwich report that removes all calculations that rely on the Yao Study, together with a brief, not to exceed five pages, that supports the appropriateness of such revisions." *Id.* at 18.

On November 22, 2019, Plaintiff filed its Brief in Response to the Court's Order (Dkt. 620) and attached the Amended Expert Report of David Yurkerwich ("Amended Yurkerwich Report"). Dkt. 640; sealed version of Amended Yurkerwich Report at Dkt. 675-1. On December 2, 2019, Defendant filed its Brief in Response to the Court's Order re Amended Expert Report of David E. Yurkerwich (Dkt. No. 620). Dkt. 664. On December 9, 2019, Plaintiff filed its Reply Brief in Response to the Court's Order (Dkt. 620). Dkt. 685. On December 11, 2019, Defendant filed its Sur-Reply Brief in Response to the Court's Order re Amended Expert Report of David E. Yurkerwich (Dkt. No. 620). Dkt. 697. On January 7, 2020, an Order issued that accepted the Amended Yurkerwich Report as a procedural matter, but noted that the report was still "subject to a substantive challenge under *Daubert*." Dkt. 739 at 4.

B. Amended Yurkerwich Report

The Amended Yurkerwich Report includes what is offered as a reasonable royalty analysis for the '213 Patent. There, Yurkerwich opines about the calculation of the profit that he opines should be credited to the '213 Patent. Amended Yurkerwich Report ¶¶ 262-82. Specifically, Yurkerwich "first calculate[s] the benefit of the '213 Patent . . . due to reduced join time," then "[s]econd, [he] measure[s] the '213 Patent's benefits with respect to reducing the instance of buffering events." *Id.* ¶¶ 264, 265.

With respect to the second step, Yurkerwich starts by estimating the increase in content watched by Hulu's users due to adaptive bit rate streaming. *Id.* ¶ 267. He asserts that, although a Hulu internal document states "users utilizing adaptive bit rate watched [redacted] he "conservatively" used a different estimate. *Id.* (citing HULU-SOUNDVIEW-00161530-35 at -34). His "conservative" estimate is based on information in a press release titled "Conviva Releases Viewer Experience Report," dated February 13, 2013. *Id.* (citing Dkt. 760-2 ("Conviva Press Release")).

The Conviva Press Release refers to an underlying study that purportedly demonstrates "[v]iewers watch 250% more when they have an optimal experience with fast startup, little to no buffering and a high-sustained bitrate for high resolution and visual clarity." Conviva Press Release at 2. From this, Yurkerwich "conservatively estimate[s] that Hulu viewers with adaptive bit rate watch[] 250% more content," *i.e.*, "Hulu's users without adaptive streaming watched 40% of the content of its adaptive users." *Id.* Yurkerwich then averages the rebuffering ratios from two different studies (Conviva and Ooyala) correlating to a 40% reduction in playtime, to reach a 1.7% rebuffering ratio. *Id.* ¶ 272. Yurkerwich then uses the rebuffering ratio to calculate the number of rebuffering events, the corresponding audience loss, and the resulting impact to advertising revenue and subscription revenue. *Id.* ¶¶ 273-74.

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III. Analysis

A. Legal Standards

"Rule 702's 'helpfulness' standard requires a valid scientific connection to the pertinent inquiry as a precondition to admissibility." *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 591-92 (1993). Trial courts must conduct a "preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue." *Id.* at 592-93. *Daubert*'s gatekeeping obligation applies to all expert testimony, not just "scientific" testimony. *Kumho Tire Co., Ltd. v. Carmichael*, 526 U.S. 137, 147 (1999). In making a reliability determination, courts "scrutinize not only the principles and methods used by the expert, but also whether those principles and methods have been properly applied to the facts of the case." Fed. R. Evid. 702 Advisory Committee's Note (2000 Amendment).

"When the methodology is sound, and the evidence relied upon sufficiently related to the case at hand, disputes about the degree of relevance or accuracy (above this minimum threshold) may go to the testimony's weight, but not its admissibility." *i4i Ltd. P'ship v. Microsoft Corp.*, 598 F.3d 831, 852-856 (Fed. Cir. 2010) (citations omitted), *aff'd*, 131 S.Ct. 2238 (2011) (affirming admission of survey evidence over *Daubert* challenge). "Vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence." *Daubert*, 509 U.S. at 596.

B. Application

Defendant argues that Yurkerwich's reliance on the Conviva Press Release is inappropriate under the foregoing standards. It contends that Yurkerwich has never seen the underlying study. Dkt. 760 at 4. Defendant adds that the hyperlink to the underlying study that appears in the press release does not function, which implies that it is no longer available online. *Id.* Defendant next argues that Yurkerwich's opinion is deficient because without reviewing and evaluating the underlying study, no expert, party or factfinder can determine either its overall reliability or how the data it presents relates to Defendant, Defendant's users, or adaptive bit rate streaming. *Id.* at 7-8.

Plaintiff responds that Yurkerwich's calculation did not begin with the Conviva Press Release, but instead with an internal Hulu document that states [redacted] Opp. at 1. Plaintiff adds that the Conviva Press Release was used by Yurkerwich as a "conservative check." *Id.* at 1-2.[2] Plaintiff then argues that the Conviva Press Release is sufficiently reliable because it is quite detailed. *Id.* Thus, Plaintiff notes that the Conviva Press Release states the study was based on "22.6 billion video streams from viewers in more than 190 countries watching content on more than 150 of the most recognizable video sites in the world." *Id.* at 8. Plaintiff then points out that the Conviva Press Release identifies the criteria used to quantify viewership, i.e., "fast startup, little to no buffering and a high-sustained bitrate." *Id.* at 8-9. Plaintiff further responds that Yurkerwich testified that the data analyzed in the Conviva Press Release was useful because it represents an average across different devices. *Id.* at 14.

[2] Amended Yurkerwich Report ¶ 267 ("Utilizing these two data points, I conservatively estimate that Hulu viewers with adaptive bit rate watched 250% more content.").

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Under certain circumstances, an expert may present an opinion with a sufficiently reliable basis by relying on a summary of a study, rather than on the study itself. However, in this case, the press release does not include a sufficient, in-depth discussion of the study so that it can be assessed, and then compared to the accused technology. The Conviva Press Release states the underlying study contains results from users in 190 countries, watching content on more than 150 video sites. Conviva Press Release at 2. However, the Conviva Press Release does not provide any information regarding a breakdown of the study participants by location or video site. *Id.* Yurkerwich has not offered any explanation as to why these differences did not affect the appropriateness of his reliance on the Conviva Press Release in calculating damages.

Because the Conviva Press Release does not provide any information about what percentage of study participants were located within the United States, or who used Hulu, Yurkerwich's reliance on the press release presents the same reliability issues as the Yao Study. Nor does the Conviva Press Release contain any information regarding the users' bandwidth environments. It is significant that the Yao Study was excluded because Yurkerwich did not account for the fact that some of Defendant's users were stationary, using WiFi or using a wired cable connection. Dkt. 620 at 12-13. Although Yurkerwich testified that the results are appropriate because they are an "average" of different devices, Yurkerwich provides insufficient bases for this conclusion. Yurkerwich is not a technical expert, and he did not consult with one in formulating this aspect of his opinion.

The Amended Yurkerwich Report also has other shortcomings. It makes other technical assumptions that are not sufficiently supported. Yurkerwich states that he has relied on the opinions of Plaintiff's technical expert, Richardson, to support his technical assumptions. Richardson previously opined that certain benefits, including startup time, video failure and re-buffering ratio, are benefits of three of the originally asserted patents, including the '213 Patent. The Conviva Press Release states the underlying study determined viewers "watch 250% more when they have optimal experience with fast startup, little to no buffering and a high-sustained bitrate for high resolution and visual clarity." Conviva Press Release at 2. Based on these statements, Yurkerwich concludes that the benefits discussed in the Conviva Press Release match the benefits presented in Richardson's opinion. Yurkerwich then states that he "conservatively estimate[s] that Hulu Viewers with adaptive bit rate watched 250% more content." Yurkerwich Amended Report ¶ 267.

Yurkerwich's methodology is insufficiently supported, for several reasons. *First*, he did not consult with Richardson as to whether the benefits identified in the Conviva Press Release actually correlate to those of the '213 Patent. Nor does Yurkerwich have the technical expertise to support such an opinion. This deficiency in his opinion is critical. Both Richardson and Yurkerwich emphasize that the '213 Patent relates to ABR technology, but the Conviva Press Release is not so limited. Instead, it refers to an "improved . . . viewer experience." Conviva Press Release at 1. Thus, it is not clear from the Conviva Press Release that its listed benefits are necessarily attributable to the '213 Patent's claimed technology, as stated by Richardson and Yurkerwich.

Second, even if there were a correlation of the benefits identified in the Conviva Press Release and in the '213 Patent, Yurkerwich did not consult with Richardson regarding whether the benefits of the '213 Patent can reasonably be tied to an increase of 250% in viewed content. Yurkerwich does not offer any opinion whether apportionment was warranted. Nor does Yurkerwich rely on Richardson to do so.

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Instead, Yurkerwich simply attributes the entirety of the increase in viewed content referenced in the Conviva Press Release to the '213 Patent. These gaps in Yurkerwich's technical assumptions, and in his corresponding technical opinion, show why the Amended Yurkerwich Report is unreliable.

Plaintiff argues that, according to Defendant, "unless Mr. Yurkerwich was able to find a study limited to Hulu users that specifically quantifies the benefits of ABR in Hulu's products, Mr. Yurkerwich cannot present a damages opinion in this case." Opp. at 12. However, an assumption that this would be the only path to the admission of the opinion, is inconsistent with the controlling law. Instead, the threshold question is whether an expert's opinion is sufficiently reliable to permit its admission. Fed. R. Evid. 702. "[O]ne major determinant of whether an expert should be excluded under *Daubert* is whether he has justified the application of a general theory to the facts of the case." *Uniloc USA, Inc. v. Microsoft Corp.*, 632 F.3d 1292, 1316 (Fed. Cir. 2011). When an opposing party disagrees with how an expert applies a theory, the normal remedy is "[v]igorous cross-examination" at trial. *Daubert*, 509 U.S. at 596. However, before getting to that step in the process, it must be determined "whether expert testimony proffered in the case is sufficiently tied to the facts of the case . . . ." *Id.* at 591 (citing Fed. R. Evid. 702). Here, for the reasons discussed in the preceding paragraphs, Yurkerwich's opinion is not.

Plaintiff argues that Yurkerwich begins his calculation from Hulu's internal document that reflects [redacted] Plaintiff then claims that the Conviva Press Release is used as a "conservative check" [redacted] Opp. at 10. However, to serve as a check on an underlying figure, a document must confirm it. This is distinct from providing the initial basis for the claimed amount.[3] Here, Yurkerwich based his calculation on the 250% figure in the Conviva Press Release. This was not using the figure as a "check" of an alternative, analytical basis for the figure. Thus, if the 250% figure were removed, Yurkerwich's damages calculation would change. If [redacted] were removed, Yurkerwich's damages calculation would remain the same. Simply using the lowest of several figures, without showing that it is tied to the technology at issue, is not a conservative method of calculation, and is unreliable.

The exclusion is also justified for independent reasons. Yurkerwich testified that he requested access to the report,[4] Plaintiff asserts the report is easily retrievable,[5] and Plaintiff admitted that the report was not as expressly tied to Defendant and its patented invention as the corresponding [redacted].[6]

For these reasons, Defendant's Motion to Exclude is **GRANTED**, and the Yurkerwich Amended Report is **STRICKEN**. The parties are directed to meet and confer within five business days of the issuance of this Order regarding its effect on future proceedings in this action, including: (1) whether Plaintiff contends that any aspect of Yurkerwich's original opinion, which did not rely on the Yao Study, adequately supports

[3] In *GPNE Corp. v. Apple, Inc.*, an expert was permitted to testify regarding prior litigation settlement licenses in part because he "only relies on the . . . settlement licenses to check the reasonableness of his royalty calculation," he "does not rely on [the settlement] licenses to precisely measure the value of the . . . patents." No. 12-cv-2885, 2014 WL 1494247, at *10 (N.D. Cal. Apr. 16, 2014).

[4] At his deposition, Yurkerwich testified that he "asked counsel if they had access" to the report. Dkt. 760-3 at 80:18-23.

[5] Plaintiff asserts that "[a] simple Google search for '2012 Conviva Viewer Experience Report' returns a link to the study itself on the very first page of results." Opp. 9.

[6] Opp. 6 ("Even though the [Conviva Press Release] was not as explicitly tied to [Defendant] as [redacted] from Hulu's own document… .").

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a monetary damages claim; and (2) whether Defendant may rely on some or all of the February 2020 rebuttal opinions of Chase and Jeffords in light of the determination reached regarding the Amended Yurkerwich Report. Within 10 business days of the issuance of this Order, the parties shall file a joint report stating their collective and/or respective positions on these issues. That report shall not exceed ten pages.

IV. Conclusion

For these reasons, Defendant's Supplemental Motion to Exclude Testimony of Mr. David Yurkerwich is **GRANTED**. The parties shall meet and confer, and then file a timely joint report as stated in this Order.

IT IS SO ORDERED.

Initials of Preparer CW

US006708213B1

(12) **United States Patent**
Bommaiah et al.

(10) **Patent No.: US 6,708,213 B1**
(45) **Date of Patent: Mar. 16, 2004**

(54) **METHOD FOR STREAMING MULTIMEDIA INFORMATION OVER PUBLIC NETWORKS**

(75) Inventors: **Ethendranath N. Bommaiah**, Old Bridge, NJ (US); **Katherine H. Guo**, Eatontown, NJ (US); **Sanjoy Paul**, Marlboro, NJ (US); **Markus A. Hofmann**, Tinton Falls, NJ (US)

(73) Assignee: **Lucent Technologies Inc.**, Murray Hill, NJ (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/537,270**

(22) Filed: **Mar. 29, 2000**

Related U.S. Application Data

(60) Provisional application No. 60/169,086, filed on Dec. 6, 1999.

(51) **Int. Cl.**[7] **G06F 15/173**

(52) **U.S. Cl.** **709/226**; 709/203; 709/225; 709/231; 709/104; 370/401; 710/56

(58) **Field of Search** 709/200–203, 709/223–226, 231–233, 236, 238, 246, 102–104; 710/56; 370/400–401, 468

(56) **References Cited**

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Reza Rejaie, et al., "Proxy Caching Mechanism for Multimedia Playback Streams in the Internet," AT&T Canter for Internet Research at ICSI, Berkeley, CA 94704, Apr. 16, 1999.

* cited by examiner

Primary Examiner—Bharat Barot

(57) **ABSTRACT**

A method and apparatus for enhancing existing caching systems to better support streaming media over the Internet and other public network system are disclosed herein. By using helpers inside the network, which operate as caching and streaming agents, existing caching techniques are enhanced to better support streaming media over the Internet. The helpers serve to implement several methods specifically designed to support streaming media, including proxy caching, client request aggregation which describes the use of memory and disk resources at the helpers, and data transfer rate control to reduce start-up latency.

The method and apparatus advantageously reduces server and network loads by employing the above methods to overcome arrival time and range heterogeneity in client requests thereby improving the quality perceived by end users.

17 Claims, 9 Drawing Sheets

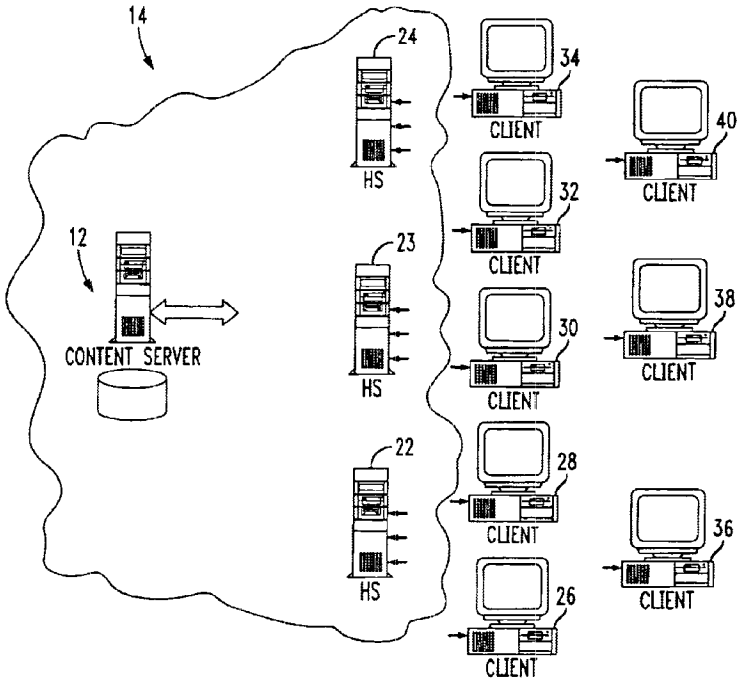


FIG. 1

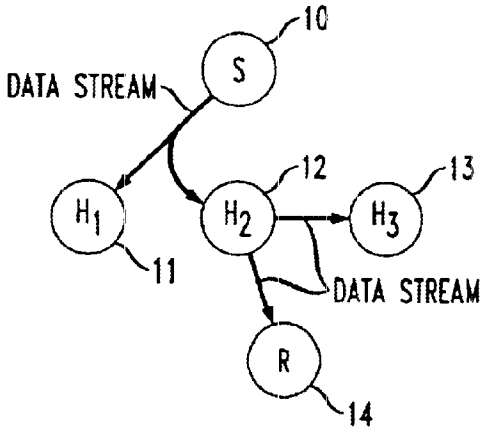

10
S
DATA STREAM
12
13
H_1
H_2
H_3
11
DATA STREAM
R
14

FIG. 2

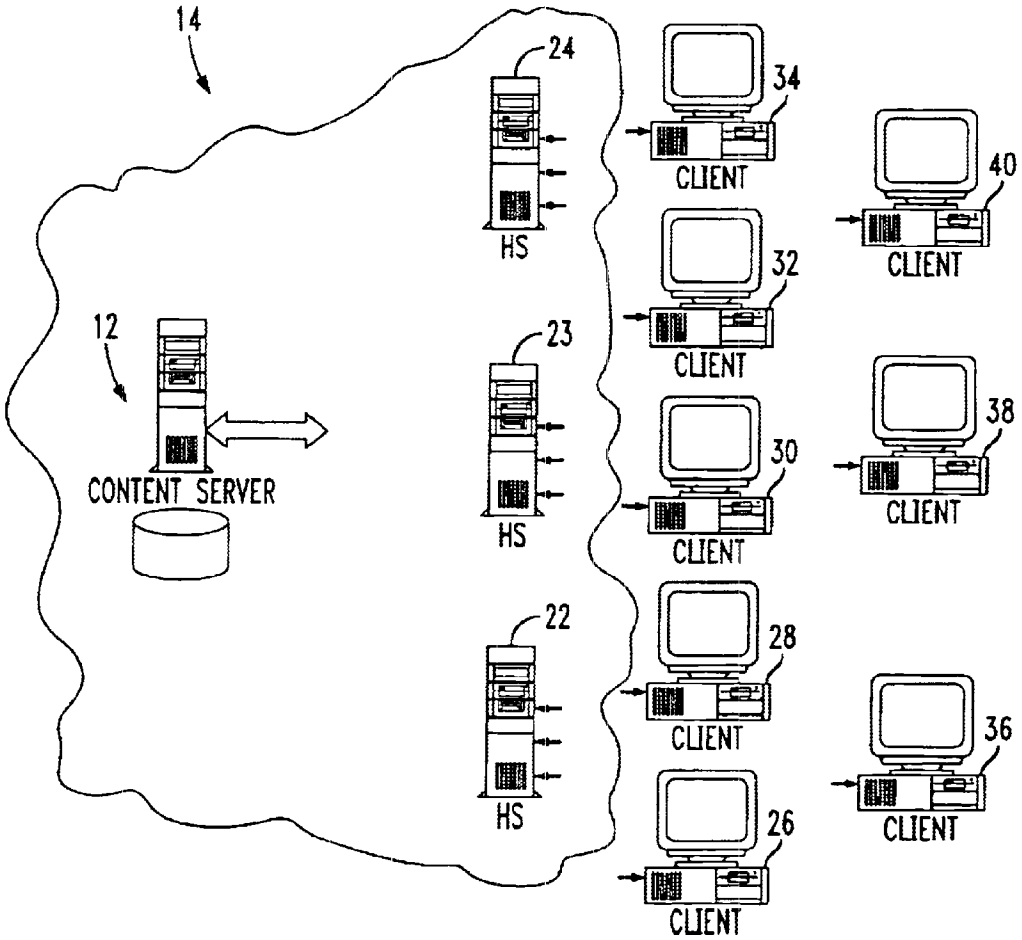

14
24
34
CLIENT
40
CLIENT
HS
12
32
CLIENT
23
CONTENT SERVER
HS
38
CLIENT
30
CLIENT
22
28
CLIENT
36
CLIENT
HS
26
CLIENT

FIG. 3

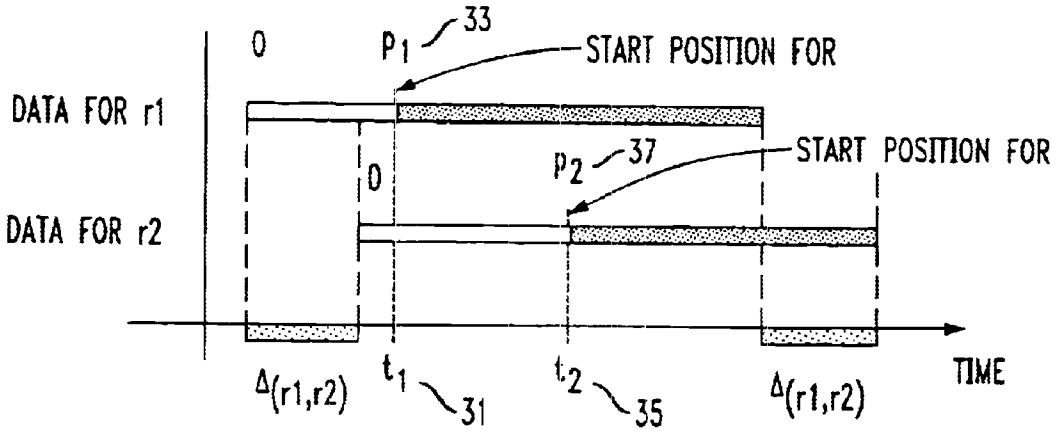

0
P1
33
START POSITION FOR
DATA FOR r1
0
P2
37
START POSITION FOR
DATA FOR r2
Δ(r1,r2)
t1
31
t2
35
Δ(r1,r2)
TIME

FIG. 4

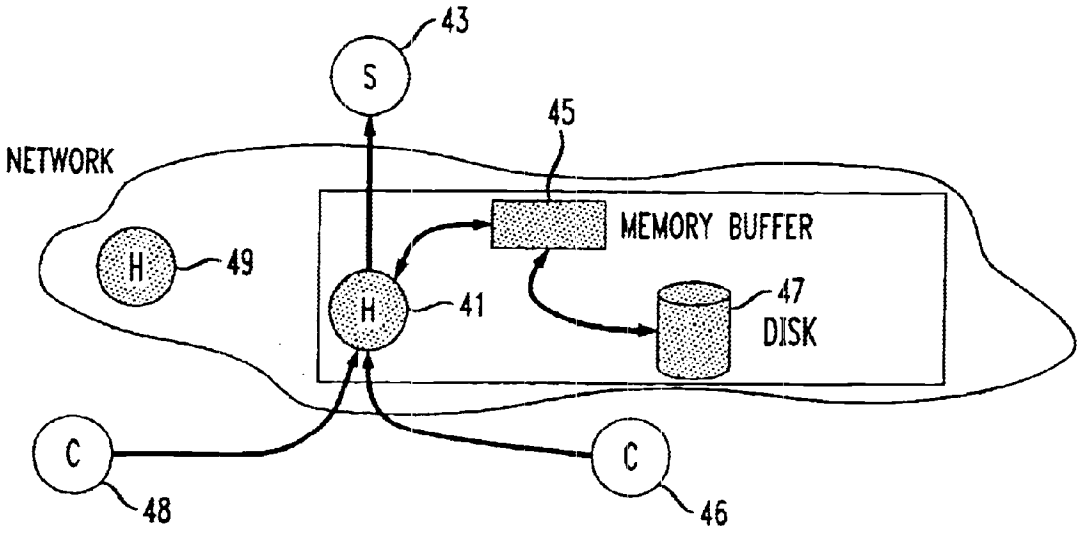

43
S
45
NETWORK
MEMORY BUFFER
H
49
H
41
47
DISK
C
48
C
46

FIG. 5A

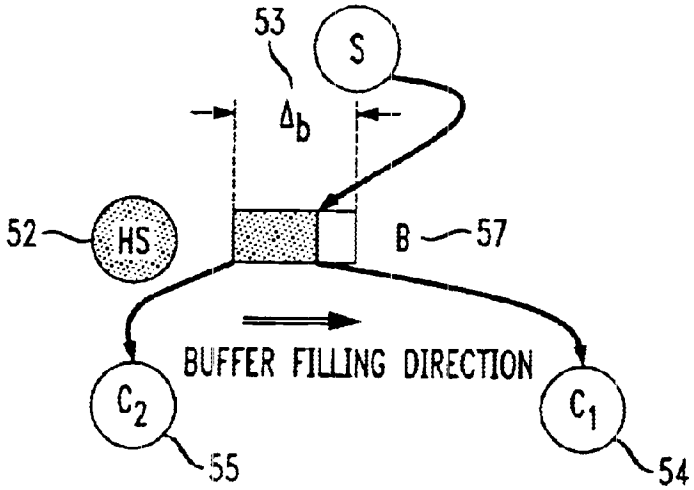

53
S
Δ_b
52
HS
B
57
BUFFER FILLING DIRECTION
C_2
55
C_1
54

FIG. 5B

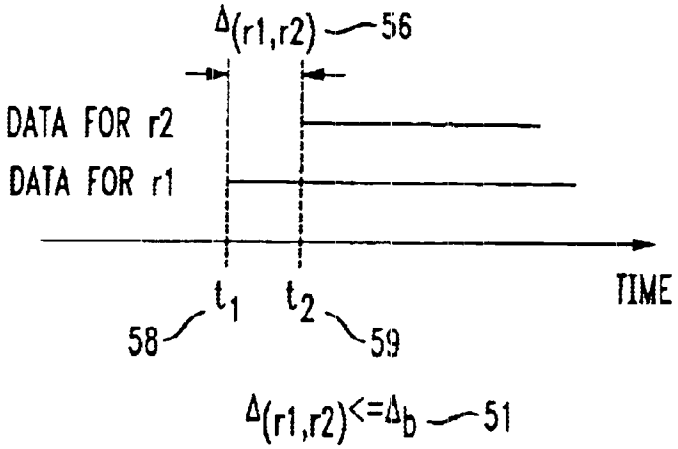

$\Delta(r1,r2)$
56
DATA FOR r2
DATA FOR r1
TIME
t_1
t_2
58
59
$\Delta(r1,r2) <= \Delta_b$
51

FIG. 6A

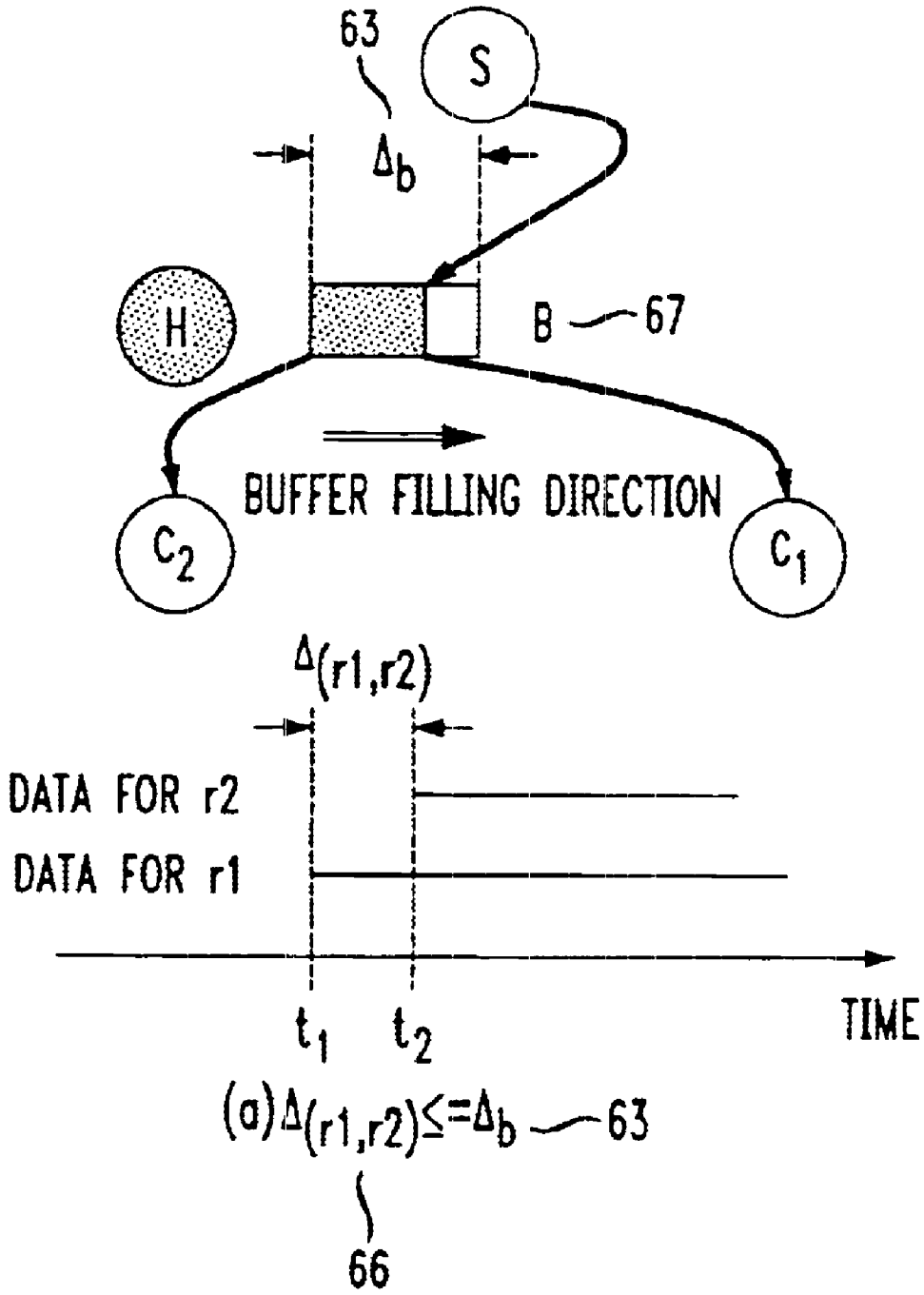

63
S
Δ_b
H
B
67
BUFFER FILLING DIRECTION
C_2
C_1
$\Delta(r1,r2)$
DATA FOR r2
DATA FOR r1
t_1
t_2
TIME
(a) $\Delta(r1,r2) <= \Delta_b$
63
66

FIG. 6B

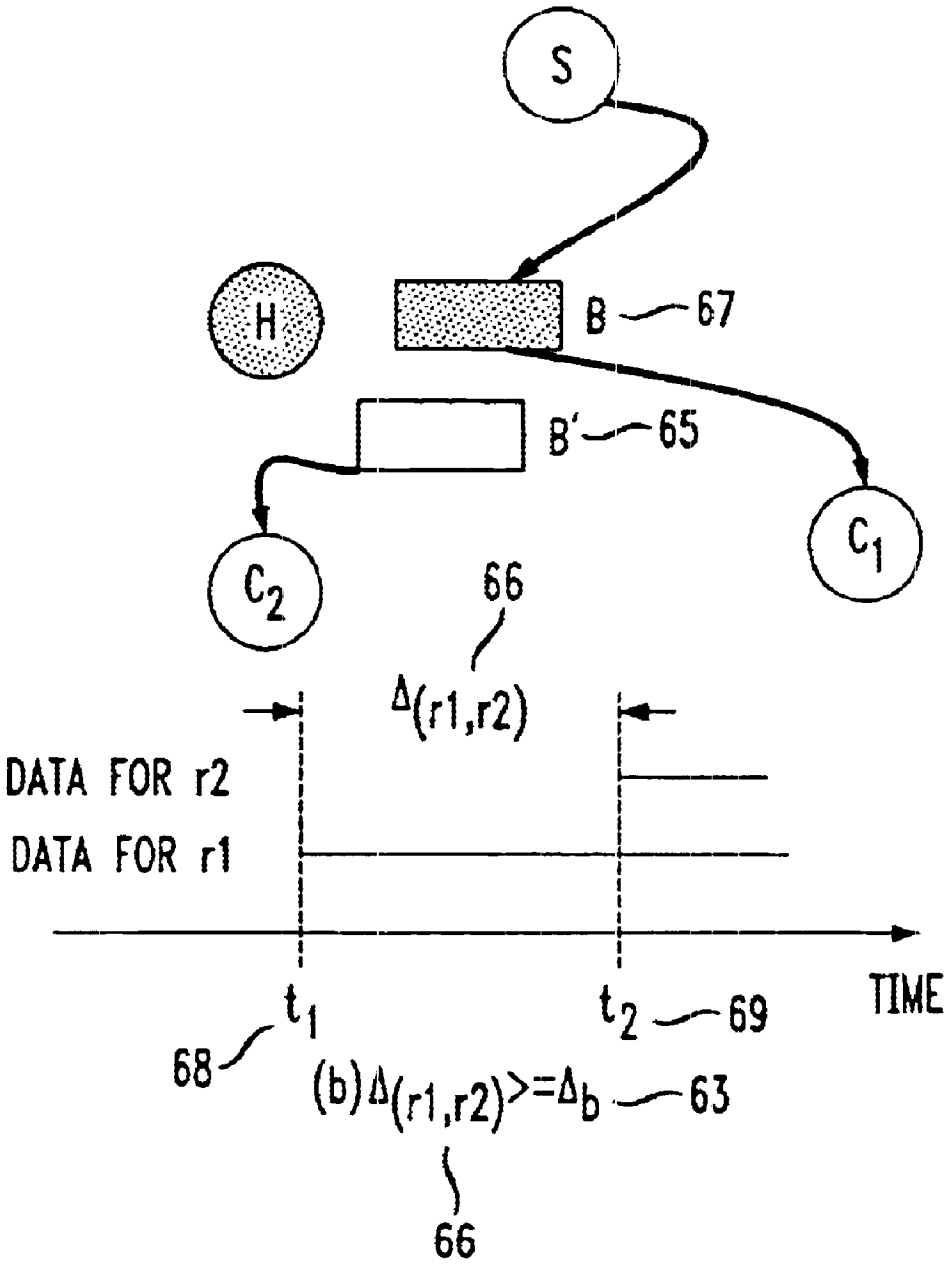

S
H
B
67
B'
65
C1
C2
66
Δ(r1,r2)
DATA FOR r2
DATA FOR r1
TIME
t1
t2
69
68
(b) Δ(r1,r2)>=Δb
63
66

FIG. 7A

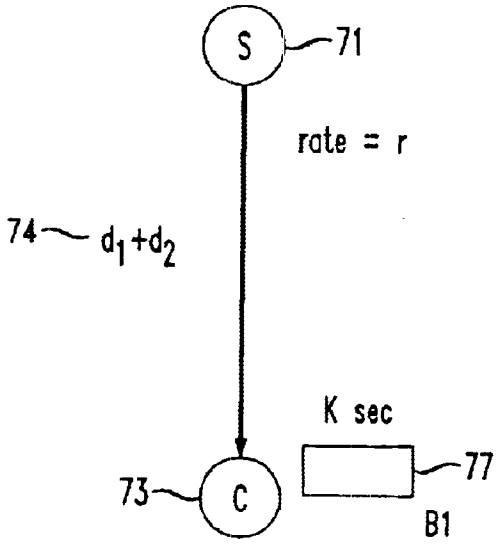

S
71
rate = r
74
d_1+d_2
K sec
77
73
C
B1

FIG. 7B

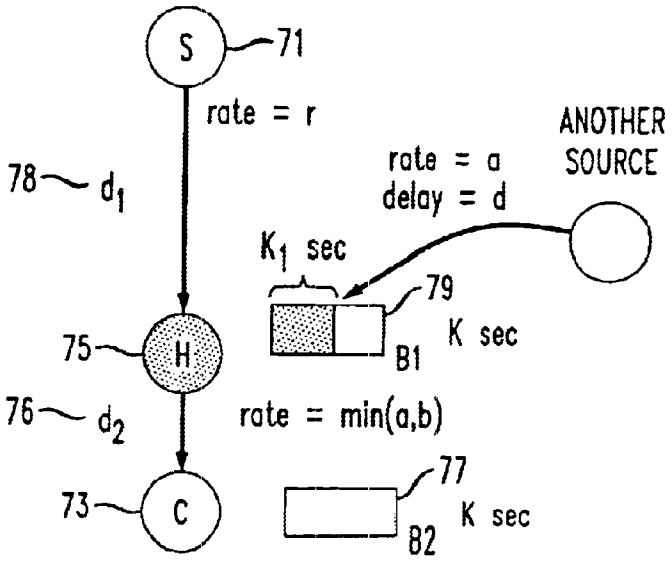

S
71
rate = r
ANOTHER SOURCE
rate = a
delay = d
78
d_1
K_1 sec
79
K sec
75
H
B1
76
d_2
rate = min(a,b)
77
K sec
73
C
B2

FIG. 8A

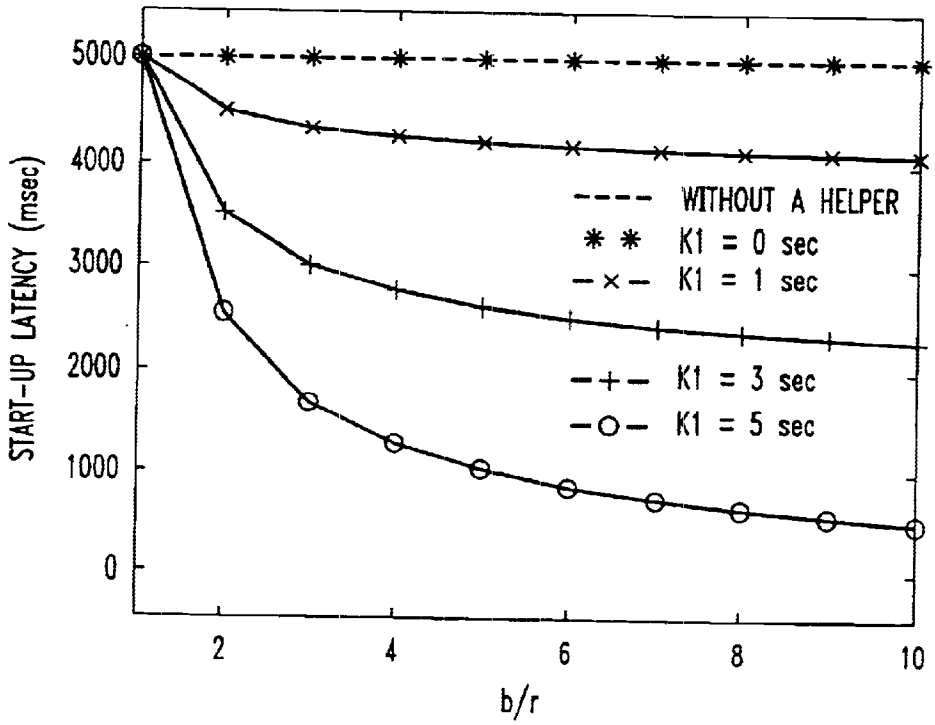

START-UP LATENCY (msec)
5000
4000
3000
2000
1000
0
2
4
6
8
10
b/r
WITHOUT A HELPER
K1 = 0 sec
K1 = 1 sec
K1 = 3 sec
K1 = 5 sec

FIG. 8B

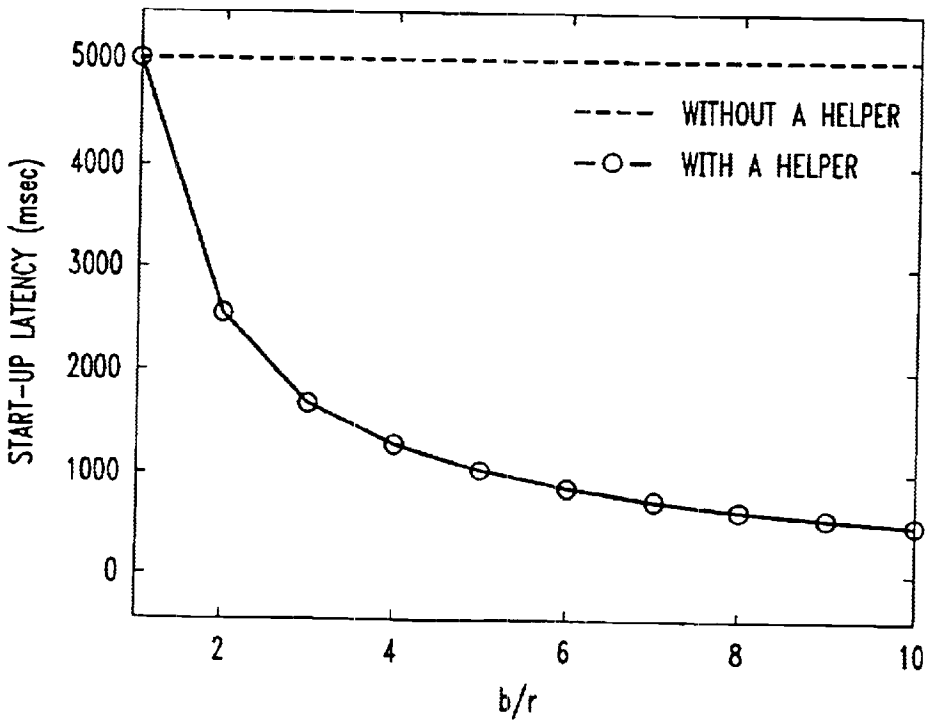

START-UP LATENCY (msec)
5000
4000
3000
2000
1000
0
2
4
6
8
10
b/r
WITHOUT A HELPER
WITH A HELPER

FIG. 9

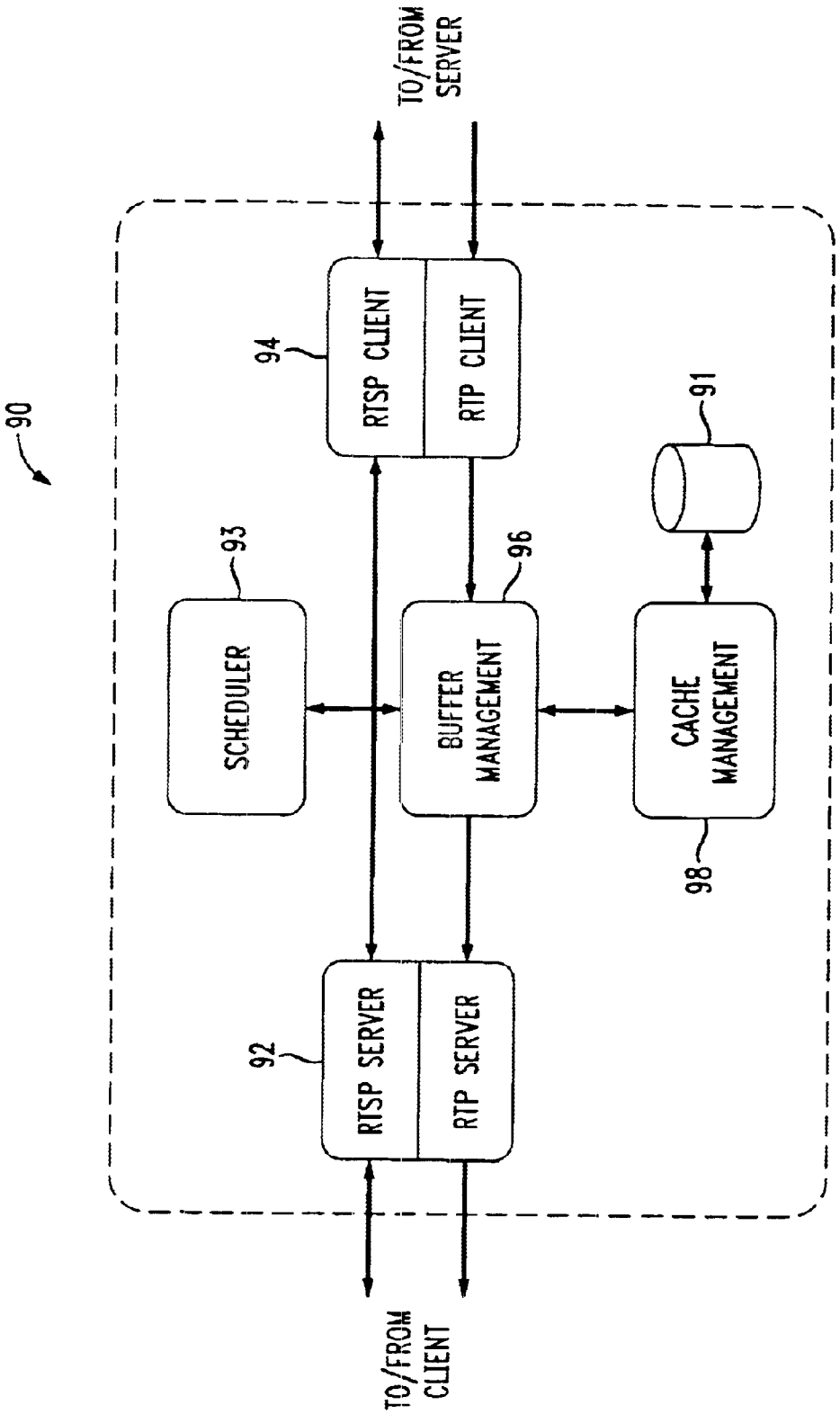

90
TO/FROM SERVER
94
RTSP CLIENT
RTP CLIENT
91
93
96
SCHEDULER
BUFFER MANAGEMENT
CACHE MANAGEMENT
98
92
RTSP SERVER
RTP SERVER
TO/FROM CLIENT

FIG. 10A

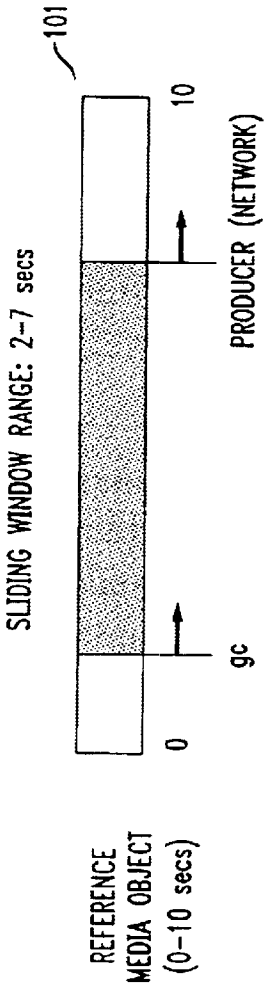
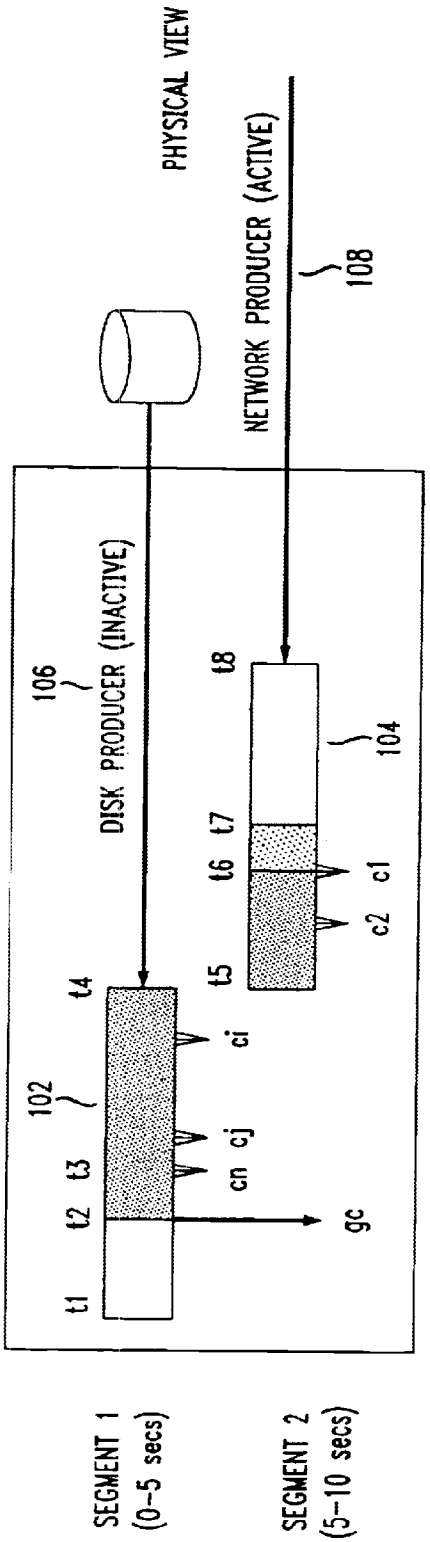


FIG. 10B



METHOD FOR STREAMING MULTIMEDIA INFORMATION OVER PUBLIC NETWORKS

This application claims priority to U.S. Provisional Ser. No. 60/169,086 filed on Dec. 6, 1999; the contents of which are incorporated herein by reference.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to network systems, and particularly to public network systems, such as the Internet. More particularly, this invention relates to methods which improve the caching of streaming multimedia data (e.g., audio and video data) from a content provider over a network to a client's computer.

2. Description of the Related Art

Computer networks such as the Internet are increasingly being used to transmit multimedia data (e.g., audio, video). In the network-based context, one simple model of producing the information involves the client requesting the downloading of the multimedia data. Once downloaded, the client may then consume, or present, the information. This model is relatively easy to implement, however, it is non-optimal in that the client is required to wait for the downloading to complete before the presentation can begin. This delay can be considerable.

A more sophisticated model of producing information involves a content server at one network site "streaming" the multimedia information over the network to a client at another site. The client begins to present the information as it arrives (i.e., just-in-time rendering), rather than waiting for the entire data set to arrive before beginning presentation. At the client computer, received data is buffered into a cache memory and continuously processed as soon as, or soon after, being received by the client. The advantage of streaming is that the client computer does not have to wait until all data is downloaded from the server before some of the data is processed and the multimedia output is created.

An example of multimedia data streaming is found in the Real player that is available over the Internet at Universal Resource Locator ("URL") http://www.real.com. The Real player continuously sends audio data over the Internet from a server computer to the client computers. The audio data is buffered and processed by the client computers while the data is being sent. The client computers process the data by creating ari audio output from the audio data.

Applications such as the Real player have conditioned computer network users to expect instantaneous streaming data on demand. The Internet, however, is often unable to deliver streaming data. This inability is most pronounced for video data. The inability to deliver streaming data on demand is due in part to the fact that live and on-demand streaming multimedia objects are generally delivered over the Internet and other data networks via unicast connections. This architecture has many shortcomings, both from the content provider's point of view and the user or recipient's point of view. From the content provider's point of view, one is faced with a server load that increases linearly with the number of clients. That is, each additional client requesting streaming multimedia (SM) data imposes an additional burden upon the content provider to meet the increased demand. From the Internet Service Provider's (ISP's) point of view, streaming multimedia under a unicast architecture poses network congestion problems. From the client's point of view, there is often long delays between the time video content is requested by a client and the time when the video content actually begins playing (i.e., high start-up latency). In addition to the high start-up latency there also exists unpredictable playback quality due to network congestion.

Web caching has been extensively implemented on the Internet to reduce network load (i.e., bandwidth consumption), server load, and high start-up latency. The utilization of Web caching on the Internet has been extensively studied. For a more detailed discussion of Web caching, see T. Bernesrs-Lee, A. Lutonen, and H. F. Nielsen Meyr: http://www.w3.org/Daemon/Status.html, 1996; and C. M. Bowman, et al., Harvest: "A scaleable, customizable discovery and access system," Technical Report CU-CS-732-94, Dept. of Computer Science, University of Colorado, Boulder, Colo., USA, 1994, the contents of which are incorporated by reference herein. See also, D. Wessels, "ICP and the squid cache," National Laboratory for Applied Network Research, 1999, http://ircache.nlanr.net/Squid; the contents of which are incorporated by reference herein. However, current caching systems, like those described above, are restricted to support static web objects such as HTML documents or images. Static web objects are typically small and as such are always cached in their entirety. Current caching methods, therefore, do not adequately support streaming multimedia data (i.e., web objects) such as video and audio clips. Streaming multimedia data like video objects, for example, are usually too large to be cached in their entirety. A single, two hour long MPEG movie, for example, requires about 1.4 Gbytes of disk space. Given a fixed investment in disk space, only a few streams could be stored at a cache, thus, decreasing the hit probability and the efficiency of the caching system. A natural solution would be to break video objects into smaller pieces for the purpose of caching. This solution is deficient, however, in that existing caching systems will treat different chunks from the same video object independently, while it might be desirable to consider the logical relationship among the various pieces.

SM objects can be generally differentiated from static web objects in that SM objects consist of multimedia data whose transmission has temporal characteristics such that the transmission rate is explicitly regulated or else the data becomes useless. In addition, the size of an SM object typically is at least an order of magnitude or two larger than that of a static web object, and therefore, do not lend themselves to be cached in their entirety. Given that caches have finite disk space, it is not feasible to statically store more than a few complete SM objects. If there are several simultaneous requests for different SM objects, it is easy to show that the cache will be busy replacing one SM object with another resulting in significant performance degradation.

Accordingly, there exists a need to develop improved techniques to enhance current caching systems to facilitate distribution of streaming multimedia over public networks, such as the Internet.

SUMMARY OF THE INVENTION

The present invention discloses a method and apparatus for enhancing existing caching systems to better support streaming multimedia (SM) over the Internet and other public network systems. Illustrative embodiments of the present invention present a novel architecture and method for supporting high quality live and on-demand streaming multimedia on a public network system, such as the Internet. By using helper servers (HS), also referred to as helpers, which operate as caching and streaming agents inside the network, existing caching techniques are enhanced to better support streaming media over the Internet. The helpers serve

to implement several methods specifically designed to support streaming media, including proxy caching, client request aggregation which describes the use of memory and disk resources at the helpers, and data transfer rate control to reduce start-up latency.

The invention advantageously reduces server and network loads by employing the above methods to overcome arrival time and range heterogeneity in client requests thereby improving the quality perceived by end users making requests for SM objects.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing features of the present invention will become more readily apparent and may be understood by referring to the following detailed description of an illustrative embodiment of the present invention, taken in conjunction with the accompanying drawings, where:

FIG. **1** is an illustration of a network system which includes HSs used in accordance with the present invention;

FIG. **2** is an illustration of a network system constructed according to one implementation of the invention;

FIG. **3** is an illustration for describing arrival time heterogeneity and range heterogeneity;

FIG. **4** is an illustration of a network system for describing the allocation of a ring buffer in accordance with the present invention;

FIGS. **5***a* and **5***b* is a network configuration and associated timing diagram which illustrates the allocation of a single ring buffer in the local memory of helper to service multiple requests in accordance with the present invention;

FIGS. **6***a* and **6***b* is a network configuration and associated timing diagram which illustrates the allocation of a second ring buffer in the local memory of a helper in accordance with the present invention;

FIG. **7***a* is an illustration of data rate control parameters for a network including a server in direct communication with a client;

FIG. **7***b* is an illustration of data rate control parameters for a network including a server, client, and a helper;

FIGS. **8***a* and **8***b* are graphs which illustrate start-up latency with and without an HS in the network;

FIG. **9** is a schematic block diagram of the functional components of a helper in the network system utilizing the RTP protocol;

FIG. **10***a* is an illustration of a logical view of producer/consumer events acting upon a ring buffer according to the present invention; and

FIG. **10***b* is a physical view of producer/consumer events of FIG. **10***a*.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

This application is related to co-pending U.S. patent application, Ser. No. 09/538.351, filed on Mar. 29, 2000 by Katherine Guo, Markus Hofman, Paul Snajoy and Hui Zhang having a common assignee; the contents of which are incorporated herein by reference.

To facilitate an understanding of illustrative embodiments of the present invention, it is advantageous to first consider the network operating environment of the present invention, as well as a selection of definitions relating to system architecture and operation.

Illustrative embodiments of the present inventive architectures, systems, and methods described herein focus on data streaming in global, worldwide networks, such as the Internet. Those skilled in the art will recognize, however, that the present architectures, systems, and methods will be applicable to a wide variety of data networks and applications. The following terms and definitions are used in the present disclosure.

Cache: a region on the computer disk that holds a subset of a larger collection of data.

Streaming multimedia object (SM object): a type of data whose transmission has temporal characteristics such that the data may become useless unless the transmission rate is regulated in accordance with predetermined criteria (e.g., audio and video files). Transmission can start at any point within the object and can be terminated by the receiver at any time.

Helper Server (HS): An HS, also referred to as a helper, is one of a plurality of servers in the network that provide certain value-added services. For example, an HS can provide caching services and/or prefetching services. HSs selectively cooperate and communicate streaming SM objects (or segments of such objects) between and among each other and between content providers and clients. That is, HSs understand an object's transmission requirements and can behave, in some respects, like a content provider.

Data stream: a data stream transmits segments of an SM object from one source to one or more multiple receiving hosts. The source might be the sender (i.e., the content provider) or an HS. Receiving hosts could be HSs or receivers (i.e., clients).

FIG. **1** illustrates various elements of the terms defined above. Specifically, FIG. **1** shows an illustrative source **10** delivering a data stream directly to each of the helpers H1 **11** and H2 **12**. Helper H2 **12** is further shown delivering a data stream to each of the helper H3 **13** and receiver R**14**. In general, the data stream from helper H2 **12** to helper H3 **13** need not be the same as that arriving at receiver R **14**, but in this example the data stream from helper H2 **12** to helper H3 **13** is illustratively part or all of the same SM object transmitted by the data stream arriving at receiver R **14**.

Streaming architectures in accordance with illustrative embodiments of the present invention support techniques to enhance caches to support streaming multimedia over a public network system, such as the Internet. While caching is the traditional approach for improving scalability, it fails to scale in terms of object size and number of supported streams for streaming multimedia objects. In particular, existing solutions for streaming multimedia on the Internet have several shortcomings because these solutions use a separate unicast stream for each request, thus requiring a stream to travel from the server to the client across the Internet for every request.

To overcome these drawbacks and to further enhance the ability of existing caching systems to properly scale in terms of object size and number of supported streams, illustrative embodiments of the present invention advantageously combine three methods which are implemented via a novel system architecture to enhance existing caching systems. The methods are: (1) proxy caching to reduce signaling costs, (2) client request aggregation which describes the use of memory and disk resources at the helpers, and (3) data transfer rate control to reduce start-up latency.

An exemplary arrangement of using the invention is shown in FIG. **2** which illustrates a public network system (PNS) **14**. FIG. **2** further includes a server computer, as represented by content server **12**, which stores and serves content over the network **14**. The illustrative network **14** is

a high-speed, high-bandwidth interactive distribution network, and can be representative of the Internet. The content server **12** serves content in the form of text, audio, video, graphic images, and other multimedia data. In the Internet context, the content servers might represent Web sites which serve or multicast content in the form of hypermedia documents (e.g., Web pages) to "client" computers, as represented by client computers **26–40**. The network further includes HSs **22–24**. Each HS **22–24** is configured as a conventional server having processing capabilities, including a CPU (not shown) and storage. HSs **22–24** cache Internet resources, such as those requested by client computers **26–40** that have been downloaded from the content server **12** to allow localized serving of those resources. The interaction and cooperation of the above entities are further described below.

SM objects differ from static objects, such as HTML pages or Images, in that each SM object stream has an associated starting playback time and an ending playback time. Thus, when an SM object request arrives at a cache, the request will most likely result in a partial hit in the sense that one part of the requested SM object will typically be stored in the local cache, while the remainder of the SM object will be stored in part at the various HSs **22–24** throughout the network. This is different from conventional web caching where entire objects are stored in a local cache. Given that an HS will typically store only a portion of an SM object, upon receiving a request for an SM object from a client, the HS is required to retrieve the non-stored portions of the SM object from the other HSs in the network **22–24**. This practice has the effect of increasing signaling costs and also increases the probability of losing synchronization. Therefore, at a given HS, it is preferable to cache successive segments rather than cache a sequence of segments with multiple gaps in it. This is achieved by prefix caching, where segments of an SM object are ejected from the end by replacing the last segment first. In prefix caching, the last access time of each SM object stored in the local cache is recorded, and when space is required on the local cache to store another SM object, the least recently used SM object is replaced from its end.

Client Request Aggregation

A client request for a SM object can be served from the memory of the HS to which the request was made, the disk of any of the HSs **22–24** in the network, the content server **12**, or combinations of each. An objective of the present invention is to reduce latency by reducing the number of requests sent to the content server **12** by servicing as many requests for the same SM object from it own memory and/or disk, thereby reducing server load and network load. This objective is achieved in accordance with a strategy referred to herein as client request aggregation which is implemented in a preferred embodiment by a buffering scheme to be described below.

In accordance with the teachings of the present invention, the buffering scheme for implementing client request aggregation utilizes ring buffers in the memory of the HS. The ring buffers represent a type of short term storage to service multiple requests for the same object which occur within a certain time range. The allocation of ring buffers is advantageous in that multiple requests may be serviced from a single stream from the server thereby reducing latency and network congestion. That is, ring buffers are allocated in anticipation of other clients requesting the same SM object from an HS within a certain time range.

The time range within which multiple requests may be serviced by the same ring buffer is referred to as the buffer temporal distance. To better understand buffer temporal distance, the more global generic concept of temporal distance is first defined in the context of heterogeneity. Requests for SM objects are heterogeneous in nature. In particular, heterogeneity can appear in three forms: media object heterogeneity, arrival time heterogeneity, and range heterogeneity. Media object heterogeneity describes the situation of different clients **26–40** making requests for different SM objects. Media object heterogeneity, is not relevant to the present discussion and is not described in detail herein. Arrival time heterogeneity describes requests for the same SM object arriving at an HS **22–24** at different times, and range heterogeneity describes that each request from a client **26–40** for a SM object has an associated requested playback range (i.e., a starting and ending time). Typically, the starting time for an SM object is the beginning of the SM object. However, a request may be received with starting times other than the beginning of an object, for example, VCR operations involving rewind and fast forward.

FIG. **3** is an exemplary illustration which describes temporal distance as a function of arrival time heterogeneity and range heterogeneity. Consider two requests for the same media object, r_1 and r_2 where r_1 represents a request for an SM object at time t_1 **(31)**, with a requested starting position p_1 **(33)** seconds from the beginning of the object, and an ending time equal to the end of the SM object. Further, r_2 represents a request for the same SM object at time t_2 **(35)**, with a requested starting position p_2 **(37)** seconds from the beginning of the object to the end of the object. The temporal distance is computed as:

$$\Delta(r_1,r_2)=(t_2-p_2)-(t_1-p_1)=(t_2-t_1)-(p_2-p_1) \quad (1)$$

Equation (1) illustrates that temporal distance is a function of both the arrival time heterogeneity (t_2-t_1), and the range heterogeneity (p_2-p_1).

Having described temporal distance, the method of allocating a ring buffer in the memory of an HS is now described with reference to FIG. **4**. FIG. **4** illustrates a portion of a network including an HS **41** having an associated memory buffer **45** and a disk unit **47**. The network of FIG. **4** also includes a second HS **49**, a content server **43**, and two clients C_1 **46** and C_2 **48**. Whenever a request for an SM object is received at an HS **41** for the first time, the HS **41** forwards the request to the content server S **43**. Upon receipt of the request, the content server S **43** starts streaming the requested SM object to the HS **41**. In this particular example, the HS **49** does not have the requested SM object stored locally. In general, when a ring buffer is first allocated at an HS, such as HS **41**, it is filled with data from one or more of the following data sources: preferably H **41** if the data is available there, otherwise H **49**, or the content server S **43**. The HS **41** stores the received SM object in its memory **45** and disk **47**, and at the same time streams data to the client making the request, and allocates a ring buffer in memory (not shown in FIG. **4**) having a buffer temporal distance Δ_b seconds of data. That is, the ring buffer B stores a moving window of Δ_b seconds of the SM object stream, where Δ_b is a measure of the buffer size in time units.

Once a ring buffer is allocated in the memory of an HS it is available to service additional requests for that SM object which occur within a time interval defined by the buffer temporal distance, Δ_b. FIGS. **5***a* and **5***b* illustrate the case where an initial client request, r_1, and a subsequent client request, r_2 are serviceable from an allocated ring buffer. FIGS. **6***a* and **6***b* illustrate the case where the subsequent client request, r_2, is not serviceable from the ring buffer allocated to service request r_1.

Referring first to FIGS. **5***a* and **5***b* which illustrate the first case of servicing requests r_1 and r_2 from the same ring buffer B **57**. The first request, r**1**, is initiated by client C**1** **54** at time t**1** **(58)**. At some later time t_2 **(59)**, client C_2 **55** makes a request, r_2, at time t_2 **(59)** to the HS **52** for the same SM object, also from the beginning of the stream. FIG. **5***b* illustrates the temporal distance of the two requests, $\Delta(r_1,r_2)$ **56**. In the illustrative example of FIG. **5***b*, the temporal distance $\Delta(r_1,r_2)$ **56**, as defined by equation (1), does not exceed the buffer temporal distance, Δ_b **53** (i.e., buffer size) as shown in FIG. **5***a* and described by equation (2).

$$\Delta(r_1,r_2)=t_2-t_1\leqq\Delta_b \tag{2}$$

Satisfying the inequality defined by equation **2** allows the subsequently received request, r_2, to be serviced from the allocated ring buffer B **57**.

It is noted that, the first ring buffer **57** is capable of servicing any number of requests for the stored SM object which may occur within the time interval defined by the buffer temporal distance, Δ_b. As such, the ring buffer **57** operates as a type of short term cache which stores a portion of an SM object for a fixed time interval. It is also convenient to view the ring buffer **57** as a sliding window in the sense that portions of an SM object are initially cached in the ring buffer **57** and then deleted to store successive portions of the SM object. This sliding window process is described in greater detail with reference to FIGS. **10***a* and **10***b*.

Referring now to FIG. **6***b* which illustrate the second case where a subsequent request is not serviceable from an allocated ring buffer B **67**. FIG. **6***b* illustrates the allocation of a second ring buffer B=**65** to service request r_2. The allocation of a second ring buffer is required in this example by considering the request times associated with the first and second request. In particular, FIG. **6***b* illustrates request times t_1 **(68)** and t_2 **(69)** for requests r_1 and r_2, respectively. In this example the temporal distance $\Delta(r_1,r_2)$ **(66)**, as defined by equation (1), exceeds the buffer temporal distance, Δ_b **63** (i.e., buffer size). Accordingly, the subsequently received request, r_2, is not serviceable from the previously allocated ring buffer B **67**. In this case, a second ring buffer B=**65** is allocated to service the second request, r_2. In this case, the temporal distance the buffer is exceeded, as described by equation (3):

$$\Delta(r_1,r_2)=t_2-t_1>\Delta_b \tag{3}$$

When the inequality defined by equation (3) is true, it indicates that a subsequently received request (e.g., r_2) is not serviceable by a first allocated ring buffer B **67**, as the request is received at a point in time where the beginning of the SM object stream is no longer available in the previously allocated buffer B **67**. In this case, the second ring buffer B=**65**, is allocated with a buffer temporal distance of Δ_b seconds, and is filled with data from the beginning of the SM object stream.

It is further noted, that whenever a ring buffer is allocated in memory in response to a client request, as the ring buffer is filled, the data is simultaneously streamed to the requesting client. It is also further noted, that in general, the number of ring buffers which may be allocated is practically limited by the size of the local memory which is small in comparison to disk space which is also limited at a HS. Because the ring buffer represents a limited resource, when client requests cannot be fully satisfied through the deployment of ring buffers, an HS can serve a client's request from any combination of sources including: the memory ring buffer, cache on the disk, the memory or disk of other HSs in the network, and the content server.

Data Transfer Rate Control

As described above client request aggregation represents one approach for enhancing existing caching systems to reduce latency. A second approach for reducing latency is data transfer rate control which is generally defined as the rate at which data streams are transmitted between clients, HSs and content servers in the network.

Subsequent to receiving a client request for an SM object at a content server, the content server responds by sending out data packets at a playback rate of r bytes/second. Each client in the network maintains a playout buffer of K seconds, and does not start playing an SM object until its playout buffer is full. The use of playout buffers to absorb jitter is well known in the art. When a client request is served from a HS at a rate "r" bytes/second, the playout buffer can be filled faster from the HS than from the content server due to the smaller network distance and reduced network congestion.

FIGS. **7***a* and **7***b* illustrate two network configurations which describe data transfer rate control. In the first network configuration, illustrated in FIG. **7***a*, no intermediary HS is employed.

Referring first to FIG. **7***b*, which illustrates a content server S **71** streaming data to an HS **75** having an associated buffer B**1** **79**, whereby the HS **75** in turn streams the received data to a client C **73**. Client C **73** has an associated playout buffer B**2** **77** of size K sec. In this situation, the delay between the content server **71** and the helper **75** is assumed to be d_1 **(78)**, and the delay between the helper **75** and the client C **73** is assumed to be d_2 **(76)**.

Referring now to FIG. **7***a*, the delay between the content server S **71** and the client C **73** is assumed to be d_1+d_2 **(74)** when no intermediary HS is present. It is further assumed that in FIGS. **7***a* and **7***b*, the content server S **71** sends streaming data at a rate of "r" bytes/sec to the client C **73**. The start-up latency is calculated as

$$L_0=2(d_1+d_2)+K \tag{4}$$

Equation (4) is comprised of two parts: a first part, **2**(d_1+d_2), which describes the latency associated with the round trip time of the initial request from client C **73** to content server S **71** and back, and the second part describes the time required to fill the initial client playout buffer B**2** **77** with the requested data.

Referring again to FIG. **7***b*, which includes the intermediary HS **75**. It is assumed that the HS **75** initially has K_1 seconds of data in its buffer B**1** **79** where $0\leqq K_1\leqq K$. The client's C **73** request takes d_2 seconds to arrive at the HS **75**. Upon receiving the request at the HS **75**, two processes are started concurrently. A first process is to download the existing K_1 seconds of data stored in the playout buffer B**1** **79** associated with the HS **75** to the client C **73** as fast as the bandwidth allows. Assuming the average rate of transfer between the HS **75** and the client C **73** is "b" bytes/second, the first process takes $(K_1*r)/b$ seconds to download K_1 seconds of data from the playout buffer B**1** **79**.

The second concurrent process is for the HS **75** to request $K-K_1$ seconds of data from either its local disk, or another HS, or the content server S **71** so that the client's C **73** playout buffer B**2** **77** may be completely filled. Let "d" generally designate the one way latency between these sources and the HS **75**, and let "a" designate the bandwidth from these sources to the HS **75**. It therefore takes 2d seconds for the first byte of data to arrive at the HS **75**.

Only after both the first and second processes conclude, where process one represents the download of the first K,

seconds of data to the client, and process two represents the retrieval of the remaining $K-K_1$ seconds of data, can the HS **75** start to send the remaining $K-K_1$ seconds of data to the client **73**. The time for both the first and second processes to conclude is calculated as:

$$\max[(K_1*r)/b,2d] \quad (5)$$

Upon completion of processes one and two, described above, the buffer B2 **79** at the HS **75** is filled at a rate "a" and drained with an average rate of "b" with the remaining $K-K_1$ seconds of data. In order to avoid buffer underflow, the draining rate for the buffer B2 **79** is set to be the minimum of the fill and drain rates, min(a,b). Therefore, the time it takes for the remaining $K-K_1$ seconds of data to be downloaded to the client **73** is computed as

$$d_2+[(K-K_1)*r]/\min(a,b) \quad (6)$$

Equation (6) is made up of two parts: the first part represents the one-way latency, d_2, associated with the time required for the first byte to be transmitted from the HS **75** to the client C **73**. The second part of equation (6) represents the time required to send $(K-K_1)*r$ bytes of data at a minimum playout buffer draining rate of min(a,b).

The resulting start-up latency is then computed from equations (5) and (6) as

$$L_1=(d_2+\max[(K_1*r)/b,2d])+(d_2+[(K-K_1)*r]/\min(a,b)) \quad (7)$$

The start-up latency, defined by equation (7) is composed of two terms: a first term which represents the maximum time that the HS **75** must wait before it can start sending the remaining $K-K_1$ seconds of data to the client (i.e., $d_2+\max[(K_1*r)/b, 2d]$), and a second term which defines the time it takes for the remaining $K-K_1$ seconds of data to be downloaded to the client **73** (i.e., $d_2+[(K-K_1)*r]/\min(a,b)$).

Consider the situation where a HS **75** does not have any data initially cached in its out buffer B1 **79** (i.e., $K_1=0$), and it is further determined that the content server S is the best choice to obtain the requested SM object (i.e., $d=d_1$). Further assume that the fill rate is a=r, and therefore the drain rate is represented as $\min(a,b)=\min(r,b)=r$. Given these assumptions, the start-up latency is computed from equation (7) as

$$L_1=2d_1+2d_2+K \quad (8)$$

L_1 is the same as Lo as shown in equation (4), which is the start-up latency for the configuration without an HS.

The only parameter under the control of the HS to improve start-up latency is the data transfer rate from the HS to the client, "b". FIGS. **8***a* and **8***b* are illustrations of graphs comparing the variation in the start-up latency when an HS is employed, shown by the solid curve, and the start-up latency without a HS (i.e., the dotted line). The following assumptions are made in each graph: a=r, d_1=10 ms, d_2=1 ms, K=5 s(i.e., K is capable of storing 5 s). The ratio between the HS data transfer rate, "b", and the content server's playback rate "r" is varied between 1 and 10. The amount of cached data K_1 is varied between 0 and 5 seconds. In FIG. **8***a*, the HS requests $K-K_1$ seconds of data from the content server. It is shown in FIG. **8***a* that the start-up latency decreases as the ratio b/r increases where "r" is the fixed playback rate. Therefore, it is shown that the start-up latency can be decreased with increasing values of "b".

In contrast with FIG. **8***a* where the remaining data resides at the content server, FIG. **8***b* describes the situation where the remaining $K-K_1$ seconds of data resides at the HS. In this case, d=0, where d represents the one-way latency between various sources and the HS, and network bandwidth is of no consideration, only the disk bandwidth is applicable

RTP/RTSP Embodiment

The present invention may be implemented to accommodate control and data protocols well known in the art. In a preferred embodiment, the present invention is implemented using the real-time streaming protocol (RTSP) as the control setup protocol and the real-time protocol (RTP) as the transport protocol. RTSP is a proposed protocol for standardizing streaming media on the Internet and is used as one of the streaming protocol by Real Networks (TM). RTSP utilizes the Internet standard protocols, including: UDP, TCP/IP, and IP Multicast, and operates with RTP.

Turning now to FIG. **9**, there is shown a high level block diagram of the main modules which make up a HS **90** in the network implementing the RTSP and RTP protocols. The HS **90** includes an RTSP/RTP server module **92**, an RTSP/RTP client module **94**, a buffer management module **96**, a cache management module **98**, and a scheduler **93**.

The RTSP/RTP server module **92** performs a number of functions including: receiving and processing RTSP requests from clients, interacting with the RTSP/RTP client module **94** to forward the client requests to the content server S after appropriate header translation, and streaming data to clients using the RTP protocol. The RTSP/RTP client module **94** contacts media servers or other HSs **22–24** across the network to fetch data to satisfy client requests. The buffer management module **96** manages the available memory in the form of a pool of buffers, each buffer being associated with an SM object identified by a URL and a time range. As requests are received at the HS, the buffer management module **96** attaches each new incoming SM object request to an existing buffer in the buffer pool if one is available. In the case all existing buffers in the buffer pool are currently associated with an SM object, the buffer management module **96** allocates a new buffer for the incoming SM object. The buffer management module **96** also manages the RTSP/RTP client module **94** to fetch data that is not available in local disk cache, and interacts with the cache management module **98** when recording data for an SM object onto the cache and reading data for an SM object from the cache. The cache management module **98** maps URLs received as a parameter along with an SM object request from a client to local filenames and manages the disk space allocated for caching by implementing a cache replacement policy (i.e., how segments of SM objects are added/deleted).

The buffer management module **96** is the central multiplexing-demultiplexing point of the HS **90**. This module serves as the data source for the RTSP/RTP server module **92** and as the data sink for the RTSP/RTP client module **94**. This module also interacts with the cache management module **98** for recording data onto the cache **91** and reading data from the cache **91**.

The buffer management module **96** manages a pool of buffers in the main memory of an HS. Each buffer contains data to service a client request for an SM object having a specified time range (i.e., starting time, ending time). The buffer size is specified in time units. At any instant, there could exist multiple buffers in the buffer pool containing data for the same SM object, where each buffer corresponds to a different specified time range in response to randomly received requests from multiple clients in the network, where each request has a specified time range. The buffer pool size is constrained by the size of the memory.

The scheduler module **93** manages the global queue of events, where each event is scheduled for execution at a certain time. Example events include data producer and consumer events, and garbage collector events to be discussed below.

FIG. **10***a* is an illustration of a logical view of the processes of data insertion and deletion associated with a representative memory buffer **101** created at a HS to service an SM object request received from a client in the network. FIG. **10***a* illustrates a buffer allocated with a size of 10 seconds, i.e., [0 s,10 s]. In one embodiment, a minimum amount of data must be present in the buffer at all times which is equivalent to the buffer temporal distance. For the illustrative example of FIG. **10***a*, this minimum amount of data is shown to be from 2 to 7 seconds. This minimum amount of data may be viewed as a sliding or moving window in the sense that as incrementally higher ordered time packets are inserted into the buffer, the right edge of the sliding window moves to the right, and as the garbage collector function removes lower ordered time packets from the buffer the left edge also moves to the right.

FIG. **10***b* is an embodiment of the logical view of buffer data insertion and deletion of FIG. **10***a*. As previously described, a ring buffer may be made up of multiple data segments, where each data segment represents data obtained from a separate data source (e.g., local disk, remote disk). The ring buffer illustrated in FIG. **10***b* illustrates two data segments: a first data segment, segment **1**, whose segment size is defined as $[t_1;t_4]$ **102**, and a second data segment, segment **2**, whose segment size is defined as $[t_5;t_8]$ **104**. In general, data is sourced to a segment of a ring buffer from a producer event. FIG. **10***b* illustrates two producer events, a disk producer **106** for sourcing data to the first segment **102**, and a network producer **108** for sourcing data to the second segment **104**.

In addition to the producer events shown, consumer events stream data out of the buffer. FIG. **10***b* shows n consumers: c_1, c_2, . . . , c_n. Each consumer represents a separate request for the SM object at a particular starting point in the object. In the example of FIG. **10***b*, the local disk is the producer which sources data to the first segment **102**, and the remote server, which could be either the content server and/or the HS is the producer which sources data to the second segment **104** of the ring buffer. Further, t_1, t_2, . . . t_8 represent RTP timestamps of data packets which comprise the SM object in accordance with the RTP protocol. Client requests (i.e., consumers) request a starting point of an SM object by specifying an RTP timestamp associated with the object.

Buffer underflow and overflow problems need to be addressed for each allocated ring buffer. To address buffer underflow and overflow, a list of consumers (e.g., c_1, c_2, . . . , c_n.) for each buffer is sorted in accordance with the position of the next packet to be streamed from the buffer. To handle buffer underflow, a producer event (i.e., data source) must occur ahead of the first consumer c_1, and to handle buffer overflow the garbage collector, gc, which is an event which frees RTP packets from the buffer no longer needed by any of the consumers, must occur behind the last consumer, c_n. Each buffer is associated with a garbage collection event, gc, which is first created when the buffer is filled with data and frees the RTP packets from the buffer after they have been forwarded from the buffer by the last consumer. In the example of FIG. **10***b* that the garbage collector gc has already freed RTP packets in the range $[t_1,t_2]$ from the buffer. It should be noted that the first and last consumer of a buffer are not stationary but rather may change with time due to range, rate, and arrival time heterogeneity across consumers using the buffer.

While the invention is susceptible to various modifications and alternative forms, specific embodiments thereof have been shown by way of example in the drawings and have been described in detail. It should be understood, however, that it is not intended to limit the invention to the particular forms disclosed, but on the contrary, the intention is to cover all modifications, equivalents and alternatives falling within the spirit and scope of the invention as defined by the appended claims.

What is claimed is:

1. In a network having a content server which hosts a plurality of streaming multimedia (SM) objects which comprise a plurality of time-ordered packets for distribution over said network through a plurality of helper servers (HS) to a plurality of clients, a method of reducing latency associated with distributing said plurality of SM objects from said content server and said plurality of helper servers HSs to said plurality of clients, said method comprising:

servicing a first request received from one of said plurality of clients, including a requested starting position of said SM object, for one of said plurality of SM objects by allocating a first ring buffer in a memory associated with said one of said plurality of HSs for storing data representing a first portion of one of said plurality of SM objects, wherein said first portion includes a packet having an associated time-stamp approximately equal to the requested starting position;

maintaining the first ring buffer in the memory as a sliding window by replacing stored data with data representing successive portions of said one of said plurality of SM objects; and

allocating a second ring buffer to service a further request for said one of said plurality of SM objects received at said one of said plurality of helper servers, if it is determined that said further request cannot be serviced from said first ring buffer, otherwise servicing said further request from said first ring buffer.

2. The method according to claim **1**, wherein said further request is determined not to be serviceable from said first ring buffer by performing the following steps:

calculating a temporal distance between said first request and said further request;

comparing the calculated temporal distance with a buffer temporal distance associated with said first ring buffer; and

determining that the calculated temporal distance is greater than the buffer temporal distance.

3. The method according to claim **2**, wherein said temporal distance is calculated as:

$$\Delta(r_1,r_2)=(t_2-p_2)-(t_1-p_1)-(p_2-p_1)$$

where

r_1 is said first request for said one of said plurality of SM objects;

r_2 is said further request for said one of said plurality of SM objects;

t_1 is the request time associated with the first request;

t_2 is a request time associated with the further request;

P_1 is a requested starting position of said one of said plurality of SM objects, in seconds, associated with the first request; and

P_2 is a requested starting position of said one of said plurality of SM objects, in seconds, associated with the further request.

4. The method according to claim 2, wherein the temporal distance is a function of the request time and the requested starting position for said one of said plurality of SM objects.

5. The method according to claim 1, wherein said further request is determined not to be serviceable from said first ring buffer by determining that said requested starting time is not contained in a range between a largest timestamp associated with a packet stored in the buffer and a smallest time-stamp associated a packet stored in the buffer.

6. The method according to claim 2, wherein the buffer temporal distance is a measure of the allocated buffer size in units of time.

7. The method according to claim 1, wherein said stored data comprises a plurality of data segments, wherein each of said plurality of data segments is sourced from one of said content server and/or said plurality of HSs.

8. The method according to claim 1, wherein a further ring buffer associated with said one of said plurality of SM objects is allocated in the memory, if it is determined that a previously allocated ring buffer associated with said one of said plurality of SM objects cannot service a current request for said one of said plurality of SM objects.

9. The method of claim 8, wherein the number of ring buffers capable of being allocated in memory is dependent upon the size of the memory.

10. The method according to claim 1, further including the step of replacing stored data with data representing successive portions of said one of said plurality of SM objects, wherein said step further comprises the steps of:

a) determining that said first ring buffer is full;

b) initiating a garbage collector event including the steps of:

i) determining that a stored packet having the lowest associated time-stamp is less than the current position associated with a most recently received request and wherein said stored packet having the associated lowest time-stamp value is less than the difference between the stored packet having an associated highest time-stamp value and the buffer temporal distance;

ii) removing said stored packet from said first ring buffer, if determination step (i) is true;

iii) repeating steps(i) through (ii), until determination step (i) is no longer true,

iv) de-initiating said garbage collector event, until it is determined that step (a) is true again and returning to step (b).

11. The method according to claim 1, wherein said first ring buffer is de-allocated from the memory upon removing all stored packets from said first ring buffer.

12. The method according to claim 1, wherein said time-ordered packets are RTP packets.

13. In a network having a content server which hosts streaming multimedia (SM) objects, each of said SM objects comprising a plurality of time-ordered packets for distribution over said network through a plurality of HSs to a plurality of clients, a method of reducing latency associated with distributing said SM objects from said content server and said plurality of helpers (HS) to said plurality of clients, said method comprising:

receiving a first request for an SM object, including a requested starting position, received from one of said plurality of clients at one of said plurality of HSs;

allocating a first ring buffer in a memory associated with said one of said plurality of HSs upon receiving said first request;

retrieving said SM object comprising said plurality of time-ordered packets from at least one of said plurality of HSs including said one of said plurality of HSs and said content server;

sequentially storing said plurality of time-ordered packets from said retrieved SM object in said first ring buffer by replacing lower time-ordered packets with higher time-ordered packets;

servicing a second request for said SM object from said first ring buffer, if it is determined that said subsequent request includes a starting request position within a range between a largest timestamp associated with a packet stored in the buffer and a smallest time-stamp associated a packet stored in the buffer; and

allocating a second ring buffer in the memory, if it is determined at the servicing step that said second request cannot be serviced from said first ring buffer.

14. The method according to claim 13, wherein at said retrieving step, said data is retrieved from said one of said plurality of HSs, if said data is it determined to reside at said one of said plurality of HSs.

15. The method according to claim 14, wherein said method further comprises the steps of, if it is determined a first portion of said requested SM object is not stored at said one of said plurality of HSs:

forwarding said first request for said SM object from said one of said plurality of HSs to said content server; and

receiving at least said first portion of said requested SM object at said one of said plurality of HSs from said content server in response to said forwarded first request.

16. A method of reducing latency in a network having a content server which hosts streaming media (SM) objects which comprise a plurality of time-ordered segments for distribution over said network through a plurality of helpers (HSs) to a plurality of clients, said method comprising:

receiving a request for an SM object from one of said plurality of clients at one of said plurality of helper servers;

allocating a buffer at one of said plurality of HSs to cache at least a portion of said requested SM object;

downloading said portion of said requested SM object to said requesting client, while concurrently retrieving a remaining portion of said requested SM object from one of another HS and said content server; and

adjusting a data transfer rate at said one of said plurality of HSs for transferring data from said one of said plurality of helper servers to said one of said plurality of clients.

17. A network of interconnected helper servers (HSs), each of said interconnected helpers comprising

means for receiving and processing real-time streaming protocol (RTSP) requests from clients;

means for forwarding client requests to a content server;

means for streaming data to a plurality of clients using the real-time (RTP) protocol;

means for managing available memory in the form of a buffer pool, each buffer in said buffer pool being associated with an SM object identified by a uniform resource locator (URL);

means for mapping URLs identifying said objects received as a parameter along with an SM object request to local filenames;

means for managing the disk space allocated for caching by implementing a cache replacement policy;

means for recording data onto said cache and reading data from said cache; and

scheduler means for managing data producer, data consumer, and garbage collector events, wherein said data producer events are events which source at least a portion of said SM object to said one of said plurality of helper servers to be stored in one of said buffers in said buffer pool, said data consumer events are RTSP

requests from clients, and garbage collector events are events associated with removing a portion of said SM objects stored in said buffer pool to free the available memory.

* * * * *

CERTIFICATE OF SERVICE

I hereby certify that on this 16th day of September, 2021, I served the foregoing CORRECTED NONCONFIDENTIAL OPENING BRIEF OF APPELLANT SOUND VIEW INNOVATIONS, LLC on all counsel of record via electronic mail at:

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FORM 19. Certificate of Compliance with Type-Volume Limitations **Form 19**
July 2020

UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT

CERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME LIMITATIONS

Case Number: 2021-1998

Short Case Caption: Sound View Innovations, LLC v. Hulu, LLC

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Date: 09/16/2021

Signature: /s/ Frederick J. Ding

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FORM 31. Certificate of Confidential Material **Form 31**
July 2020

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

CERTIFICATE OF CONFIDENTIAL MATERIAL

Case Number: 2021-1998

Short Case Caption: Sound View Innovations, LLC v. Hulu, LLC

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Date: 09/16/2021

Signature: /s/ Frederick J. Ding

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