IN THE UNITED STATES DISTRICT COURT FOR THE
EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

SPORTSCASTR INC. (d/b/a PANDA INTERACTIVE), Plaintiff, v. SPORTRADAR GROUP AG, and SPORTRADAR AG, Defendants.	Case No. 2:23-cv-00472-JRG

DEFENDANTS' AMENDED P.R. 3-3 AND 3-4 INVALIDITY CONTENTIONS

Pursuant to local Patent Rules 3-3 and 3-4 and the First Amended Docket Control Order of November 8, 2024 (Dkt. 93), Defendants Sportradar Group AG and Sportradar AG (collectively "Defendants"), by and through their undersigned counsel, provide the following Amended Invalidity Contentions to Plaintiff Sportscastr Inc. (d/b/a PANDA Interactive) ("Plaintiff" or "PANDA") concerning U.S. Patent Nos. 10,805,687 (the "'687 Patent"); 10,425,697 (the "'697 Patent"); 11,039,218 (the "'218 Patent"); and 11,871,088 (the "'088 Patent") (collectively, the "Asserted Patents") in connection with the above-referenced action.

I. BACKGROUND INFORMATION, GENERAL INTRODUCTION, & RESERVATION OF RIGHTS.

A. Overview.

Defendants' Invalidity Contentions herein reflect Defendants' knowledge, thinking, and contentions as of this date of this document. Defendants reserve the right, to the extent permitted by the Court and the applicable statutes and rules, to modify and supplement, without prejudice, their Invalidity Contentions, whether in response to any amendment by Plaintiff of its

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Infringement Contentions (*e.g.*, providing information that it failed to provide in its Local Patent Rule 3-1 and 3-2 disclosures, amending its Local Patent Rule 3-1 or 3-2 disclosures in any way, and/or attempting to rely upon any information at trial, in a hearing or during a deposition which it failed to provide in its Local Patent Rule 3-1 and 3-2 disclosures), or otherwise becoming aware of additional prior art or other information. Additionally, Defendants reserve the right to modify their contentions should any of the claim limitations be construed by the Court. Defendants further reserve the right to amend these Invalidity Contentions consistent with Local Patent Rule 3-6.

Defendants provide the information below, as well as the accompanying production of documents, for the sole purpose of complying with P.R. 3-3 and P.R. 3-4. The information provided shall not be deemed an admission regarding the scope of any claims or the proper construction of those claims or any terms contained therein. Nothing contained in these Invalidity Contentions should be understood or deemed to be an express or implied admission or contention with respect to the proper construction of any terms in the asserted claim, or with respect to the alleged infringement of that claim.

Defendants reserve the right to rely on any prior art and invalidity contentions identified, produced, or otherwise discovered in any other cases asserting any of the patents-in-suit and/or related litigation, including, for example, *Sportscastr Inc. v. Genius Sports Ltd.*, Case No. 2:23-cv-471. Additionally, to the extent relevant to Defendants' Invalidity Contentions, Defendants hereby rely on and incorporate by reference, as if originally set forth herein, any invalidity contentions and associated prior art, claim charts, exhibits, analyses, references and other documents identified and/or filed by any other defendants in any other proceedings regarding the '687 Patent, '697 Patent, '218 Patent, and/or '088 Patent.

Defendants also incorporate by reference, as if fully and originally set forth herein, the complete file histories for the ’687 Patent, ’697 Patent, ’218 Patent, and ’088 Patent.

B. Ongoing Discovery.

Because discovery has only just begun, Defendants have not yet completed their search for and analysis of relevant prior art, nor has, to Defendants’ knowledge, Plaintiff produced all relevant prior art of which it is in possession of and/or aware, Defendants expressly reserve the right to revise, amend, and/or supplement the prior art, Invalidity Contentions, and information provided herein, including, but not limited to, identifying, charting, and relying on any additional prior art references, and additional invalidity defenses, should additional discovery, Plaintiff’s disclosures/discovery responses, and/or Defendants’ further investigation, searches, and analyses yield any additional information or prior art references -- consistent with this Court’s Orders, the Local Rules, the Federal Rules of Civil Procedure, and any leave that may be granted by the Court (if necessary).

Discovery is ongoing and, for example, Defendants’ prior art investigations and third-party discovery are not complete and discovery is not yet complete. Defendants expressly reserve the right to present additional invalidity theories, evidence, and prior art references under 35 U.S.C. §§ 102 and/or 103, located and/or discovered during the course of discovery or further investigation.

C. Claim Constructions.

To the extent that these Invalidity Contentions rely on or otherwise embody any particular constructions of terms, phrases, or limitations, in the asserted claims, Defendants are not proposing any such constructions as proper constructions of those terms or phrases. The Court has established separate deadlines for the parties' proposed claim constructions, and Defendants will timely provide proposed constructions in accordance with those deadlines.

Defendants expressly reserve the right to amend and revise their contentions concerning the invalidity of the asserted claims, which may vary and/or change depending upon the Court's construction of any of the claim terms and/or limitations, and/or testimony and/or positions that Plaintiff and/or fact or expert witness(es) may take or provide concerning the claims, claim terms/limitations, invalidity, and/or infringement. Defendants do not waive the right to contest any claim constructions or to take any positions during claim construction proceedings that may be inconsistent with the invalidity contentions herein. Consequently, Defendants also expressly reserve the right to amend or supplement these contentions based upon such additional proceedings, information, and developments of the case, including, but not limited to, discovery and/or the Court's claim constructions.

Further, these Invalidity Contentions including, but not limited to, the attached charts, may be based on certain claim constructions or assumptions that appear in part to comprise Plaintiff's infringement allegations, which Defendants do not adopt or in any way agree upon. Based upon the incompleteness, timing, and lack of any definitive claim constructions positions and/or rulings, Defendants do not concede and/or in any way admit that any of Plaintiff's apparent, presumed, and/or express constructions are proper, and have not waived and do not waive any arguments that Defendants have made or may make in support of their proposed claim constructions and/or in opposition to any claim constructions that Plaintiff has made or will make. Moreover, nothing herein admits in any manner any proposed claim constructions and/or that any accused product reads upon any claim limitation or element, and/or infringes any of the asserted claims. Indeed, Defendants' positions reflect, that under any analysis, including Plaintiff's flawed infringement allegations, the asserted claims are not infringed and, indeed, are invalid.

D. Plaintiff's Infringement Contentions

Plaintiff's apparent disclosures under P.R. 3-1 and 3-2 are deficient in numerous respects. For example, Plaintiff has failed to specifically identify where each element of each asserted claim is found within each specific Accused Instrumentality as required by P.R. 3-1. Because such deficiencies may lead to further grounds for invalidity, Defendants specifically reserve the right to modify, amend, or supplement their contentions as Plaintiff modifies, amends, or supplements its disclosures under P.R. 3-1, 3-2 and/or 3-6, and/or produces documents in discovery.

E. Rebuttal Evidence

Prior art not included in these Invalidity Contentions, whether known or not known to Defendants, may become relevant. In particular, Defendants are currently unaware of the extent, if any, to which Plaintiff will contend that limitations of the asserted claims are not disclosed in prior art identified herein. To the extent that such an issue arises, Defendants reserve the right to identify other references that disclose, teach, and/or render obvious the allegedly missing limitation(s).

F. Contextual Evidence

The claim charts attached hereto cite to particular teachings and disclosures of the prior art as applied to features of the asserted claims. However, persons having ordinary skill in the art at the time of the alleged invention(s) generally may view an item of prior art in the context of his or her experience and training, other publications, literature, products, and understanding. As such, the cited portions are only representative examples, and Defendants expressly reserve the right to rely on uncited portions of the prior art references and on other publications and expert testimony, for example: (1) as aids in understanding and interpreting the prior art, and cited portions, as providing context thereto; (2) as additional evidence that the prior art discloses

and/or renders obvious a claim limitation or the claimed subject matter as a whole; and (3) to establish bases for combinations of certain cited references that render the asserted claims obvious. The references discussed in the claim charts may disclose the elements of the asserted claims explicitly and/or inherently, and/or may be relied upon to show the state of the art in the relevant timeframe. The suggested obviousness combinations are provided in the alternative to any identified anticipation and single-reference obviousness contentions, and are not to be construed to suggest that any reference included in the combinations is not itself invalidating, anticipating, prior art.

Throughout the attached charts, Defendants provide representative examples of where prior art references disclose subject matter recited in the preamble; however, Defendants only do so without regard to whether the preamble is a limitation in or to any asserted claims. Defendants expressly reserve the right to argue that the preamble, and/or any portions thereof, are and/or are not limiting during the subsequent claim construction process in these actions. By including any prior art references that teach, suggest, or disclose, anything that may be in any such preamble, Defendants do not waive or in any way relinquish any rights or arguments that they may have.

In an effort to focus the issues at this preliminary stage of the actions, in the attached charts Defendants have identified only exemplary, non-exclusive portions of cited references, and reserve the right to rely on uncited portions of any of the identified prior art, and/or any additional prior art that Defendants may identify and/or that Plaintiff may disclose, to exhibit and establish the invalidity of the asserted claims. Moreover, Defendants reserve the right to rely on uncited portions of the identified prior art, other prior art, references that show the state of the art

(irrespective of whether such references themselves qualify as prior art), and/or expert testimony to provide context to or aid in understanding the cited portions of the identified prior art.

Where Defendants cite to a particular drawing or figure in the accompanying charts, the citation encompasses the description of the drawing or figure, as well as any text associated with the drawing or figure. Similarly, where Defendants cite to particular text concerning a drawing or figure, the citation encompasses that drawing or figure as well – but none of the foregoing shall in any way be limited by such drawings or figures.

Although certain prior art references are listed as evidence for particular prior art solutions, certain of those prior art references describe, relate to, and/or are evidence of multiple prior art solutions that render the asserted claims invalid. Defendants reserve the right to rely on any identified piece of prior art as evidence supporting any of those relevant prior art solutions. Defendants also reserve the right to rely on any identified piece of prior art individually to anticipate all or any of the asserted claims and/or to render obvious all or any of the asserted claims in view of the knowledge of one of ordinary skill in the art at the time of the claimed inventions or in combination with other references identified herein and/or which may be disclosed or discovered in the future.

Certain pieces of identified prior art inherently disclose features of the asserted claims; to the extent that inherency is not already expressly asserted in the attached charts, Defendants expressly reserve the right to rely on inherency to demonstrate the invalidity of the asserted claims. Moreover, as certain prior art references and solutions inherently disclose certain features and parameters of the asserted claims as construed by Plaintiff, Defendants may rely on cited or uncited portions of the prior art, other documents, and expert testimony to establish the

inherency of certain features and parameters of the prior art to exhibit that the asserted claims are invalid.

Defendants further expressly reserve the right to rely on any reference identified in these Invalidity Contentions or any other prior art or reference to establish that the prior art solutions and references set forth in the attached charts are enabled, or to explain the meaning of a term used in the solutions or in any reference.

To the extent that Plaintiff challenges any aspect of these Invalidity Contentions, including, without limitation and for example, whether a particular reference constitutes prior art or whether a combination of prior art references is properly combinable, Defendants expressly reserve the right to assert and/or supplement these Invalidity Contentions to address any such challenge. Defendants also expressly reserve the right to supplement these Invalidity Contentions based on information discovered and/or discovery taken or received – from Plaintiff, third parties, or any other sources – given that discovery in this case has only recently begun. These contentions and disclosures are also subject to correction for inadvertent errors or omissions, if any.

II. THE ASSERTED CLAIMS ARE NOT ENTITLED TO PRIORITY.

A "patent may only claim priority to an earlier application if the earlier application fulfils the requirements of § 112, first paragraph, which requires, in part, that the application 'shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same.'" *Chiron Corp. v. Genentech, Inc.*, 363 F.3d 1247, 1253 (Fed. Cir. 2004).

In its operative Infringement Contentions, Plaintiff alleges that the '687 Patent, '218 Patent, and '697 Patent "claim[] priority to provisional application No. 62/371,558, filed on

August 5, 2016" ("the '558 Application"), Dkt. 17, ¶¶ 46-48, and that the '088 Patent "claims priority to U.S. Provisional application No. 62/507,158 filed May 16, 2017" ("the '158 Application), Dkt. 17, ¶ 49. The '687 Patent, '218 Patent, and '697 Patent each also claim priority on their face to U.S. Provisional Patent Application Serial Nos. 62/435,361, filed Dec. 16, 2016 ("the '361 Application"); 62/485,878, filed Apr. 14, 2017 ("the '878 Application"); and 62/518,506, filed Jun. 12, 2017 ("the '506 Application"). The earliest non-provisional application to which the '687 Patent, '218 Patent, and '697 Patent claim priority is International Patent Application No. PCT/US2017/045801, filed Aug. 7, 2017 ("the '801 Application"). The '088 Patent also claims priority on its face to U.S. Provisional Patent Application Serial Nos. 62/542,729, filed Aug. 8, 2017 ("the '729 Application") and 62/627,859, filed Feb. 8, 2018 ("the '859 Application"). The earliest non-provisional application to which the '088 Patent claims priority is International Patent Application No. PCT/US2018/033016, filed May 16, 2018 ("the '016 Application").

As an initial matter, Plaintiff has not met its burden of demonstrating, for each limitation of the Asserted Claims, that the disclosures of any of the provisional applications satisfy the written description and enablement requirements of 35 U.S.C. § 112 with respect to the claimed subject matter. Accordingly, Defendants contend that no Asserted Claim of the '687 Patent, '218 Patent, and '697 Patent is entitled to a priority date any earlier than August 7, 2017 and no Asserted Claim of the '088 Patent is entitled to a priority date earlier than May 16, 2018.

Further, Defendants contend that the Asserted Claims are not entitled to claim priority to any of the Provisional Applications. For example, none of the provisional applications contain an enabling description of the claimed "socket server" or a written description sufficient to show that the inventors were in possession of a "socket server" having the functionality recited in at

least Claim 19 of the ’687 Patent, Claim 19 of the ’697 Patent, Claim 1 of the ’218 Patent, Claim 1 of the ’088 Patent, or claims dependent upon any of the foregoing. Similarly, none of the provisional applications provide support for a socket server having a “first event socket” or “at least one first event socket” or “at least one second event socket” (or a “first socket” performing the same role) as recited by Claim 19 of the ’687 Patent, Claim 19 of the ’697 Patent, Claim 1 of the ’218 Patent, Claim 1 of the ’088 Patent, or claims dependent upon any of the foregoing. The provisional applications also fail to support the transmission of certain information via channels “between” such event sockets and various configurations of viewer client devices as required by at least Claim 19 of the ’687 Patent, Claim 19 of the ’697 Patent, Claim 1 of the ’218 Patent, Claim 1 of the ’088 Patent, or claims dependent upon any of the foregoing. In sum, none of the earlier applications disclose any particular structure or describe any functionality regarding the operations of a socket server, event socket, or their equivalent. Therefore, the provisional applications fail to “reasonably convey[] to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date” and thereby do not provide priority to the filed applications. *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010). Defendants expressly reserve the right to supplement these contentions concerning priority, including based on information discovered and/or discovery taken or received – from Plaintiff, third parties, or any other sources – given that discovery in this case has only recently begun, and, in response to the Court’s claim construction rulings and in the event Plaintiff modifies, amends, or supplements its disclosures under P.R. 3-1, 3-2 and/or 3-6.

Moreover, as discussed in Section VI, *infra*, the disclosures of the ’801 Application and ’016 Application (the earliest non-provisional applications to which the Asserted Patents

allegedly claim priority) do not satisfy 35 U.S.C. § 112 with respect to one or more of the Asserted Claims, including with respect to the same subject matter described within this Section.

III. PATENT RULES 3.3(A), (B) – THE IDENTITY OF EACH ITEM OF PRIOR ART THAT ANTICIPATES AND/OR RENDERS OBVIOUS EACH ASSERTED CLAIM.

These Invalidity Contentions address the claims Plaintiff asserts in its September 30, 2024, First Amended Disclosure of Asserted Claims and Preliminary Infringement Contentions and accompanying charts. In those contentions, Plaintiff contends that Defendants infringe the following claims (the "Asserted Claims"):

- '687 Patent: Claims 1-30
- '697 Patent: Claims 1-30
- '218 Patent: Claims 1-30
- '088 Patent: Claims 1-34

As set forth below and in the accompanying charts (attached as Appendices A-D), each of the asserted claims is invalid on multiple bases under 35 U.S.C. §§ 101, 102, 103 and/or 112. The tables below, which are based on Defendants' current knowledge and understanding, identify prior art products and patents, publications, public uses, sales, and/or offers for sale that anticipate and/or render obvious each of the asserted claims. Each of the asserted claims is anticipated by and/or obvious in view of one or more of these references, alone or in combination.

The identified prior art is not exclusive, and Defendants reserve the right to rely upon these listed references, references produced pursuant to P.R. 3-4(b), as well as other art that may be discovered, become known and/or relevant during the course of these or related proceedings. Defendants reserve the right to rely on any prior art identified or produced to Plaintiff by any

other party in any proceeding including, but not limited to, the pending litigation with Genius Sports, and/or that Plaintiff is aware, learns of, or possesses and has not produced or disclosed. Defendants reserve the right to revise their disclosures, contentions, and/or claim charts to rely on any of these listed references, references produced pursuant to P.R. 3-4(b), and other art that may become known and/or relevant during the course of these or related proceedings, to further establish the invalidity of the asserted claims in a manner consistent with the Federal Rules of Civil Procedure, the Docket Control Order, the Patent Rules, and/or the rules or Orders of the Court.

U.S. Pat./Pub. No.	First Named Inventor	Issue/Publication Date
7,386,870	Lu	6/10/2008
7,458,093	Dukes	11/25/2008
8,595,186	Mandyam	11/26/2013
8.677,420	Cromarty	3/18/2014
8,880,719	Cooper	11/4/2014
8,850,053	Basso	9/30/2014
9,065,984	Arseneau	6/23/2015
9,100,461	Lemmons	8/4/2015
9,357,246	Wright	5/31/2016
9,393,485	Sullivan	7/19/2016
9,456,230	Bota	9/27/2016

U.S. Pat./Pub. No.	First Named Inventor	Issue/Publication Date
9,905,082	Dengler	2/27/2018
10,462,524	Barnett	10/29/2019
10,535,177	Cornell	1/14/2020
11,405,658	Masterson	8/2/2022
2004/0039788	Lim	2/26/2004
2006/0224761	Howarth	10/5/2006
2007/0033531	Marsh	2/8/2007
2007/0204321	Shen	8/30/2007
2009/0183215	McCartie	7/16/2009
2011/0247044	Jacoby	10/6/2011
2012/0011267	Ma	2/12/2012
2013/0086278	Schmidt	4/4/2013
2013/0194431	O'Connor	8/1/2013
2013/0198044	O'Connor	8/1/2013
2013/0198769	Bountour	8/1/2013
2013/0218942	Willis	8/22/2013
2013/0222597	Brink	8/29/2013

U.S. Pat./Pub. No.	First Named Inventor	Issue/Publication Date
2013/0311595	Milatinovici	11/21/2013
2014/0129680	Mukherjee	5/8/2014
2014/0229992	Ellis	8/14/2014
2015/0163379	Herzog	6/11/2015
2016/0006817	Mitic	1/7/2016
2016/0036910	Spivey	2/4/2016
2016/0037215	Cardona	2/4/2016
2016/0261927	Smolic	9/8/2016
2016/0294906	Levinson	10/6/2016
2016/0316262	Chen	10/27/2016
2016/0366464	Rouady	12/15/2016
2016/0381408	Triano	12/29/2016
2017/0041686	Park	2/9/2017
2018/0176621	Grubbs	6/21/2018
2018/0213266	Kwak	7/26/2018
2018/0367820	Abulikemu	12/20/2018
7,228,349	Barone	6/5/2007

U.S. Pat./Pub. No.	First Named Inventor	Issue/Publication Date
7,882,533	Alao	2/1/2011
8,010,986	Dakss	8/30/2011
8,214,429	Chidel	7/3/2012
8,555,313	Newman	10/8/2013
8,656,042	Glasser	2/18/2014
8,752,113	Good	6/10/2014
8,775,501	Chidel	7/8/2014
8,813,125	Reisman	8/19/2014
9,066,153	Pfeiffer	6/23/2015
9,143,565	Hensgen	9/22/2015
9,246,613	McKee	1/26/2016
9,246,965	Stoica	1/26/2016
9,350,780	Good	5/24/2016
9,973,785	Yang	5/15/2018
10,150,030	Perlman	12/11/2018
11,159,851	Stern	10/26/2021
11,418,845	Wong	8/16/2022

U.S. Pat./Pub. No.	First Named Inventor	Issue/Publication Date
2002/0145621	Nguyen	1/30/2002
2008/0052751	Cromarty	1/31/2005
2014/0108534	Good	4/17/2014
2014/0281007	Lemmons	9/18/2014
2014/0282677	Mantell	3/12/2014
2015/0127845	Phillips	5/7/2015
2017/0250882	Kellicker	2/29/2016
EP 3,063,945	Forsman	8/29/2018
CA 2,304,286	Wilkins	10/7/2001

In addition to the patents and publications identified above, Defendants further identify the following products, standards, systems, and/or services that, based upon Defendants' current understanding and investigations, were disclosed, published, publicly used, sold, and/or offered for sale, prior to the priority dates of the Asserted Patents and anticipate and/or render obvious each and all of the asserted claims:

- 10Bet
- 360 Betting Mobile
- Apple HTTP Live Streaming
- BAMTech
- Betstream
- Create:Share
- Deltatre
- Facebook Live
- Justin.tv
- Kaazing

- Livestream
- Meerkat
- MLB At Bat
- Musical.ly
- NHL GameCentre Live
- OneTwoSee
- Periscope
- RTP
- Sportradar Scout Client
- Sportradar Live Channel Retail
- Sportradar Live Channel Online
- Twitch
- UDP
- uStream
- Vimeo
- WatchESPN Live Toolbar
- WebRTC
- WebSocket
- Wowza
- YouTube Live

Defendants also state that many elements and limitations of the Asserted Claims merely describe and/or recite elements or limitations that were and would have been well-known to a POSITA prior to the alleged invention of the Asserted Patents. By way of example, it was well known to a POSITA prior to any of the alleged inventions how to stream or broadcast live media of an event (including a sporting event) to multiple users over the Internet and to provide related data to multiple subscribers at substantially the same time, including, but not limited to, through the use of well-known networking and streaming standards such as, for example, HTTP, TCP/IP, UDP, RTP, WebRTC, RTMP, SCTP, WebSockets, DASH, HLS, and/or IP multicast. Furthermore, as another example, the use of content delivery networks (CDN) to distribute information to multiple users over the Internet was well known to a POSITA at the time of the alleged invention(s). The scope of the prior art (including the above-mentioned products, standards, systems, and/or services) are demonstrated by at least, among others, the following

prior art and Defendants may rely upon any of the documents and references below to demonstrate that each of the Asserted claims were anticipated and/or obvious to a POSITA at the time of the alleged invention(s):

Prior Art Publications, Public Uses, Sales, and/or Offers for Sale	At least by
5 Reasons Why Periscope Is Winning The Live-Streaming Battle, SETUP (Apr. 14, 2015), setup.us/blog/2015/4/14/5-reasons-why-periscope-is-winning-the-live-streaming-battle	April 14, 2015
Adrien Danjou, How is the Sporting World Using Periscope Nowadays?, SNACK MEDIA (Apr. 2016), https://www.snack-media.com/2016/04/how-is-the-sporting-world-using-periscope-nowadays/	April 6, 2016
Andrew S. Tanenbaum & David J. Wetherall, COMPUTER NETWORKS (5th Ed. 2011)	2011
Andy Harris, HTML5 AND CSS3 ALL-IN-ONE FOR DUMMIES (3d Ed. 2014)	2014
APPLE INC. HTTP LIVE STREAMING OVERVIEW (2016)	2016
APPLE INC. TIMED METADATA FOR HTTP LIVE STREAMING (2011)	2011
Arjen Veenhuizen & Ray van Brandenburg, Frame accurate media synchronization of heterogeneous media sources in an HBB context, MEDIA SYNCHRONIZATION WORKSHOP (2012)	2012
Betgenius Acquire Boolabus, BOOLABUS BLOG (Sept. 9, 2011), https://web.archive.org/web/20150504045439/http://www.boolabus.com:80/blog/	Sept. 9, 2011
BETRADAR, 2011/2012 Product Brochure (2011)	2011
BETRADAR, Betradar - Feature Update: Bowls now available on Live Odds & Live Scouting services (Oct. 2014)	Oct. 2014
BETRADAR, Betradar – Feature Update: Snooker now available on Live Scout service (Dec. 2013)	Dec. 2013
BETRADAR, Betradar Help (Oct. 2012)	Oct. 2012
BETRADAR, Bowls Scout Client Specification (SRAD_00009616)	2014

Prior Art Publications, Public Uses, Sales, and/or Offers for Sale	At least by
BETRADAR, Snooker Scout Client (2013) (SRAD_00011037, SRAD_00009671, SRAD_00009686, SRAD_00010905, SRAD_00011061, SRAD_00011062, SRAD_00011088)	2013
Betstream Product Review in August Edition of "Egaming Review," BOOLABUS BLOG (Oct. 23, 2015), https://web.archive.org/web/20151023032626/http://www.boolabus.com/2010/09/betstream-product-review-in-august-edition-of-egaming-review/	Sept. 11, 2010
BOOM. More Transcode Servers., TWITCH BLOG (July 8, 2015), https://blog.twitch.tv/en/2015/07/08/boom-more-transcode-servers-427bcbfb519/	July 8, 2015
Brian Petrocelli, Attention Broadcasters: Channel Feed Beta is Now Available, TWITCH BLOG (Mar. 28, 2016), https://blog.twitch.tv/en/2016/03/28/attention-broadcasters-channel-feed-beta-is-now-available-28f7c3dff995/	Mar. 28, 2016
Brian Petrocelli, Channel Feed: Now with Comments!, TWITCH BLOG (July 11, 2016), https://blog.twitch.tv/en/2016/07/11/channel-feed-now-with-comments-b7a0bc18e806/	July 11, 2016
Building a Better Twitch – Updating to HTTPS, TWITCH BLOG (Mar. 9, 2016), https://blog.twitch.tv/en/2016/03/09/building-a-better-twitch-updating-to-https-cf06c7a02c3a/	Mar. 9, 2016
Carlos R. Morales et al., Development of a Multi-Platform High Performance Computing Streaming Video Distribution Cluster, AM. SOC'Y FOR ENG'G EDUC. (2013)	2013
Cong Zhang & Jiangchuan Liu, On Crowdsourced Interactive Live Streaming: A Twitch.TVBased Measurement Study, 25TH ACM WORKSHOP ON NETWORK AND OPERATING SYS. SUPPORT FOR DIGITAL AUDIO & VIDEO 55 (2015)	2015
David Carr, Amazon Bets on Content in Deal for Twitch, N.Y. TIMES (Aug. 31, 2014), https://www.nytimes.com/2014/09/01/business/media/amazons-bet-on-content-in-a-hub-for-gamers.html	Aug. 31, 2014
David Pierce, Twitter's Periscope App Lets You Livestream Your World, WIRED (Mar. 26, 2015), https://www.wired.com/2015/03/periscope/	Mar. 26, 2015

Prior Art Publications, Public Uses, Sales, and/or Offers for Sale	At least by
Douglas Soo, Twitch Engineering: An Introduction and Overview, TWITCH ENG'G (Jan. 19, 2016)	Jan. 19, 2016
Embed Scoreboard User Guide, LIVE SCORE APP, https://web.archive.org/web/20150926085347/http://www.live-score-app.com:80/userguide/embed-scoreboard	Sept. 26, 2015
Fidji Simo, Introducing New Ways to Create, Share and Discover Live Video on Facebook, FACEBOOK WATCH (Dec. 8, 2016)	Dec. 8, 2016
From NHL GameCenter to NHL.TV: A Look at MLBAM's Relaunch of NHL Digital Properties, SPORTS BUS. J. (Feb. 26, 2016), https://www.sportsbusinessjournal.com/Daily/Issues/2016/02/26/Technology/from-nhl-gamecenter-to-nhl-tv-a-look-at-mlbams-relaunch-of-nhl-digital-properties.aspx	Feb. 26, 2016
Hisayuki Ohmata et al., Hybridcast: A New Media Experience by Integration of broadcasting and Broadband, ITU KALEIDOSCOPE (2013)	2013
How Does Twitch Keep a Persistent Video Window over Several Pages, STACK OVERFLOW, https://stackoverflow.com/questions/41286748/how-does-twitch-keep-a-persistent-videowindow-over-several-pages	Dec. 22, 2016
How Facebook Live Streams to 800,000 Simultaneous Viewers, HIGH SCALABILITY (June 27, 2016), https://highscalability.com/how-facebook-live-streams-to-800000-simultaneous-viewers/	June 27, 2016
How to Create a WebSocket Server, WOWZA BLOG (June 23, 2016), https://web.archive.org/web/20170926004104/https://www.wowza.com/docs/how-to-create-a-websocket-server	June 23, 2016
How to Stream to Facebook Live, TELESTREAM, https://www.telestream.net/telestream-support/wire-cast/how-to-stream-to-facebook-live.htm	August 2015
HTML5 Chat is Live!, TWITCH BLOG (June 30, 2015), https://blog.twitch.tv/en/2015/06/30/html5-chat-is-live-345782edded0/	June 30, 2015
Ian Sherr, Videogames Become a Spectator Sport, WALL ST. J. (Nov. 24, 2013), http://online.wsj.com/article/SB10001424052702304607104579210140721840928.html	Nov. 24, 2013
Ida-Maria Tunturipuro, Building a Low-Cost Streaming System, May	May 14, 2015

Prior Art Publications, Public Uses, Sales, and/or Offers for Sale	At least by
14, 2015, Bachelor's Thesis, Helsinki Metropolia University of Applied Science	
Jake Smith, Facebook Rolls Out Live Video Streaming to All iPhone Users Across US, ZDNET (Jan. 28, 2016), https://web.archive.org/web/20160129091001/http://www.zdnet.com/article/facebook-rolls-out-live-streaming-to-all-iphone-users-across-us/	Jan. 28, 2016
James Cook, Twitch Founder: We Turned A 'Terrible Idea' into a Billion-Dollar Company, BUS. INSIDER (Oct. 20, 2014)	Oct. 20, 2014
James Trew, MLB At Bat 2012 App Update Brings New Stats Overlay, Ford SYNC integration and more, ENGADGET (Sept. 3, 2012), https://www.engadget.com/2012-09-03-mlb-at-bat-2012-app-update-brings-new-stats-overlay.html	Sept. 3, 2012
Jan Ozer, Ustream, Justin.tv, Livestream, and Bambuser: Streaming Unplugged, STREAMING MEDIA (June 6, 2012), https://web.archive.org/web/20120608121331/http://www.streamingmedia.com/Articles/Editorial/Featured-Articles/Ustream-Justin.tv-Livestream-and-Bambuser-Streaming-Unplugged-83016.aspx	June 6, 2012
Jan Ozer, Ustream Review: Strong Customization, but a Weak Embedded Player, STREAMING MEDIA (Feb. 24, 2012), https://web.archive.org/web/20131102125058/http://www.streamingmedia.com/Articles/Editorial/Featured-Articles/Ustream-Review-Strong-Customization-but-a-Weak-Embedded-Player-80899.aspx	Feb. 24, 2012
Jason Cipriani, How to Start a Facebook Live Video, CNET (July 8, 2016), https://www.cnet.com/tech/services-and-software/how-to-use-facebooks-live-video-feature/	July 8, 2016
Jason Maestas, Top Games for July 2015 – Rocket League Edition, TWITCH BLOG (Aug. 10, 2015), https://blog.twitch.tv/en/2015/08/10/top-games-for-july-2015-rocket-league-editionf278d248475a/	Aug. 10, 2015
Jeff Baumgartner, Comcast's X1 Blends Sports with Interactivity, MULTICHANNEL NEWS (June 29, 2015), https://www.nexttv.com/news/comcast-s-x1-blends-sports-interactivity-391773	June 29 2015
Jie Deng et al., Behind the Game: Exploring the Twitch Streaming Platform, IEEE 14TH INT'L WORKSHOP ON NETWORK AND SYS. SUPPORT FOR GAMES (2015)	2015

Prior Art Publications, Public Uses, Sales, and/or Offers for Sale	At least by
Jillian D'Onfro, Facebook just proved how serious it is about live video with a huge product update, BUS. INSIDER (Apr. 6, 2016), https://www.businessinsider.com/facebook-live-video-update-2016-4	Apr. 6, 2016
John C. Tang et al., Meerkat and Periscope: I Stream, You Stream, Apps Stream for Live Streams, 4770 CHI (2016)	2016
John Constine, Facebook Launches "Live" Streaming Video Feature, But Only for Celebrities, TECHCRUNCH (Aug. 5, 2015), https://techcrunch.com/2015/08/05/facescope/	Aug. 5, 2015
Jordan Golson, MLB At Bat Goes Live for 2012 with Improved Pricing Scheme, MACRUMORS (Feb. 29, 2012), https://web.archive.org/web/20120302182806/http://www.macrumors.com: 80/2012/02/29/mlb-at-bat-goes-live-for-2012-with-improved-pricing-scheme	Feb. 29, 2012
Jordan Golson, MLB At Bat Updated for the 2013 Season, Local Game Video Still Blacked Out, MACRUMORS (Feb. 21, 2013), https://web.archive.org/web/20130225104539/http://www.macrumors.com:80/2013/02/21/mlb-at-bat-updated-for-the-2013-season-local-game-video-still-blacked-out/	Feb. 21, 2013
Joshua Carroll, How to Live Stream a Sporting Event, INSTRUCTABLES, http://www.instructables.com/id/How-to-live-stream-a-sporting-event-using-equipmen/	2016
Julia Greenberg, Zuckerberg Really Wants You to Stream Live Video on Facebook, WIRED (Apr. 6, 2016), https://www.wired.com/2016/04/facebook-really-really-wants-broadcast-watch-live-video/	Apr. 6, 2016
Julianna Reyes, How OneTwoSee's Baseball App is Getting in front of Millions of Comcast Subscribers, TECHNICAL.LY (June 30, 2015), https://technical.ly/startups/comcast-mlb-baseball-onetwosee/	June 30, 2015
Justin.tv's Live Video Broadcasting Architecture, HIGH SCALABILITY (Mar. 16, 2010), https://highscalability.com/justintvs-live-video-broadcasting-architecture/	Mar. 16, 2010
Kaazing WebSocket Gateway: Detailed Technical Overview (June 2010)	June 2010
Karine Pires & Gwendal Simon, YouTube Live and Twitch: A Tour of User-Generated Live Streaming Systems, 225 MMSYS (2015)	2015

Prior Art Publications, Public Uses, Sales, and/or Offers for Sale	At least by
Kate Abrosimova, What Technology Powers Periscope's Live Video Stream?, MEDIUM (June 6, 2016), https://medium.com/yalantis-mobile/what-technology-powers-periscopes-live-video-stream-1de663a13ebd	June 6, 2016
Katie Collins, Periscope CEO: 'our app is just not very good at piracy,' WIRED (July 3, 2015), https://web.archive.org/web/20160807230614/http://www.wired.co.uk:80/article/periscope-ceo-kayvon-beykpour-wimbledon-game-of-thrones	July 3, 2015
Kinji Matsumura et al., Personalization of Broadcast Programs using Synchronized Internet Content, ICCE (2010)	2010
Lexsan, Twitch and Youtube Settings Guide, XENFORO (Mar. 5, 2015)	Mar. 5, 2015
Live Betting in 2009? Just a Warm up for 2010, BOOLABUS BLOG (Jan. 2, 2010), https://web.archive.org/web/20100414002141/http://www.boolabus.com:80/2010/01/live-betting-in-2009-just-a-warm-up-for-2010/	Jan. 2, 2010
Livestream Platform Tech Specs, https://web.archive.org/web/20150426170547/http://livestream.com:80/platform/tech-specs	Apr. 26, 2015
LIVESTREAM, LIVESTREAM BROADCASTER PRO USER MANUAL (2015)	June 24, 2015
LIVESTREAM, NEW LIVESTREAM	Aug. 5, 2016
LIVESTREAM, STUDIO LIVE PRODUCTION SWITCHER USER MANUAL FOR LIVESTREAM STUDIO VERSION 1.1	Aug. 5, 2016
LIVESTREAM, STUDIO SURFACE USER MANUAL (2015)	Jan. 23, 2015
Lourdes Beloqui Yuste & Hugh Melvin, Client-side Multisource Media Streams Multiplexing for HbbTV, 2ND INT'L CONF. ON CONSUMER ELECS. (1012)	2012
Lourdes Beloqui Yuste & Hugh Melvin, Enhanced IPTV Services Through Time Synchronisation, 14TH INT'L SYMP. ON CONSUMER ELECS. (2010)	2010
Lourdes Beloqui Yuste et al., Effective Synchronisation of Hybrid Broadcast and Broadband TV, INT'L CONF. ON CONSUMER ELECS. (2012)	2012

Prior Art Publications, Public Uses, Sales, and/or Offers for Sale	At least by
M. Michalko et al., Building Video Streaming Platform for Educational Content Delivery, 331 ICETA (2014)	2014
Mari Smith, Facebook Live: What Marketers Need to Know, SOC. MEDIA EXAM'R (Jan. 4, 2016), https://www.socialmediaexaminer.com/facebook-live-what-marketers-need-to-know/	Jan. 4, 2016
Mario Marques Da Silva, MULTIMEDIA COMMUNICATIONS AND NETWORKING (2012)	2012
Mark Newman, MLB.com At Bat launches into Spring, MLB (Feb. 25, 2014), https://www.mlb.com/news/mlbcom-at-bat-launches-into-spring/c-68295956	Feb. 25, 2014
MARKETLINE, BETGENIUS ACQUIRES BOOLABUS (2011)	Sept. 9, 2011
Maury Brown, MLB Approves New Digital Media Company Spin-Off That Will Create Billions In New Revenues, FORBES (Aug. 13, 2015), https://www.forbes.com/sites/maurybrown/2015/08/13/mlb-approves-new-digital-media-company-spin-off-that-will-create-billions-in-new-revenues/	Aug. 13, 2015
Matthew Prince, CloudFlare Now Supports WebSockets, CLOUDFLARE BLOG (Aug. 5, 2014), https://blog.cloudflare.com/cloudflare-now-supports-websockets/	Aug. 5, 2014
Miroslav Michalko et al., Protected Streaming of Video Content to Mobile Devices, JSAT 1 (2014)	2014
MLB At Bat for iOS brings Live Overlay of Gameday Data onto TV Broadcasts and More, NEXT WEB (Aug. 31, 2012), https://thenextweb.com/news/mlb-at-bat-ios-updates-ford-sync-integration-social-sharing-highlight-videos	Aug. 31, 2012
Nick Wingfield, In E-Sports, Video Gamers Draw Real Crowds and Big Money, N.Y. TIMES (Aug. 30, 2014), https://www.nytimes.com/2014/08/31/technology/esports-explosion-brings-opportunity-riches-for-video-gamers.html	Aug. 30, 2014
Nick Wingfield, Julia Child Marathon to Stream on Twitch as Gaming Site Widens Focus, N.Y. TIMES (Mar. 15, 2016), https://www.nytimes.com/2016/03/16/technology/julia-child-marathon-to-stream-on-twitch-in-bet-on-prerecorded-content.html	Mar. 15, 2016

Prior Art Publications, Public Uses, Sales, and/or Offers for Sale	At least by
Nick Wingfield, What's Twitch? Gamers Know, and Amazon Is Spending $1 Billion on It, N.Y. TIMES (Aug. 25, 2014), https://www.nytimes.com/2014/08/26/technology/amazon-nears-a-deal-for-twitch.html	Aug. 25, 2014
Noreen T.M., HTML5 Video Player Beta Begins Today, TWITCH BLOG (July 14, 2016), https://blog.twitch.tv/en/2016/07/14/html5-video-player-beta-begins-today-135d1b7baa65/	July 14, 2016
Omar Bladonado & Paul Saab, Networking @Scale, May 2016 – Recap, ENG'G META (May 24, 2016), https://engineering.fb.com/2016/05/24/networking-traffic/networking-scale-may-2016-recap/	May 24, 2016
OneTwoSee Provides Licensed, White-labeled Products that Help Some of the Biggest Names in Sports Engage and Monetize Their Audiences Through any Screen, ONETWOSEE (July 6, 2016), https://web.archive.org/web/20160706140110/http://onetwosee.com:80/	July 6, 2016
Periscope Versus Meerkat, BUS. INSIDER (Mar. 2015), https://web.archive.org/web/20150328235030/http://www.businessinsider.com:80/periscope-versus-meerkat-2015-3	Mar. 26, 2015
Peter Stewart, THE PERISCOPE BIBLE (2015)	Nov. 2015
Preston Smalley, Comcast Bolsters Sports Technology Team with Acquisition of OneTwoSee, COMCAST VOICES, https://web.archive.org/web/20160310025618/http://corporate.comcast.com/comcast-voices/comcast-bolsters-sports-technology-team-with-acquisition-of-onetwosee	Mar. 10, 2016
Preston Smalley, Watch a Game Like Never Before with New Baseball Extras for the X1 Platform, COMCAST VOICES, https://web.archive.org/web/20150630175059/http://corporate.comcast.com:80/comcast-voices/watch-a-game-like-never-before-with-new-baseball-extras-for-the-x1-platform	June 30, 2015
Real-Time Second Screen Connectivity, Kaazing, https://web.archive.org/web/20130815224633/http://www.kaazing.com/solutions/real-time-second-screen-connectivity/	Aug. 15, 2013
Rhys Hiltner, Go's March to Low-latency GC, TWITCH BLOG (July 5, 2016), https://blog.twitch.tv/en/2016/07/05/gos-march-to-low-latency-gc-a6fa96f06eb7/	July 5, 2016

Prior Art Publications, Public Uses, Sales, and/or Offers for Sale	At least by
Rich McCormick, Periscope Users Can Now Save Their Live-streamed Broadcasts Forever, TECHCRUNCH (May 5, 2016), https://www.theverge.com/2016/5/5/11595244/how-to-saveperiscopes-live-streams	May 5, 2016
Richard Clark, Whitepaper: Real-Time Data, KAAZING (2014)	2014
Richard Nieva, Facebook Live-streaming Brings the Love and the Wow, with a Side of Sepia, CNET (Apr. 6, 2016), https://www.cnet.com/tech/mobile/facebook-live-streaming-tool-adds-filters-and-reactions/	Apr. 6, 2016
Rip Empson, Baseball's Digital Trifecta and How America's Pastime is Setting the Pace for Sports Online, TECHCRUNCH (Nov. 4, 2013), https://web.archive.org/web/20131110013907/http://techcrunch.com:80/2013/11/04/baseballs-digital-trifecta-and-how-americas-pastime-is-setting-the-pace-for-sports-online/	Nov. 4, 2013
Rob Manson, GETTING STARTED WITH WEBRTC (2013)	2013
Salvatore Loreto & Simon Pietro Romano, REAL-TIME COMMUNICATION WITH WEBRTC (2014)	2014
Schulzrinne et al., RTP: A TRANSPORT PROTOCOL FOR REAL-TIME APPLICATIONS (2003)	2003
Second Screen App, KAAZING, https://web.archive.org/web/20130818005342/http://developer.kaazing.com/portfolio/second-screen-application/	Aug. 18, 2013
Second Screen App, KAAZING, https://web.archive.org/web/20130914172647/http://developer.kaazing.com:80/portfolio/second-screen-application	Sept. 14, 2013
Shalini Kurian, High Performing Native Chat on Twitch, TWITCH BLOG (July 15, 2016), https://blog.twitch.tv/en/2016/07/15/high-performing-native-chat-on-twitch-79c1492eca06/	July 15, 2016
Skybet Go Live with the Betstream Advanced Football Module, BOOLABUS BLOG (Oct. 12, 2015), https://web.archive.org/web/20151023032850/http://www.boolabus.com/2010/10/skybet-live-football/	Oct. 12, 2015
Socket.IO Broadcasting events, SOCKET.IO, https://socket.io/docs/v4/broadcasting-events/	Apr. 1, 2015

Prior Art Publications, Public Uses, Sales, and/or Offers for Sale	At least by
Socket.IO Docs, SOCKET.IO https://web.archive.org/web/20150401041027/http:/socket.io/docs	Apr. 1, 2015
Socket.IO Documentation, SOCKET.IO, https://socket.io/docs/v4/	Apr. 1, 2015
Socket.IO on PubNub, PUBNUB https://web.archive.org/web/20150924221323mp_/http:/www.pubnub.com/socket.io	Sept. 24, 2015
Sportingbet in:play, BOOLABUS BLOG (Apr. 5, 2010), https://web.archive.org/web/20151023063447/http://www.boolabus.com/2010/04/sportingbet-inplay/	Apr. 5, 2010
Steve Kovach, Stream Live Baseball Games to Your iPad with MLB At Bat, BUS. INSIDER (Mar. 31, 2011), https://www.businessinsider.com/stream-live-baseball-games-with-mlb-at-bat-2011-3	Mar. 31, 2011
Streaming Engine Documentation, WOWZA MEDIA SYS., https://web.archive.org/web/20150311225020/http://www.wowza.com:80/products/streaming-engine/documentation	Mar. 11, 2015
The Backbone of Periscope: Wowza Streaming Engine, WOWZA BLOG (Nov. 17, 2015), https://web.archive.org/web/20170314164317/https://www.wowza.com/blog/the-backbone-of-periscope-wowza-streaming-engine	Nov. 17, 2015
The Beginner's Guide to Periscope for Bloggers, FABULOUS BLOGGING, https://www.fabulousblogging.com/2015/08/the-beginners-guide-to-periscope-for-bloggers/	August 2015
Twitch API Overview, TWITCH DEV (2017), https://web.archive.org/web/20170325170124/https://dev.twitch.tv/docs	Mar. 25, 2017
Twitch Engineering: An Introduction and Overview, TWITCH BLOG (Dec. 18, 2015), https://blog.twitch.tv/en/2015/12/18/twitch-engineering-an-introduction-and-overviewa23917b71a25/	Dec. 18, 2015
Twitch iOS 9 Multitasking Support Is Here!, TWITCH BLOG (Oct. 14, 2015), https://blog.twitch.tv/en/2015/10/14/twitch-ios-9-multitasking-support-is-herea6364debed5f/	Oct. 14, 2015
Twitch Live Annotations FAQ, TWITCH BLOG (July 1, 2014), https://blog.twitch.tv/en/2014/07/01/twitch-live-annotations-faq-	July 1, 2014

Prior Art Publications, Public Uses, Sales, and/or Offers for Sale	At least by
6db54fadeede/	
Update: Chat Replay is Now Live!, TWITCH BLOG (Mar. 2, 2016), https://blog.twitch.tv/en/2016/03/02/update-chat-replay-is-now-live-aac0b82305b6/	Mar. 2, 2016
Vanessa Wang et al., THE DEFINITIVE GUIDE TO HTML5 WEBSOCKET (2013)	2013
Watch and Chat in Full Screen with Theater Mode, TWITCH BLOG (Dec. 16, 2014), https://blog.twitch.tv/en/2014/12/16/watch-and-chat-in-full-screen-with-theater-mode-321238b7bd38/	Dec. 16, 2014
WEBRTC, TUTORIALS POINT (2015)	2015
WOWZA MEDIA SYSTEMS, TECH-GUIDE: BUILDING A LIVE MOBILE STREAMING APP (2016)	2016
WOWZA MEDIA SYSTEMS, THE HISTORY OF STREAMING	Aug. 5, 2016
WOWZA MEDIA SYSTEMS, WOWZA STREAMING ENGINE OVERVIEW (Feb. 2014)	Feb. 2014
WOWZA MEDIA SYSTEMS, WOWZA STREAMING ENGINE USER'S GUIDE 4.0 (2007–2014)	2014
WOWZA MEDIA SYSTEMS, WOWZA STREAMING ENGINE USER'S GUIDE 4.1 (2006–2015)	2015
WOWZA MEDIA SYSTEMS, WOWZA STREAMING ENGINE USER'S GUIDE 4.7.5 (2007–2018)	Aug. 5, 2016
Yoree Koh & Evelyn M. Rusli, Twitter Acquires Live-Video Streaming Startup Periscope, WALL ST. J. (Mar. 9, 2015), http://www.wsj.com/articles/twitter-acquires-live-video-streaming-startup-periscope-1425938498	Mar. 9, 2015
Roger Pantos & William May, HTTP Live Streaming v.19 (April 4, 2016), https://datatracker.ietf.org/doc/draft-pantos-http-live-streaming/19/	April 4, 2016
H. Parmer & M. Thornburgh, Adobe's Real Time Messaging Protocol (Dec. 21, 2012)	Dec. 21, 2012
L. Lancerica et al., MITv – A Solution for an Interactive TV Based on IP Multicast over Satellite, 2004 IEEE INT'L CONF. ON MULTIMEDIA	June 30, 2004

Prior Art Publications, Public Uses, Sales, and/or Offers for Sale	At least by
AND EXPO (ICME) (June 27-30, 2004), https://ieeexplore.ieee.org/document/1394696	
OpenTV – iTV Applications (June 25, 2003), https://web.archive.org/web/20030625115746/http://www.opentv.com/solutions/applications/sports/soccer.html	June 25, 2003
U. Rauschenbach, A Scalable Interactive TV Service Supporting Synchronized Delivery over Broadcast and Broadband Networks, IBC CONF. 2004 (Sep. 2004), https://www.rauschenbach.net/Publications/docs/paper-IBC04-SAVANT-rauschenbach_et_al.pdf	Sep. 2004

Plaintiff's Infringement Contentions currently identify and accuse the following products of infringement: emBet, Live Channel Trading (LCT), Live Channel Online, Live Channel Promotion, Live Channel Retail, Live Channel Retail Flex, Live Data Client, Mixed Reality Streams, and Sportradar OTT. A number of the products Plaintiff accuses of infringement were made, used, offered for sale, published, and/or sold in the United States prior to the priority dates, as well as the claimed priority dates, of the Asserted Patents (for example, at least Live Channel Online, Live Channel Retail, and Live Data Client). Accordingly, based upon Plaintiff's allegations (regardless of Defendants' non-infringement arguments, positions, and defenses), each of the Asserted Patents and claims are invalid as anticipated and/or obvious in view of Plaintiff's own contentions as, at least, Live Channel Online, Live Channel Retail, and Live Data Client, were known, made, used, offered for sale, published, and/or sold prior to any alleged priority dates of any of the Asserted Patents. *See, e.g., Bristol-Myers Squibb Co. v. Ben Venue Lab'ys, Inc.*, 246 F.3d 1368, 1378 (Fed. Cir. 2001) ("[I]t is axiomatic that that which would literally infringe if later anticipates if earlier.").

Discovery is ongoing and, for example, Defendants' prior art investigations and third-party discovery are not complete and discovery is not yet complete. Accordingly, Defendants

expressly reserve the right to present additional invalidity theories, evidence, contentions, and prior art references under 35 U.S.C. §§ 102 and/or 103, located and/or discovered during the course of discovery or further investigation.

IV. PATENT RULE 3.3(B) – EXEMPLARY REASONS, MOTIVATIONS, AND BASES FOR PRIOR ART COMBINATIONS.

Each of the asserted claims of the Asserted Patents is anticipated by and/or obvious in view of one or more of the references or items listed above, alone or in combination. In general, it would have been obvious to one of ordinary skill in the art at the time of the alleged invention(s) to combine the teachings of one or more of these references or items with one or more of the other references or items listed in order to arrive at the claimed invention. Motivation to combine the teachings of any two or more of the references or items in the tables above comes generally from the fact that all of the references or items teach and/or are directed to the same technical subject matter. Each reference or item describes systems and/or methods for streaming video and/or information or data about an event or media to one or more users, including video and/or data relating to live events such as sporting events with the aims of reducing latency, increasing efficiency, and minimizing delay. Each of the references or items is directed to solving the same or similar problems that the Asserted Patents claim to have solved, namely, providing video and/or event data to multiple users over the Internet quickly and at scale. A POSITA at the time of the alleged invention(s) would have been motivated by such obvious considerations of delivering such information, as well as efficiency, reduced latency, and scalability, to combine the various teachings to arrive at the claimed alleged invention. Stated differently, the references and items in the tables above (as well as the attached Charts) demonstrate that there was, at the time of the alleged invention, a well-known desire and ability to provide video and/or event data to multiple users over the Internet rapidly and efficiently and

there were predictable solutions known to POSITA at the time of the alleged invention making the claimed invention(s) obvious.

A POSITA at the time would have understood and recognized the alleged claimed problem, appreciated and known to look to the identified prior art, and understood and appreciated that he/she could combine the elements in the manner claimed and would have been motivated to modify the reference or item by, for example, at least one of: (1) the application of known methods to yield predictable results; (2) a simple substitution of one known element for another to obtain predictable results; (3) the application of a known technique to a known method ready for improvement to yield predictable results; (4) choosing a finite number of identified, predictable solutions (i.e., obvious to try); or (5) the combination of results from known work prompting a variation of it based on design incentives or other market forces, where the variations would have been predictable to a POSITA. This includes, for example, at least one trend in the prior art at the time that he or she could have followed toward the systems and methods claimed by the patentee in the asserted patents. For example, the trend in the video and data streaming industry at the time of the alleged invention(s) toward using multiple communication channels to communicate different media (including, for example, video live streams and/or event-related data), using socket-based connections to transfer data and other information quickly and efficiently, and pairing relevant event information (or interactive elements) with live video streams, were known and ascertainable by a POSITA from at least one of the cited prior art systems and references as well as a person of ordinary skill in the vast knowledge of prior art systems. For example, a person of ordinary skill in the art of video and data streaming at the time knew and would have had knowledge of current video and data

streaming systems, server, socket server, and webserver systems, and methods and systems for video and data transmission.

A POSITA would also have had knowledge that: (1) at least one cited prior art system, reference, or component or teaching thereof, was of special importance in the field; (2) knowledge that using different communication channels for live video streaming and the provision of data related to the event being live-streamed was known and desirable; (3) the design and functionality of a prior art reference, specifically the functionalities associated with providing both live video streaming and data related to the event being live-streamed; (4) knowledge regarding the use of multiple communication channels in the video and data streaming fields and in other related fields; and/or (5) alternatively, it should be inferred that the modification was so obvious to a person having ordinary skill in the art that the author or developer of the prior art reference or system did not see a need to discuss combining multiple systems.

Specific examples of anticipation and obviousness, along with the motivation to combine the selected prior art, are set forth below, but these combinations are not intended to be and are not exhaustive, as a POSITA would understand, there are myriad possible combinations of the references listed herein and it is not practical, particularly at this early stage prior to further factual investigation and claim construction proceedings, to identify and list all potentially relevant combinations. It would also have been obvious to combine the teachings of any two or more of the references contained in Appendices A-D as they are all directed to and teach systems and/or methods for streaming video and/or information or data about an event or media to one or more users.

A. Identified Combinations

It would have been obvious to a POSITA at the time of the alleged invention of the patent in suit to combine any and each of the prior art references identified in these invalidity contentions with one or more other prior art references identified herein. The following section describes several combinations that demonstrate the reasons and motivations that a POSITA at the time would have had for combining these references. The combinations are not intended to be an exhaustive list, but merely a sampling of some representative combinations and the reasons and motivations for combining those references. Any reference or combination of references that anticipates or renders obvious an asserted independent claim also renders obvious any asserted claim dependent on that independent claim because every element of each dependent claim was known to and by a person of ordinary skill at the time of the alleged invention, and it would have been obvious to a person of ordinary skill in the art at the time to combine those known elements with the independent claim at least as a matter of common sense and routine innovation. Accordingly, Defendants contend that each asserted claim would have been obvious not only by the combinations explicitly defined in these contentions, but also by any combination of references that renders obvious an asserted claim.

To the extent Plaintiff may contend that any reference contains multiple distinct embodiments, it would have been obvious to a POSITA to combine elements from any alleged distinct embodiments. A POSITA at the time would have been motivated to make such a combination at least because the elements are found in the same reference and the reference as a whole is directed to the same topic or topics.

Numerous prior art references, including those identified above pursuant to P.R. 3-3(a), reflect the common knowledge of POSITA at the time, as well as the state, scope and content of the prior art before the priority dates of the asserted patents. *See Graham v. John Deere Co.,* 383

U.S. 1, 35-36 (1966). As it would be unduly burdensome to create detailed claim charts for the myriad invalidating combinations, the combinations cited herein are illustrative and not exhaustive. Though the claim charts provide illustrative citations to where each element may be found in the prior art references, or in their obvious combinations, the cited references may contain other disclosures of each claim element as well, and Defendants reserve the right to argue any claim elements of the Asserted Claims are disclosed in non-cited portions of these references.

A POSITA would have been motivated to combine the disclosures of at least Ellis, Herzog, Cromarty, Sportradar Scout Client, Sportradar Live Channel Retail, and/or Kaazing, with additional disclosures from at least Spivey, Mitic, Bota, Dengler, Ma, Mukherjee, Mandyam, Lu, Dukes, Cooper, Basso, Levinson, Park, Apple HLS, Abulikemu, Grubbs, Perlman, Good ’534, Lemmons, Good ’113, Good ’780, Newnam, Hensgen, Stoica, Phillips, and/or Kellicker, for the following reasons.

Each of the asserted claims is anticipated by and/or obvious in view of Ellis, but, to the extent Ellis may be found not to include an element and/or limitation of an Asserted Claim, it would have been obvious to a POSITA at the time of the alleged invention to combine Ellis with any one or more of, at least Herzog, Cromarty, Sportradar Scout Client, Sportradar Live Channel Retail, and/or Kaazing, or to combine it with the disclosures of Spivey, Mitic, Bota, Dengler, Ma, Mukherjee, Mandyam, Lu, Dukes, Cooper, Basso, Levinson, Park, Apple HLS, Abulikemu, Grubbs, Perlman, Good ’534, Lemmons, Good ’113 Good ’780, Newnam, Hensgen, Stoica, Phillips, and/or Kellicker, as each of the combined references relates to the same technical subject matter as the alleged invention including, but not limited to, systems and/or methods for streaming video and/or information or data about an event or media to one or more users,

including video and/or data relating to live events such as, but not limited to, sporting events, with the aims of, among other things, reducing latency, increasing efficiency, and minimizing delay, and solves the same or similar problems that the Asserted Patents claim to have solved, disclose complementary means of achieving the common goal of scalability and reducing latency and delay in transmitting multiple forms of data, including video and metadata, and transmitting said data to one or more users, and the combination would only require a POSITA to merely choose from a finite number of identified, predictable, elements and/or solutions, with a reasonable expectation of success, simply substitute one known element for another to obtain predictable results, and/or use known techniques to improve a known or similar devices, methods, or systems ready for improvement in the same way.

Similarly, each of the asserted claims is anticipated by and/or obvious in view of Herzog, but, to the extent Herzog may be found not to include an element and/or limitation of an Asserted Claim, it would have been obvious to a POSITA at the time of the alleged invention to combine Herzog with any one or more of, at least Ellis, Cromarty, Sportradar Scout Client, Sportradar Live Channel Retail, and/or Kaazing, or to combine it with the disclosures of Spivey, Mitic, Bota, Dengler, Ma, Mukherjee, Mandyam, Lu, Dukes, Cooper, Basso, Levinson, Park, Apple HLS, Abulikemu, Grubbs, Perlman, Good ’534, Lemmons, Good ’113, Good ’780, Newnam, Hensgen, Stoica, Phillips, and/or Kellicker, as each of the combined references relates to the same technical subject matter as the alleged invention including, but not limited to, systems and/or methods for streaming video and/or information or data about an event or media to one or more users, including video and/or data relating to live events such as, but not limited to, sporting events, with the aims of, among other things, reducing latency, increasing efficiency, and minimizing delay, and solves the same or similar problems that the Asserted Patents claim to

have solved, disclose complementary means of achieving the common goal of scalability and reducing latency and delay in transmitting multiple forms of data, including video and metadata, and transmitting said data to one or more users, and the combination would only require a POSITA to merely choose from a finite number of identified, predictable, elements and/or solutions, with a reasonable expectation of success, simply substitute one known element for another to obtain predictable results, and/or use known techniques to improve a known or similar devices, methods, or systems ready for improvement in the same way.

Additionally, each of the asserted claims is anticipated by and/or obvious in view of Cromarty, but, to the extent Cromarty may be found not to include an element and/or limitation of an Asserted Claim, it would have been obvious to a POSITA at the time of the alleged invention to combine Cromarty with any one or more of, at least Ellis, Herzog, Sportradar Scout Client, Sportradar Live Channel Retail, and/or Kaazing, or to combine it with the disclosures of Spivey, Mitic, Bota, Dengler, Ma, Mukherjee, Mandyam, Lu, Dukes, Cooper, Basso, Levinson, Park, Apple HLS, Abulikemu, Grubbs, Perlman, Good ’534, Lemmons, Good ’113, Good ’780, Newnam, Hensgen, Stoica, Phillips, and/or Kellicker, as each of the combined references relates to the same technical subject matter as the alleged invention including, but not limited to, systems and/or methods for streaming video and/or information or data about an event or media to one or more users, including video and/or data relating to live events such as, but not limited to, sporting events, with the aims of, among other things, reducing latency, increasing efficiency, and minimizing delay, and solves the same or similar problems that the Asserted Patents claim to have solved, disclose complementary means of achieving the common goal of scalability and reducing latency and delay in transmitting multiple forms of data, including video and metadata, and transmitting said data to one or more users, and the combination would only require a

POSITA to merely choose from a finite number of identified, predictable, elements and/or solutions, with a reasonable expectation of success, simply substitute one known element for another to obtain predictable results, and/or use known techniques to improve a known or similar devices, methods, or systems ready for improvement in the same way.

Furthermore, each of the asserted claims is anticipated by and/or obvious in view of Sportradar Scout Client, but, to the extent Scout Client may be found not to include an element and/or limitation of an Asserted Claim, it would have been obvious to a POSITA at the time of the alleged invention to combine Scout Client with any one or more of, at least Ellis, Herzog, Cromarty, Sportradar Live Channel Retail, and/or Kaazing, or to combine it with the disclosures of Spivey, Mitic, Bota, Dengler, Ma, Mukherjee, Mandyam, Lu, Dukes, Cooper, Basso, Levinson, Park, Apple HLS, Abulikemu, Grubbs, Perlman, Good '534, Lemmons, Good '113, Good '780, Newnam, Hensgen, Stoica, Phillips, and/or Kellicker, as each of the combined references relates to the same technical subject matter as the alleged invention including, but not limited to, systems and/or methods for streaming video and/or information or data about an event or media to one or more users, including video and/or data relating to live events such as, but not limited to, sporting events, with the aims of, among other things, reducing latency, increasing efficiency, and minimizing delay, and solves the same or similar problems that the Asserted Patents claim to have solved, disclose complementary means of achieving the common goal of scalability and reducing latency and delay in transmitting multiple forms of data, including video and metadata, and transmitting said data to one or more users, and the combination would only require a POSITA to merely choose from a finite number of identified, predictable, elements and/or solutions, with a reasonable expectation of success, simply substitute one known element

for another to obtain predictable results, and/or use known techniques to improve a known or similar devices, methods, or systems ready for improvement in the same way.

Also, each of the asserted claims is anticipated by and/or obvious in view of Kaazing, but, to the extent Kaazing may be found not to include an element and/or limitation of an Asserted Claim, it would have been obvious to a POSITA at the time of the alleged invention to combine Kaazing with any one or more of, at least Ellis, Herzog, Cromarty, Sportradar Scout Client, and/or Sportradar Live Channel Retail, or to combine it with the disclosures of Spivey, Mitic, Bota, Dengler, Ma, Mukherjee, Mandyam, Lu, Dukes, Cooper, Basso, Levinson, Park, Apple HLS, Abulikemu, Grubbs, Perlman, Good ’534, Lemmons, Good ’113, Good ’780, Newnam, Hensgen, Stoica, Phillips, and/or Kellicker, as each of the combined references relates to the same technical subject matter as the alleged invention including, but not limited to, systems and/or methods for streaming video and/or information or data about an event or media to one or more users, including video and/or data relating to live events such as, but not limited to, sporting events, with the aims of, among other things, reducing latency, increasing efficiency, and minimizing delay, and solves the same or similar problems that the Asserted Patents claim to have solved, disclose complementary means of achieving the common goal of scalability and reducing latency and delay in transmitting multiple forms of data, including video and metadata, and transmitting said data to one or more users, and the combination would only require a POSITA to merely choose from a finite number of identified, predictable, elements and/or solutions, with a reasonable expectation of success, simply substitute one known element for another to obtain predictable results, and/or use known techniques to improve a known or similar devices, methods, or systems ready for improvement in the same way.

Lastly, each of the asserted claims is anticipated by and/or obvious in view of Sportradar Live Channel Retail, but, to the extent Live Channel Retail may be found not to include an element and/or limitation of an Asserted Claim, it would have been obvious to a POSITA at the time of the alleged invention to combine Live Channel Retail with any one or more of, at least Ellis, Herzog, Cromarty, Sportradar Scout Client, and/or Kaazing, or to combine it with the disclosures of Spivey, Mitic, Bota, Dengler, Ma, Mukherjee, Mandyam, Lu, Dukes, Cooper, Basso, Levinson, Park, Apple HLS, Abulikemu, Grubbs, Perlman, Good '534, Lemmons, Good '113, Good '780, Newnam, Hensgen, Stoica, Phillips, and/or Kellicker, as each of the combined references relates to the same technical subject matter as the alleged invention including, but not limited to, systems and/or methods for streaming video and/or information or data about an event or media to one or more users, including video and/or data relating to live events such as, but not limited to, sporting events, with the aims of, among other things, reducing latency, increasing efficiency, and minimizing delay, and solves the same or similar problems that the Asserted Patents claim to have solved, disclose complementary means of achieving the common goal of scalability and reducing latency and delay in transmitting multiple forms of data, including video and metadata, and transmitting said data to one or more users, and the combination would only require a POSITA to merely choose from a finite number of identified, predictable, elements and/or solutions, with a reasonable expectation of success, simply substitute one known element for another to obtain predictable results, and/or use known techniques to improve a known or similar devices, methods, or systems ready for improvement in the same way.

A POSITA would have been motivated to create the above-described combinations for at least the following reasons:

First, all of the prior art identified in Appendices A–D relates to the same technical subject matter. In particular, each reference describes systems and/or methods for streaming video and/or information or data about an event or media to one or more users, including video and/or data relating to live events such as sporting events with the aims of, for example, reducing latency, increasing efficiency, and minimizing delay:

Reference/Prior Art	Exemplary Citation
Ellis at Abstract	"Systems and methods for enhanced sports-related media content access and display are provided. … An interactive scoreboard may also be displayed with various game status and alert icons. The interactive scoreboard may allow a viewer to quickly tune between high-interest sporting events. Sports-specific features, such as wagering and fantasy league support, are also provided."
Herzog at Abstract	A mobile device "receive[s] live video and audio data" as well as "live meta-data" from a "communication network" and "time synchronize[s] the selected metadata with the video and audio data for simultaneous display"
Cromarty at Abstract	"The present invention relates to portable video decoder devices that are used by sporting enthusiasts to monitor and access real time information concerning a sporting event" and receiving "a plurality of media feeds related to an event"
Scout Client, at Betradar Help (SRAD_00008954) at 25	"Betradar's new Live Scout Client offers a range of important information about the selected match as well as several configuration options" including both raw data and visual representations of play
Live Channel Retail at 2017 LCR Brochure (SRAD_00062364) at 2	"Betradar's Live Channel Retail delivers a unique combination of live streams, live statistics and live odds – all on one screen to help drive more revenue to your business."
Kaazing, at "Second Screen App" (SRAD_00011125)	"The Second Screen Solution provides a synchronized viewing experience between a primary screen (TV) and a second screen (smartphone). … This solution demonstrates two-way real-time interaction: questions pushed to mobile devices, as well as viewers displayed on the leaderboard."
Spivey at Abstract	An "apparatus to broadcast live event data in real-time" including "a subscription component … to receive a topic entry from a message queue server, and to push the topic entry to a subscribed client device substantially simultaneously with the message queue server receiving the topic entry from a live data source"

Mitic at Abstract	Systems and methods for "pushing live media to a client" using a "websocket interface … to facilitate a websocket session with the client" such that "media segments" are pushed "to the client device substantially in real time during the websocket session"
Bota at Abstract	"[G]enerating and distributing overlay streams in real time over an overlay stream distribution channel that overlays events of a video stream distributed in a separate video channel"
Dengler at Abstract	A "live event management system" for providing event updates "in real time or substantially real time"
Ma ¶ [0005]	"[D]elivering live content (live video and/or audio) as streaming media over the Internet"
Mukherjee at Abstract	Providing streaming content "for an event to be streamed"
Mandyam at 25:41-26:10	A "livecasting engine" allowing "[m]ultiple end-users … to simultaneously consume" an information stream in real time, including "sports scores"
Lu at Abstract, 5:13-23	A method to rebroadcast media at "reduced quality" and also stream additional "supplementary information"
Dukes at Abstract	"A system and method for presenting fantasy sports content with broadcast content is disclosed."
Cooper at Abstract	A server to "multicast" requested multimedia sources to a "plurality of clients"
Basso at Abstract	A method to provide "real-time metadata" regarding "a plurality of multimedia data streams" in "real time" on a "metadata stream"
Levinson at Abstract	"A system and method for simultaneous real time video streaming … through a server to recipient mobile devices or other video displays … and to enable responses from those recipients, for security, personal, entertainment or commercial applications."
Park at Abstract, ¶[0009]	"A method for broadcasting sports includes receiving a bio-signal output … receiving live video data … and generating sports data" and "broadcasting… the sports data including the first live video data … in real time or substantially real time during a sporting event"
Apple HLS Overview at 1	HTTP Live Streaming allows "[s]treaming live events"
Abulikemu at Abstract	"a broadcasting system and method that allows incorporation of user-generated content such as user videos of a live event and user commentary (audio and/or video) about the live event. The live video and audio including the user-generated content can be streamed to users over the internet or via more traditional broadcasting methods such as over-the-air (OTA) broadcast, satellite, cable, etc."
Grubbs ¶35	"methods and systems wherein users may create and broadcast live streaming video, which may be embedded with other digital content

	streams, over a network through use of multiple communicating servers interconnected and be able to edit and composite such live streaming video and other digital content streams simultaneous to their broadcast over a network and to multiple viewers on multiple platforms."
Perlman at Abstract	"The method further includes broadcasting the twitch action video game or real-time application in one or more streams of real-time compressed digital video from the hosting service center to one or more viewing client devices over the Internet. The method also includes selectively overlaying, by the hosting service center, feedback data (e.g., text, comments, audio, etc.) from one or more of the viewing client devices onto the one or more streams of real-time compressed digital video."
Good '534 ¶15	"The system 100 includes a media server 102 that is communicatively coupled to one or more publishing devices . . . and to one or more viewing devices . . . The media server 102 may receive one or more media streams from the publishing device 120 and may provide one or more media streams to the viewing devices 140, 160, and 180."
Lemmons at Abstract	"Systems and methods of automatically publishing a stream to multiple destinations are disclosed."
Good '113 at 1:31–49; *see also* Good '780 at 1:41–59	"Systems and methods of inserting graphic overlays ... into a stream are disclosed. Advantageously, overlays may be inserted by a media server that acts as a transcoding intermediary between a live stream provider and a destination device. ... The media server may provide a flexible, application programming interface (API)-driven framework for overlays. ..."
Newnam at 5:10-14	"A character generator (CG) application 400 communicates with a CG 410 to display ITV content 210 on-air. A character generator is a well-known device used to insert content, such as sports scores at the bottom of the television during a sports news broadcast."
Hensgen at Abstract	"A media server machine may be configured to provide media content within a datastream. This datastream may be provided to a media device that is configured to present the media content on a display."
Stoica at 1:15–17	disclosing means to "access content, such as video files and live streaming/video on demand content, via client machines"
Phillips, Abstract	"A system and method for optimizing defragmentation of content in a content delivery network (CDN)."
Kellicker ¶4	"systems and methods of coordinating data analytics to improve performance of streaming servers , client devices , and analytics servers"

Each of the references solves the same or similar problems that the Asserted Patents claim to have solved, namely, providing video and/or event data to multiple users over the Internet quickly and at scale:

Reference/Prior Art	Exemplary Citation
Ellis ¶ [0039]	"Any suitable number of users may have one or more user equipment devices, such as user equipment 102, coupled to content source 130, data sources 140, and supplemental content source 120."
Herzog ¶ [0049]	"The solutions integrator 44 publishes the video imagery, related audio and meta-data that are received from the content provider 42 onto the content delivery network 47 for presentation to users/consumers of the content."
Cromarty at 1:46-51	"a personal video monitoring and information apparatus for monitoring and accessing real time information concerning an event [and m]ultiple keys are provided … to select media feeds"
Scout Client, at Betradar Help (SRAD_00008954) at 24	"This service offers fast, accurate and very detailed information about live events."
Live Channel Retail at 2017 LCR Brochure (SRAD_00062364) at 4	"With Betradar's adaptable Live Channels, you will receive dedicated live streaming solutions that fulfil your customer's demand for accurate information, betting stimulation, and match visualisation."
Kaazing, at WebSocket Gateway (SRAD_00011127) at 3	"Kaazing WebSocket Gateway, lets you build, deploy, and manage real-time web applications that can handle very large numbers of users and very high message volumes, using standard browsers and protocols"
Spivey ¶ [0027]	"[U]sing topic queues and open duplex communication connections" to "increase the speed at which live event data (e.g. sports scores and breaking news), are broadcast to mobile devices"
Mitic ¶ [0004]	"to reduce the overall end-to-end delay so that the media as viewed by the end consumer is as close as possible in time to reality"
Bota at Abstract	Streams are "distributed to subscriber recipient components via a unicast channel in order to enhance user viewing" by using a "publisher subscriber component and caching techniques" to allow for "low latency, high availability unicasting based real time overlay distribution system for a large numbers of concurrent overlay recipients"
Dengler at 3:15-17	Events can be "automatically synchronized, in real time, to each of the recorded video streams, in a frame-accurate manner"
Ma ¶ [0005]	"deliver, in a scalable and cost-effective manner, live and time-shifted streaming of content over the Internet" to "a large number of endpoints"

Mukherjee ¶ [0032]	Serving "tens of thousands of client devices"
Mandyam at 25:62-65	multiple end users can "access information that is guaranteed to arrive within a certain period of time"
Lu at 1:33-44	"there is a need in the art for viewing … broadcast channels at a reduced quality, such as at a slow frame rate and/or resolution"
Dukes at 1:43-60	"the method further includes … displaying, on a display of the client-side device, fantasy sports data that is based on the plurality of fantasy sports preferences from the user account, and displaying, simultaneously with the fantasy sports data, the broadcast programming content on the display."
Cooper at 18-22	"a multimedia content delivery system and method that maximizes the efficiency of network bandwidth consumption through selective multicasting of the multimedia."
Basso at 3:65-4:17	A "metadata server 150 provides metadata in real-time to user devices 160[;] … the metadata comprises information pertaining to content in a respective multimedia data stream that is being multicast"
Levinson ¶ [0003]	"simultaneous video streaming from multiple mobile devices or other sources through a server to recipient mobile devices or other video displays"
Park at ¶[0012]	"broadcasts the sports data to the at least one end user device through the wireless communications link in real time or substantially real time during a sporting event"
Apple HLS Overview at 10	"dynamic switching between streams of different data rates in response to changing connection speeds" thereby allowing for "continuous broadcasts"
Abulikemu ¶10	"Embodiments of the disclosure are directed to a broadcasting system and method that allows incorporation of user-generated content such as user videos of a live event and user commentary (audio and/or video) about the live event. The live video and audio including the user-generated content can be streamed to users over the internet or via more traditional broadcasting methods such as over-the-air (OTA) broadcast, satellite, cable, etc. This can provide a way for a viewer to customize the video/audio feed of an event rather than having no choice but to accept the feed provided by the broadcasting company."
Grubbs ¶35	"methods and systems wherein users may create and broadcast live streaming video, which may be embedded with other digital content streams, over a network through use of multiple communicating servers interconnected and be able to edit and composite such live streaming video and other digital content streams simultaneous to their broadcast over a network and to multiple viewers on multiple platforms."
Perlman at Abstract	"The method further includes broadcasting the twitch action video game or real-time application in one or more streams of real-time compressed digital video from the hosting service center to one or more viewing client

	devices over the Internet. The method also includes selectively overlaying, by the hosting service center, feedback data (e.g., text, comments, audio, etc.) from one or more of the viewing client devices onto the one or more streams of real-time compressed digital video."
Good '534 ¶15	"The system 100 includes a media server 102 that is communicably coupled to one or more publishing devices (e.g., an illustrative publishing device 120) and to one or more viewing devices (e.g., illustrative viewing devices 140, 160, and 180). The media server 102 may receive one or more media streams from the publishing device 120 and may provide one or more media streams to the viewing devices 140, 160, and 180."
Lemmons ¶ 38	"The method 400 may further include automatically publishing the stream to the first publishing destination and to the second publishing destination, at 406. Publishing the stream may include transmitting the stream in accordance with a protocol identified in the entry and /or by a profile identified by the entry (e.g., the RTMP, RTP, and/or MPEG-TS protocols)."
Good '113 at Abstract; *see also* Good '780 at Abstract	"Systems and methods of inserting overlays into a stream are disclosed. A media server may receive a stream. The media server may selectively add one or more images (e.g., graphics and/or text) to the stream prior to scaling the stream to produce one or more scaled streams. ... The scaled streams may be encoded for adaptive streaming to a computing device."
Newnam, 2:62-3:11	"The embodiment of the present invention provides a method to automatically display, on viewers's television screens, real-time data generated by an ITV program. This provides an advantage for ITV programming by completing a feedback loop of ITV content and TV programming. Showing the data generated by the ITV program to television viewers encourages participation in the interactive content, and makes the interactive content more compelling for the viewer."
Hensgen at 2:17-32	disclosing means to transmit and display synchronized media on user devices
Stoica at 1:18-20	disclosing means to distributing "[video] content efficiently and with high quality"
Phillips ¶35; Fig. 1	("content may be delivered via CDN 100 using . . . HTTP Live Streaming or HLS . . .")
Kellicker ¶¶ 98-100,102; Fig. 12	server 1250 is provided with the ability to receive a live media stream 1220, and stream that media to user devices.

It therefore would have been obvious to a POSITA at the time of the alleged invention, based on his or her own knowledge, the explicit and implicit teachings of the prior art references, and the nature of the claimed invention and the problem(s) purportedly being solved, to look to and/or combine any of the identified references to arrive at the claimed inventions of the

Asserted Patents, rendering them obvious. To the extent that any suggestion, motivation, or teaching is required, it is provided by the identified prior art itself as well as the knowledge of a POSITA.

Second, the prior art identified in Appendices A–D disclose complementary means of achieving the common goal of scalability and reducing latency and delay in transmitting multiple forms of data, including video and metadata, and transmitting said data to one or more users. For example, each of Ellis, Herzog, Cromarty, Sportradar Scout Client, Sportradar Live Channel Retail, and/or Kaazing disclose systems for transmitting live video and related event data to multiple viewers viewing one or more different live events over the Internet that are agnostic as to at least some of the specific details of the transmission mechanism:

Reference/Prior Art	Exemplary Citation
Ellis ¶ [0045]; *see also* [0074]	"Content source 130 and supplemental content source 120 may be configured to transmit signals to user equipment 102 over any suitable communications paths" which "may be transmitted as a broadcast, multicast, unicast, or any other suitable transmission stream."
Herzog ¶ [0003]; *see also* [0045-46], [0049]	"a capability of receiving multiple sources of live information that are related to each other" such as "video that is streamed live from the Internet" and to "simultaneously view other information, such as meta-data, that provides additional information related to" the video
Cromarty at 2:44--3:8	"Network interface 1010 represents a broadband connection that is used for communicating with information resources (for data source media feeds) through the Internet such as web sites and searchable databases, with real time updates" and "[c]entral broadcast node 1005 contains appropriate software to transcode received audio, video, and data into a format that is capable of being transmitted through wireless network interface 1015 to personal monitoring device 1050."
Scout Client, at Betradar Help (SRAD_00008954) at 24	"This service offers fast, accurate and very detailed information about live events."
Live Channel Retail at 2017 LCR Brochure (SRAD_00062364) at 4	"With Betradar's adaptable Live Channels, you will receive dedicated live streaming solutions that fulfil your customer's demand for accurate information, betting stimulation, and match visualisation."

Kaazing, at "Second Screen App" (SRAD_00011125)	Agnostic as to method or system of transmission of video or media to the primary screen, identifying either of "TV" or "desktop browser" as "primary screen"

In view of this, a POSITA would have looked to complementary disclosures in other prior art references to, for example, supply the details of backend systems for transmitting video and event data to multiple users:

Reference/Prior Art	Exemplary Citation
Spivey at Abstract	an "apparatus to broadcast live event data in real-time"
Mitic ¶¶ [0006-7]	a "media server" through which "live media can be pushed to the client using a persistent socket connection over HTTP" or a "websocket connection"
Bota at 1:47-63	"overlay distribution components" to "publish a set of overlay streams in real time via a second channel"
Dengler at 10:21-35; *see also* 8:12-26	a live event management system that aggregates event information and synchronizes it "with a corresponding video stream."
Ma ¶ [0030-43], [0054]	a "live streaming system" that enables live video for "multiple" "concurrent live events"
Mukherjee ¶¶ [0028-31]	a CDN to "provide live streaming content"
Mandyam at 25:52-26:10	a "livecasting engine" for delivering real-time sports scores in separate streams for each sports match, with each stream having separate "channels" for videos and scores
Lu at claim 1	"1. A method of facilitating broadcast channel surfing, comprising: … broadcasting the plurality of surfing signals substantially concurrent in time with the corresponding broadcast signals to enable channel surfing of the surfing signals at a remote device …"
Dukes at 3:38-55	"In the embodiment of FIG. 1A, the client-side system 130 may also receive broadcast content 140 and allow for simultaneous presentation of both non-broadcast content 115 and broadcast content 140 within the same user experience".
Cooper at 2:3-18	"a novel streaming multimedia broadcasting system and method that selectively multicasts its content based on client requests and usage"
Basso at 5:61-6:3, 7:61-8:22	A "content aware multicast (CAM) module" that receives a "metadata stream" and can select "from among the multimedia data streams" and display each stream "simultaneously"
Levinson at Abstract	"A server … simultaneously transmits videos from multiple sender devices to requesting recipient devices and other designated recipient devices."

Park at ¶[0046]	"networks… may be a local area network (LAN), a wireless local area network (WLAN), such as wireless fidelity (Wi-Fi), a wireless personal area network (WPAN), a wireless universal serial bus (USB), a 3rd generation (3G) mobile communications network, a 4th generation (4G) mobile communications network, a long term evolution (LTE™) mobile communications network, the Internet, or the wireless Internet; however, it is not limited thereto."
Apple HLS Overview at 4	a "server component" for "encoding" input streams into digital formats, "encapsulating them in a format suitable for delivery, and preparing the encapsulated media for distribution" and a "distribution component" consisting of "standard web servers" that "accept[] client requests and deliver[] prepared media and associated resources to the client.
Abulikemu ¶13	a "central server 100," which "can offer live streaming of the event as captured by the plurality of cameras including the broadcasting system's cameras 102 and the viewers' cameras 104. The central server can also offer different live commentaries by one or more of the official commentators, independent commentators, and/or viewers. The central server can provide the different views and commentaries via a network (e.g., internet or satellite network) to a viewer's device (e.g., viewer device 108, 110, and/or 112) and allow the viewer to select the view(s) and/or commentaries to watch/listen."
Grubbs ¶35	"methods and systems wherein users may create and broadcast live streaming video, which may be embedded with other digital content streams, over a network through use of multiple communicating servers interconnected and be able to edit and composite such live streaming video and other digital content streams simultaneous to their broadcast over a network and to multiple viewers on multiple platforms."
Perlman at Abstract	a "hosting service center," which is configured to "broadcast[] the twitch action video game or real-time application in one or more streams of real-time compressed digital video ... to one or more viewing client devices over the Internet."
Good '534 ¶17	a "media server" enabled by "wired and/or wireless [network] interfaces . . . to communicate data via a network, such as the Internet."
Lemmons ¶10	a "media server," which "is configured to send and receive data from various other devices (e.g., via a network, such as a local area network (LAN) or the Internet)."
Good '113 at 9:57–10:16; *see also* Good '780 at 10:14–25	a media server that may "periodically check for updates to the overlay image. The time period for checking for updates may be programmable by a user or may be fixed (e.g., 750 milliseconds). For example, the "Check For Updates" option for the scoreboard overlay is enabled. As data for the scoreboard changes (e.g., the current score changes), an updated image for the scoreboard may be pushed to the storage location identified by the image path for the scoreboard. By checking for updates to the scoreboard image, up-to-date scoreboard information may be inserted into the rendition 310."

Newnam, 8:41-9:4	"An advantage of the system and method described here is that the timing of ITV content 210 can not only be determined in real-time, but the content item itself can be generated in real-time. This ability makes the system and method of the present invention well suited for real-time enhanced ITV content production for multiple types of end user devices. The ITV coordination authority 100 can be used to produce real-time content. The ITV content server 200 can then push that content, as well as generate the appropriate trigger, to imbed ITV data 615 using the trigger insertion application 600 in a real-time manner."
Hensgen at Abstract	"A media server machine may be configured to provide media content within a datastream. This datastream may be provided to a media device that is configured to present the media content on a display."
Stoica at 1:15–17	disclosing means to "access content, such as video files and live streaming/video on demand content, via client machines"
Phillips, Abstract	"A system and method for optimizing defragmentation of content in a content delivery network (CDN)."
Kellicker ¶4	"systems and methods of coordinating data analytics to improve performance of streaming servers , client devices , and analytics servers"

Accordingly, it would have been obvious to a POSITA at the time of the alleged invention(s) to combine one or more of the elements of a system including the interactive video and event information components of Ellis, Herzog, Cromarty, Sportradar Scout Client, Sportradar Live Channel Retail, or Kaazing, with one another, as well as the implementation details of the above-listed references using well-known methods (*e.g.*, well-known computer programming techniques and/or computer hardware design and networking architectures) to yield predictable results.

Third, it would have been obvious to combine elements found in each of the identified prior art references because doing so would only require a POSITA to merely choose from a finite number of identified, predictable, elements and/or solutions, with a reasonable expectation of success. For example, Ellis, Herzog, Cromarty, Sportradar Scout Client, Sportradar Live Channel Retail, and/or Kaazing, each disclose mechanisms for transmitting video and related

event information from a source system to one or more end users who may select among multiple different live event broadcasts:

Reference/Prior Art	Exemplary Citation
Ellis ¶ [0041]; *see also* [0042]	"sports-related information is provided to user equipment 102 as a plurality of real-time data feeds" and "[e]ach data feed may be individually accessed"
Herzog ¶ [0049]	"The solutions integrator 44 publishes the video imagery, related audio and meta-data that are received from the content provider 42 onto the content delivery network 47 for presentation to users/consumers of the content."
Cromarty at 2:15-27	"a user may access information relating to an ongoing sporting event or historical information about a participant in the sporting event, a team in the sporting event, the venue of the sporting event, a sponsor of a sporting event, or a vendor at the sporting event. A user may also access information relating to sporting events occurring concurrently with the present event and may also access audio and video transmissions related to the ongoing or concurrent sporting events."
Scout Client, at Betradar Help (SRAD_00008954) at 25	"Betradar's new Live Scout Client offers a range of important information about the selected match as well as several configuration options" including both raw data and visual representations of play
Live Channel Retail at 2017 LCR Brochure (SRAD_00062364) at 4	"With Betradar's adaptable Live Channels, you will receive dedicated live streaming solutions that fulfil your customer's demand for accurate information, betting stimulation, and match visualisation." including video and data,
Kaazing, at "Second Screen App" (SRAD_00011125)	"The Second Screen Solution provides a synchronized viewing experience between a primary screen (TV) and a second screen (smartphone). … This solution demonstrates two-way real-time interaction: questions pushed to mobile devices, as well as viewers displayed on the leaderboard."

A POSITA would have looked to complementary disclosures in other prior art references that disclose identified and predictable solutions to augment the systems of Ellis, Herzog, Cromarty, Sportradar Scout Client, Sportradar Live Channel Retail, or Kaazing, to include the transmission protocols or methods of one or more of the following references, and it would have been obvious to a POSITA at the time to try to combine such disclosures and teachings:

Reference/Prior Art	Exemplary Citation
Spivey ¶¶ [0027], [0058]	"topic queues and open duplex communication connections" employing a "message queue server device" that may be implemented using "open source message broker software" to broadcast "data from a live event (e.g., news event, a gaming event, sporting event, etc.)" to multiple users "in real-time."
Mitic ¶ [0037]	Utilizing standards-based streaming protocols such as "MPEG-DASH" and "HTTP Live Streaming (HLS)"
Bota at 5:53-6:3	"overlay distribution system" with a network structure incorporating "publishers," "distributor components" and "subscribers."
Dengler at 3:15-17	a server-based live event management system that synchronizes video and event data in real time
Ma ¶ [0065]	Utilizing live streaming protocols such as RTMP, RTSP/RTP, and HTTP Live Streaming (HLS)
Mukherjee ¶¶ [0028-31]	a CDN to "provide live streaming content"
Mandyam at 8:46-57	a "livecasting engine" that uses "standard network protocols"
Lu at 4:13-25	"multicasting" or "unicasting" with "Internet video streaming technologies which are well known in the art."
Dukes at 4:43-62, 5:16-4; *see also* 7:19-37	Disclosing the use of "standard data protocols" and "any protocol require[d]"
Cooper at 1:18-22	"a multimedia content delivery system and method that maximizes the efficiency of network bandwidth consumption"
Basso at 3:65-4:17	A "metadata server" to "provide[] metadata in real-time to user devices," which could include "content-specific information relating to programs currently being multicast, such as: a current score of a basketball game, …"
Levinson ¶ [0150]	Disclosing the use of "SOCKETS, HTTP Uploads, RTP, RTSP, RTMP and/or MQTT" and any "other protocols for communication, transfer and receipt of data may also be used"
Park at ¶[0017]	"receiving at a synchronization processor.. bio-signal data… for a current sporting event… receiving at the synchronization processor first live video data… combining the first current bio-signal data… with the first live video data
Apple HLS Overview at 2	"uses HTTP" and is "automatically supported by nearly all edge servers, media distributors, caching systems, routers, and firewalls"
Abulikemu ¶13	"central server 100," which "can offer live streaming of the event as captured by the plurality of cameras including the broadcasting system's cameras 102 and the viewers' cameras 104."
Grubbs ¶35	"methods and systems wherein users may create and broadcast live streaming video, which may be embedded with other digital content streams, over a network through use of multiple communicating servers

	interconnected and be able to edit and composite such live streaming video and other digital content streams simultaneous to their broadcast over a network and to multiple viewers on multiple platforms."
Perlman at Abstract	a "hosting service center," which is configured to "broadcast[] the twitch action video game or real-time application in one or more streams of real-time compressed digital video ... to one or more viewing client devices over the Internet."
Good '534 ¶35	"origin media server" that "perform[s] stream processing (e.g., encoding or transcoding) and protocol-level functions . . . to generated output data to be provided to one or more media server," which ultimately publishes digital content to a "destination viewing device."
Lemmons ¶10	"media server" that "publishes a stream to multiple destinations [i.e., playback devices]" via "a network, such as a local area network (LAN) or the Internet."
Good '113 at 3:14–27; *see also* Good '780 at 3:25–38	"The media server 150 may support communication (e.g., adaptive streaming and non-adaptive streaming) protocols including, but not limited to, hypertext transfer protocol (HTTP) live streaming (HLS), HTTP dynamic streaming (HDS), smooth streaming, and MPEG dynamic adaptive streaming over HTTP (MPEG-DASH) (also known as international organization for standardization (ISO)/international electrotechnical commission (IEC) 23009-1). The media server 150 may also support real time messaging protocol (RTMP) (and variants thereof), real-time streaming protocol (RTSP), real-time transport protocol (RTP), and MPEG-2 transport stream (MPEG-TS). Additional audio formats, video formats, coder/decoders (CODECs), and/or protocols may also be supported."
Newnam, 2:41-61	"The embodiment of the present invention allows a more efficient production of ITV programming by automating the insertion of triggers during the television broadcast, and avoiding the need for incorporating the content or triggers into a dubbed copy of a master tape. Using conventional equipment already widely used in television studios to insert data onto broadcast tapes (such as encoder/inserter equipment sold by Norpak Corporation, located in Canada), the system allows insertion of ITV content during the broadcast, so controlled from a remote location by the ITV system."
Hensgen at 8:3-9	"The datastream may be provided via any one or more data communication technologies (e.g., cable television network, satellite television net work, a cellular telephone network, Internet protocol television (IPV), hypertext transfer protocol live streaming (HLS), over the top (OTT) streaming, or any suitable combination thereof)."
Stoica Fig. 9	disclosing transmission via PDL, DS, HLS, SS, RTMP
Phillips ¶35; Fig. 1	("content may be delivered via CDN 100 using . . . HTTP Live Streaming or HLS . . .")

Kellicker ¶106	"The computing device 1250 may support communication (e.g., adaptive streaming and non-adaptive streaming) protocols including, but not limited to, hypertext transfer protocol (HTTP) live streaming (HLS), HTTP dynamic streaming (HDS), smooth streaming, and MPEG dynamic adaptive streaming over HTTP (MPEG-DASH) (also known as international organization for standardization (ISO)/international electrotechnical commission (IEC) 23009-1). The computing device 1250 may also support real time messaging protocol (RTMP) (and variants thereof), real-time streaming protocol (RTSP), real-time transport protocol (RTP), web real-time communication (WebRTC), and MPEG-2 transport stream (MPEG-TS). Additional audio formats, video formats, coder/decoders (codecs), and/or protocols may also be supported."

Fourth, combining certain elements disclosed in the prior art would have been obvious because doing so would require only the simple substitution of one known element for another to obtain predictable results. For example, Ellis, Herzog, Cromarty, Sportradar Scout Client, Sportradar Live Channel Retail, or Kaazing each disclose various network components and architectures to act as a source and transmission means for media and event information to be provided to users:

Reference/Prior Art	Exemplary Citation
Ellis ¶ [0047]	"Content source 130, supplemental content source 120, and data sources 140 are shown in FIG. 1 as separate elements" but "[i]n practice, their functionality may be combined into a single mechanism and provided from a single system at a single facility, or their functionality may be provided by multiple systems at multiple facilities."
Herzog ¶ [0060]	Information may be provided by "any server, such as server 31, or server 33, or server 25"
Cromarty at 2:44-3:8	"Network interface 1010 represents a broadband connection that is used for communicating with information resources (for data source media feeds) through the Internet such as web sites and searchable databases, with real time updates" and "[c]entral broadcast node 1005 contains appropriate software to transcode received audio, video, and data into a format that is capable of being transmitted through wireless network interface 1015 to personal monitoring device 1050"
Scout Client, at Betradar Help (SRAD_00008954) at 25	"Betradar's new Live Scout Client offers a range of important information about the selected match as well as several configuration options" including both raw data and visual representations of play using at least XML

Live Channel Retail at 2017 LCR Brochure (SRAD_00062364) at 4	"With Betradar's adaptable Live Channels, you will receive dedicated live streaming solutions that fulfil your customer's demand for accurate information, betting stimulation, and match visualisation." including video and data,
Kaazing, at "Second Screen App" (SRAD_00011125)	"The Second Screen Solution provides a synchronized viewing experience between a primary screen (TV) and a second screen (smartphone)" using "HTML5, Websocket, JMS"

It would have been obvious to a POSITA at the time of the alleged inventions to predictably substitute portions and/or elements of the systems of Ellis, Herzog, Cromarty, Sportradar Scout Client, Sportradar Live Channel Retail, or Kaazing, with each other, and/or with those disclosed in other prior art references:

Reference/Prior Art	Exemplary Citation
Spivey ¶¶ [0034]	"FIG. 1 illustrates a block diagram for a system 100 for broadcasting live data in real-time. … Although the system 100 shown in FIG. 1 has a limited number of elements in a certain topology, it may be appreciated that the system 100 may include more or fewer elements in alternate topologies as desired for a given implementation."
Mitic ¶ [0007]	"a general HTTP server configured for adaptive streaming"
Bota at 13:1-5, 14:14-17	a "two-tier client server model or a multi-tier model" that can include processes "localized on one computer and/or distributed between two or more computers."
Dengler at 6:26-67	a live event management system employing generic server hardware and software components
Ma ¶ [0065]	a scalable live streaming system relying on components such as HTTP servers and RTSP/RTP servers
Mukherjee ¶¶ [0028-31]	a CDN comprising ordinary components and connected with "known communication methods," including well-known live streaming protocols such as "RTSP … or any other suitable live streaming application."
Mandyam at 8:29-57, 11:8-29	a "livecasting engine" that utilizes generic servers and standard Internet technologies
Lu at claim 1, 4:13-25	"A method of facilitating broadcast channel surfing" using "Internet video streaming technologies which are well known in the art."
Dukes at 7:19-37	The system "may provide data in a stream format based on the specific client request"
Cooper at 6:3-62, 7:37-54	a "multimedia content delivery system" utilizing UDP and/or TCP traffic and/or HTTP servers

Basso at 4:30-44	a "metadata server" employing generic hardware and software components
Levinson ¶ [0094]	Disclosing a system "centered around three pieces of software"
Park at ¶ [0056]-[0059]	"broadcasting system 160 may generate sports data SDATA based on a digital video broadcasting-cable (DVB-C) standard… based on an Integrated Services Digital Broadcasting (ISDB) standard… based on a terrestrial-digital multimedia broadcasting (T-DMB) standard and/or a satellite-digital multimedia broadcasting (S-DMB) standard"
Apple HLS Overview at 1-2	Apple's HLS architecture uses ordinary web server software
Abulikemu at [0028]	A "central server" "implemented by hardware, software, or a combination of hardware and software"
Grubb at Abstract	disclosing a "broadcast ingest server," "a platform ingest server," and a "compositing engine"
Perlman at Abstract	operating a "hosting service center"to "selectively overlay[], by the hosting service center , feedback data (e . g . , text , comments , audio , etc .) from one or more of the viewing client devices onto the one or more streams of real - time compressed digital video" utilizing "twitch"
Good '534 ¶ 40	a "media server" that "performs stream processing . . . to generate output data to be provided (e.g., 'pushed') to a CDN" and, ultimately, "viewing devices."
Lemmons ¶ 10	a "media server" that "communicate[s] with one or more playback devices 170 (e.g., devices that are configured to output a display of a stream of content)" using "a network, such as a local area network (LAN) or the Internet."
Good '113 at 3:14–27; *see also* Good '780 at 3:25–38	"Media Servers" that handle video transmission
Newnam, 4:5-25	"Referring to FIG. 1, the ITV coordination system includes an ITV coordination authority 100, an ITV server system 200, and a broadcast server system 300. The ITV coordination authority 100 is preferably implemented as a software program residing on a hardware device, such as a computer, for determining the ITV content sequence and display … .The ITV coordination authority 100 can reside on any device connected via a communication network to the ITV server system 200 and broadcast server system 300."
Hensgen at 3:39-40	"The web server machine 120 may be or include an Internet streaming video server"
Stoica at 1:18-20	disclosing means to distributing "[video] content efficiently and with high quality"
Phillips ¶¶ 30-31; Fig.	a hierarchal server structure wherein "a central or national distribution node may in turn operate as a parent node to one or more child regional

12	distribution nodes" providing "for high-performance streaming . . . to subscribers using one or more Internet-based infrastructures"
Kellicker ¶¶ 98-100,102; Fig. 12	server 1250 is provided with the ability to receive a live media stream 1220, and stream that media to user devices.

Fifth, it would have been obvious to a POSITA at the time of the alleged invention(s) to combine certain elements found in the prior art because doing so would require only the use of known techniques to improve a known or similar devices, methods, or systems ready for improvement in the same way. For example, each of Ellis, Herzog, Cromarty, Sportradar Scout Client, Sportradar Live Channel Retail, or Kaazing disclose systems for transmitting live video and related event data to multiple viewers viewing one or more different live events over the Internet:

Reference/Prior Art	Exemplary Citation
Ellis ¶ [0041]; *see also* [0042]	"sports-related information is provided to user equipment 102 as a plurality of real-time data feeds" and "[e]ach data feed may be individually accessed"
Herzog ¶ [0049]; *see also* ¶¶ [0003], [0045-46]	"The solutions integrator 44 publishes the video imagery, related audio and meta-data that are received from the content provider 42 onto the content delivery network 47 for presentation to users/consumers of the content."
Cromarty at Abstract	"The present invention relates to portable video decoder devices that are used by sporting enthusiasts to monitor and access real time information concerning a sporting event" and receiving "a plurality of media feeds related to an event"
Scout Client, at Betradar Help (SRAD_00008954) at 25	"Betradar's new Live Scout Client offers a range of important information about the selected match as well as several configuration options" including both raw data and visual representations of play
Live Channel Retail at 2017 LCR Brochure (SRAD_00062364) at 2	"Betradar's Live Channel Retail delivers a unique combination of live streams, live statistics and live odds – all on one screen to help drive more revenue to your business."
Kaazing, at "Second Screen App" (SRAD_00011125)	"The Second Screen Solution provides a synchronized viewing experience between a primary screen (TV) and a second screen (smartphone). … This solution demonstrates two-way real-time

	interaction: questions pushed to mobile devices, as well as viewers displayed on the leaderboard."

A POSITA would have readily adapted techniques from other prior art references known at the time to improve upon the systems of Ellis, Herzog, Cromarty, Sportradar Scout Client, Sportradar Live Channel Retail, or Kaazing particularly to reduce latency, increase efficiency, and minimize delay. For example, other prior art references disclose:

Reference/Prior Art	Exemplary Citation
Spivey ¶¶ [0096]	A method to "push the data payload to client device 110, and to any other connected client devices that also requested that topic" "substantially simultaneously with the message queue server receiving the topic entry from a live data source, e.g. with a time delay of 100 milliseconds or less."
Mitic ¶ [0007]	Utilizing a "bidirectional websocket session" to deliver "segments of a live media programming stream" "substantially in real time"
Bota at 4:1-21	Describing a system that "supports a very large number of users, and has a high availability and low latency"
Dengler at 3:15-17	Events can be "automatically synchronized, in real time, to each of the recorded video streams, in a frame-accurate manner"
Ma ¶ [005]	A scalable live streaming system that "deliver[s], in a scalable and cost-effective manner, live and time-shifted streaming of content over the Internet" to "a large number of endpoints."
Mukherjee ¶¶ [0012], [0013], [0063], [0067]	Using "group-write operation[s]" "eliminate[s] … redundant data processing" and achieves "an edge server efficiency of 80–90%"
Mandyam at 25:41-26:10	a "livecasting engine" that allows "[m]ultiple end-users … to simultaneously consume" information include sports scores and live video in real time
Lu at 1:57-63	A method to allow for multiple broadcasts of the same media employing streams with comparatively "reduced quality"
Dukes at 1:16-21	"a system and method for integrating personalized data, services, content and community with broadcasted, recorded and/or downloaded content"
Cooper at 1:18-22	"a multimedia content delivery system and method that maximizes the efficiency of network bandwidth consumption through selective multicasting of the multimedia"
Basso at Abstract	A "metadata server" to provide "real-time metadata" regarding "a plurality of multimedia data streams" in "real time" on a "metadata stream"
Levinson at Abstract	"A system and method for simultaneous real time video streaming …

	through a server to recipient mobile devices or other video displays … and to enable responses from those recipients, for security, personal, entertainment or commercial applications."
Park at ¶[0012]	"broadcasts the sports data to the at least one end user device through the wireless communications link in real time or substantially real time during a sporting event"
Apple HLS Overview at 1-2	Apple's HLS architecture supports "multiple alternate streams at different bit rates" such that each client viewer could "switch streams intelligently as network bandwidth changes."
Abulikemu ¶13	a "central server 100," which "can offer live streaming of the event as captured by the plurality of cameras including the broadcasting system's cameras 102 and the viewers' cameras 104. The central server can also offer different live commentaries by one or more of the official commentators, independent commentators, and/or viewers. The central server can provide the different views and commentaries via a network (e.g., internet or satellite network) to a viewer's device (e.g., viewer device 108, 110, and/or 112) and allow the viewer to select the view(s) and/or commentaries to watch/listen."
Grubbs ¶35	"methods and systems wherein users may create and broadcast live streaming video, which may be embedded with other digital content streams, over a network through use of multiple communicating servers interconnected and be able to edit and composite such live streaming video and other digital content streams simultaneous to their broadcast over a network and to multiple viewers on multiple platforms."
Perlman at Abstract	a "hosting service center," which is configured to "broadcast[] the twitch action video game or real-time application in one or more streams of real-time compressed digital video ... to one or more viewing client devices over the Internet."
Good '534 ¶35	an "origin media server," which leverages a "packet generator/processor 208, a stream encoder 210, [and] a stream decoder 212" to "perform stream processing (e.g., encoding or transcoding) and protocol-level functions with respect to the received BMS 230 to generate output data to be provided to one or more edge media server 240."
Lemmons ¶4	"When multiple streams being received by the media server match entries in the publishing map, the media server may publish each stream to multiple publishing destinations. The described techniques may therefore enable automatic push publication of multiple received streams to multiple publishing destinations at the same time."
Good '113 at 7:24-53, 9:57-10:16; *see also* Good '780 at 7:33–62, 9:66–10:25	dynamic overlays specific to the live content the user is watching, e.g., football, and send a stream to "multiple destinations with destination specific overlays."
Newnam, 2:41-61	"The embodiment of the present invention allows a more efficient production of ITV programming by automating the insertion of triggers during the television broadcast, and avoiding the need for incorporating the content or triggers into a dubbed

	copy of a master tape. … Content is provided to two-screen systems via a server system, and to one-screen systems via timed real-time trigger insertion, with the content provided based on the same timing information from the automation system (the playlist)."
Hensgen at 2:17-32	disclosing means to transmit and display synchronized media on user devices
Stoica at 1:18-20	disclosing means to distributing "[video] content efficiently and with high quality"
Phillips ¶30	a server structure which provides "high-performance streaming . . . to subscribers using one or more Internet-based infrastructures"
Kellicker ¶4	"systems and methods of coordinating data analytics to improve performance of streaming servers , client devices , and analytics servers"

In addition, it would have been obvious for a POSITA to utilize or extend any of the prior art products identified above, including at least Sportradar Scout Client, Sportradar Live Chnnel Retail, Kaazing, Betstream, Facebook Live, MLB At Bat, OneTwoSee, RTP, WebSocket, and WebRTC, based on the teachings of one or more of the prior art patents and publications identified above. Investigations into the functioning and operation of prior art products and services, which includes information uniquely in the possession of third parties, is ongoing. Accordingly, Defendants reserve the right to supplement their contentions based on information produced by such third parties in the course of discovery.

B. Secondary Considerations

Plaintiff has not yet made any argument as to secondary considerations of alleged non-obviousness. Any allegations in Plaintiff's Complaint and/or Amended Complaint do not demonstrate that a nexus exists between any unsupported statements and the merits of its claimed invention.

Plaintiff has also yet to produce any evidence of any alleged long-felt, but unsolved need that its purported invention(s) solves, the failure of others to address that need, unexpected results, or the commercial success of its own products to evidence the non-obviousness of the

alleged inventions of the Asserted Patents. Indeed, the bevy of prior art (including patents, publications, and products) identified and discussed above and identified in the charts provided demonstrate that technologies for streaming video and/or information or data about an event or media to one or more users with the aims of reducing latency, increasing efficiency, and minimizing delay were numerous, were already well-known, and available long-before the earliest priority date of the Asserted Patents.

V. PATENT RULE 3.3(C) – INVALIDITY CHARTS

Defendants assert that each of the asserted claims is invalid as anticipated by prior art under various subsections of 35 U.S.C. § 102 and/or as obvious in view of the prior art under 35 U.S.C. § 103. The accompanying Charts, attached as Appendices A-D, provide examples of prior art references identified by Defendants that disclose, either expressly or inherently, and/or that render obvious, each and every element and limitation of the asserted claims. Defendants have endeavored to cite the most relevant portions of the identified prior art; however, other portions of the identified prior art do and/or may disclose, either cumulatively, separately, expressly and/or inherently, and/or render obvious, one or more limitations of the asserted claims, and may be equally relevant. Defendants further incorporate by reference, as if fully and completely set forth herein, the relevant portions of the file histories of each of the Asserted Patents, including, for example and without limitation, the disclosures and teachings of the identified prior art references and the reasons and motivations to combine those references.

Reference/Prior Art	'697 Chart	'687 Chart	'218 Chart	'088 Chart
U.S. Patent No. 7,386,870 ("Lu")	A-1	B-1	C-1	D-1
U.S. Patent No. 7,458,093 ("Dukes")	A-2	B-2	C-2	D-2
U.S. Patent No. 8,595,186 ("Mandyam")	A-3	B-3	C-3	D-3
U.S. Patent No. 8.677,420 ("Cromarty")	A-4	B-4	C-4	D-4

Reference/Prior Art	’697 Chart	’687 Chart	’218 Chart	’088 Chart
U.S. Patent No. 8,880,719 (“Cooper”)	A-5	B-5	C-5	D-5
U.S. Patent No. 8,850,053 (“Basso”)	A-6	B-6	C-6	D-6
U.S. Patent No. 9,393,485 (“Sullivan”)	A-7	B-7	C-7	D-7
U.S. Patent No. 9,456,230 (“Bota”)	A-8	B-8	C-8	D-8
U.S. Patent No. 9,905,082 (“Dengler”)	A-9	B-9	C-9	D-9
U.S. Patent App. Pub. No. 2012/0011267 (“Ma”)	A-10	B-10	C-10	D-10
U.S. Patent App. Pub. No. 2014/0129680 (“Mukherjee”)	A-11	B-11	C-11	D-11
U.S. Patent App. Pub. No. 2014/0229992 (“Ellis”)	A-12	B-12	C-12	D-12
U.S. Patent App. Pub. No. 2015/0163379 (“Herzog”)	A-13	B-13	C-13	D-13
U.S. Patent App. Pub. No. 2016/0006817 (“Mitic”)	A-14	B-14	C-14	D-14
U.S. Patent App. Pub. No. 2016/0036910 (“Spivey”)	A-15	B-15	C-15	D-15
U.S. Patent App. Pub. No. 2016/0294906 (“Levinson”)	A-16	B-16	C-16	D-16
U.S. Patent App. Pub. No. 2017/0041686 (“Park”)	A-17	B-17	C-17	D-17
U.S. Patent App. Pub. No. 2018/0367820 (“Abulikemu”)	A-18	B-18	C-18	D-18
Sportradar Scout Client	A-19	B-19	C-19	D-19
Kaazing	A-20	B-20	C-20	D-20
WebRTC	A-21	B-21	C-21	D-21
RTP	A-22	B-22	C-22	D-22
WebSocket	A-23	B-23	C-23	D-23
Apple HLS	A-24	B-24	C-24	D-24
Betstream	A-25	B-25	C-25	D-25
Facebook Live	A-26	B-26	C-26	D-26
MLB AtBat	A-27	B-27	C-27	D-27
OneTwoSee	A-28	B-28	C-28	D-28
Sportradar Live Channel Retail	A-29	B-29	C-29	D-29
U.S. Patent App. Pub. No. 2018/0176621 (“Grubbs”)	A-30	B-30	C-30	D-30
U.S. Patent No. 10,150,030 (“Perlman”)	A-31	B-31	C-31	D-31
U.S. Patent App. Pub. No. 2014/0108534	A-32	B-32	C-32	D-32

Reference/Prior Art	’697 Chart	’687 Chart	’218 Chart	’088 Chart
(“Good ’534”)				
U.S. Patent App. Pub. No. 2014/0281007 (“Lemmons”)	A-33	B-33	C-33	D-33
U.S. Patent No. 8,752,113 (“Good ’113”)	A-34	B-34	C-34	D-34
U.S. Patent No. 9,350,780 (“Good ’780”)	A-35	B-35	C-35	D-35
U.S. Patent No. 8,555,313 (“Newnam”)	A-36	B-36	C-36	D-36
U.S. Patent No. 9,143,565 (“Hensgen”)	A-37	B-37	C-37	D-37
U.S. Patent No. 9,246,965 (“Stoica”)	A-38	B-38		
U.S. Patent App. Pub. No. 2015/0127845 (“Phillips”)	A-39	B-39		
U.S. Patent Pub. 2017/0250882 (“Kellicker”)	A-40	B-40		D-40

Although Defendants have intended to identify at least one citation per limitation for each prior art reference, each and every disclosure of the same limitation in a particular reference is not necessarily identified, and the lack of a citation for a limitation is not and shall not be deemed to be an admission that the limitation is not disclosed or is not inherent in any uncited portion of the reference.

VI. LOCAL PATENT RULE 3.3(D) – INSUFFICENT WRITTEN DESCRIPTION, LACK OF ENABLEMENT, AND INDEFINITENESS

Pursuant to P.R. 3-3(d), Defendants contend that one or more of the Asserted Claims are invalid for insufficient written description and lack of enablement under 35 U.S.C. § 112(a) and indefiniteness under 35 U.S.C. § 112(b) based on at least the grounds described below.

The claims and limitations identified herein are not intended to be exhaustive, but instead illustrate examples of the various ways in which the Asserted Claims lack sufficient written description, are not enabled, and/or are indefinite.

Plaintiff has not yet identified proposed terms for construction in this lawsuit or provided any proposed claim constructions in this lawsuit for any of the terms and phrases that Defendants

anticipate will be in dispute. Defendants, therefore, cannot provide a complete list of their § 112 defenses because Defendants do not know whether Plaintiff will proffer a construction or asserted claim scope for the asserted claims terms and phrases that is broader than, or inconsistent with, the construction that would be supportable by the disclosure set forth in the specification. Defendants offer these contentions pursuant to the Local Patent Rules, in reliance upon Plaintiff's apparent interpretation of the claims as evidenced by, for example, the Amended Complaint and asserted claims, and without prejudice to any position any Defendant or Plaintiff may ultimately take as to any claim construction or claim scope issues. These contentions do not constitute, and should not be interpreted as, admissions regarding the construction or scope of any of the asserted claims.

Defendants reserve all rights to supplement, correct, amend, or modify its 35 U.S.C. § 112 contentions based upon, for example, what discovery may yield (including, but not limited to, whether the asserted claims satisfy the best mode requirement of § 112(a)), how the asserted claims are ultimately construed by the Court, and any express or implied changes in Plaintiff's Infringement Contentions and/or its interpretation of the Asserted Claims. With respect to claim terms that Defendants contend are indefinite, Defendants reserve the right to propose constructions for those terms at the claim construction stage should the Court determine that those terms are not indefinite.

A. Legal Standard.

To satisfy the written description requirement, a patent's specification must reasonably convey to a person having ordinary skill in the art that the inventor had possession of the full scope of the claimed subject matter as of the filing date. *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (*en banc*) (internal quotations omitted); *ICU Med., Inc. v.*

Alaris Med. Sys., Inc., 558 F.3d 1368, 1376-79 (Fed. Cir. 2009); *LizardTech, Inc. v. Earth Resource Mapping, Inc.,* 424 F.3d 1336, 1344-47 (Fed. Cir. 2005).

"[T]he hallmark of written description is disclosure." *Ariad,* 598 F.3d at 1351. Thus, the written-description test requires "an objective inquiry into the four corners of the specification from the perspective of a person of ordinary skill in the art." *Id.* A specification that merely renders obvious the full scope of the claimed invention does not satisfy the written-description requirement. *Id.; Lockwood v. Am. Airlines, Inc.,* 107 F.3d 1565, 1572 (Fed. Cir. 1997) ("It is not sufficient for purposes of the written description requirement of § 112 that the disclosure, when combined with the knowledge in the art, would lead one to speculate as to modifications that the inventor might have envisioned, but failed to disclose."). "[A] patent can be held invalid for failure to meet the written description requirement, based solely on the language of the patent specification." *Univ. of Rochester v. G.D. Searle & Co.,* 358 F.3d 916, 927 (Fed. Cir. 2004).

Furthermore, to satisfy the enablement requirement, the specification must provide a written description of the claimed invention in a manner that enables a person of ordinary skill in the art to make and use the full scope of the claimed invention without undue experimentation as of the filing date. *See, e.g., In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988); *Alza Corp. v. Andrx Pharms., LLC,* 603 F.3d 935, 941-42 (Fed. Cir. 2010); *Sitrick v. Dreamworks, LLC,* 516 F.3d 993, 999 (Fed. Cir. 2008). To satisfy the enablement requirement, the specification of a patent must enable a person of skill in the art, as of the filing date, to practice the full scope of the claimed invention without undue experimentation. "Enabling the full scope of each claim is part of the quid pro quo of the patent bargain." *Sitrick,* 516 F.3d at 999 (quoting *AK Steel Corp. v. Sollac,* 344 F.3d 1234, 1244 (Fed. Cir. 2003) (quotations omitted)). The focus of an enablement inquiry is on the teachings in the specification. *See* 35 U.S.C. § 112 ("The

specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains . . . to make and use the same. . . .") (emphasis added).

To satisfy the plain language of 35 U.S.C. § 112, the patentee is "required to provide an adequate enabling disclosure in the specification; it cannot simply rely on the knowledge of a person of ordinary skill to serve as a substitute for the missing information in the specification." *Alza,* 603 F.3d at 941; *see also Auto. Tech.,* 501 F.3d at 1283-84 (claims encompassing electronic sensors held invalid despite the fact that known technologies could be used to create the electronic sensors, where specification did not teach electronic sensors).

There are several factors that a court may consider when deciding whether the specification requires undue experimentation: "(1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims." *Alza,* 603 F.3d at 940. These factors need not be addressed in detail in these contentions, and are subject to further exploration and elucidation through discovery and expert disclosures. However, "when there is no disclosure of any specific starting material or of any of the condition under which a process can be carried out, undue experimentation is required." *Id.* at 941 (quoting *Auto. Tech.,* 501 F.3d at 1283-84).

Finally, a patent claim must "particularly point[] out and distinctly claim[] the subject matter which the inventor or a joint inventor regards as the invention." 35 U.S.C. § 112(b). A "patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the

art about the scope of the invention." *Nautilus, Inc. v. Biosig Instruments, Inc.,* 134 S. Ct. 2120, 2124 (2014); *see also In re Packard,* 751 F.3d 1307, 1314 (Fed. Cir. 2014). Eliminating the "zone of uncertainty" is the responsibility of the patentee: "[A]bsent a meaningful definiteness check . . . patent applicants face powerful incentives to inject ambiguity into their claims. Eliminating that temptation is in order, and 'the patent drafter is in the best position to resolve the ambiguity in . . . patent claims.'" *Id.* (quoting *Halliburton Energy Servs., Inc. v. M-I LLC,* 514 F.3d 1244, 1255 (Fed. Cir. 2008)).

B. Neither a "Socket Server" nor an "Event Socket" Are Enabled.

The specifications of the Asserted Patents do not contain an enabling description of the claimed "socket server" and "event socket(s)" nor does the specification for any of the Asserted Patents contain a written description sufficient to show that the inventors were in possession of a "socket server" with "event sockets" having the functionality recited in the Asserted Claims. *See, e.g.*, '687 Patent, claims 19–20; '697 Patent, claims 19–20; '218 Patent, claims 1, 4; '088 Patent, claim 1.

The Asserted Claims disclose, among other things, a "socket server" having a "first event socket," "at least one first event socket," or a "first socket." *Id.* The claims require that "event information" (or "score information" or "digital content corresponding to the [] event information") be transmitted "between" an event socket of the socket server and a "viewer client device" on an "[Internet] communication channel." *See* '687 Patent, claim 19; '697 Patent, claim 19; '218 Patent, claim 1, '088 Patent, claim 1. The same event socket of the socket server transmits information to both a "first [viewer] client device" and a "second [viewer] client device" on different Internet communication channels. *See* '687 Patent, claims 19–20; '697 Patent, claims 19–20; '218 Patent, claims 1, 4; '088 Patent, claim 1.

Plaintiff's Amended Complaint alleges that the Asserted Patents claim "a novel socket server architecture, in which a socket is dedicated to a particular live stream … [and which] allow[s] multiple users to connect to the same event socket, thereby achieving a one-to-many socket architecture … counter to the then-conventional understanding and use of sockets." Dkt. 17, ¶ 11. The specifications of the Asserted Patents, however, do not provide sufficient written description to disclose such an allegedly novel socket server architecture or to demonstrate that the inventors were in possession of the full scope of the claimed subject matter, nor do the disclosures contain sufficient information to enable a POSITA to make and use the claimed invention without undue experimentation.

The Asserted Patents provide little detail about the claimed socket server and merely describe it in generic or functional terms, stating that the one or more socket servers "facilitate communication, to one or more broadcaster client devices and one or more viewer client devices, of synchronized event information retrieved by the control server [] and associated with video-based commentary relating to a particular event" and that "one or more sockets of the socket server(s) dedicated to the particular event allow respective client devices to establish an event information channel with the socket server(s), such that the event information (e.g., in the form of 'event messages') is shared in a synchronized manner by all broadcasters/viewers following the particular event." *E.g.*, '687 Patent at 20:10–21:4. The Asserted Patents do not define or provide descriptions of the structure of a "socket," "event socket," or "socket server," except to note that in "one aspect" the "connections between a given client device and a particular socket of a socket server are persistent authenticated connections." *Id.* at 20:55–57. The Asserted Patents disclose that "web server(s) [] provide to the first viewer client device [] a first event identifier (a first EventID) that corresponds to the first event socket," that the "viewer client

device [] uses the first EventID to connect to the first event socket," and that "first score information [] is then transmitted to the first viewer client device [] via a first event information Internet communication channel [] between the first even socket [] and the first viewer client device." *Id.* at 21:63–22:16. The Asserted Patents do not disclose any specific structure or describe any functionality regarding the operations of the socket server or event sockets that would allow for and/or facilitate its allegedly novel "one-to-many socket architecture."

The Asserted Patents do purport to disclose "technological problems addressed by the invention solutions" disclosed therein, including "how to synchronize such low latency and high quality copies of broadcaster live streams of digital content with event information associated with the digital content." *E.g.*, '687 Patent at 25:4–43. But in discussing the alleged solution to the problem of synchronization, the Asserted Patents disclose only the generic use of a separate "communication channel … dedicated to … event information germane to an event" where viewer client devices connect to a "socket-based 'event information channel' dedicated to the event" such that "all viewers (and broadcasters) of the event … connect to one or more sockets of a socket server that is/are dedicated to the event, such that all live streams relating to the event are similarly synchronized to event information and updates to same." *Id.*, 26:29–27:14. The problem is also allegedly addressed by using a single control server "provid[ing] changes [in state] to the one or more sockets dedicated to the event (to which all viewers and broadcasters of video-based commentary regarding the event are communicatively coupled), resulting in a single synchronized update to all client devices." *Id.*, 27:15–37. Again, the Asserted Patents do not disclose any specific structure or describe any functionality regarding the operations of the socket server or event sockets that would allow for and/or facilitate its allegedly novel "one-to-many socket architecture."

Moreover, the Asserted Patents state that the implementations described in the specifications "may be implemented using hardware, software or a combination thereof," and that "software code can be executed on any suitable processor or collection of processors, whether provided in a single computer or distributed among multiple computers." '687 Patent at 53:64–54:2. In particular, according to the Asserted Patents, the "various servers and other computing devices of the broadcast/viewing servers and memory storage devices shown for example in FIGS. 2 and 3, may comprise one or more processors, one or more memory devices or systems communicatively coupled to the one or more processors (e.g., to store software code and other data), and one or more communication interfaces communicatively coupled to the one or more processors[.]" '687 Patent at 55:16–25.

Accordingly, and to the extent that Plaintiff contends that the claimed socket server and event sockets are novel, unconventional, and/or distinct from the pre-existing, generic networking components the Asserted Patents assert that the Asserted Claims can be implemented using, such a contention is not supported by the specification and the Asserted Claims are not enabled by adequate written description. To the extent a POSITA would have appreciated that the claimed systems can be used to transmit event information to multiple viewer client devices from one or more event sockets in a socket server, that appreciation could only have come from what was already disclosed in or obvious over the prior art, not from the written description of such capabilities in the Asserted Patents.

C. To the Extent Plaintiff Asserts That the "Socket Server" and "Event Socket" Are Generic Components/Terms, these Claim Terms Invoke Section 112(f) and the Claims Are Indefinite Under 112(b).

As noted previously, Plaintiff's Amended Complaint alleges that the Asserted Patents claim "a novel socket server architecture, in which a socket is dedicated to a particular live stream … [and which] allow[s] multiple users to connect to the same event socket, thereby

achieving a one-to-many socket architecture … ***counter to the then-conventional understanding and use of sockets***." Dkt. 17, ¶ 11 (emphasis added). To the extent Plaintiff asserts or argues that the functions performed by the claimed "socket server" and "event socket" comprise a "novel architecture" and therefore cannot be performed by structures already well-understood by a POSITA, the terms are indefinite under at least 35 U.S.C. § 112(f) and § 112(b).

Under Plaintiff's apparent interpretation, the claims recite a means ("socket server" and/or "event socket") that is performing a function and is, in its own words, operating contrary to the conventional understanding and use of the term "socket." The claims therefore do not recite "sufficient structure for performing [the recited function]" and § 112(f) applies. *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1348 (Fed. Cir. 2015). But, if § 112(f) applies, the claims are limited to the "structures or acts" in the specification that correspond to the claimed function, *id.* at 1351, and, as discussed above, the specification provides little to no guidance about the structure of the "socket server" and "event socket."

Furthermore, § 112(f) limitations where the structure is a computer or computer element must disclose an "algorithm for performing the claimed function." *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1367 (Fed. Cir. 2008). No such guidance is provided by the specification. If the terms "socket server" and "event socket" refer to generic computing elements performing new functions (*e.g.*, such as a previously-known processor carrying out a new function), they are governed by § 112(f), and the specifications do not provide corresponding adequate structure (*e.g.*, an algorithm). Therefore the claims are therefore indefinite under § 112(b).

D. Both the '687 and '697 Patents Improperly Use Functional Claiming

Claim 27 of the '687 Patent recites a "means for transmitting the first event information to at least the first viewer client device via a first event information communication channel that is

different from the first video communication channel." Claim 27 of the '697 Patent similarly recites "means for transmitting the first score information to at least the first viewer client device via a first event information communication channel that is different from the first video communication channel." Such claims and the claims that depend from them utilize the scope of 35 U.S.C. § 112(f), but the specifications claim only that the functions may be implemented using any combination of hardware and software, including code "executed on any suitable processor" or collection of processors in a single or distributed computer system, coupled to "one or more communication interfaces." '687 Patent at 53:64–54:2, 54:53–59, 55:16–25. Merely reciting a generic computer or analogous term is insufficient without disclosing a corresponding procedural algorithm. The Asserted Patents do not disclose a procedural algorithm clearly linked to the claim functionality of the "means for transmitting," rendering those limitations indefinite and invalid.

E. The Specifications of the '218 and '088 Patents Fail to Sufficiently Describe the Claimed "Instructions"

The specifications of the '218 and '088 Patents do not contain sufficient written description of the claimed "instructions" transmitted by the webserver to convey to a POSITA that the inventor had possession of the full scope of the invention (as opposed to merely rendering it obvious). *See, e.g.*, '088 Patent, claim 1; '218 Patent, claim 21.

For example, the '088 Patent discloses that "web server(s) [] provide to the first viewer client device [] a first event identifier (a first EventID) that corresponds to the first event socket," and that the "viewer client device [] uses the first EventID to connect to the first event socket," '088 Patent at 21:34–54, the specification fails to disclose "instructions … [that] ***cause*** the first client device to: connect … connect … render … and obtain access … ," *id.*, claim 1. Methods of performing such operations were well-known in the prior art, but a specification that merely

renders obvious the full scope of the claimed invention does not satisfy the written-description requirement. To the extent a POSITA would have understood how to craft instructions to perform the claimed systems, such knowledge would have been the result of choosing from a variety of obvious and well-known methods and the exact bounds of the claimed invention would be indeterminate.

F. Claim 20 of the ’687 and ’697 Patents Include Terms Lacking Antecedent Basis.

Claim 20 of the ’687 Patent recites a “third video Internet communication channel between the plurality of media sources and the second viewer client device of the first plurality of viewer client devices,” a “fourth video Internet communication channel between the plurality of media sources and the second viewer client device of the second plurality of viewer client devices,” a “third event information Internet communication channel between the at least one first event socket of the at least one socket server and the second viewer client device of the first plurality of viewer devices,” and a “fourth event information Internet communication channel between the at least one second event socket of the at least one socket server and the second viewer client device of the second plurality of viewer devices.” Claim 19, from which Claim 20 depends, recites only a “first Internet communication channel between the plurality of media sources and the first viewer client device of the first plurality of viewer client devices,” a “second Internet communication channel between the plurality of media sources and the first viewer client device of the second plurality of viewer client devices,” a “third Internet communication channel between at least one first event socket of the at least one socket server and the first viewer client device of the first plurality of viewer devices,” and a “fourth Internet communication channel between at least one second event socket of the at least one socket server and the first viewer client device of the second plurality of viewer devices.” Claim 19 does not

recite "first" or "second" "video Internet communication channels" or "event information Internet communication channels" nor does it recite any "video Internet communication channel[s]" or "event information Internet communication channel[s]." Claim 20 lacks antecedent basis for those terms, thus rendering the claim indefinite.

Similarly, Claim 20 of the '697 Patent recites a "third video Internet communication channel between the plurality of media sources and the second viewer client device of the first plurality of viewer client devices," a "fourth video Internet communication channel between the plurality of media sources and the second viewer client device of the second plurality of viewer client devices," a "third event information Internet communication channel between the at least one first event socket of the at least one socket server and the second viewer client device of the first plurality of viewer devices," and a "fourth event information Internet communication channel between the at least one second event socket of the at least one socket server and the second viewer client device of the second plurality of viewer devices." Claim 19, from which Claim 20 depends, recites only a "first Internet communication channel between the plurality of media sources and the first viewer client device of the first plurality of viewer client devices," a "second Internet communication channel between the plurality of media sources and the first viewer client device of the second plurality of viewer client devices," a "third Internet communication channel between at least one first event socket of the at least one socket server and the first viewer client device of the first plurality of viewer devices," and a "fourth Internet communication channel between at least one second event socket of the at least one socket server and the first viewer client device of the second plurality of viewer devices." Claim 19 does not recite "first" or "second" "video Internet communication channels" or "event information Internet communication channels" nor does it recite any "video Internet communication

channel[s]" or "event information Internet communication channel[s]." Claim 20 lacks antecedent basis for those terms, thus rendering the claim indefinite.

Similarly, claims 22 of the '687 and '697 Patents recite a "third video Internet communication channel between the plurality of media sources and the second viewer client device of the first plurality of viewer client devices," a "fourth video Internet communication channel between the plurality of media sources and the second viewer client device of the second plurality of viewer client devices," a "third event information Internet communication channel between the at least one first event socket of the at least one socket server and the second viewer client device of the first plurality of viewer devices," and a "fourth event information Internet communication channel between the at least one second event socket of the at least one socket server and the second viewer client device of the second plurality of viewer devices" without antecedent basis, rendering the claim indefinite for the same reasons.

G. Claim Limitations Requiring "Synchronization" Are Indefinite.

The Asserted Claims of the '218 Patent and '088 both require that event information or digital content be shared or received in a "synchronized" manner. *See, e.g.*, '218 Patent, Claim 4 ("the online gaming information is shared in a synchronized manner by the first viewer client device and the second viewer client device"); '088 Patent, Claim 1 ("so that the first digital content received at the first client device and the second client device is synchronized and client-by-client latency between the first client device and second client device to render the first event information is thereby mitigated or significantly reduced").

However, sharing information "in a synchronized manner" or having digital content received by two different client devices be "synchronized"[1] or that "client-by-client latency … is thereby mitigated or significantly reduced" are indefinite terms that do not inform a POSITA of their scope with reasonable certainty. In particular, each of the foregoing are terms of degree with no clear baseline provided by the claims or specification. The specifications do not provide any boundaries for the degree of synchronization required to fall within the scope of the claims. The specifications also fail to identify any parameters for acceptable latency mitigation in the context of transmitting event information or digital content.

Notably, the '088 Patent does state that: "all broadcasters providing video-based commentary on a particular event provide respective integrated live event and commentary streams that are substantially synchronized (e.g., with a delay relative to the original audio/video feed of the live event of approximately one HLS window/buffer length, e.g., 8 to 12 seconds for 4 or 6 pointers, respectively), and all viewers of a given broadcaster receive respective copies of the integrated live event and commentary stream from the broadcaster that are substantially synchronized (e.g., with a delay relative to the original audio/video feed of the live event of approximately two HLS windows/buffer lengths, e.g., 16 to 24 seconds for 4 or 6 pointers, respectively)," but this language refers to the delay between the original video feed, the broadcasters, and the viewers, not any synchronization between the viewers themselves. '088 Patent at 58:11–33. To the extent Plaintiff intends to rely on this language, it is conspicuously absent from the specification of the '218 Patent.

[1/] Putting aside the specifications' failure to adequately define "synchronize," this latter use is doubly indefinite for stating that two data are synchronized as opposed to the receipt or transmission of said data.

The only disclosure common to both the '218 and '088 Patents' specifications that discloses numerical values for latency are provided in the context of streaming live video, not event information. *See, e.g.*, '218 Patent at 26:25–36 (describing RTMP CDN servers that "introduce appreciably low latency (e.g., on the order of less than 150 milliseconds)," "appreciably low latency introduced by the media servers and RTMP CDN (e.g., on the order of about 500 milliseconds or even less)," and "client-introduced digital content latency (e.g., on the order of about one-to-two seconds for continuous streaming consumers)"), 40:31–34 ("significantly reduced HLS latency of approximately 8 to 12 seconds"). The latency figures provided in the specifications also span orders of magnitude (from hundreds of milliseconds to tens of seconds) and are not provided any upper or lower bound. *See, e.g.*, 26:25–36, 40:31–34.

Accordingly, a POSITA would not be able to ascertain with reasonable certainty the degree of synchronization or latency, in either absolute or relative terms, required in order to practice the claims, rendering them indefinite.

H. Claim Limitations Reciting "Germane" or "Related" Information Are Indefinite.

The Asserted Claims of the '687, '697, and '218 Patents all require the retrieval and transmission of "first event information germane to [a/the] first live sporting event." *See* '687 Patent, Claim 19; '697 Patent, Claim 19; '218 Patent, Claim 1; *see also* '088 Patent, Claim 1 ("first event information relating to the live event"). However, event information "germane" or "relating" to a sporting event is an indefinite term that does not inform a POSITA of its scope with reasonable certainty. The specifications do not provide sufficient limiting boundaries that would allow a POSITA to determine if information is "germane" or "related" or not and thus whether a particular system might fall within the scope of the claims.

The specifications specifically identify "score information" as qualifying information. *See, e.g.*, '697 Patent, 9:45-46. It also provides examples of other "event information" that might be displayed in an alleged implementation of the invention, including (but not limited to) "one or more of team information (e.g., team names, abbreviations and/or logos), score information (e.g., with essentially real-time score updates synchronized with the video-based commentary), player information, venue information, game status information (e.g., on-base, at-bat, timeouts, fouls, pole position, yards-to-go, yards-to-goal, down), team statistics, player statistics and the like." '697 Patent, at 4:41–5:6. But the specification does not identify that such additional information is necessarily "germane" or what additional "event information" might or might not be "germane." Ultimately, the term's use in the Asserted Claims is also indefinitely circular as it is not clear how "event information" could or could not be "germane" to the event itself.[2]

Accordingly, a POSITA would not be able to ascertain with reasonable certainty whether specific non-score information is or is not "germane" to the event, as required to practice the claims, rendering them indefinite.

I. The Phrase "the first score information the at least some of the first event information" Renders Claim 19 Indefinite.

Claim 19 of the '697 Patent fails to particularly point out and distinctly claim the subject matter which the alleged inventors regard as the purported invention. Claim 19 is ill-formed and non-sensical as it includes the language "transmit at least the first score information the at least some of the first event information to the first viewer client device of the first plurality of viewer client devices via a third Internet communication channel." '697 Patent, Claim 19.

[2/] This is distinct from the specification's recitation of "various event information or other information germane to a given broadcaster's video-based commentary." '697 Patent, at 5:1-3.

Accordingly, a POSITA would not be able to ascertain with reasonable certainty exactly what the claim requires and is thus indefinite.

VII. 35 U.S.C. § 101: INELIGIBILTY

Pursuant to the Court's Standing Order Regarding Subject-Matter Eligibility Contentions, Defendants contend that the Asserted Claims do not qualify as patent-eligible subject matter for the reasons explained in the charts attached hereto as Appendix E.

VIII. PATENT RULE 3-4

A. Documents Related to Accused Products Under P.R. 3-4(a)

Defendants have produced and/or made available for inspection representative specifications, schematics, flow charts, artwork, formulas, or other documentation sufficient to show the operation of any aspects or elements of the products Plaintiff has accused of infringing the Asserted Patents, to the extent such information is in Defendants' possession, custody, or control and could be located after a reasonable search. Defendants' production of technical documentation may be found at the documents bearing production numbers SRAD_00003182 – SRAD_00007879 and SRAD_00058893 – SRAD_00072199. Such documents may also constitute prior art under P.R. 3-4(b). Defendants will make source code available for inspection pursuant to the terms of the entered Protective Order (Dkt. 94).

B. Documents Related to Prior Art Under P.R. 3-4(b)

Based on their respective investigations to date, pursuant to P.R. 3-4(b), Defendants are collectively producing documents currently within their possession, custody, or control that constitute and/or relate to the prior art references identified above and/or in the attached charts in connection with Defendants' P.R. 3-3(a) disclosure. Defendants have produced or are producing prior art identified with the following production numbers: SRAD_00000001 –

SRAD_00003181; SRAD_00007880 – SRAD_00011333; SRAD_00053430 – SRAD_00058892; and SRAD_00072200 – SRAD_00072390.

Dated: December 9, 2024

Respectfully submitted,

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that all counsel of record are being served with a copy of this document by email on this 9th day of December, 2024.

/s/ George G. Brell