United States Court of Appeals
for the Federal Circuit

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**AKAMAI TECHNOLOGIES, INC.,
THE MASSACHUSETTS INSTITUTE OF
TECHNOLOGY,**
Plaintiffs-Appellants

v.

LIMELIGHT NETWORKS, INC.,
Defendant-Cross-Appellant

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2009-1372, 2009-1380, 2009-1416, 2009-1417

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Appeals from the United States District Court for the District of Massachusetts in Nos. 06-CV-11585, 06-CV-11109, Judge Rya W. Zobel.

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Decided: November 16, 2015

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Before PROST, *Chief Judge,* LINN and MOORE, *Circuit Judges.*

LINN, *Circuit Judge.*

This case first came to this court after, *inter alia*, a jury verdict finding Akamai's U.S. Pat. No. 6,108,703 ("'703 patent") not invalid and directly infringed by Limelight, followed by the entry of judgment as a matter of law ("JMOL") overturning the jury's infringement verdict on the basis of divided infringement. *Akamai Techs., Inc. v. Limelight Networks, Inc.* (*Akamai II*), 614 F. Supp. 2d 90 (D. Mass. 2009). After several rounds of appeals and remands, culminating with the *en banc* court's reversal of the district court's JMOL determination on the divided infringement issue, the case returns to this panel, which is tasked with resolving "all residual issues" in the appeal and cross-appeal. *Akamai Techs., Inc. v. Limelight Networks, Inc.* (*Akamai IV*), 797 F.3d 1020, 1025 (Fed. Cir. 2015) (en banc).

On this record, the only issues remaining stem from Limelight's cross-appeal, which argued alternative grounds for overturning the jury's verdict of infringement and challenged the damages award. Specifically, three issues remain to be adjudicated. First, whether the district court erred in construing the claim term "tagging."[1] Second, whether the district court properly constructed the term "optimal," and properly instructed the jury on the construction.[2] Third, whether the district court erred in allowing Akamai to present a lost profits theory based on the testimony of its expert.

Because the district court did not err in its claim constructions and appropriately instructed the jury, and because we find no error in the district court's allowance of Akamai's lost profits expert, we decline Limelight's invitation to find an alternate basis to overturn the jury verdict on infringement and its damages award. Accordingly, we reiterate the *en banc* court's reversal of the district court's grant of JMOL of non-infringement and remand with instructions to reinstitute the jury's original verdict and damages award. We also confirm our previously reinstated affirmance of the district court's judgment of non-infringement of U.S. Patent Nos. 6,553,413 (the "'413 patent") and 7,103,645 (the "'645 patent").

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[1]   Limelight argues that the district court erred in its construction, and that the jury lacked sufficient evidence to find infringement in light of the correct construction.

[2]   Limelight argues both that the claim construction was erroneous, and that the subsequent jury instruction improperly left claim construction to the jury.

I. BACKGROUND

A. The Technology and the Nature of the Dispute

A detailed description of the technology and the claims at issue in this case is set forth in the prior reported opinions of this court and the Supreme Court and will not be repeated except to the extent germane hereto. *See Akamai IV*, 797 F.3d 1020; *Limelight Networks, Inc. v. Akamai Techs., Inc.*, 134 S. Ct. 2111 (2014); *Akamai Techs., Inc. v. Limelight Networks, Inc. (Akamai III)*, 629 F.3d 1311 (Fed. Cir. 2010).

B. Prior Proceedings

In 2006, Akamai sued Limelight in the United States District Court for the District of Massachusetts asserting infringement of claims 19–21 and 34 of the '703 patent, along with certain claims of the '413 and '645 patents. After the district court's first claim construction order, *Akamai Techs., Inc. v. Limelight Networks, Inc.*, 494 F. Supp. 2d 34 (D. Mass. 2007), Akamai stipulated that it could not prove infringement of the '645 patent under the district court's construction. The district court thus entered judgment of non-infringement. The district court subsequently entered summary judgment of non-infringement of the asserted claims of the '413 patent.

As relates to the '703 patent, the parties stipulated to a construction of "tagging" in claims 17, 19, and 34 of the '703 patent as "providing a 'pointer' or 'hook' so that the object resolves to a domain other than the content provider domain." *Akamai Techs., Inc. v. Limelight Networks, Inc. (Akamai I)*, No. 06-11109, 2008 WL 697707, at *1 (D. Mass. Feb. 8, 2008). The meaning of this term was not disputed until Limelight requested a jury instruction explaining that tagging could only be accomplished by "either prepending or inserting a virtual server hostname into the URL," and filed Rule 50 motions for judgment of non-infringement because the accused

products did not tag in this way. The district court denied the requested jury instruction and the Rule 50 motions.

The parties also stipulated that "to resolve to a domain other than the content provider domain" in claims 17, 19, and 34 of the '703 patent should be construed as "to specify a particular group of computers that does not include the content provider from which *an optimal server* is to be selected." *Akamai I*, 2008 WL 697707 at *1 (emphasis added). However, the parties disagreed on the meaning of the word "optimal" in the construction, with Limelight arguing that a single optimal server must be selected, and Akamai arguing that several servers could be "optimal" if they each met some criteria. *Id.* The district court construed "optimal server" as "requir[ing] the selection of a content server that is better than other possible choices in terms of the criteria established by the specification." *Id.* at *3.

Akamai's claim that Limelight infringed the '703 patent proceeded to a jury trial. The district court instructed the jury on "tagging" per the stipulation discussed above, and added the following gloss for "an optimal server":

> one or more content servers that are better than other possible choices considering some or all of the following criteria: (1) being close to end users; (2) not overloaded; (3) tailored to viewers in a particular location; (4) most likely to already have a current version of the required file; and (5) dependent on network conditions.

To prove damages, Akamai relied heavily on the testimony of its expert, Dr. Keith Ugone's calculation of Akamai's lost-profits. Dr. Ugone considered the elasticity of the market for content delivery network services, the competition between Akamai and Limelight, and the price disparity between Akamai's and Limelight's products. Ultimately, Dr. Ugone concluded that but-for Limelight's

infringement, Akamai would have collected about $74 million.

The jury returned a verdict of infringement and awarded Akamai approximately $40 million in lost profits, $1.4 million in reasonable royalty damages, and $4 million in price erosion damages. As noted, *supra*, the district court did not let the verdict stand and, instead, granted JMOL of no infringement. *Akamai II*, 614 F. Supp. 2d at 96.

Akamai appealed the district court's rulings regarding all three patents-in-suit and Limelight cross-appealed. This court rejected Akamai's argument that Limelight's cross-appeal was improper, *Akamai Techs., Inc. v. Limelight Networks, Inc.*, No. 2009-1372, 2010 WL 331770 (Fed. Cir. Jan. 27, 2010) (Order), and subsequently affirmed the district court's rulings regarding the '413 and '645 patents. *Akamai III*, 629 F.3d at 1322–31. The portion of this court's *Akamai III* opinion dealing with the '645 and '413 patents, though initially vacated upon grant of en banc rehearing, *Akamai Techs., Inc. v. Limelight Networks, Inc.*, 419 F. Appx 989 (Fed. Cir. 2011), was later reinstated, *see Akamai Techs., Inc. v. Limelight Networks, Inc.*, 786 F.3d 899, 903-904 (Fed. Cir. May 13, 2015) (explaining procedural history), *overruled en banc on other grounds* by *Akamai IV*, 797 F.3d 1020. As noted, *supra*, this court reversed the non-infringement judgment and returned the case to this panel for resolution of all residual issues. *Akamai IV*, 797 F.3d at 1025.

This court has jurisdiction pursuant to 28 U.S.C. § 1295(a)(1).

II. DISCUSSION

A. Standard of Review

The "ultimate interpretation" of a claim term, as well as interpretations of "evidence intrinsic to the patent (the patent claims and specifications, along with the patent's

prosecution history),” are legal conclusions, which this court reviews *de novo*. *Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 841 (2015). Review of the district court’s interpretation of the parties’ pre-trial stipulations is “much like” review of any contract interpretation, *see Scanner Techs. Corp. v. ICOS Vision Sys. Corp. N.V.*, 528 F.3d 1365, 1383 (Fed. Cir. 2008): this court reviews underlying factual findings for clear error and reviews the ultimate interpretation of the stipulation *de novo*, *see Teva*, 135 S. Ct. at 837–38.

This court reviews challenges to jury instructions, grants or denials of motions for JMOL, and questions of judicial estoppel under the law of the regional circuit where the district court sits. *See AbbVie Deutschland GmbH & Co., KG v. Janssen Biotech, Inc.*, 759 F.3d 1285, 1295 (Fed. Cir. 2014); *Source Search Techs., LLC v. LendingTree, LLC*, 588 F.3d 1063, 1071 (Fed. Cir. 2009). “When examining preserved claims of instructional error, [the First Circuit] afford[s] de novo review to questions as to whether jury instructions capture the essence of the applicable law, while reviewing for abuse of discretion the court’s choice of phraseology.” *Ira Green, Inc. v. Military Sales & Servs. Co.*, 775 F.3d 12, 18 (1st Cir. 2015) (citations omitted). The First Circuit “review[s] the district court’s grant or denial of judgment as a matter of law de novo . . . viewing the evidence in the light most favorable to the verdict-winner, and vacating the jury verdict only if it lacks a sufficient evidentiary basis.” *Kennedy v. Town of Billerica*, 617 F.3d 520, 537 (1st Cir. 2010). The First Circuit “review[s] the district court’s decision not to invoke judicial estoppel for abuse of discretion . . . accept[ing] the trial court’s findings of fact unless they are clearly erroneous, and evaluat[ing] its answers to abstract questions of law de novo.” *Knowlton v. Shaw*, 704 F.3d 1, 9–10 (1st Cir. 2013) (citations omitted).

“Whether lost profits are legally compensable in a particular situation is a question of law that we review de

novo." *Siemens Med. Solutions USA, Inc. v. Saint-Gobain Ceramics & Plastics, Inc.*, 637 F.3d 1269, 1287 (Fed. Cir. 2011).

B. Claim Construction

1. *"[T]agging"*

In a prior litigation relating to the '703 patent, the district court construed "tagging" as "providing a 'pointer' or 'hook' so that the object resolves to a domain other than the content provider domain." *Akamai Techs., Inc. v. Digital Island*, No. 00-11851-RWZ, 2001 WL 36172136, at *1 (D. Mass. Nov. 8, 2001). The district court defined "to resolve to a domain other than the content provider domain" as "to specify a particular group of computers that does not include the content provider from which an *optimal* server is to be selected." *Id.* (emphasis added). The parties accepted these constructions by stipulation in the instant case. *Akamai I*, 2008 WL 697707 at *1. This construction was not disputed during the *Markman* hearing, and was first challenged by Limelight in attempting to re-craft the construction for the jury instructions.

Limelight argues that: 1) in the context of the '703 patent, "tagging" is necessarily limited to using a "pointer" or "hook" that either prepends or inserts a virtual server hostname into the URL because the '703 patent discloses no other way to "tag" to achieve the goals of the invention; and 2) that "alphanumeric string" as used in the '645 patent (and which this court has construed to necessarily include prepending or inserting a virtual server hostname in the URL) is the product of tagging in the '703 patent, which necessarily means that the '703 patent incorporates the same limitations as the '645 patent. Akamai counters that: 1) Limelight waived the argument by failing to assert it during *Markman* and again failing to assert it after the jury instructions were read; 2) the stipulation to which Limelight agreed was made without further limita-

tion of the types of "hook" or "pointer" to use, and is thus binding on Limelight; 3) "tagging" in the '703 patent is not equivalent to "alphanumeric string" in the '645 patent; 4) certain claims in the '703 patent specifically require prepending while others don't, and claim differentiation requires that the broader term "tagging" thus not be limited to prepending; 5) prepending is merely a preferred embodiment and Limelight is improperly attempting to limit the claim scope to a preferred embodiment; and 6) Limelight argued that the asserted claims lacked written description because the specification taught that the only way to tag was to prepend a virtual hostname into an existing URL – but the jury rejected this argument.

Limelight's attempt to import a "prepending" limitation into the claims fails. "[O]ur cases recognize that the specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess. In such cases, the inventor's lexicography governs." *Phillips v. AWH Corp.*, 415 F.3d 1303, 1316 (Fed. Cir. 2005) (en banc). However, a claim term is only given a special definition different from the term's plain and ordinary meaning if the "patentee . . . clearly set[s] forth a definition of the disputed claim term other than its plain and ordinary meaning." *Thorner v. Sony Comput. Entm't Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012) (citations omitted). A patentee can also disavow claim scope, but the standard "is similarly exacting." *Id.* at 1366. "[C]laims are not necessarily and not usually limited in scope simply to the preferred embodiment." *RF Del. v. Pac. Keystone Techs., Inc.*, 326 F.3d 1255, 1263 (Fed. Cir. 2003).

The '703 patent describes prepending as a "prefer[ence]." '703 patent, col.4 ll.2–3. Figure 4 describes "prepend[ing a] virtual server host name," but the patent likewise describes Figure 4 as showing the "preferred" method. *Id.* at col.6 ll.44–45. The patent's reference to

preferred embodiments where the virtual server hostname is prepended does not provide the clarity necessary to find that the patentees intended to limit the term tagging to the preferred embodiment. Moreover, claim 17 of the '703 patent expressly recites "tagging . . . by prepending," suggesting that the term "tagging"—without modification and as recited in the asserted claims—is not so limited. *See Ancora Techs., Inc. v. Apple, Inc.*, 744 F.3d 732, 735 (Fed. Cir. 2014) (explaining that using the phrase "application software program" in one claim, and "program" alone in another "tends to reinforce . . . adoption of the broad ordinary meaning of 'program' by itself").

The prosecution history cited by Limelight also fails to provide the necessary clarity to limit "tagging" to the preferred embodiment. During prosecution, Akamai amended what is now claim 17 to require tagging "by prepending" and amended claim 19 to require that the content provider "serv[e] the given page" and that the Content Delivery Network serve the embedded image. In their remarks, the applicants stated that "the embedded object URL is modified . . . to prepend given data to the domain name and path normally used to retrieve the embedded object." In view of the amendment now requiring claim 17 to tag "by prepending," a person of skill in the art could reasonably understand the applicants' description of prepending the data as referring only to claim 17. This statement therefore does not provide the necessary clarity required for disavowal in claim 19.

Limelight claims that the only method of tagging described in the '703 patent involves prepending a virtual server hostname. However, as this court has held, "even where a patent describes only a single embodiment, claims will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using words or expressions of manifest exclusion or restriction." *Innova/Pure Water, Inc. v. Safari Water Filtration Sys.*, 381 F.3d 1111, 1117 (Fed. Cir. 2004)

(internal citations omitted). As explained above, no such indication of exclusion appears in the patent specification or prosecution history.

We note that the district court read to the jury the construction of "tagging" to which Limelight stipulated. Though Limelight points to *O2 Micro International Ltd. v. Beyond Innovation Technology Co.*, 521 F.3d 1351, 1361 (Fed. Cir. 2008), for the proposition that its stipulation did not "give up any right to argue that further construction or interpretation of tagging would be needed," that case is inapposite. In *O2 Micro*, the Court was clearly aware of the parties' disagreement about the claim term "only if," and the Court refused to construe it beyond its ordinary meaning. *Id.* at 1357 ("The parties agreed, for the most part, that a previously issued claim construction order . . . controlled in this case. . . . However, the parties presented a handful of additional terms for the court to construe [of which "only if" was one]."); *id.* at 1361 ("The parties presented a dispute to the district court regarding the scope of the asserted claims."). *See also id.* at 1361 ("[T]he parties disputed not the *meaning* of the words themselves, but the *scope* that should be encompassed by this claim language." (emphasis in original)). Here, the parties *agreed* in the stipulation as to both the meaning and the scope of the term during claim construction: "tagging" means "providing a 'pointer' or 'hook' so that the object resolves to a domain other than the content provider domain." This meaning was agreed-upon *with no further limitations*. The lack of further limitations was itself a characteristic of the construction to which both parties agreed. Limelight cannot argue at the jury instruction stage – after the bulk of the trial was framed and directed by the *Markman* construction to which it agreed – that the construction was somehow too broad. Limelight stipulated to a construction of "tagging," and it is bound by that stipulation.

We find no error in the district court's construction of "tagging" or the jury instruction pursuant thereto. The parties do not assert that there is any remaining issue of fact as to whether Limelight performs "tagging" (apart from the "optimal server" issue addressed below).

2. *"[A]n optimal server"*

The second remaining dispute is whether "an optimal server" is necessarily limited to a single "best" server, or can refer to several potentially optimal servers from which content is retrieved.

The phrase "optimal server" does not appear in the patent. Instead, it is nested within the parties' stipulated claim constructions as follows. "Tagging" was stipulated to mean "providing a 'pointer' or 'hook' so that the object resolves to a domain other than the content provider domain." The phrase "to resolve to a domain other than the content provider domain" was stipulated to mean "to specify a particular group of computers that does not include the content provider from which *an optimal server* is to be selected." Substituting the stipulated constructions into claim 19 results in the following, with emphasis added:

> **19 [substituted].** A content delivery service, comprising . . . .
>
> for a given page normally served from the content provider domain, providing a 'pointer' or 'hook' to embedded objects on the page so that requests for those objects *specify a particular group of computers* that does not include the content provider *from which an optimal server is to be selected*
>
> . . . .

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> serving at least one embedded object of the given page from a given content server in the domain instead of from the content provider domain.

During the *Markman* hearing, the parties disputed the meaning of "an optimal server." The district court construed claim 19 to require "the content delivery system to serve an embedded object from one or more content servers which are '[m]ost favorable or desirable,' that is, servers which meet some or all of the criteria described in the specification." In the jury instruction, the district court elaborated on the criteria, explaining that "an optimal server" was: "one or more content servers that are better than other possible choices considering some or all of the following criteria: (1) being close to end users; (2) not overloaded; (3) tailored to viewers in a particular location; (4) most likely to already have a current version of the required file; and (5) depend[e]nt on network conditions."

Limelight argues that: 1) the unambiguous meaning of "optimal" is necessarily restricted to a single aggregate "best" server; 2) the court's ambiguous construction improperly left a claim construction issue for the jury; and 3) Akamai is judicially estopped from arguing that "optimal" does not require a single "best" server by its statements equating "optimal" to "best."

Limelight's arguments are unconvincing. First, Limelight fails to appreciate the context of the selection of "an optimal server" in the claim. The selection of "an optimal server" describes the functionality enabled by the necessary "tagging." In other words, the embedded objects are tagged such that a group of computers is identified, and from which an optimal server is chosen. The '703 patent is replete with examples in which conditions or circumstances *independent of the tag* influence which server ultimately serves the embedded object. The tagging

described in the '703 patent thus allows for the tag to ultimately lead to service from more than a single possible server. When the browser makes a request for an object, then the software on the ghost does the following: "If a copy of the file is already stored on the ghost, then the data is returned immediately. If, however, no copy of the data on the ghost exists, a copy is retrieved from the original server *or another ghost server*." '703 patent, col.12, ll.31-35. Similarly, the specification explains that the tagging allows "a ghost server [to] redirect the user to a closer server (or to another virtual address that is likely to be resolved to a server that is closer to the client)." *Id.* at col.12, ll.44-47. And again, "[p]erformance for long downloads can also be improved by dynamically changing the server to which a client is connected based on changing network conditions." *Id.* at col.12, ll.53-55.

These examples undermine Limelight's position in two ways. First, the tagging of the embedded objects provides the capability to select a server, and then select a different server – in other words, tagging enables the selection of one of several servers. Second, the criteria for server selection are not aggregated during tagging, wherein the system only allows serving from the single server that is the "winner" of the aggregated criteria. Instead, in one instance, a server may be chosen because it is closest to the user; in another instance, because another server does not have the file; and in yet another instance, because of overload of the server or network conditions. Choosing based on *any* of these criteria is indicated as a capability of the claimed tagging system – not merely choosing a single "aggregate best" server. Nothing in the patent limits the functionality of the tag to selecting an "aggregate best" – indeed, which criteria is ultimately decisive is not a function of the tag, but occurs while the objects are served.

This reading is confirmed by dependent claims 21 and 22, which further limit the *serving* step in claim 19 to

"resolving a request to the domain as a function of a requesting user's location," '703 patent, cl. 21, or "resolving a request to the domain as a function of a requesting user's location and then-current Internet traffic conditions," *id.* at cl. 22.   In other words, determining the ultimate server from which the embedded object will be served using one particular criteria, or two criteria. Nothing in the specification or the claims implies that these two functionalities would necessarily return the aggregate best server, or that the two rules would return the same server. Limelight argues that this identification of "one or more content servers" is an *additional step* identifying the list of all possible content servers from which the optimum server is selected. Limelight Supp. Opening Br. at 4.   Limelight ignores that claim 20 is limiting "the serving step," which occurs after the tagging step.

Limelight's argument that the "unambiguous" meaning of "optimal" is a single "best" is also unconvincing. As discussed above, the intrinsic evidence supports the district court's construction. Moreover, neither the plain meaning of "optimal" nor the plain meaning of "best" is as limited as Limelight suggests to an "aggregate best" or "aggregate optimal."

The district court's construction did not improperly leave a claim construction issue for the jury by not construing a disputed term.   The district court construed optimal server during the *Markman* hearing as described above, and elaborated during jury instructions that "an optimal server" was: "one or more content servers that are better than other possible choices considering some or all of the following criteria: (1) being close to end users; (2) not overloaded; (3) tailored to viewers in a particular location; (4) most likely to already have a current version of the required file; and (5) depend[e]nt on network conditions." Nothing in the construction or the jury instructions requires the jury to construe the term.   Limelight

merely disagrees with the construction the district court adopted.

Finally, Akamai's use of "optimal" and "best" in the prior litigation does not estop Akamai from arguing that "optimal" allows for serving from other than a single composite best server because the point at issue in the discussions cited was distinct from the issue here. Limelight points to a colloquy wherein the district court questioned Akamai's counsel about the functionality and sequencing of the tagging step, and Akamai's counsel stated: "at some time during the serving of that object, picking the best computer to serve that object, that's during the serving step, identifying the best computer," and also agreed with the district court's categorization that the process "is two steps. It tags to find the best domain and then also identifies the best computer or server within that domain." Limelight's reliance on this colloquy is misplaced. The discussion in that case was about the role of tagging, and Akamai's attorney explained that the timing of the tagging step occurs with the selection of a domain, but that the selection of the "best computer" occurs during the object serving step. The issue of whether tagging enables serving from only a single "optimal server" or from a server which performs better than others within a particular criteria was never addressed.

For these reasons, there is no error in the district court's construction of "an optimal server," nor in the jury instruction.

C. Damages

To collect lost profits, a "patentee must show 'a reasonable probability that 'but for' the infringing activity, the patentee would have made the infringer's sales." *Ericsson, Inc. v. Harris Corp.*, 352 F.3d 1369, 1377 (Fed. Cir. 2004) (citations omitted). This is done by determining what profits the patentee would have made absent the

infringing product. *Id.* This analysis must be supported by "sound economic proof of the nature of the market and likely outcomes with infringement factored out of the economic picture." *Id.* (citing *Grain Processing Corp. v. Am. Maize-Prods. Co.*, 185 F.3d 1341, 1350 (Fed. Cir. 1999)).

Limelight argues the district court committed legal error in allowing lost profits as a measure of damages because Akamai failed to show a causal connection between Limelight's infringement and Akamai's lost profits. Limelight argues that Dr. Ugone's calculation of the share of Limelight's customers that would have gone to Akamai absent Limelight's infringement was arbitrary and not based in sound economic theory. The underlying basis for this argument is the price disparity between Limelight's and Akamai's products, which Limelight says Dr. Ugone either failed to incorporate into his analysis, or incorporated arbitrarily. Limelight's arguments are inapposite.

Limelight originally sold a different, non-infringing service than the one at issue in this case. Limelight's infringing service was released in April of 2005. Dr. Ugone testified that in 2005 Akamai had a market share of 79.8% and Limelight had a market share of 5% and in 2006 Akamai had a market share of 74.7% and Limelight had a market share of 10.7%. Dr. Ugone then calculated an adjusted market share[3] for the years when Limelight's infringing service was on the market and concluded that, assuming Limelight only sold its earlier software, Akamai's market share would have been 81% in 2005 and 79.9% in 2006. Because he did not have sufficient data to determine the market share for 2007, he assumed it would be the same as the market share for 2006. For the

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[3]   An adjusted market share is the calculated market share Akamai would have had absent infringement.

sake of "conservatism," Dr. Ugone reduced Akamai's share by 3% and excluded the lowest earning 25% of Limelight's customers who he categorized as particularly price sensitive consumers, who may be unlikely to purchase a higher-priced alternative without Limelight's infringing products in the market. Subject to these assumptions and modifications, Dr. Ugone opined that Limelight's infringing sales totaled approximately $87.5 million.

The lost profit analysis was complicated by the fact that Limelight sold its product for half the price of Akamai's. This affected Dr. Ugone's calculations in two ways. First, he assumed that in the but-for world where Limelight did not sell an infringing product, Akamai would sell its product to some of those customers for twice as much as Limelight had. Second, because of the difference in price between Akamai's product and Limelight's product, Dr. Ugone assumed that the demand for Akamai's product would be 25% less than the demand for Limelight's infringing products. Dr. Ugone explained that, in economics, how a change in price affects a change in demand is described as "elasticity." The more elastic the demand, the more sensitive it is to change. A demand is described as "inelastic" if, when the price changes by a certain percentage, the demand changes by a smaller percentage. As Dr. Ugone explained, "if you change prices by 10 percent and quantity demanded changes by only 5 percent . . . that's an example of something we call inelastic."

Dr. Ugone opined that the demand for Akamai's products was relatively inelastic (i.e. relatively price-insensitive) and provided two justifications for calculating that 75% of Limelight's sales would potentially have been made by Akamai. First, because Akamai's costs were "revenue-generating costs," customers would be more willing to expend money to buy Akamai's product. Second, though there would be some "price sensitivity" such that some of Limelight's customers would not purchase

the higher-priced Akamai product, the demand was relatively inelastic – meaning the quantity demanded would not change as much as the price changed. The relative inelasticity of demand was supported by Akamai's evidence that Akamai and Limelight were direct competitors, including statements by Limelight that 1) Akamai was its largest competitor; 2) "Limelight and Akamai are, from a scale and quality standpoint, head and shoulders above the rest of . . . Limelight's competition"; 3) demand was driven by end-users not customers; and 4) Akamai maintained a dominant market share despite Limelight's infringing service and lower price. Dr. Ugone conceded that in picking 75% he "had to make a judgment call based on the attributes and come to a conclusion what the adjustments would be." Based on his assumptions, Dr. Ugone determined that Akamai's lost profits were about $74 million.

The considerations outlined above sufficiently support the district court's decision to allow Dr. Ugone's adjusted lost-profits analysis. This court has repeatedly approved similar adjusted market share analyses for estimating lost profits. *See, e.g. Ericsson*, 352 F.3d at 1377–80. There is no basis for Limelight's claim that such an analysis here is legally unavailable.

Limelight's argument appears to be that the price disparity between Akamai's and Limelight's prices necessarily created a market segmentation in which Akamai was separate from Limelight. Limelight's argument rests on *BIC Leisure Prods., Inc. v. Windsurfing International, Inc.*, 1 F.3d 1214 (Fed. Cir. 1993), where this court determined that lost profits were unavailable because the accused infringer and the patentee serviced different markets based on a 60–80% price disparity. Limelight argues that in the face of a 100% price disparity, lost profits are legally unavailable. However, this court's decision in *BIC* did not rest solely on the price disparity of the two companies. For one, the court noted that "[the

patentee] Windsurfing concentrated on the One Design class hull form and BIC [the infringer] did not. Windsurfing's boards differed fundamentally from BIC's boards." *Id.* at 1218. Moreover, the court explained that "at least fourteen competitors vied for sales in the sailboard market." *Id.* In the instant case, in contrast, Akamai presented evidence that Akamai and Limelight were direct competitors, and the two leaders in the field, with capabilities and infrastructure beyond those of its competitors. Next, the court in *BIC* explained that the "record contains uncontradicted evidence that demand for sailboards is relatively elastic." *Id.* Again, the instant case is different - Dr. Ugone explained that the market was relatively inelastic, and set forth a number of reasons, discussed above, for this conclusion. Furthermore, the court noted that Windsurfing had licensed its patent to two competitors, both selling Boards similar to the patentee's Boards at significantly lower prices. *Id.* Finally, there was evidence that Windsurfing's "sales continued to decline after the district court enjoined BIC's infringement," but that the market share indeed went to one of the patentee's licensees. *Id.* No such evidence exists here.

In conclusion, Dr. Ugone's 25% adjustment for market elasticity was sufficiently grounded in economic principles for the district court to allow it. Though Limelight is correct that its customers expressed a clear preference for lower-priced products — as evidenced by their buying Limelight's significantly cheaper product — and therefore would have been less likely to buy Akamai's products than the average consumer, Dr. Ugone's testimony took this consideration into account both in excluding the lowest 25% of Limelight's customers from his lost profits analysis, and for discounting the potential award for price elasticity. Whether this discount was sufficient is not a legal challenge to the availability of lost profits, but as to the *amount* of lost profits, which Limelight failed to address in its panel briefing.

For the first time in supplemental briefing, Limelight attempts to challenge the evidentiary basis for the amount of the jury's award, as distinct from the legal challenge to the availability of lost profits. Also for the first time in the supplemental briefing, Limelight argues that Dr. Ugone's 3% downward adjustment of Akamai's adjusted market share indicates an internal inconsistency, because the reduction was not carried through into the lost profits calculation. Because the supplemental briefing was limited to arguments contained in the panel briefing, *Akamai Techs., Inc. v. Limelight Networks, Inc.*, 2009-1372 (Fed. Cir. Aug. 19, 2015) (non-precedential order) ("[T]he parties are requested to file letter briefs supplementing the original briefing of Limelight's cross-appeal *and limited to the issues raised therein.*" (emphasis added)), we need not consider this argument. Even if we were to consider it, we find it unconvincing.

Limelight also appears to argue that the jury's damages award "was unfairly tainted by the district court's refusal to instruct the jury that it should reject a los[t] profits claim based on speculative evidence." This argument is without merit. The district court did instruct the jury that "[t]he amount of lost profits must be proved with reasonable certainty and cannot be left simply to speculation." The district court's instructions captured the applicable law.

III. CONCLUSION

The en banc court reversed the district court's grant of Limelight's motion for JMOL of non-infringement of the '703 patent. For the foregoing reasons, we conclude that the outstanding arguments in Limelight's cross-appeal have no merit. Thus, this case is remanded with instructions to reinstate the jury verdict and the jury's damages award. This court's previously reinstated affirmance of the district court's judgment of non-

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infringement of the '413 and '645 patents is also re-confirmed.

AFFIRMED-IN-PART, REVERSED-IN-PART, AND REMANDED

COSTS

Each party shall bear its own costs.