

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CISCO SYSTEMS, INC.
Petitioner

v.

UMBRA TECHNOLOGIES,
Patent Owner

Case IPR2024-00497
Patent No. 10,630,505

PATENT OWNER'S SUR-REPLY

Mail Stop PATENT BOARD
Patent Trial and Appeal Board
U.S. Patent and Trademark Office
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TABLE OF EXHIBITS

Exhibit	Description
2001	Dr. A.L. Narasimha Reddy Deposition - 11/2024
2002	Declaration of Dr. Micah Beck in IPR2024-00270
2003	Dr. A.L. Narasimha Reddy Deposition -03/2025

I. INTRODUCTION

Patent Owner UMBRA Technologies Ltd. (“Patent Owner”) hereby files this sur-reply in response to Petitioner Cisco Systems, Inc.’s (“Petitioner”) Petition for Inter Partes Review seeking to find the Challenged Claims of U.S. Patent No. 10,630,505 (“’505 patent”) invalid, and more particularly to Petitioner’s Reply to Patent Owner’s Response (“Reply”).

The Reply finally acknowledges that the ’505 patent separately describes both “*point-to-point*” and “*end-to-end*” tunnels, noting that a problem with the former “is limited control over routing and quality of service of the total connection.” (Paper 22, Reply, at 13.) Yet Petitioner fails to consider how an end-to-end tunnel will function differently from a point-to-point tunnel to yield improvement. This failure leads Petitioner to misread the applicability of Hankins,¹ which discloses only point-to-point tunnels. Unwilling to concede that Hankins fails to disclose end-to-end tunnels formed by intermediate access point servers, Petitioner turns to untimely and extrinsic claim construction, which conflates these two distinctly different tunnel concepts. This aside, the ’505 Patent is clear on what an end-to-end tunnel entails (a point Petitioner, itself, makes several times). This sur-reply returns the focus back to the actual disclosures of the

¹ The Reply refers to “Hawkins” several times. Patent Owner assumes that each was meant to refer to “Hankins.”

'505 Patent regarding the end-to-end tunnel claim element, and contrasts this with the lack of similar disclosure in Hankins.

Finally, Petitioner concedes that *at least* the control server's operations distinguish the claimed invention from the prior art. (Paper 22, Reply, at 9 ("... what distinguishes the claimed invention from the prior art is not an end-to-end tunnel, but a *control server* that selects the intermediate tunnels that are joined at intermediate access point servers.")) While this statement confuses the claimed operation of the control server, it is still an admission by the Petitioner that the control server element of the claims is novel. Such an admission should be given significant weight as Petitioner's last statement on the subject.

II. PETITIONER'S REPLY DOES NOT RESOLVE THE PETITION'S FATAL FLAWS

A. Petitioner's Reply Invents a Claim Construction Dispute

The Reply begins with an acknowledgement that neither the Petition nor Patent Owner's Response raise a claim construction issue. (Paper 22, Reply, at 3.) Despite this acknowledgement, Petitioner offers a red herring, arguing that Patent Owner made a claim construction argument in Patent Owner's Preliminary Response ("POPR"). (*Id.* at 3.) Not so.

At no point in the POPR does Patent Owner argue that any term of the '505 patent requires construction. Rather, as Petitioner cites in its Reply, Patent Owner offered a statement on how the '505 patent itself refers to "end-to-end tunnels."

(See Paper 22, Reply, at 3, *citing* Paper 6, POPR, at 3.) In reality, the Reply misreads the POPR’s contextual references to the ’505 patent. These references merely illustrate the types of tunnels the patent describes. (Paper 6, POPR, at 3-5.) It does not propose the construction of claim terms, but rather, explains how the Board’s preliminary construction (done without the benefit of claim construction briefing) is at odds with the plain meaning of a term *and* the ’505 patent’s own intrinsic evidence.

If Petitioner now—for the first time in its Reply—insists that a term of the ’505 patent requires construction, Petitioner’s argument must either be disregarded as being outside the briefed scope of the Petition or the Parties must be permitted to—for the first time—fully brief the issue for the Board. Without such briefing specifically addressing the construction of a disputed term, the Board’s *sua sponte* construction remains improper for the reasons stated in Patent Owner’s Response.

B. Petitioner Improperly Conflates “End-to-End Tunnels” with Various Other Tunnel Types Discussed in the ’505 Patent

For convenience, the following is the portion of claim 1 of the ’505 patent wherein the phrase “*end-to-end tunnels*” is introduced:

... a plurality of intermediate access point servers that form a plurality of ***end-to-end tunnels***² connecting the first device and the second device ...

(Ex. 1001, claim 1, at 58:16-18.)

² Unless otherwise specified, all emphasis in this brief is added.

As discussed in Patent Owner's Response, the '505 patent is explicit when identifying a structure as an end-to-end tunnel. For example, Figures 33, 34, and 35 are individually described in the '505 patent specification as depicting an "end-to-end tunnel". (See Ex. 1001 at 33:8-11, 33:25-28, 33:37-41.) Unlike Figures 9 and 23, Figures 33, 34 and 35 **are** the figures of the '505 patent described as illustrating an end-to-end tunnel.

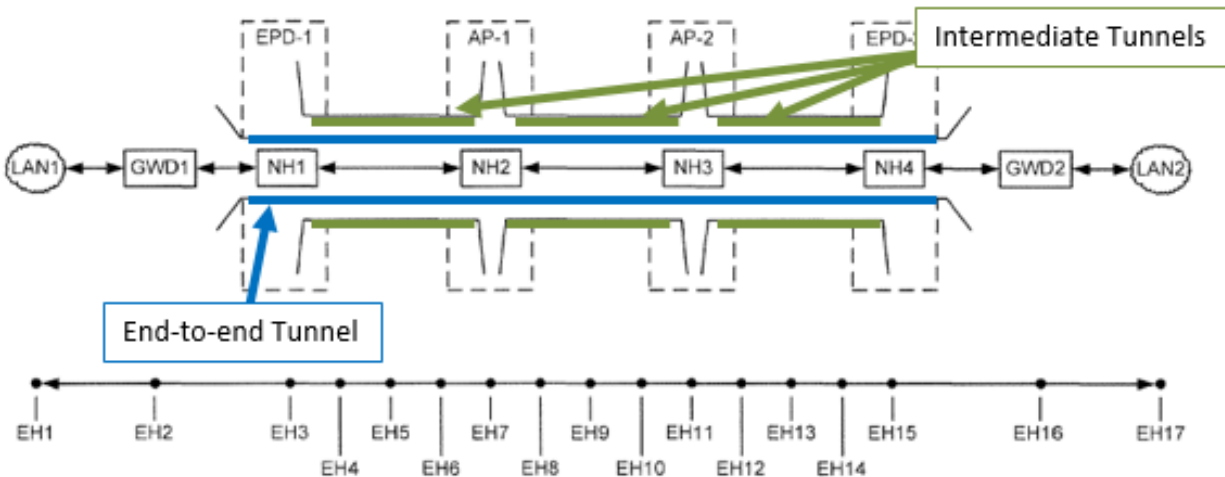
The '505 patent explains the following about the singular "GVN" end-to-end tunnel that appears as the long interior tunnel in each of Figures 33, 34, and 35:

While FIGS. 33, 34 and 35 all illustrate the joining of tunnels at AP hops, ***this is viewed as a single tunnel by client devices within LAN1 and LAN2. This singular tunnel represents the neutral Third Layer of the GVN within which it is possible to run all traffic*** that would normally transit over the internet, including TCP, UDP, and other protocols, plus other tunnels such as IPSec, OpenVPN, PPTP, or other. . . .

(Ex. 1001 at 34:1-7.)

The following annotation of Figure 34 of the '505 patent highlights a depicted singular "end-to-end" tunnel (blue)³ formed by "a plurality of intermediate access points," as it appears in the '505 patent claims:

³ The '505 Patent uses a horizontal line pair with spreading openings at each end to indicate a tunnel. This is reinforced by the fact that other figures that label this line pairing symbol as a tunnel do so consistently. See, e.g., the description of Fig. 39 and tunnels TUN 39-P10 and TUN 39-P12 and internal tunnel INT TUN 39-P20. (Ex. 1001 36:41-48.)



(Ex. 1001 at Fig. 34 (annotated).)

This concept of a single tunnel from the “client perspective” is reiterated in the ’505 patent’s description of Figure 48 which references “routing via end-to-end tunnels”:

An important point illustrated by this example is that *client traffic which is carried by the GVN is through a GVN Third Layer which from the client perspective is the same as a path through the Internet* and is consequently able to carry any type of traffic through it while still realizing the benefits of the improvements and greater degree of security offered by the GVN.

For example, *path P008* illustrates WAN Optimization connectivity *between* a firewall GW 002 *device* and a firewall GW 202 *device* to create *a LAN-WAN-LAN bridge*. The *device to device communication is carried inside Third Layer of GVN and is transparent* to GW 002 and GW 202.

(Ex. 1001 at 41:49-65; see also, *id.* at 47:55-58 (“From the perspective of the host client 101, their traffic will flow through an internet protocol (IP) network with as few number of hops and best possible latency at the third layer of the GVN.”).)

Petitioner’s argument that Figure 9 of the ’505 patent illustrates an end-to-end tunnel—even though Petitioner itself admits that this figure illustrates a “point-to-point tunnel”—is self-defeating. (Paper 22, Reply, at 6.) The terms “point-to-point tunnel” and “end-to-end tunnel” are **not** interchangeable. This distinction is discussed at length in Patent Owner’s Response (see Paper 21, POR, at 3, 10, 13), and is further evident when comparing Figure 9 (illustrating a point-to-point tunnel) with Figure 33 (illustrating an end-to-end tunnel). (*Compare*, Ex. 1001, Fig. 9 & Fig. 33).

Petitioner again demonstrates its misunderstanding when it asserts that “the point-to-point tunnel of Figure 9 spans ***from one endpoint device to another endpoint.***” (Paper 22, Reply, at 7.) The ’505 patent labels endpoint devices as “EPD” (*see, e.g.*, Ex. 1001 at 23:56) and gateway devices as “GWD” (*see, e.g.*, Ex. 1001 at 12:48 and Fig. 9). Notably, FIG. 9 is described as illustrating “a point-to-point tunnel TUN built between two gateway device” and includes devices labelled “GWD” but does not include an “EPD” device. (Ex. 1001 at 12:47-48.) While Figure 9 is described in the ’505 patent as illustrating a point-to-point tunnel, the paragraphs discussing Figures 33, 34, and 35 expressly recite an “end-to-end tunnel”.

Petitioner repeats its misunderstanding by asserting that Figure 23 also illustrates an end-to-end tunnel. (Paper 22, Reply, at 7-8.) While an end-to-end

tunnel hypothetically *could be built* (using teachings from other patent figures and descriptions) to run through the tunnels identified in Figure 23, this figure and its description do not indicate that an end-to-end tunnel has been built. For example, Figure 23 shows infrastructure including multiple point-to-point tunnels through which traffic could flow along a path between EPD 100 and EPD 23-102, through multiple access point servers, SRV_APs. (Ex. 1001, Fig. 23.) But Figure 23 does not show any end-to-end tunnel formed within its point-to-point tunnels. (*Id.*)

This stands in contrast with Figures 33, 34, and 35, which are described within the specification as having an “end-to-end GVN tunnel” and are illustrated as an internal tunnel running through the point-to-point tunnels and through neutral hops on a third layer of the overlay network. (Ex. 1001, 33:8-42 & Figs. 33-35.) Each of these end-to-end tunnels directly connects the two end point devices (EPDs). (*Id.*) In fact, the description of Figure 33 explains that the end-to-end tunnel “extends over the entirety of the transit through the Internet from EH3 through EH15,” which are the locations of the endpoint devices. (Ex. 1001, at 33:12-13.)

Said differently, there is no description or suggestion in the ’505 patent that the point-to-point tunnels entering and exiting the access point servers in Figure 23 are tied together as part of an end-to-end path. There is no suggestion that device EPD 100, sending traffic through tunnel 23TP00, would see SRV_AP 300 as

anything other than the exit of tunnel. Any suggestion to the contrary is defeated by Figure 23 showing that traffic *could be* forwarded from SRV_AP 300 over any of tunnels 23TP10, 23TP12, or 23TP14, or over a direct path 23PE00 to Internet 23-410. Thus, EPD 100 in Figure 23 is not indicating use of a predetermined end-to-end path for traffic leaving tunnel 23TP00. While control server SRV_CNTRL 200 hypothetically could instruct EPD100 and SRV_AP 300 to form an end-to-end tunnel over a specified path, Figure 23 neither describes nor shows such an end-to-end tunnel or even its building.

By contrast, as shown in Figure 33, the end-to-end tunnel is a direct link between two EPDs from GWD1 to GWD-2 with no other tunnel exit (*e.g.*, no place at which a tunnel encoding protocol such as encapsulation would be “***remove[d]***”⁴). (Ex. 1001, Fig. 33.) This fundamental difference was explained by Patent Owner’s expert, Dr. Micah Beck, in the following uncontested statement:

... Data packets sent through an end-to-end tunnel travel through intermediate access point servers (*e.g.*, AP-1), but the inner tunnel headers of the data packets are not un-encoded at the access point servers. Conversely, data packets sent through two back-to-back point-to-point tunnels exit a first tunnel at an access point server, where the data packets are unencoded and processed before being reencoded for a second tunnel and forwarded.

(Ex. 2002, Declaration of Micah Beck, at ¶31.)

⁴ As noted below, a packet arriving at the Hankins “tunnel server” are described as having the tunnel encoding protocol (*e.g.*, encapsulation) “***remove[d]*** to determine where to forward” the packet and then reapplying it for forwarding. (Ex. 1004 at 13:12-15; 30:7-11.)

The end-to-end tunnel of Figure 33 is shown as the internal tunnel formed within and running through the point-to-point tunnels. The end-to-end tunnel is, in a sense, like a restricted access express lane from EPD-1 to EPD-2, while the intermediate tunnels are akin to regular lane highway sections linking EPD-1 to AP-1 and AP-1 to EPD-2. Both types of lanes are built on a common right-of-way and all traffic uses the highway, but one lane gives traffic no intermediate entrance/exit options and the other lanes have off and on ramps at each junction. Unlike Figures 33 to 35, Figure 23 does not illustrate an end-to-end tunnel, instead only showing the intermediate tunnels (i.e., local lanes) linking EPD 100 to SRV_AP 300, SRV_AP 300 to SRV_AP 23-302, and SRV_AP 23-302 to EPD 23-102. (See Ex. 1001 at Fig. 23.)

Petitioner is mistaken where it mislabels Figures 33 and 34 of the '505 patent in the Reply. (See Paper 22, Reply, at 10-12.) While Petitioner is correct that part of each of these two figures depicts an end-to-end tunnel, Petitioner incorrectly labels which part of the figures illustrate the end-to-end tunnel. Specifically, Petitioner incorrectly asserts that the combination of what Petitioner calls intermediate tunnels 1 and 2 just “come together” to form the end-to-end tunnel. Petitioner is wrong.

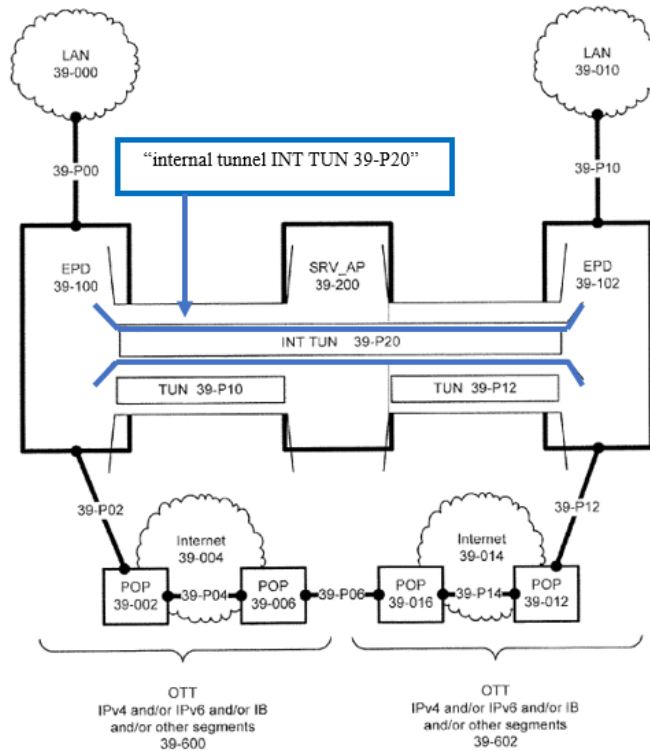
The end-to-end tunnel in each figure is not formed by the mere co-existence of adjacent point-to-point tunnels, but rather is formed by connections (in the

embodiments, layer three overlay with neutral hops) that allow the end-to-end tunnel to extend ***within and through the point-to-point tunnels***. The '505 patent's description of the "internal tunnel" in Figure 39 further reinforces that such internal tunnel paths do not automatically arise whenever two intermediate tunnels meet at an access point server (SRV_AP):

EPD 39-100 builds a tunnel TUN 39-P10 between itself and SRV_AP 39-200. EPD 39-102 also builds a tunnel TUN 39-P12 between itself and SRV_AP 39-200. One or both of these tunnels may or may not be encrypted or secured. ***There can also be another tunnel, internal tunnel INT TUN 39-P20 run through both of the other tunnels, joined at the SRV_AP 39-200 through which traffic can flow.*** This tunnel can be the communications path through which the WAN is built.

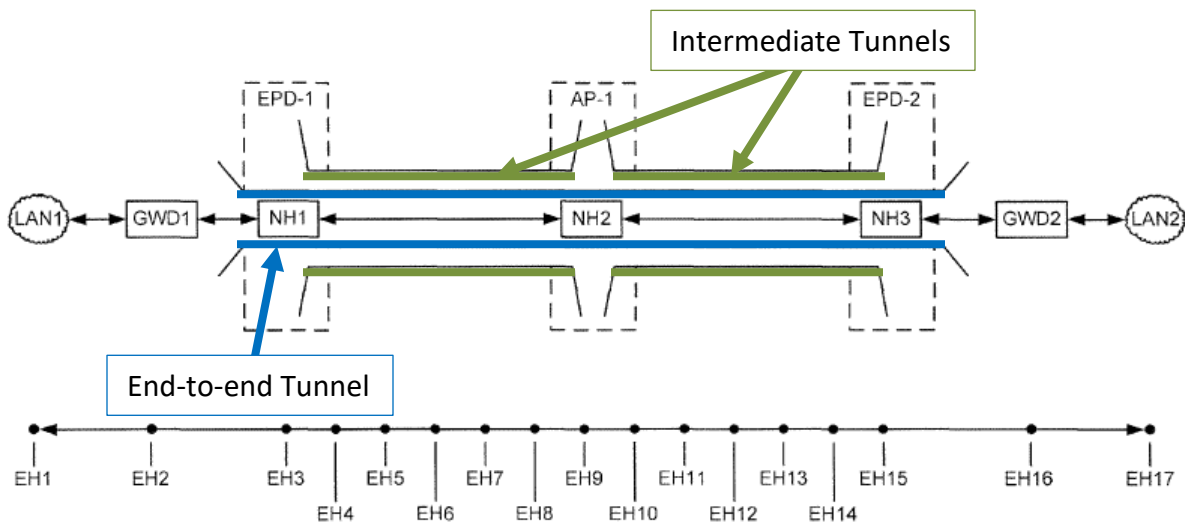
(Ex. 1001 at 36:41-48.)

The following annotated reproduction of Figure 39 illustrates the alternative option of "another . . . internal tunnel that "***can***" be formed within the two adjacent tunnels (TUN 39-P10 and TUN 39-P12) that were otherwise built as paths on either side of SRV_AP 39-200:



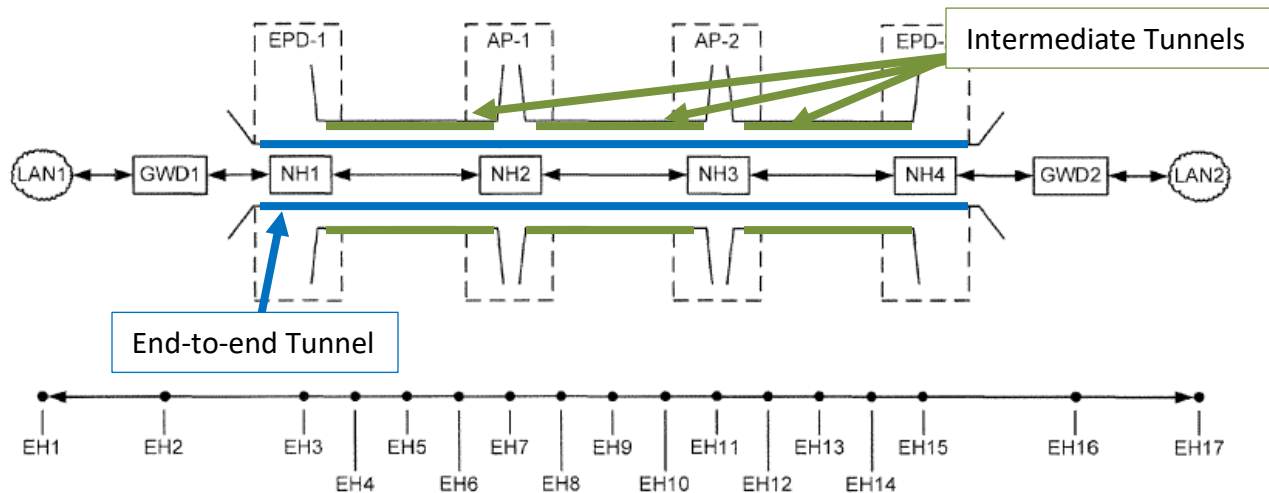
(Ex. 1001, Fig. 39 (annotated).)

And the following annotation of Figure 33 shows this clearly by illustrating a single tunnel running through the two intermediate tunnels:



(Ex. 1001, Fig. 33 (annotated).)

Petitioner likewise ignores the existing tunnel markings of Figure 34 in the Reply. (See Paper 22, Reply, at 11.) The end-to-end tunnel of Figure 34 is not the combination of what Petitioner refers to as intermediate tunnels 1, 2, and 3, but is the internal tunnel formed within the intermediate tunnels by the neutral hops of the endpoint devices and access point servers:



(Ex. 1001, Fig. 34 (annotated).)

The above not only corrects Petitioner’s misdescription of the ’505 patent specification and figures (re: end-to-end tunnel), but also reveals the impropriety of the Board’s *sua sponte* claim construction. For these reasons, the Board should withdraw its incorrect claim construction for “end-to-end tunnel” and reject Petitioner’s Grounds for unpatentability of the ’505 patent.

Petitioner’s expert, Dr. Reddy, submits a new, supplemental declaration in support of the Reply. (Ex. 1012.) But Dr. Reddy only reinforces the baselessness of Petitioner’s position. While Dr. Reddy testified that Figures 33 and 34 depict

end-to-end tunnels, Dr. Reddy refused to specify which part of the figures actually depict the end-to-end tunnel:

Q. Right. And so my question is: Looking at Figure 33 again, in light of what that description from the patent, can you tell if --whether any of these lines are depicting a tunnel? A. No, I can't.

(Ex. 2003, 2025-03-13 Reddy Dep., at 20:1-5.) Contrary to what is shown above, and discussed in greater depth below, Dr. Reddy fails to distinguish between: (a) an end-to-end tunnel functioning as a singular internal tunnel deliberately formed (via intermediate access points) between two endpoints; and (b) two (or more) adjacent tunnels connected by mere virtue of having common access point(s). (See, e.g., *id.* at 56:8-25; 57:14-58:14; 63:13-64:11.)

Dr. Reddy characterizes this formation of an “end-to-end” tunnel as “gluing” (or “glue[d]”) together intermediate tunnels. (See Ex. 2003, 2025-03-13 Reddy Dep., at 52:4-53:4, 54:2-55:5, 55:14-56:3, 66:12-18, 68:21-69:7, 69:8-70:23, 71:21-72:3, 72:19-25.) Dr. Reddy specifically characterized this process as follows:

Q. . . . And then again you say it at the end of the second sentence. You say: Can be selected **to form multiple end-to-end tunnels**.

A. So the figures are showing that the way that **these tunnels are being put together to form to form end-to-end tunnel**.

...

So you terminate one terminal and then you restart the other tunnel. That would be one way to do things.

...

So I'm talking about here, not generally. . . . That's why **you can glue together two tunnels to form a longer tunnel**, and that's what I'm

talking about here, which is that I ***can take tunnel 1 between two end points and tunnel 2 that starts at the end point of the first tunnel and effectively extend the tunnel 1 and tunnel 2 together to form a longer tunnel.***

(*Id.* at 52:7-53:4.) This recognition that you must “take” a first tunnel and “effectively extend [it] . . . to form a longer tunnel” is an admission that the claimed “end-to-end” tunnel involves more than what Petitioner characterizes as “***simply*** the aggregation of both other tunnels” (Paper 22, Reply, at 17.)

Confusingly, while Dr. Reddy indicates the formation of the claimed “end-to-end” tunnel involves a connection whereby two intermediate tunnels are “glued” together or “extended” in order “to form a longer tunnel,” (Ex. 2003, 2025-03-13 Reddy Dep., at 52:7-53:4.), he also concedes that not all intermediate tunnels joined (“glu[ed] together”) at an intermediate access point necessarily constitute the creation of an “*internal*” tunnel:

Q. Okay. So you could have tunnels 39P10 [in ‘505 patent Fig. 39] and 39P12 without necessarily having tunnel 39P20?

A. Absolutely.

Q. In order to have 39P20, what happens? What's the difference from the perspective of a packet that's traversing 39 P 10 and then 39 P 12 when there -- there is no internal tunnel versus when there is?

A. Depends on what the internal tunnel is doing, depends on how this implementation is made. So, for example, if you go with just quality of service and ***you're gluing together, there's no need for internal tunnel but you don't want to do internal tunnel for different reasons***, so depending on application.

(*Id.* at 68:18-69:7).)

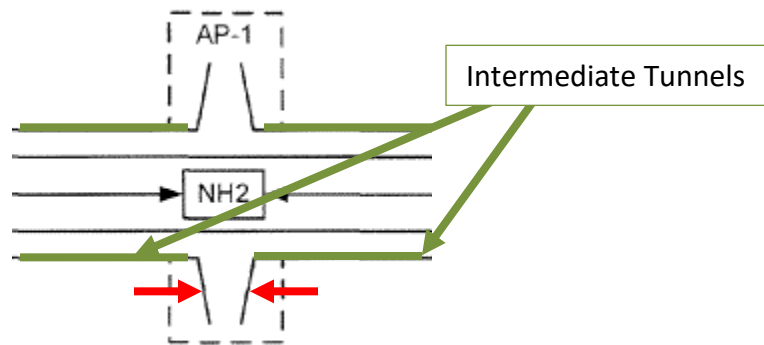
As Figures 33 to Figure 35 and 39 of the '505 patent show, in the context of a network system that runs traffic over point-to-point tunnels, an “internal” tunnel formed by and through the intermediate access point server(s) is the end-to-end tunnel of the Asserted Claims. Such an “internal” tunnel is nowhere disclosed in Hankins. In sum, the Petition fails to identify any teaching in Hankins for the claimed “*form[ing]*” of end-to-end tunnels from existing, adjacent intermediate tunnels.

C. The Remainder of Petitioner’s Reply Applies Petitioner’s Incorrect Interpretation of an End-to-End Tunnel to Patent Owner’s Arguments

The remainder of Petitioner’s Reply only further muddies the water by applying a flawed construction of an end-to-end tunnel to the '505 patent specification and Patent Owner’s arguments in the Response.

Petitioner also errs by attempting to shift the burden of proof from itself to Patent Owner, asserting that “[t]here is no factual support for the POR’s argument that a single end-to-end tunnel cannot include multiple tunnels joined together at intermediate points.” (Paper 22, Reply, at 14.) The burden of proving invalidity rests with Petitioner. By attempting to shift the burden to Patent Owner, Petitioner effectively concedes that it cannot support its own interpretation of the '505 patent specification.

For instance, rather than prove what the '505 patent specification means when it discusses “joined tunnels,” Petitioner merely ignores the impact of these words and shifts the burden to Patent Owner to prove what an end-to-end tunnel is. This argument does not survive scrutiny in view of Figure 33. Specifically, if two adjacent tunnels will necessarily form a single, joined tunnel, then Figure 33 (as annotated below) should not need to depict both the single internal tunnel, in addition to the two external, intermediate tunnels (green) separated by a gap:



(Ex. 1001, Fig. 33 (annotated).)

The mere existence of two adjacent intermediate tunnels does **not** necessarily form a single end-to-end tunnel (as noted above regarding Figure 39 of the '505 patent). There must be a separate mechanism to “form” an end-to-end tunnel to receive “internal tunnel” traffic in the context of the overlay network. This end-to-end tunnel, formed to run within the intermediate tunnels, will cause a packet to treat the intermediate access point, AP-1, as transparent. (Ex. 1001, at 3:51-55, 34:1-3, 41:64.) Although Patent Owner has offered ample intrinsic

evidence in the POR and earlier in this sur-reply explaining why Petitioner's interpretation of the '505 patent is wrong, it has never been Patent Owner's burden to do so. The burden remains on Petitioner. Thus, Petitioner must reconcile why the '505 patent describes and illustrates a difference between (i) two intermediate point-to-point tunnels that terminate at a same access point and (ii) a path that is a single, end-to-end tunnel running "*on top of*" (*i.e.*, "*within*") those intermediate tunnels. Not only has Petitioner failed to address this distinction, it fails to identify prior art showing the latter rather than merely the former.

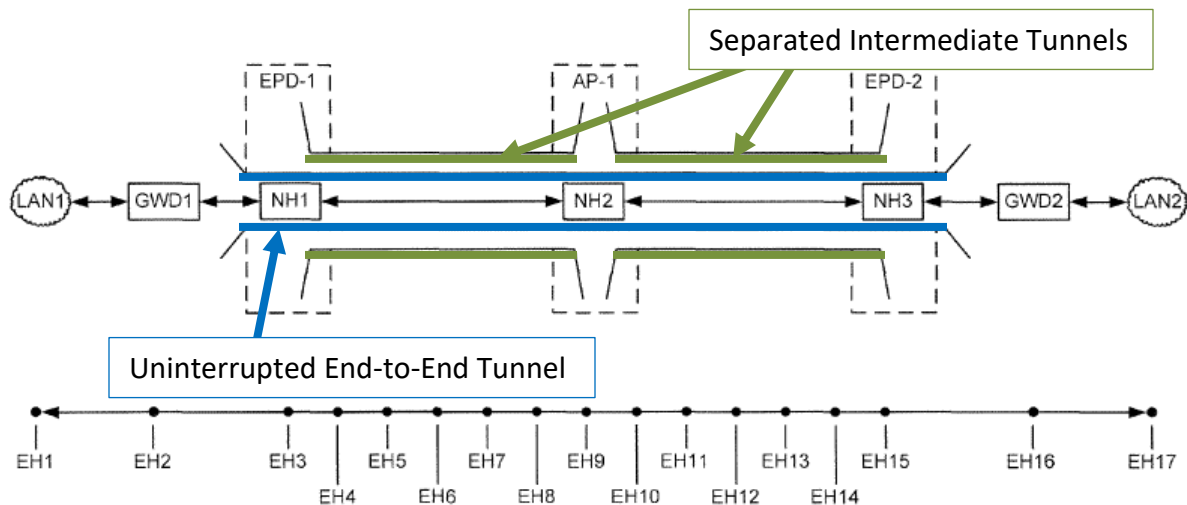
Again, Dr. Reddy's new declaration does not help Petitioner. Specifically, Dr. Reddy asserts that the two intermediate tunnels joined via an intermediate access point and connecting two endpoint devices is the same as a single tunnel connecting those same endpoint devices. (See, e.g., Ex. 1012 at ¶13.) Dr. Reddy cites nothing in Hankins disclosing that these two intermediate tunnels have been formed into a single tunnel. Nor does he explain how a tunnel in Hankins could be considered "end-to-end" if a packet arriving at an intermediate access point "tunnel server" has its tunnel encoding⁵ (*e.g.*, encapsulation) "remove[d] to determine

⁵ See, *supra*, the uncontested statement of Dr. Beck explaining that "data packets sent through two back-to-back point-to-point tunnels exit a first tunnel at an access point server, where the data packets are unencoded and processed before being reencoded for a second tunnel and forwarded." (Ex. 2002, Beck Decl., ¶31.)

where to forward” the packet and then reapplied to forward it. (Ex. 1004 at 13:12-15; 30:7-11.).

And Dr. Reddy certainly does not explain why the arrows Petitioner relies on to indicate traffic arriving at a Hankins tunnel server in a tunnel must leave on a specifically paired/joined tunnel coming out of that tunnel server. Notably, Hankins shows six different double-sided arrows pointing to/from each tunnel server, but nowhere suggests that a pair of these arrows will get joined to the exclusion of all other arrows. (Ex. 1004 at Fig. 2.) As described in more detail below, this supposed pairing is demonstrably false. In essence, Dr. Reddy and Petitioner’s characterization of Hankins reveals their mistaken belief that there is no difference between positionally adjacent intermediate tunnels and a separate end-to-end tunnel configured to run, internally, through those intermediates as part of its transport path.

Petitioner’s Reply also incorrectly asserts that “[t]here is no factual support that an end-to-end tunnel spans in an ‘uninterrupted fashion’ between endpoints.” (Paper 22, Reply, at 18.) Again, Petitioner ignores Figure 33 to make this assertion. As the following annotated reproduction of Figure 33 shows, there is an uninterrupted end-to-end tunnel (blue) formed within the two, separated intermediate tunnels (green):



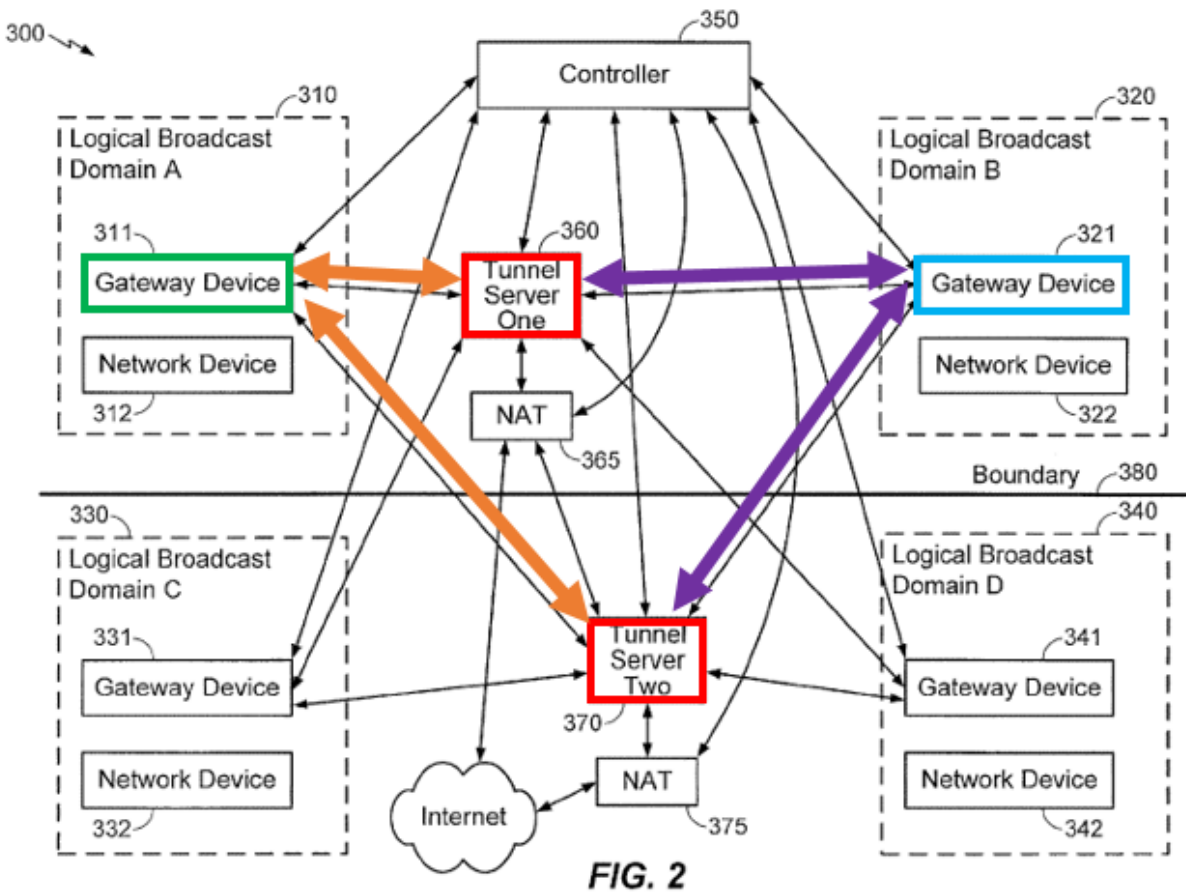
(Ex. 1001, Fig. 33 (annotated).) Simply put, Petitioner fails to show why two separate intermediate tunnels (which is Hankins, at best) should be considered the same as a single end-to-end tunnel (which is nowhere disclosed in Hankins).

D. Hankins Does Not Teach the End-To-End Tunnel of the '505 Patent

The remainder of Petitioner's Reply is dedicated to restating what it has already expressed in the Petition. Specifically, Petitioner relies on the same annotated images of Hankins' Figures 2 and 3 as in the Petition to assert that Hankins teaches the claimed "end-to-end" tunnel. For all of the reasons already discussed in the POR, Petitioner is wrong.

Petitioner is further wrong because Hankins' Figure 2 does not depict an end-to-end tunnel for at least some of the same reasons that the '505 patent's Figure 23 does not depict an end-to-end tunnel. Even if one may infer that the arrows extending between "Tunnel Server[s]" and "Gateway Device[s]" indicate

tunnels formed between individual gateway devices and individual tunnel servers, these arrows could at best only illustrate that one must use two intermediate tunnels (brown, purple) to ingress and egress each Tunnel Server: one connecting gateway device 311 (green) to tunnel server 360 (red), and another connecting tunnel server 360 (red) to gateway device 321 (blue), and then (alternatively) the same concept but now applied to tunnel server 370 (red).



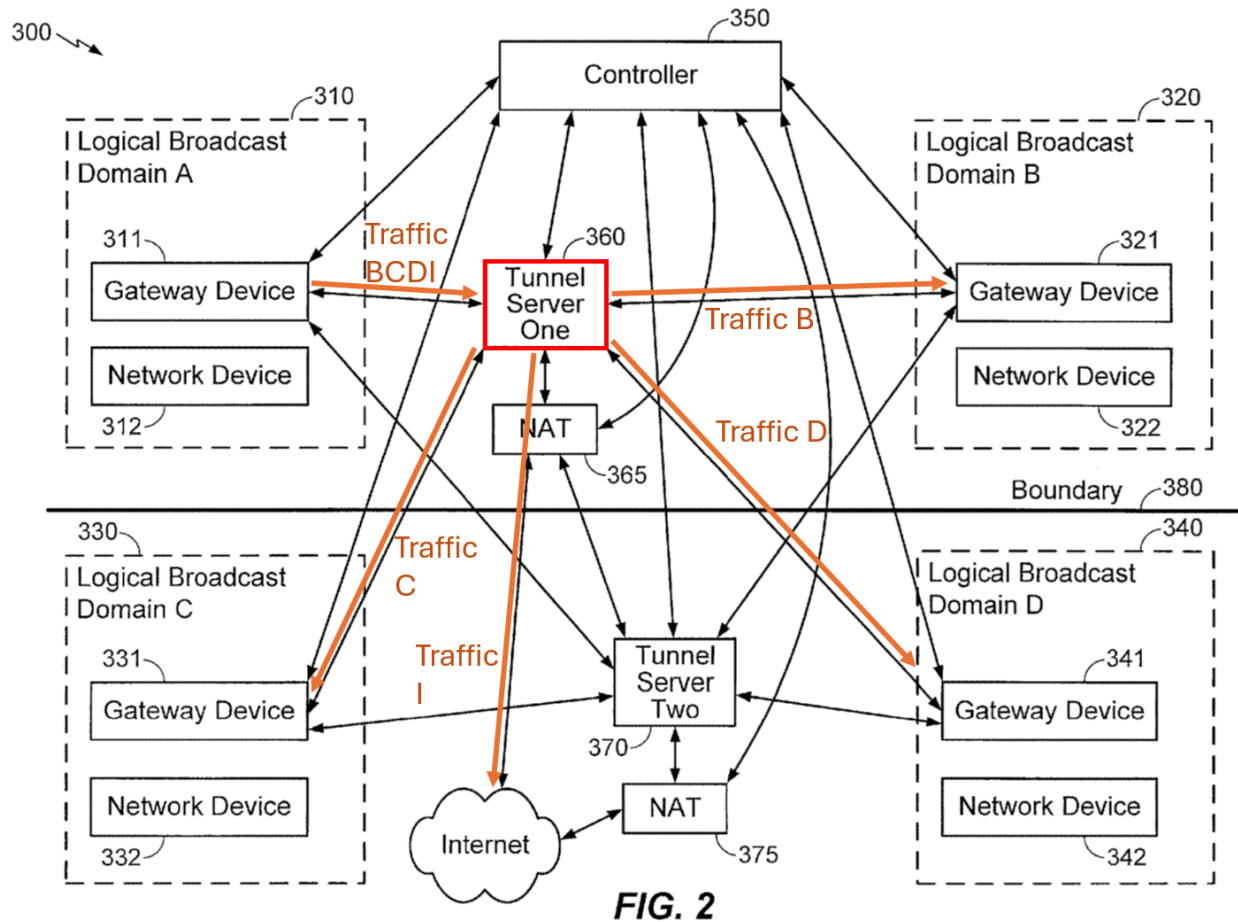
Even assuming that the arrows are tunnels and the gateway devices are end points—which, as discussed earlier in this brief, Patent Owner disputes—this

figure again only depicts, at best, intermediate tunnels connecting four gateway devices (311, 321, 331, 341) to each of Tunnel Servers 360 and 370.

It is illogical to view any two of those gateway device connections as “glued” at a tunnel server. Gateway device 311, for example, uses two connections to two tunnel servers to have connectivity to at least four destinations (the three other gateways and the Internet). Petitioner has not, and cannot, explain how the two connections can be dedicated to reaching only one of those four destinations. Hankins unequivocally states that the connection to either tunnel server can be used to reach any of the four destinations: “. . . four logical broadcast domains may be in communication via more than one tunnel server.” (Ex. 1004 at 24:45-47.) Accordingly, that connection cannot be part of an “end-to-end tunnel” because Hankins does not identify a tunnel with one specific origin and one specific destination. Put differently, any attempt to create an end-to-end tunnel between two logical broadcast domains using the tunnel servers shown in Hankins Figure 2 would immediately preclude use of that tunnel server to transit packets to the other two logical broadcast domains. Such an outcome is contrary to the depiction of Figure 2 and the ability to have four logical broadcast domains “in communication via more than one tunnel server” as stated above.

This is easily visible on Hankins Figure 2 when one considers *how* gateway device 311 reaches each destination. As shown in the annotated version below,

only one connection from gateway device 311 to tunnel server one 360 exists to carry traffic bound for: (i) Logical Broadcast Domain B (Traffic B), (ii) Logical Broadcast Domain C (Traffic C), (iii) Logical Broadcast Domain D (Traffic D), and (iv) the Internet (Traffic I).



That some of this traffic may pass instead to Tunnel Server Two 370 does not alleviate the problem, which Petitioner has failed to address. Nothing in the Petition or expert report explains how the path from gateway device 311 to tunnel server one 360 can be part of an alleged “end-to-end tunnel” to gateway device 321 when it must also carry traffic that should NOT go to gateway device 321.

Petitioner appears to be suggesting that the four-domain communication setup illustrated in Hankins Figure 2 could be modified with an undisclosed “end-to-end tunnel glue” capability—which changes the basic principle under which the Hankins’ reference operates (*i.e.*, that traffic outbound from Logical Broadcast Domain A to other destinations can just be sent to the tunnel server as if it were one connected domain), and which is not even found in a reference. This suggestion is not a *prima facie* acceptable modification in an obviousness analysis. *See, e.g., in re Ratti*, 270 F.2d 810, 813 (CCPA 1959) (rejecting argument that amounted to a substantial reconstruction and redesign that changed the basic principles under which the primary reference operated); *see also Eisai Co. Ltd. V. Dr. Reddy’s Labs., Ltd.*, 533 F.3d 1353, 1359 (Fed. Cir. 2008) (in a KSR analysis, modification of a reference that removed an advantage taught by the reference with no reasoning why that advantage would be abandoned was deficient as a matter of law).

Keeping this described functionality in mind, there is no discussion in Hankins (let alone the Petition) as to whether or how the arrows coming in and out of tunnel servers 360 and 370 would be connected (or, in Dr. Reddy’s words, “glued together”) to form one singular end-to-end tunnel from the perspective of two client devices at either end. Again, such a dedicated end-to-end tunnel would

be contrary to the description of the Hankins tunnel server as facilitating communication across four logical broadcast domains. (Ex. 1004 at 24:45-47.)

In sum, Petitioner fails to show the existence of the claimed end-to-end tunnels in the prior art.

III. CONCLUSION

For the reasons discussed above and in Patent Owners Response (Paper 21), Petitioner has failed to meet its burden to show that the Challenged claims are unpatentable. Accordingly, Patent Owner respectfully requests that the Board issue a Final Written Decision denying Petitioner's challenge.

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CERTIFICATE OF SERVICE

The undersigned certifies that the foregoing PATENT OWNER'S RESPONSE UNDER 37 C.F.R. § 42.120 was served on April 4, 2025, in its entirety by filing this document through the Patent Trial and Appeal Case Tracking System (P-TACTS) as well as providing a courtesy copy via e-mail to the following attorneys of record for the Petitioner listed below:

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