

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CISCO SYSTEMS, INC.
Petitioner,

v.

UMBRA TECHNOLOGIES LTD.
Patent Owner.

Case No. IPR2024-00497

U.S. Patent No. 10,630,505

PATENT OWNER'S RESPONSE

Under 37 C.F.R. § 42.120

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Exhibit	Description
2001	Dr. A.L. Narasimha Reddy Deposition Transcript, dated Nov. 13, 2024
2002	Declaration of Dr. Micah Beck in Support of Patent Owner's Response

I. INTRODUCTION

Patent Owner UMBRA Technologies Ltd. (“Patent Owner”) hereby Responds 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. For the reasons stated below, Patent Owner respectfully asks that the Board *reject* the Petition’s assertions that the ’505 patent’s Challenged Claims are unpatentable.

II. TECHNOLOGY BACKGROUND

The ’505 patent resulted from the pioneering efforts of, among others, the inventors Joseph E. Rubenstein and Jørn Allen Dose Knutsen, in the areas related to secure network optimization, virtual networks including large area or global virtual networks (GVNs), next generation software-defined wide area networking (SD-WAN), advanced smart routing (ASR), slingshot interconnection systems for sending files, for example, via remote direct memory access (RDMA), security such as multiple perimeter firewalls and other technologies. These efforts resulted in the development of systems and methods for improving the performance of internet connections and large networks. For example, the inventions improved quality of service in a virtualized network. The SD-WAN inventions provide a wide range of benefits for individuals and distributed organizations, including improved architectures for implementing highly efficient, secure, optimized virtual WAN architectures over the top of the regular internet and other fabrics. The slingshot

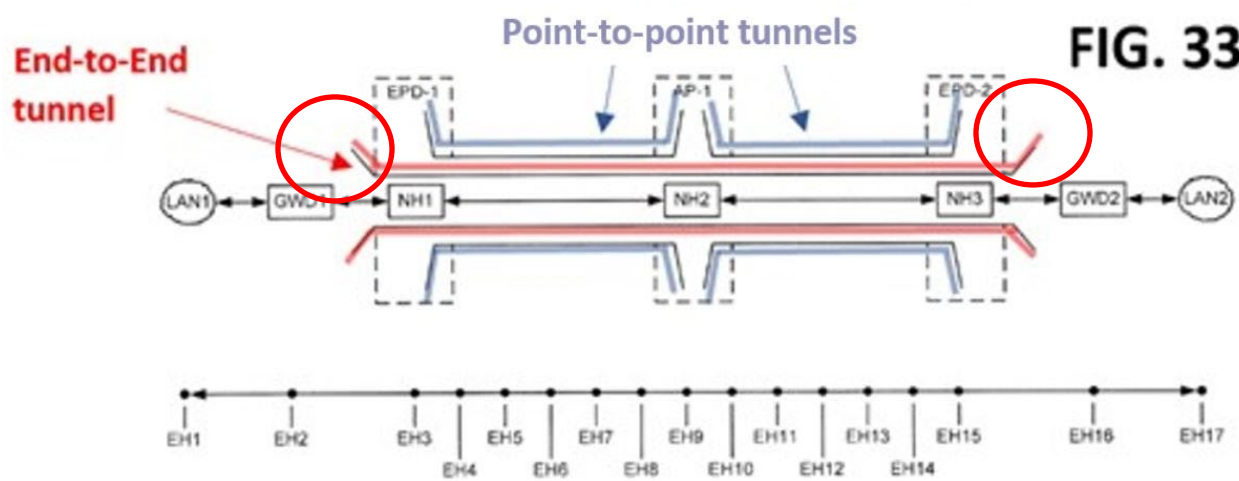
inventions improve over past technologies by, for example, overcoming limitations related to packetization and next-hop routing.

At the time of these pioneering efforts, the most widely implemented technology in use involved multiprotocol label switching, or MPLS, a networking technology that routed traffic using the shortest path based on “labels,” rather than network addresses. MPLS networks have the disadvantage of needing to transmit all traffic from the branch to a centralized data center and have limited capabilities for low latency/high performance access to cloud applications. In addition, the security and management requirements associated with disparate traffic flows in MPLS adds to the complexity of managing network operations, thus increasing operational requirements. The invention claimed in '595 patent overcomes these limitations in traditional MPLS networks as well as other limitations in various prior art technologies. As one example, the patented invention provides a number of advantages over the prior art and improve the operations of virtualized networks implementing highly efficient, secure, optimized virtual WAN architectures.

The patented invention disclosed and claimed in the '505 patent resolves technical problems related to systems and methods of operating a control server and a plurality of intermediate access point servers in a network system, for example problems related to selecting at least one end-to-end tunnel for communications between devices in the network system. As the '505 patent explains, certain limitations of prior art systems related to long distance connectivity and throughput

over a network, due to distance, protocol limitations, peering, interference, and/or other problems and threats. (See, e.g., Ex. 1001 at 1:31-34.) The invention of the '505 patent increases versatility in managing traffic, as the tunnel can represent a neutral third layer of a virtualized network within which it is possible to run traffic that would normally transit over the internet. (Ex. 1001 at 34:1-11.)

Specifically, the claims of the '505 patent recite “a plurality of intermediate access point servers that form a plurality of end-to-end tunnels...,” embodiments of which are shown in the annotated version of the '505 patent's FIG. 33, shown below:



(Ex. 1001 at Fig. 33 (annotated).) As shown, the specification differentiates such end-to-end tunnels from point-to-point tunnels. 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*. (Ex. 2002 at ¶31.) 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 at ¶31.)

III. APPLICABLE LEGAL PRINCIPLES

A patent is invalid for anticipation under 35 U.S.C. § 102 only “if a single prior art reference discloses *each and every*¹ limitation of the claimed invention.” *Schering Corp. v. Geneva Pharms., Inc.*, 339 F.3d 1373, 1377 (Fed. Cir. 2003) (citing *Lewmar Marine, Inc. v. Barient, Inc.*, 827 F.2d 744, 747 (Fed. Cir. 1987)). A prior art reference may anticipate without disclosing a feature of a claimed invention only when that missing characteristic is necessarily present—or inherent—in the single reference. *Id.* at 1377.

To make a *prima facie* showing of obviousness under 35 U.S.C. § 103, the Petition must, among other requirements, fulfill the requirements set forth in *Graham v. John Deere Co.*, 383 U.S. 1 (1966), including demonstrating that the cited references disclose each element of a challenged claim. *In re Magnum Oil Tools Int’l.*, 829 F.3d 1364, 1376 (Fed. Cir. 2016).

Petitioner also has the burden to show that there would have been sufficient motivation to combine the asserted prior art, and that the proposed combination would render the patented claims obvious. *Unigene Labs., Inc. v. Apotex, Inc.*, 655 F.3d 1352, 1360 (Fed. Cir. 2011). Even if individual modifications or choices were

¹ Unless otherwise indicated, all emphasis in this brief is added.

obvious, a petition must explain why making all of the changes at once would have been obvious at the time of the patented invention. *Apple Inc. v. Contentguard Holdings, Inc.*, IPR2015-00442, Paper 9 at 16-17.

The Federal Circuit has found that, even for an obviousness challenge based on a single reference in view of the knowledge and skill of a person of ordinary skill in the art, there must be a motivation to make the combination and a reasonable expectation that such a combination would be successful, otherwise a skilled artisan would not arrive at the claimed combination. *In re Stepan Co.*, 868 F.3d 1342, 1345-46 (Fed. Cir. 2017). In other words, when a gap in a single prior art reference requires filling with, for example, the knowledge of one of ordinary skill, there must be a further showing that the skilled artisan would arrive at the claimed invention without anything other than the artisan's skill and the teachings of the reference.

Hindsight analysis is inappropriate; obviousness must be measured "at the time the invention was made." *Ortho-McNeil Pharm. v. Mylan Labs*, 520 F.3d 1358, 1364 (Fed. Cir. 2008) (emphasis original). The petition must demonstrate a rationale to combine prior art references without relying on the patent disclosure itself. *Apple Inc. v. Contentguard Holds.*, IPR2015-00442, Paper 9 at 15, 17 (P.T.A.B. July 13, 2015); see also *P&G v. Teva Pharms. USA, Inc.*, 566 F.3d 989, 995 (Fed. Cir. 2009). The petitioner must not use the patent as a roadmap. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007); *In re NTP, Inc.*, 654 F.3d 1279, 1299 (Fed. Cir. 2011).

IV. LEVEL OF ORDINARY SKILL IN THE ART

Petitioner offers the following credentials for a person of ordinary skill in the relevant art (“POSA”) at the time of the priority date of the ’595 patent:

familiar with network communications including virtual private networks and interconnections therebetween. EX-1003 ¶ 53. A POSITA would have a working knowledge of techniques for transmitting data via a VPN and establishing tunneling links. A POSITA would have gained knowledge of these concepts through a mixture of training and work experience, such as by having a Bachelor’s degree in computer science and four years of experience; or by obtaining a Master’s degree in computer science, but having only one to two years of experience; or by having no formal education but experience in storage systems of at least eight years.

(Petition at 16-17.) Patent Owner does not dispute this characterization of a POSA.

V. PETITIONER HAS FAILED TO SHOW THAT THE CHALLENGED CLAIMS ARE UNPATENTABLE

The Institution Decision identifies claim 1 of the ’505 patent as “illustrative of the claimed subject matter”. (Paper 9 at 8; *see also*, Pet. at 3.) The element of claim 1 identified by the Board and Petitioner as “[1.3]” is a primary focus of the Board—and the element for which a critical construction error is made. Element [1.3] recites:

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

(Ex. 1001 at 58:16-18.)

A. The Board’s Construction of “End-to-End tunnel” Is Inconsistent with Both the ’505 Patent and the Petition’s Alleged Prior Art

The Petitioner proposes that “each claim term in the Challenged Claims be given its plain and ordinary meaning in this proceeding, and that no specific construction of any claim term is required because the prior art relied on in this Petition meets each of the claim terms under any reasonable construction.” (Pet. at 15.) Patent Owner does not dispute this proposal.

Although the Board acknowledged that neither Patent Owner nor Petitioner identified any claim term needing construction, (see Paper 9 at 19), the Board nonetheless construed the term “*end-to-end tunnel*” as follows:

We preliminarily determine that the term “end-to-end tunnels” means ***communication paths connecting endpoint devices to one or more intermediate access point servers*** and one or more control servers. Ex. 1001, 4:5–8. Stated differently, the “end-to-end tunnels” connecting endpoint devices ***may include intermediate access point servers or control servers.***

(Paper 9 at 21.)²

The Board’s *sua sponte* construction is incorrect. In essence, the Board’s construction conflates a “*tunnel*” (i.e., a segment connecting two endpoints with encapsulated communications therebetween) with a “*communication path*” (i.e., a route of communication that may traverse multiple segments, each of which may or may not use a tunnel). The construction does not cite to—nor does it reflect—any recognized definition of “*tunnel*.” And it essentially eviscerates the meaning of

² Unless otherwise noted, all emphasis in this Response is added.

“*tunnel*” because, while every tunnel is built overlying one or more communication paths, *not every communication path is a tunnel*.

1. The Board’s Construction Overlooks the Intrinsic Record of the ’505 Patent

The differences of a “*communication path*” and “*tunnel*” are shown in the specification of the ’505 patent. For example, the ’505 patent’s specification states:

[a] *communication path* may comprise *one or more intermediate tunnels* connecting each endpoint device to one or more intermediate access point servers and one or more control servers[.]

(Ex. 1001, 4:5-8; see also Ex. 2002 at ¶ 32.) Again, a “path” and a “tunnel” are not the same thing—this entire summary paragraph from the specification fails to say anything about an *end-to-end tunnel*, let alone define one. While a single path may include a plurality of tunnels and a single tunnel could *extend through* a plurality of other tunnels, a single tunnel cannot be a plurality of tunnels. Based on the Board’s construction, however, a single “*end-to-end tunnel*” may include a plurality of tunnels, which, as stated, is incorrect.

The Board’s construction mischaracterizes the nature of the claimed “end-to-end tunnels” that exist between a “first” and “second” device. A single “end-to-end tunnel” will “run[] through,” (Ex. 1001, 36:41-48), rather than ‘connect’ intermediate points. This concept allows a claimed single “end-to-end” tunnel” to “extends over the entirety of the transit through [an underlying network].” (Ex. 1001, 33:8-14.)

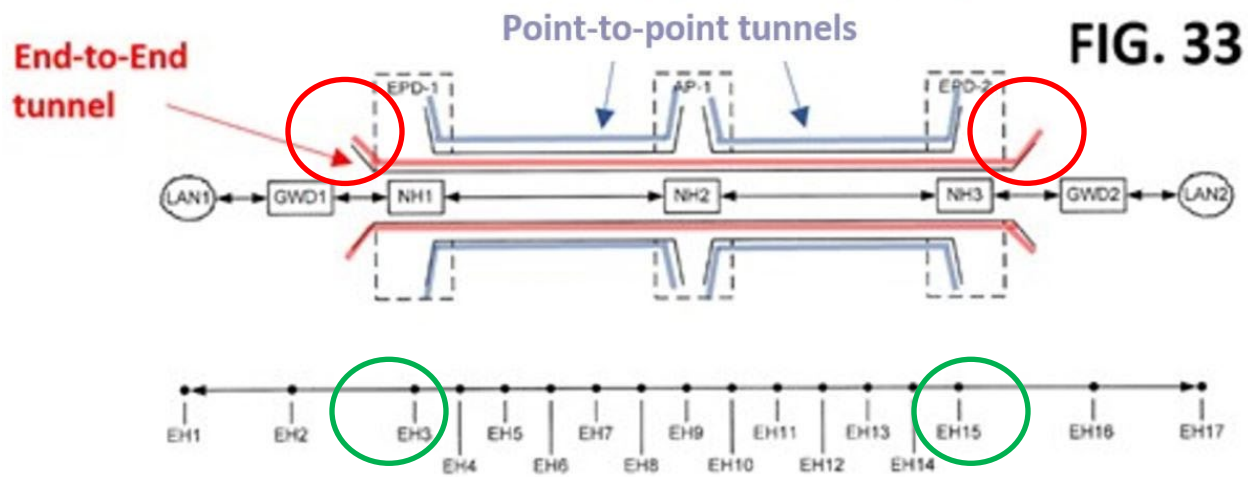
By contrast, the Board’s construction mischaracterizes the end-to-end tunnel as “connecting” endpoint devices to one or more intermediate access point servers. The Board’s view is wrong because, when three or more devices get “connected” by tunneling (i.e., maintaining agreed communications encapsulation between each set of peers), more than one tunnel must exist (one for each set of peers). (Ex. 2002 at ¶ 33.) There is simply no support in the ’505 patent, nor any of the art identified in the Petition, for a single tunnel to “be” multiple tunnels connecting three or more points. Indeed, the record in this proceeding supports such a conclusion. Specifically, the instances of “tunnel” in the record, as shown below, involve a single segment “connecting” two points.

If any construction need be given to the term “*end-to-end tunnel*”—which, as noted, neither Party asserts—the intrinsic record reveals that a single “*tunnel*” is a connection between two devices with encapsulated traffic therebetween (e.g., EPD1 and EPD2) as shown by, for example, the prosecution history of the ’505 patent.

The use of a single “end-to-end tunnel” over the “entirety” of a path between two devices is further evidenced, for example, in Figure 33 and its associated description in the ’505 patent. (Ex. 1001 FIG. 3; 33:8-14.) Figure 33 describes this single “end-to-end” tunnel “extend[ing] over the entirety of the transit” as follows:

FIG. 33 illustrates GVN Tunnel from LAN to EPD to SRV_AP to EPD to LAN. This variation illustrates **an end-to-end GVN tunnel(s)** between edges of two LANs via one SRV_AP. The difference between this variation and FIG. 32 is that **the tunnel extends over the entirety of the transit through the Internet from EH3 through EH15.**

(Ex. 1001, 33:8-14.) Thus, Figure 33 illustrates an “end-to-end GVN tunnel”, which spans, in an uninterrupted fashion, the entire overlay network path between endpoints EDP-1 and EDP2, via an intermediate access point (AP-1), which collectively “form” the tunnel. The following annotation of Figure 33 (with a red line over the end-to-end tunnel and red circles over at its endpoints), is illustrative:



(Ex. 1001 at 33:12-13 (“... the tunnel extends over the entirety of the transit through the Internet from **EH3** through **EH15**...”).)

Figure 39 (as annotated below) and its associated description lend further understanding as to an end-to-end tunnel, describing a process for building such an “internal tunnel” (red) that “run[s] through” “both of the other” point-to-point tunnels (blue), as shown below:

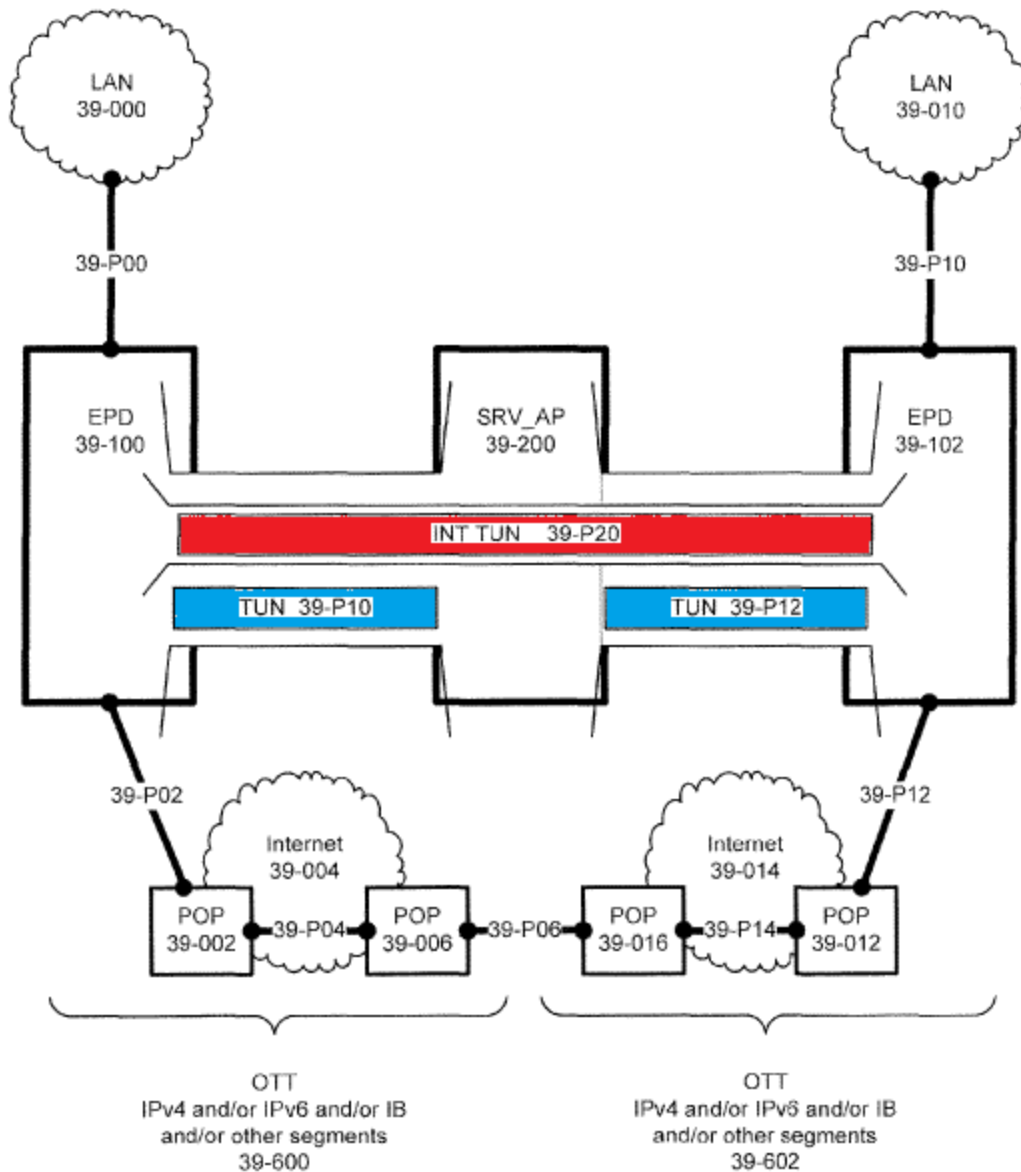


Figure # 39

(Ex. 1001 at Fig. 39.) The corresponding description of FIG. 39 from the '505 patent explains:

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, run through**

both of the other tunnels, joined at the SRV_AP 39-200 through which traffic can flow. This tunnel can be the communication path through which the WAN is built.

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

Petitioner's expert, Dr. Reddy, does not dispute this understanding of encapsulated data in an "*end-to-end tunnel*." Specifically, Dr. Reddy stated that each time a packet travels through the tunnel contemplated in the '505 patent, the packet undergoes "obfuscation," or "encapsulation," prior to entering the tunnel, which then reverses "obfuscation," or "un-encapsulates," upon exiting the tunnel, as shown below:

Q: So the data packet at the beginning of the tunnel undergoes some sort of process, some sort of change so they can travel through the tunnel. Right?

Dr. Reddy: Right.

Q: So at the end of the tunnel, is that process reversed so that you get the same data packet at the end of the tunnel that you had at the beginning of the tunnel?

Dr. Reddy: Depends on implementation. There are some implementations, for example, in something like onion routing where that may not be the case.

...

Q: Is that type of onion routing the type of encapsulation that's contemplated in Iyer and in the 505 and 595 patents?

Dr. Reddy: No.

(Ex. 2001 (Transcript of the Deposition of Dr. Reddy), at 67:10-22, 69:5-9.) In other words, Dr. Reddy agreed that a "tunnel" contemplated in the '505 patent is a

connection between two devices with encapsulated traffic therebetween, wherein the encapsulated data packet is not unencapsulated until the packet exits the tunnel.

Notably, the next paragraph describing Figure 33 in the '505 patent contrasts “*end-to-end tunnel*” with the alternative, shorter “*point-to-point tunnels*” (as annotated above in blue): “There is one tunnel between EPD-1 and AP-1. This is joined to a second tunnel between AP-1 and EPD-2.” (Ex. 1001 at 33:15-16.) Again, notice that each singularly referenced “*tunnel*” is illustrated by a single, uninterrupted line segment and connects only two points/devices, one at either end of that uninterrupted line. This concept of “*tunnel*” is repeated in the descriptions for figures 32 and 34-35, and in the '505 patent's prosecution history.

Moreover, the references cited in the Petition, and relied upon in the Board's Institution Decision, further demonstrate that a “*tunnel*” is a single segment connecting two points. (See (Paper 9 at 8, 10-12, 16, 23-30 and Pet. at 3-6, 21-23-71 (each citing Ex. 1004 (Hankins).) Hankins recites “*tunnel*” as a noun in only one instance. In that instance, the Hankins tunnel is described as connecting two points: “[f]or example, a ***software tunnel*** may be created *between a logical broadcast domain, and a VPN device.*” (Ex. 1004 at 36:16-18.)

Hankins also describes encapsulation of a packet sent to a tunnel server, where it is de-encapsulated and is described as providing a “termination” for a tunnel:

Thus, for example, if a virtual broadcast domain provides a signal packet A to a tunnel server, it may be encapsulated. Likewise, if a non-virtual broadcast domain provides a signal packet B to a tunnel server

it may be encapsulated. However, in this embodiment, a tunnel server may likewise remove encapsulation (e.g., referred to as termination) to determine where to forward a signal packet and re-encapsulate it for forwarding.

(Ex. 1004 13:8-15.)

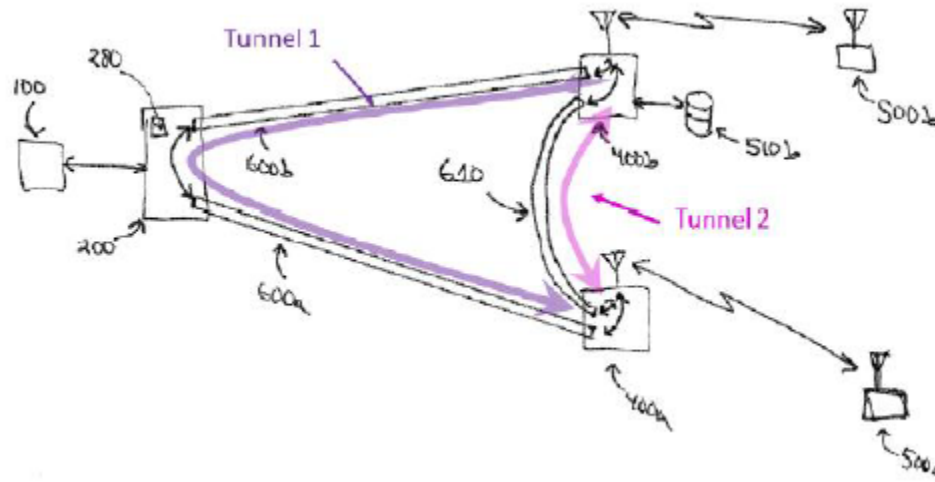
The Institution Decision also quotes from the Petition’s “*State of the Art*” section for the definition of a “*tunnel*” as a predicate for later defining “*end-to-end tunnel*.” The “*tunnel*” definition is taken from Iyre (Ex. 1007). (Paper 9 at 20 (citing Pet. at 17.)(citing Ex. 1007))). Due to Petitioner’s distorted summary of Iyre, the Board was misled into equating the “*peer-to-peer tunnels*” of Iyre with an end-to-end tunnel of the claims. When viewed in proper context, Iyre indicates that the connection formed by a single tunnel is a single connection between only ***two*** devices:

Peer-to-peer tunnels may be established between ***any two clients*** in the mobility domain or may be established on an authenticated basis.

(Ex. 1007 at ¶ 15.) Thus, the reference that both the Institution Decision and the Petition rely upon to explain the meaning of a “*communication tunnel*”, Iyre, clarifies that a tunnel forms a single connection between “***two***” devices—not multiple connections involving three or more devices, as the Board’s construction would improperly allow.

And while the illustrations and descriptions in Iyre show that a “*tunnel*” is a single segment connecting only two points, Petitioner attempts to blur this evidence

by renaming the components of Iyre's Figure 4, with Petitioner's own annotations, reproduced here:



However, Iyre's own description of this figure explains that 600a, 600b, and 610 are each deemed a separate "*tunnel*". (Ex. 1007 at ¶ 0030 ("In this manner traffic between clients 500a mid 500b rather than traveling through *tunnels 600a and 600b* and controller 200, instead travels through *tunnel 610* once the tunnel is established").) There is simply no support in Iyre for describing the path extending through tunnel 600a tunnel and 600b as a singular "Tunnel 1" as Petitioner has erroneously done in its annotation. This contributes to the misunderstanding over whether multiple tunnels may constitute a single tunnel and thus, the idea that an "*end-to-end tunnel*" could connect more than two points.

Again, Petitioner's expert, Dr. Reddy, agreed that the structure annotated by Petitioner as "Tunnel 1" in this figure of Iyre is actually composed of two tunnels, rather than one, as shown below:

Q: 600a and 600b, that's tunnels plural. Correct?

Dr. Reddy: That's correct. Tunnels. 600a, 600b, right.

(Ex. 2001 at 38:24-39:2.) Dr. Reddy therefore agrees that Petitioner's annotation of "Tunnel 1" in Figure 4 of Iyre is incorrect, as that path depicts two back-to-back tunnels.

Further, as noted above, Dr. Reddy agreed that a data packet is unencoded only at the exit of a tunnel, and then re-encoded if the packet is to enter another tunnel. Dr. Reddy further agreed during his deposition that a data packet entering tunnels 600a and 600b from Figure 4 from Iyre would be unencapsulated at the end of tunnel 600b and re-encapsulated at the entrance of 600a, as shown below:

Q: So a data packet traveling from element 400b through 600b and entering element 200, once the data packet reaches 200, would it be de-encapsulated?

Dr. Reddy: As I mentioned before, that would be the case. We're stitching together 600b and 600a. You would de-encapsulate it at the controller, re-encapsulate it going onto 600a.

(Ex. 2001 at 39:3-11.) Dr. Reddy therefore agrees that the tunnel structure of 600a and 600b in Iyre is not that same as the "*end-to-end tunnel*" contemplated in the '505 patent, because the "*end-to-end tunnel*" claimed in the '505 patent does not un-encapsulate a packet encapsulated at a first device until the packet reaches the second device (and vice versa). (Ex. 2002 at ¶ 34.)

In short, the Board's construction is incorrect because—as the experts for both parties agree—it essentially misconstrues a single tunnel as potentially connecting

(as opposed to running through) a plurality of tunnels, which would lead to a series of un-encapsulations and re-encapsulations that should not occur within an end-to-end tunnel.

2. The Board’s Construction Further Overlooks the Prosecution History of the ’505 Patent

The Board’s construction also ignores the prosecution history of the ’505 patent. This history reveals that the ’505 patent was allowed based on the “*end-to-end tunnel*” recitation. In particular, the Board’s construction ignores the portion of the prosecution history where an “*end-to-end tunnel*” is described as an “*encapsulation of communications*” between “*endpoint devices*”. (Ex. 1002 at 0150-51.) Here, during prosecution, the Applicant explained the distinguishing features of the claimed “*end-to-end tunnels*” as follows:

The Office Action identifies the Smart Device Clients 101, 107 or 109 of Chen as corresponding to “endpoint devices,” as recited by claim 1. (Office Action, pp. 3-4). The Office Action further identifies the *encapsulation of communications* between Smart Device Clients 101, 107 or 109 and Private Cloud Server 108 under the VPN protocol *as corresponding to an “intermediate tunnel,”* as recited by claim 1. (Id, p. 4). Applicant disagrees that Chen teaches these limitations. However, even assuming, arguendo, that the Smart Device Clients 101, 107 or 109 constitute “endpoint devices” and that the encapsulation of communications under the VPN protocol constitutes an “intermediate tunnel,” *Chen does not teach “a plurality of end-to-end tunnels connecting the first device and the second device,” as recited by amended claim 1.* For example, to the extent that Chen teaches the use of the VPN protocol to encapsulate “communication between the Smart Device Client 109 and the Private Cloud Server 108,” (Chen, ¶ 0059 ... *nowhere does Chen teach the use of the VPN protocol to encapsulate communications between* pairs of Smart Device Clients 101,107, or 109 (i.e., *the purported endpoint devices*). Furthermore, even if a pair

of clients among Smart Device Clients 101, 107, or 109 were to communicate with each other via separately established VPN links to Private Cloud Server 108, the separate VPN links would not constitute a “plurality of end-to-end tunnels” between the pair of clients. Specifically, ***Chen does not teach that the Private Cloud Server 108 joins multiple VPN links to provide end-to-end encapsulation and consequently the VPN links would not form a “plurality of end-to-end tunnels.”*** Consequently, Chen does not teach a “plurality of end-to-end tunnels” as recited by amended claim 1.

(Ex. 1002 at 0150-51.) The Board’s construction is akin to the Examiner’s misunderstanding noted above. Specifically, the Office Action had initially rejected Applicant’s claims based on Chen’s alleged disclosure of an “*encapsulation of communications*” between “*a purported end-point device*” and an intermediate device “108”, but Applicant successfully distinguished this as characterizing an “*intermediate tunnel*” (aka “point-to-point tunnel”) rather than the claimed “*end-to-end tunnel*”.

The distinguishing nature of forming “*a plurality of end-to-end tunnels*,” which this prosecution history reveals as corresponding to “*end-to-end encapsulation of communications*” is obviated by the Board’s incorrect construction.

B. The Petition Fails Because Petitioner Cannot Show that Hankins Teaches a “*Plurality of End-to-End Tunnels*”

Each independent claim of the ’505 patent requires a “*plurality of end-to-end tunnels*.” (See Ex. 1001 at 58:17 (claim 1), 58:61 (claim 11), 59:22 (claim 14).) Because each independent claim requires a “*plurality of end-to-end tunnels*,” each dependent claim must also include the same limitation. Petitioner was therefore

required to show that this limitation claimed in each claim of the '505 patent is taught by one of the alleged prior art references.

As discussed in the previous section, Hankins does not teach a “*plurality of end-to-end tunnels*.” (See *supra* at V.A.2.) The only other alleged prior art reference cited in the Petition which is asserted in the section of the Petitioner seeking to invalidate the independent claims of the '505 patent is Munger. (Ex. 1005.) Petitioner’s reliance on Munger in that section, however, is limited to dependent claim 2, rather than an independent claim. (See Pet at 45-50.) Petitioner therefore does not assert—because it cannot—that Munger teaches the limitation of a “*plurality of end-to-end-tunnels*,” as claimed in the independent claims of the '505 patent.

In sum, absent the Board’s incorrect construction of “*end-to-end tunnel*” that is inconsistent with the intrinsic record, Petitioner fails to show a disclosure in the alleged prior art to satisfy the required “*plurality of end-to-end tunnels*.” The Petition should therefore be denied.

VI. CONCLUSION

For all the reasons stated above, Patent Owner respectfully requests that the Petition be denied and the '505 patent be found not unpatentable.

Dated: December 11, 2024

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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 December 11, 2024, 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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