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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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CISCO SYSTEMS, INC.
Petitioner
v.
GOLDEN EYE TECHNOLOGIES LLC
Patent Owner

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Case IPR2026-00186
U.S. Patent No. Patent 10,051,556

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**PATENT OWNER PRELIMINARY RESPONSE PURSUANT TO 35 U.S.C. § 313 and 37 C.F.R. § 42.107**

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**Table of Contents**

# TABLE OF AUTHORITIES

Cases

Statutes

Rules

## I. INTRODUCTION

Golden Eye Technologies LLC ("Patent Owner") submits this Preliminary Response to the petition ("Petition" or "Pet.") of Cisco Systems, Inc. ("Petitioner") seeking *inter partes* review ("IPR") of U.S. Patent No. Patent 10,051,556 (the "'556 patent").

In a wireless local area network, the '556 patent provides a solution for inefficient and time-consuming station-to-Access Point connection during an active scan process. One objective of the '556 patent is to accelerate network access and preserve airtime by redesigning the station-to-Access Point active scan process in a wireless local area network. The invention of the '556 patent enables a station to connect to an Access Point ("AP") faster and with lower network resource consumption by: including information on a signal strength in a probe request to the AP; the AP transmitting a probe response based on information on a signal strength, for example, if the uplink quality satisfies a predetermined standard; and the station accessing the AP based on such a probe response being received, rather than waiting a maximum waiting period (e.g., a Max_Probe_Response_Time) for other probe responses to be received and selecting the AP with the most superior wireless environment. Together this approach results in fewer probe responses being sent by the AP, and faster access by the station. Thus, the time and resources consumed during the active scan process and connection process is significantly reduced.

The improved process of the ’556 patent bypasses conventional active scan latencies and initiates access by the station without delay. This advantageously eliminates mandatory waiting periods and significantly reduces the station’s power consumption during the active scan phase. Furthermore, by ensuring that the AP only responds to requests that meet the required quality standard, the invention conserves wireless resources by significantly reducing the volume of unnecessary probe responses transmitted over the air.

The prior art cited in the Petition fails to teach the novel approach of the ’556 patent for performing active scanning in, for example, a WLAN system. Indeed, the Petition fails to identify any single anticipatory reference, or combination of references, that discloses all elements of any challenged claims. Instead, the Petition resorts to cobbling together an argument that the challenged claims are rendered obvious by no less than three technically-deficient references. None of these references—Choudhary, Hasty, and Chen—alone or in combination disclose the fundamental technical advancement of the ’556 patent: an improved active scan process in a WLAN that utilizes a probe request frame carrying the information on a signal strength to an available AP, whereby the information on a signal strength is used by the AP to determine whether to send a probe response, for example, based on the uplink quality, and upon receiving a probe response from the AP, the station accessing the AP without further delay because it has established that the link quality is satisfactory.

This advancement is initiated, in part, by embedding the information on a signal strength in the probe request frame sent by the station to the AP. None of the cited prior art references disclose this foundational element of the challenged claims. And indeed, the absence of this critical element further results in deficiencies in the prior art's teachings of all other aspects of the claimed invention. Without a "probe request frame including information on a signal strength," the AP cannot, for example, determine if the access point "satisfies a predetermined standard for an uplink quality with respect to the station" (see dependent claim 4). Consequently, the AP will not "transmit a probe response frame" in response to such a request. In the absence of such a probe response from the AP, the station cannot "access the access point based on the probe response frame"—nor can the AP grant "access"—based on the probe response frame before the "maximum probe response time" (the preset maximum time period the station is otherwise required to wait) elapses. By failing to initiate immediate access based on the first response from an AP, which response is based on station-side information on a signal strength embedded in the probe request, the cited prior art, even if combinable, which is not admitted, cannot achieve the efficiencies of both reducing the volume of unnecessary probe responses and allowing the station to immediately initiate access to the station during the time remaining in the maximum response time.

While Petitioner concedes that Choudhary lacks a probe request frame including such information on a signal strength, its attempt to bridge the gap using Hasty's transmit power level (TPL) value is misplaced. Choudhary and Hasty operate in fundamentally different network topologies and seek to address different problems. As a result, the Petition fails to demonstrate that a POSITA would have looked to Hasty's ad hoc network routing solution to solve the Access Point active probing shortcomings of Choudhary. Hasty is directed to **post-association** routing in an ad hoc mesh where nodes, which have already joined the network, seek the best transmission path among *multiple paths* in a multi-hop mesh network. In Hasty's ad hoc networks, there is no centralized infrastructure such as the access points used in a wireless LAN. In contrast, the wireless LAN of Choudhary requires a direct link between a mobile unit and an Access Point. That is to say, the link involves only a *single direct path* between an AP and a mobile unit. Hasty's relative path-selection techniques are only useful because of the multiple alternative paths that exist in the ad hoc network and do not translate to the direct single link between a mobile unit and an Access Point in the network of Choudhary. Consequently, Petitioner fails to overcome the substantial hurdle in showing that a person of ordinary skill in the art ("POSITA") would have combined the disparate teachings of the cited references to arrive at the claimed invention.

Furthermore, plucking the path-loss measurement approach from Hasty and inserting it into Choudhary's air-time optimization methods would require altering Choudhary's fundamental mode of operation. Petitioner fails to provide evidence that such alteration would have been obvious or even possible. Specifically, the AP of Choudhary uses the measured RSSI of a probe request to determine whether the RSSI is sufficiently high to warrant sending a probe response. But this determination is only based on the received signal strength of the probe request. There is no information on a signal strength included in the probe request sent by a mobile unit. Under Petitioner's proposed modification of Choudhary to incorporate Hasty's path-loss calculation, the measured RSSI would be replaced as the sole filtering criteria for sending a probe response and include considerations of path loss, presumably for purposes of not responding to a probe request if the path loss is too great. But unlike Hasty there is no other path to rely on in Choudhary's situation, meaning the probing mobile unit would not be able to access the Access Point at all, despite the its probe request being received with a sufficiently high RSSI.

Further, such a path loss calculation would require the mobile unit to provide information on a signal strength to the AP. But neither Choudary nor Hasty suggest including information on a signal strength in a probe request. Accordingly, suggesting that Hasty's path loss calculation can be implemented in Choudhary ignores the impossibility of the Access Point in Choudhary calculating path loss without the availability of such information. Thus, this modification of Choudhary under Petitioner's theory is neither obvious nor practical. In addition to the impossibility of implementing Hasty's path loss calculation in Choudary, in view of the lack of relevant information in a probe request, the incompatibility of Hasty's multi-path ad hoc routing methods with Choudhary's WLAN Access Point active probing process, would not have led a POSITA to pursue such a combination.

While Petitioner relies on a third reference, Chen, to address the accessing and timing elements of the claims, Chen cannot remedy the absence of station-side information on a signal strength in the probe request and a probe response informed by that information. Notably, Chen's "fast scan" messages contain only MAC and IP addresses—and are not probe requests with embedded information on a signal strength. Because Chen fails to provide a probe request including information on a signal strength, it cannot disclose accessing an AP based on a probe response that responds to or corresponds to such a probe request. Because this deficiency persists across *all three references*, the proposed combination fails to disclose the fundamentally unique solution of the '556 patent. These material differences between the challenged claims and the proposed combination of Choudhary, Hasty, and Chen should prove fatal to the Petition.

For at least these reasons and as further provided below, the Board should decline to institute review.

## II. GROUNDS IN THE PETITION

The Petition at pages 15-16 asserts the following as the sole ground of unpatentability:

| Ground | Claims | Basis |
|---|---|---|
| #1 | 1-4 and 9-11 | 35 U.S.C. § 103 (pre-AIA) over **Choudhury** (U.S. Patent No. 9,161,293, Ex. 1005), **Hasty** (U.S. Patent No. 7,058,018, Ex. 1006), and **Chen** (U.S. Patent No. 8,503,390, Ex. 1007) |

## III. LEVEL OF ORDINARY SKILL

Patent Owner proposes that a person of ordinary skill in the art would have the following qualifications:

> A person of ordinary skill in the art at the time of the invention of the ’556 patent would have completed an undergraduate degree in electrical engineering, computer science, or equivalent experience and would have at least 3 years of professional experience in the field of wireless network communications. Alternatively, that person would have completed a graduate degree in electrical engineering, computer

science, or a similar field and would have at least 2 years of professional experience in the field of wireless network communications.

## IV. THE CHALLENGED CLAIMS OF THE '556 PATENT

The Petition challenges the following claims of the '556 patent. For reference purposes only, Patent Owner utilizes Petitioner's labels for the claim elements, e.g., [1.1], [1.2], [1.3], etc.

**1. [PRE]** A method for active scanning performed by a station, the method comprising:

**[1.1]** transmitting, to an access point, a probe request frame including information on a signal strength; and

**[1.2]** receiving, from the access point, a probe response frame in response to the probe request frame,

**[1.3]** wherein the probe response frame is transmitted by the access point based on the information on the signal strength,

**[1.4]** wherein the station accesses the access point based on the probe response frame and a maximum probe response time.

**2.** The method of claim 1, wherein the maximum probe response time comprises a preset maximum time period during which the station is required to wait for the probe response frame from the access point.

**3.** The method of claim 1, wherein the information on the signal strength includes information about transmission power of the station.

**4.** The method of claim 1, wherein the access point is an access point satisfying a predetermined standard for an uplink quality with respect to the station.

**9. [PRE]** A method for active scanning performed by an access point, the method comprising:

**[9.1]** receiving, from a station, a probe request frame including information on a signal strength; and

**[9.2]** transmitting, to the station, a probe response frame in response to the probe request frame based on the information on the signal strength,

**[9.3]** wherein an access of the station to the access point is based on the probe response frame and a maximum probe response time.

**10. [PRE]** A station configured to perform an active scanning, the station comprising:

**[10.0]** a transceiver; and a processor, wherein the processor is configured to:

**[10.1]** cause the transceiver to transmit, to an access point, a probe request frame including information on a signal strength; and

**[10.2]** cause the transceiver to receive, from the access point, a probe response frame in response to the probe request frame, and

**[10.3]** wherein the probe response frame is transmitted by the access point based on the information on the signal strength,

**[10.4]** wherein the station accesses the access point based on the probe response frame and a maximum probe response time.

**11. [PRE]** An access point configured to perform an active scanning, the access point comprising:

**[11.0]** a transceiver; and a processor, a wherein the processor is configured to:

**[11.1]** cause the transceiver to receive, from a station, a probe request frame including information on a signal strength; and

**[11.2]** cause the transceiver to transmit, to the station, a probe response frame in response to the probe request frame based on the information on the signal strength,

**[11.3]** wherein an access of the station to the access point is based on the probe response frame and a maximum probe response time.

## V. RELEVANT LEGAL STANDARDS

### A. Standards for Instituting an IPR

"In an [inter partes review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable." *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring inter partes review petitions to identify "with particularity . . . the evidence that supports the grounds for the challenge to each claim")). Importantly, the petitioner must how the prior art would have rendered the challenged claims unpatentable by specifying "where each element of the claim is found in the prior art patents or printed publications relied upon." 35 U.S.C. § 312(a)(3); 37 C.F.R. § 42.104(b)(4). "The IPR petition, thus, must provide an understandable explanation of the element-by-element specifics of the patentability challenges, including the identification of particular portions of prior art on which the petitioner is relying." *Corephotonics, Ltd. v. Apple Inc.*, 84 F.4th 990, 1001 (Fed. Cir. 2023). Unless the Petition demonstrates a likelihood of success on its asserted invalidity grounds for at least one claim, the Board should not institute review. 35 U.S.C. § 314(a) (indicating that institution of an *inter partes* review is improper unless "the information presented in the petition . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition."). Here, ***Petitioner fails to meet that standard.***

**B. Obviousness Standard**

"A patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." 35 U.S.C. § 103(a).

To be considered obvious, each and every element of the claim must be disclosed by the prior art. *In re Rijckaert*, 9 F.3d 1531, 1534 (Fed. Cir. 1993) (reversing obviousness rejection where prior art did not teach or suggest all claim limitations); *Garmin Int'l, Inc. v. Patent of Cuozzo Speed Techs. LLC*, IPR2012-00001, Paper 15 at 15 (PTAB Jan. 9, 2013) (denying institution under § 103 where the prior art did not disclose all claim limitations).

Obviousness is resolved based on factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, and (3) the level of ordinary skill in the art. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966).

It is impermissible for Petitioner to "use the claimed invention as an instruction manual or 'template' to piece together the teachings of the prior art so that the claimed invention is rendered obvious." *In re Fritch*, 972 F.2d 1260, 1266 (Fed. Cir. 1992) (citing *In re Gorman*, 933 F.2d 982, 987 (Fed. Cir. 1991)); *see also InTouch Techs., Inc. v. VGO Commc'n, Inc.*, 751 F.3d 1327, 1348-49 (Fed. Cir.

2014) (holding expert testimony to be impermissible hindsight for failing to explain what reason or motivation one of ordinary skill in the art at the time of the invention would have had to place the prior art together). The conclusion of obviousness based on a combination of references must be supported with an explicit analysis of a reason to combine those references. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). Such reasons must be more than "mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006).

Additionally, a person of ordinary skill in the art is unlikely to combine references when the proposed combination would modify the primary reference's principles of operation. *See Plas-Pak Indus., Inc. v. Sulzer Mixpac AG*, 600 F. App'x 755, 759 (Fed. Cir. 2015) (holding "the Board did not err in concluding that claims 1–15 would not have been obvious").

## VI. THE PETITION FAILS TO DEMONSTRATE A REASONABLE LIKELIHOOD OF PREVAILING ON ITS SOLE GROUND OF UNPATENTABILITY

### A. The '556 Patent Fundamentally Redesigns the Active Scanning Framework to Prioritize Connection Speed to an AP with a Sufficiently Superior Wireless Environment Over Exhaustive Candidate Searches.

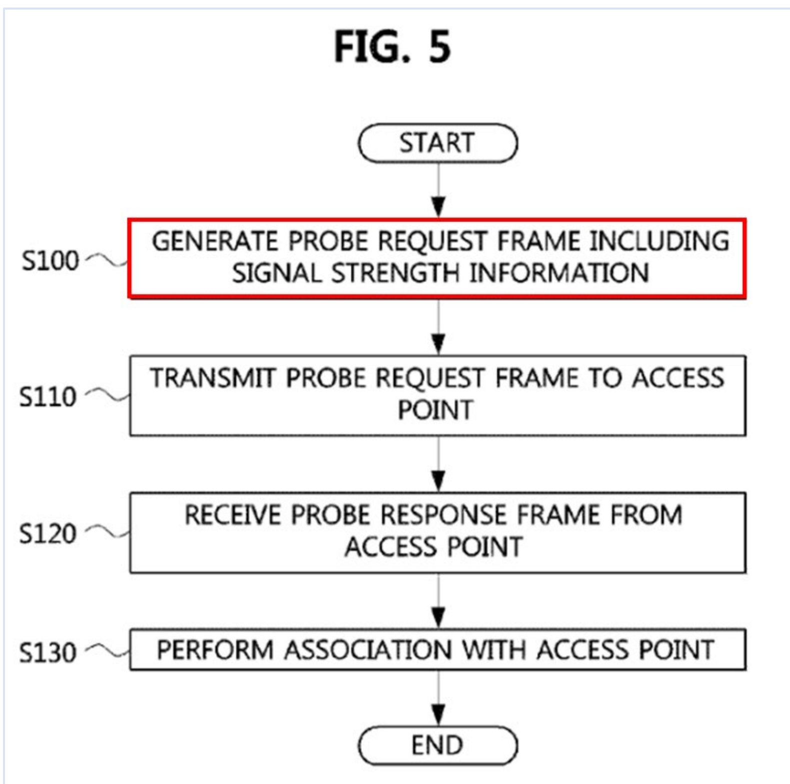
U.S. Patent No. 10,051,556 (the "'556 patent," submitted as Ex. 1001) issued on August 14, 2018, from Application No. 15/618,443. The Application was filed on June 9, 2017. The ’556 patent claims priority to Korean Patent Application No. 2012-0070043 filed on June 28, 2012, and No. 2013-0063860 filed on June 4, 2013, each in the Korean Intellectual Property Office (KIPO).

The ’556 patent describes an active access point scan method designed to resolve specific inefficiencies inherent in, for example, a wireless local area network (WLAN) system. ’556 patent, 1:15-18. In conventional active scan methods utilized at the time of the invention, a station would transmit a probe request frame to solicit responses from any available undesignated access points (*id*., 1:56-2:8), and an access point “having received the probe request transmits a probe response.” *Id*. This unconditional response to each probe request by the AP causes a “waste of wireless resources.” *Id*., 2:1-13. Under this legacy framework, if a station sends a probe request frame any access point receiving the probe request frame responds to it “without consideration of a wireless environment.” *Id*.

The ’556 patent further addresses the inherent temporal inefficiencies that plague conventional active scanning processes. Specifically, in conventional active scanning, a station broadcasts a generic solicitation for an AP and then “waits for the maximum probe response time to pass” before the station “requests access at an access point whose wireless environment is the most superior among the access points having transmitted probe response frames.” *Id*., 1:63-2:8. This mandatory waiting period, defined as the Max_Probe_Response_Time, occurs even if a suitable connection to "an access point having a superior wireless environment" has already been identified. *Id*. The specification explicitly characterizes this rigid temporal requirement as a "waste of time," delaying the station's ability to initiate a connection despite the presence of a viable access point candidate. *See id*.

The '556 patent overcomes these inefficiencies by fundamentally transforming active scanning into a more informed exchange between the station and the AP, by utilizing station-side information on a signal strength to provide the technical confidence necessary for the station to bypass legacy delays and initiate immediate access upon the first qualifying probe response. This process begins with the station generating and broadcasting a probe request frame that includes a "information on a signal strength" within the probe request itself. '556 patent, 7:55-8:26. Upon receipt of such a probe request, the access point acquires information about uplink quality with respect to the station by evaluating the "information on a signal strength" against a "predetermined standard." *Id*. The AP then transmits a probe response frame if the predetermined standard is satisfied, providing the station with the requisite technical confidence that the "uplink quality between the certain access point and the station is fair." *Id.* Significantly, the station initiates the process for the AP to grant immediate access based on that specific probe response. *Id*., 8:27–38. By leveraging the information provided by the station to inform the AP's decision to send a probe response, the '556 patent enables the connection to be finalized "instantly," bypassing the legacy requirements to wait for a maximum probe response time to elapse and to consider other probe responses received during that time. *Id.*

Consistent with the foregoing, the '556 patent discloses, in Figure 5 (shown below), that an active scan method "includes generating a probe request frame including signal strength information of the station" at step S100 (as shown in red below). For example, the '556 patent discloses that the "signal strength information of the station" that is included in probe request "may include transmission power (Tx power) information." *Id.*, 7:58-8:3.




*See* '556 patent at 7:58-8:3 (describing Figure 5).

By embedding this information directly into the initial soliciting probe request, the station provides, via the probe request frame, the foundation for a more informed assessment by the AP as to whether to respond. Further, the station gets to play a greater role in the active scanning process by providing the specific technical information upon which the AP bases its decision to transmit a probe response.

Further, the AP uses the included station-side signal information to "acquire information about uplink quality" (Step S410) and in view of that information, determines whether to respond based on whether that quality "satisfies a predetermined standard," resulting in fewer responses sent by the AP. '556 patent, 10:43-50; Fig. 11.

And because the station is now aware that a received probe response indicates that the AP has determined the link quality to be sufficient based on the information on a signal strength sent by the station, the station no longer needs to assess probe responses from other APs. Instead, the station accesses the AP immediately upon receiving such a response. That is to say, the '556 patent enables the AP to make a significantly more informed assessment of the uplink quality, which in turn enhances the confidence level the station has in the uplink quality based on receipt of a probe response from the AP. As such, the approach of '556 patent eliminates delay in the active scan process by allowing the station to perform an access to the certain access point *based on the probe response*, and specifically "before a maximum probe response time elapses." *Id*., 8:27-38. As a result, the station can initiate a connection "instantly," finalizing the access process immediately upon receiving the first qualifying response. *Id*.

The '556 patent provides a streamlined active scan process that eliminates mandatory timer-based delays—drastically reducing network access time. *See* '556 patent, 2:1-8. As demonstrated below, the Petition's reliance on the disparate network architectures of the cited references fail to bridge the gap between the simplistic RSSI-based filters of Choudhary or post-association maintenance protocols of Hasty, and the optimized and expedient WLAN active scan innovations of the '556 patent.

### B. Choudhary Does Not Disclose Any Embedded Information on a Signal Strength in the Probe Request.

The Choudhary reference addresses "air-time" inefficiency in high-density wireless networks by allowing an Access Point (AP) to hide from Mobile Units (MUs) with low received RSSI levels. *See* Ex. 1005 at 1:16-35. Under standard 802.11 protocols, every AP receiving such a broadcast typically responds with a unicast probe response, creating significant overhead from MUs that have too low a received RSSI level to maintain a quality connection but high enough for their broadcast frames to be detected. *Id*.; 2:11-25.

Choudhary identifies that this framework creates significant overhead. For example, Choudhary discloses that "[t]he 802.11 management and control frames are expected to be heard by all devices in the RF neighborhood so these frames are always sent at the lowest basic MCS [modulation and coding scheme] rate configured for a given 802.11 deployment." *Id*., 2:11-25. As a consequence, "beacons and probes, which are management frames, are also sent at the lowest basic MCS rate independent of the currently known RSSI and packet error rate between the transmitter and receiver pairs." *Id*. Because the "size of the beacons and probe frames has increased significantly" in 802.11 deployments discussed in Choudhary, sending management frames "at [the] lowest data configured data rates consumes significant air-time in 802.11n deployments." *Id*.; *see also id*., 2:29-49.

To address this problem, Choudhary proposes a filtering method where the AP measures the physical Received Signal Strength Indication (RSSI) of an incoming probe request and compares it against a predetermined threshold (e.g., RSSI_hi). The AP responds only if "the RSSI value associated with the at least one message from a MU is greater than [] the predetermined threshold." *See* Ex. 1005, 2:63-3:7.

Significantly, Choudhary does not disclose that "information on a signal strength" is included in the probe request sent by an MU, which makes it impossible for the AP to possess such station-side information during the active scanning phase.

As Choudhary explains, RSSI is a measurement (in dBm units) of the "received power at an 802.11 device (AP or client)," which is a measurement "available in most modern radio cards ***for each packet received***." *Id.*, 1:61-2:10. In other words, the RSSI value is a measured value determined after receipt at the AP; it is not based on any information included by the station in its probe request to the AP. In comparison to the claimed invention of the '556 patent which includes information on a signal strength (e.g., information associated with transmission power) in a probe request, the APs of Choudhary use the measured energy the probe request at the AP (RSSI) to decide whether or not to respond. Because Choudhary's filtering does not consider information on a signal strength provided by the station in a probe request, the AP makes a less informed decision compared to the approach of the '556 patent.

The invention of the '556 patent involves the station in the active scan process supplying information on a signal strength in the probe request thereby enabling a more informed decision-making process by the AP regarding whether or not to respond compared to the RSSI filtering approach in Choudhary. The '556 patent recognizes that the traditional quest to find the "best" AP—which requires waiting for and comparing multiple probe responses received during a maximum probe response time—is often the primary source of connection delay. By having the station play a direct part in the assessment of the uplink to an AP, the '556 patent ensures that any responding AP is inherently sufficient for the station's specific requirements. As a result, the station no longer needs to consider other probe responses but rather can immediately access the AP.

This involvement of the station in setting the conditions for a probe response to be sent is entirely absent from Choudhary. In Choudhary, the AP unilaterally measures the received signal strength (RSSI) upon the arrival of a probe request that carries no station-side information on a signal strength. Choudhary does not rely on any additional information from the mobile unit side. Consequently, the mobile unit in Choudhary exercises no comparable influence over the AP's assessment of signal quality. Without the information on a signal strength from the mobile unit in the probe request, the AP of Choudhary must rely entirely on the AP's external measurement of a signal, i.e., RSSI, that—without information on a signal strength.

This absence of station-side information on a signal strength in the probe request of Choudhary is a fundamental deficiency that cascades through the remaining elements of the claim. Because the probe request in Choudhary fails to include information on a signal strength, the AP cannot transmit a probe response based on that information, and the station cannot access the access point based on such a probe response (i.e., a probe request that responds to a probe request including information on a signal strength).

### C. Hasty is Directed to Post-Association Path Maintenance in Multi-Hop Mesh Networks.

In contrast to the claimed invention, Hasty addresses the need for accurate link quality metrics in a wireless ad hoc communication network, specifically where nodes that have already accessed the network (i.e., post-association) evaluate multiple multi-hop transmission paths to other nodes to determine the most efficient node-to-node path. Ex. 1006, 1:11-21; 4:55-64; Figs 3-5. Hasty explains that in conventional ad-hoc routing processes, a node transmits packetized data to a destination by either identifying a path in its own routing table or by forwarding the packet to intermediate nodes that continue the search until the destination is reached. *Id*., 1:56-67. These legacy algorithms often resulted in unpredictable data delivery because they failed to account for the dynamic congestion and mobility inherent in active wireless node-to-node links. *Id*., 2:1-14.

To solve this specific routing problem, Hasty proposed a "per-packet" computation of path loss where a transmitting node embeds its specific Transmit Power Level (TPL) value directly into a "broadcast routing advertisement" or data packet. Hasty, 2:48-3:22. The receiving node utilizes the TPL value along with its own ***measured*** RSSI to calculate the path loss (i.e., Path Loss = TPL - RSSI). *Id*. Hasty further extends this into a "Link Quality Ratio" (LQR) that incorporates the receiver's sensitivity (RS) to determine the reliability of the communication link already existing between two nodes. *Id.*, 4:65-5:23.

Hasty applies multi-node computations for path loss and LQR metrics that require a ***highly complex***, coordinated exchange of information between numerous nodes all interacting with each other. In Hasty, one node supplies the TPL value in its header to multiple other nodes in its broadcast range. *Id.*, 4:65-5:15. Nodes receiving the TPL value calculate path loss and LQR using their own RSSI "available from the 802.11 physical layer" and then share "information pertaining to the calculated LQR" with other nodes in the network. *Id.*, 5:15-6:3. An origination node then "calculates the aggregate link quality ratio (ALQR) for" all the paths between the origination node and the destination node. *Id.*, 6:4-20. That origination node then compares the ALQR of the different paths and "chooses the path having the highest ALQR." *Id*. Moreover, this "check for LQR is done with the delivery of each packet" such that determining the best route is done "on a continuous basis" to maintain the health of the multi-hop route. *Id.*, 6:21-33.

Critically, Hasty's disclosure is centered on path maintenance and route optimization within an established mesh network where multiple alternative routes to a destination exist. *See* Ex. 1006, 4:55-64; Figs. 3-5. This creates a fundamental distinction between Hasty's post-association routing and the '556 patent's pre-association active scan requirements. In the infrastructure-based environment of the

’556 patent (and Choudhary), active scanning occurs along a linear, single-path interaction between a station and a candidate Access Point. There are no alternative paths or intermediate nodes to rank; the only question is whether the direct uplink between that specific station and that specific AP is viable.

Because Hasty’s technical objective is to select the “best” path among a variety of multi-hop options, its logic does not translate to a single-path active scan scenario. Hasty utilizes path loss and Link Quality Ratio (LQR) to manage traffic lanes by calculating the relative health of various mesh paths. In contrast, the ’556 patent includes information on a signal strength specifically within a probe request frame of an active scan process, and the stations may access the first AP that responds based on the probe request, for example, if satisfying a threshold for uplink quality.

Crucially, the implication of applying Hasty’s teachings to Choudhary’s infrastructure network would be to deny a station access even when the measured RSSI is objectively sufficient for a direct WLAN connection. That is because Hasty is designed to reject a link due to a high path-loss. In the single-path environment of Choudhary and the ’556 patent, such a rejection would not lead the station to a “better” route; instead, it would simply prevent the AP from responding at all, leaving the station unable to access the network. Neither Choudhary nor the ’556 patent seeks to rank multiple paths between two nodes. Nor do they concern any aspect of routing optimization.

Furthermore, plucking a metric from a routing protocol for nodes already communicating in a mesh network to solve an active scanning problem whose objective is initiate a network connection between station and AP is merely the result of Petitioner's hindsight reconstruction. Hasty and Choudhary / the '556 patent are not concerned with solving similar problems, nor do they even relate to similar networks. Hasty's process is directed to the continuous coordination of traffic between established nodes, not the station-to-AP connection and access challenges of active scanning. Because Hasty's multi-path ranking logic is architecturally irrelevant to a single-path infrastructure station-to-AP access, a POSITA would not have been motivated to look to Hasty to solve the active scan challenges addressed by Choudhary or the '556 patent.

### D. Petitioner's Reliance on Hasty Fails Because Hasty Is Not Analogous Art.

Because Choudhary's AP-side filtering lacks the station-provided information on a signal strength in a probe request as required by the claims, Petitioner attempts a technical transplant by importing Hasty's mesh-routing metrics. *See* Pet., 19-24. As a threshold matter, this reliance on Hasty fails because Petitioner makes no showing—much less an allegation—that Hasty qualifies as analogous art. Indeed, it does not.

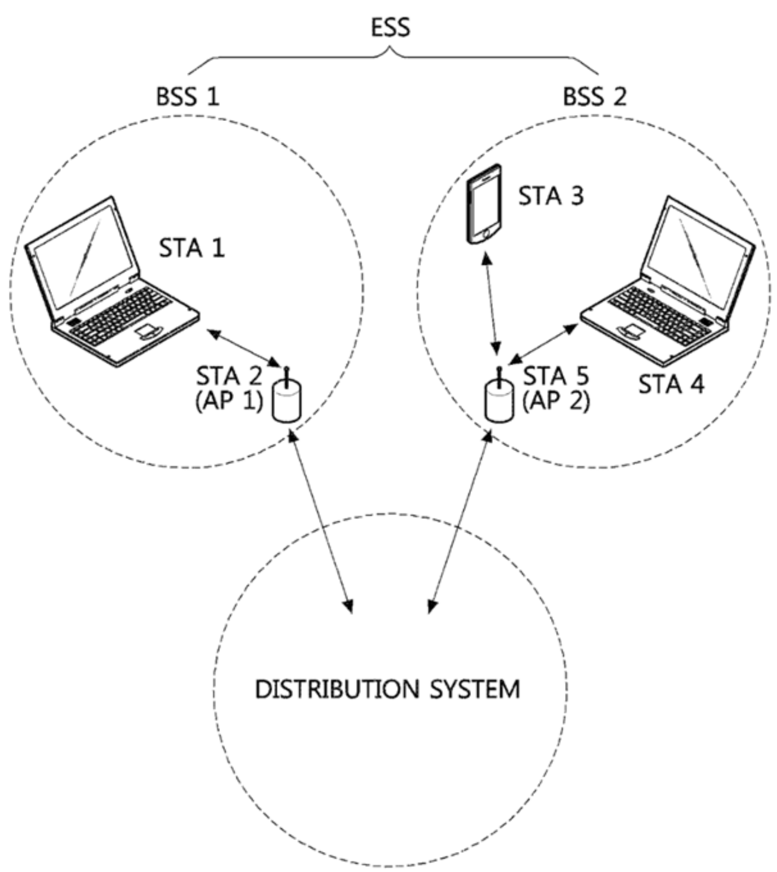
"A reference qualifies as prior art for an obviousness determination . . . ***only when it is analogous to the claimed invention***." *In re Klein*, 647 F.3d 1343, 1348 (Fed. Cir. 2011) (emphasis added). An obviousness ground that relies upon non-analogous art **fails**. *Id*., 1352. To be clear, "***Petitioner bears the burden*** of showing by a preponderance of evidence that the asserted prior art references are analogous art." *SCHOTT Gemtron Corp. v. SSW Holding Co., Inc.*, IPR2013-00358, Paper 106, 26 (Aug. 20, 2014) (emphasis added); *In re Nat. Alts., LLC*, 659 Fed. App'x. 608, 613-14 (Fed. Cir. 2016) (nonprecedential).

Petitioner makes no claim that Hasty is analogous to the claimed invention. To demonstrate any reasonable likelihood of prevailing, Petitioner should have shown that Hasty was (1) from the same field of endeavor as the '556 patent, or (2) reasonably pertinent to the particular problem with which the inventor of the '556 patent is involved. The Petition does neither. Instead, Petitioner and its expert Dr. Hansen simply assume that the Board will accept that Hasty is analogous. As explained below, such an assumption is demonstrably wrong.

### 1. Hasty and the ’556 Patent Operate in Different Fields of Endeavor.

Hasty is not analogous to the ’556 patent and therefore cannot render it obvious. Even if both Hasty and the ’556 patent relate to the broad field of wireless networks, the ’556 patent is directed to the specific field of infrastructure-based wireless local area networks (WLAN) which has problems and solutions much different than the ad hoc network of Hasty. The ’556 patent specifically seeks to optimize the active scanning and access process between a station and access point. *See* ’556 patent, 1:15-18 (stating that the technical field of the ’556 patent is “an access point method using active scheme in a wireless LAN system”); *see also* Pet., 8 (Petitioner acknowledging same). In an infrastructure-based WLAN, the architecture of which is often referred to as a basic service set (BSS), includes an access point managing one or more stations. For a station (STA) to transmit and receive data in an infrastructure BSS, the station “needs to be connected to an access point.” *See* ’556 patent, 6:26-7:4. Figure 1 (copied below) of the ’556 patent demonstrates how the network connections of stations (such as a laptops STA 1 and 4, mobile device STA 3) are managed by access points (AP 1 and 2) in a distribution system (DS). To connect to the WLAN, the stations must scan for available APs and select an AP for access purposes. This process is unique to the BSS architecture and the solution of the ’556 patent is specifically directed to solving inefficiencies of this process—problems existing in a WLAN.

FIG. 1




’556 patent, Fig. 1.

Unlike the ’556 patent, Hasty is directed to the specific field of ad-hoc networks (i.e., mesh networks) and complex routing protocols which continuously assess multiple paths from a source to a destination in a complex network environment. *See*, *e.g.*, Ex. 1006, 1:1-2:43. Hasty’s stated field of invention involves “Layer II routing in a wireless communication network” specifically using packet-level data to "compute path loss for a link" to evaluate the integrity of links between nodes *Id*. This is a field of endeavor concerned with how peer-to-peer nodes, which are already associated in a dynamic ad hoc mesh network, find and route traffic to one another without a central coordinator, which is an architecture fundamentally different from the BSS infrastructure network of the '556 patent. *Id*., 1:23-35.

In a BSS infrastructure, a centralized Access Point (AP) manages all traffic, creating a fixed, *single-path connection* between the station and the AP. *Id*., 1:23-35. But as shown in Figure 1 of Hasty, nodes in an *ad hoc network* are "capable of operating as a base station or router for the other mobile nodes, thus eliminating the need for a fixed infrastructure of base stations." *Id*., 1:24-34; 4:1-14.

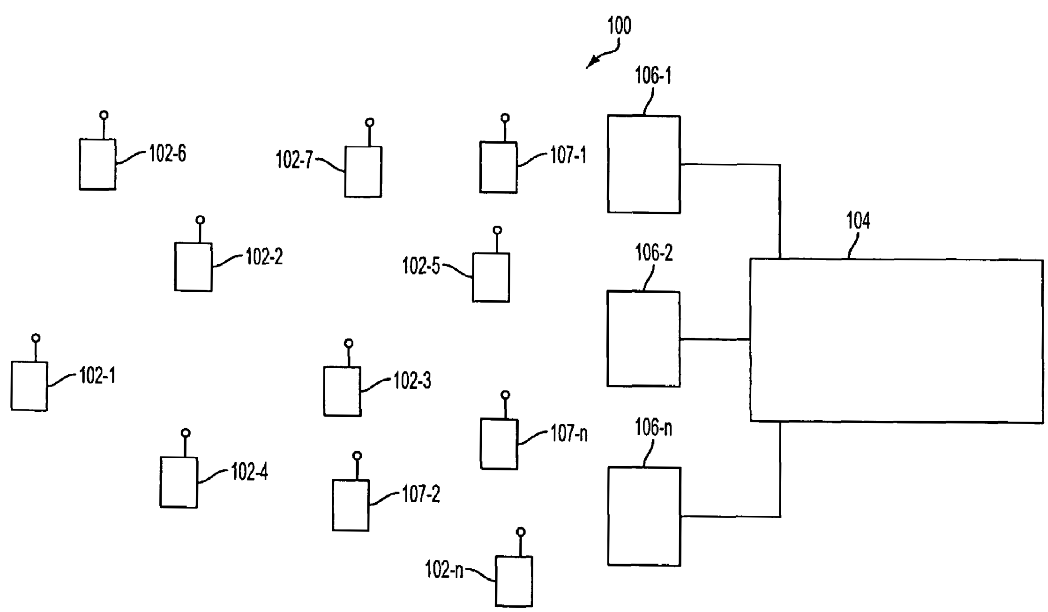



FIG. 1

Consequently, Hasty's entire technical framework is built to manage multiple alternative paths and multi-hop routes across a mesh.

The '556 patent clearly delineates these two fields stating that in an "ad hoc" mode, which is also referred to as independent basic service set (IBSS), the IBSS "does not include an access point, a centralized management entity performing a management function." '556 patent, 5:49-56. Hasty, therefore, is concerned with problems that existed in networks that excluded access points and were managed in a distributed manner. *See id*. This is fundamentally different from the infrastructure-based active scanning optimization of the '556 patent, which relates only to initiating network access along a single-path direct connection between a station and a dedicated Access Point. *See id*., 6:29-37. Because Hasty operates in the domain of mesh routing for pathfinding, it does not share the same field of endeavor as the '556 patent's station-based active scanning.

### 2. Hasty Is Not Reasonably Pertinent to the Active Scanning Problem Addressed by the '556 Patent.

Even if a reference is in a different field, it may be analogous if it is "reasonably pertinent to the particular problem" facing the inventor. *In re Klein*, 647 F.3d at 1348. The '556 patent provides a solution for inefficient and time-consuming Access Point active scan processes. *See* '556 patent, 1:63-2:8. One objective of the '556 patent is to accelerate this network access and preserve airtime by redesigning the station-to-Access Point active scan process in, for example, a wireless local area network.

The invention of the ’556 patent enables a station to connect to an Access Point (“AP”) faster and with lower network resource consumption by including information on a signal strength in a probe request to the AP. *Id*., 8:15-38. Upon receipt, the AP uses the probe request information on a signal strength to respond, e.g., to perform an assessment of uplink quality based on the information on a signal strength provided by the station. *Id*. For example, the AP transmits a probe response to the station if the uplink quality satisfies a predetermined standard. *Id*. Critically, the station accesses the AP based on receiving such a probe response (i.e., in response to a probe request including information on a signal strength) before a preset maximum probe response time elapses, i.e., “instantly” after receiving the probe response frame. *Id*.

Hasty is not concerned with problems that were “reasonably pertinent” to the same problems addressed in the ’556 patent. Hasty is not related to station-to-Access Point active scan processes at all. Indeed, the context of Hasty’s routing calculations is post-association maintenance, where the network nodes have already been organized into a network and the active scan phase is complete. In contrast, the ’556 patent focuses on pre-access active scan methods of an Access Point and a station. The problems faced when a station conducts an active scan in search of an access point for attachment are entirely outside the scope of Hasty's disclosure. Instead, Hasty addresses routing efficiency and link stability within a mesh network where nodes are already part of an established topology. Unlike the '556 patent, nodes in Hasty's networks are not involved in a "probe step of finding out an access point." '556 patent, 6:32-37. Rather, they are continuously evaluating existing peer-to-peer links to update routing tables. Hasty's solution—having a "receiving node" compute path loss based on TPL and RSSI—is designed to optimize the flow of data packets across a multi-hop mesh, which is a function that bears no relation to the problems and solutions of the '556 patent.

A POSITA seeking to optimize the active scan process for a station-to-Access Point connection would have no reason to consult Hasty. Significantly, Hasty deals with routing protocols for nodes in a multi-hop, ad-hoc mesh environment. Hasty's technical objective is to rank and select between multiple alternative paths—a problem that is entirely absent from the centralized infrastructure of the '556 patent, where stations utilize an active scan method to access an AP along a direct, single communication path to the AP. In such a single-path environment, Hasty's path-loss metrics would have provided no ranking utility. Because no alternative path exists in this infrastructure, such a modification would effectively block the station from accessing the AP altogether.

Because Hasty's multi-path maintenance logic is irrelevant to single-path active scanning, it is not "reasonably pertinent" to the particular problem addressed by the '556 patent or Choudhary. As the Federal Circuit recognized in *Klein*, "[i]f a reference is directed to a different purpose, the inventor would accordingly have had less motivation or occasion to consider it." 647 F.3d 1343, 1352 (Fed. Cir. 2011) (quoting *In re Clay*, 966 F.2d 656, 659 (Fed. Cir. 1992) and finding references not analogous) (internal brackets omitted). Petitioner offers no explanation as to why a POSITA would find Hasty's mesh-routing calculations pertinent to infrastructure-based active scanning challenges. Consequently, Hasty is non-analogous art, and Petitioner's reliance on it is misplaced.

### E. The Petition Fails to Disclose an Active Scan Probe Request Frame Carrying the Information on a Signal Strength.

In its sole ground, Petitioner argues that "a POSITA would have found it obvious for Choudhary's probe request from the station to include a transmit power level of the station," contending that this meets the requirements of claim elements, e.g., [1.1], [9.1], [10.1], and [11.1]. Pet., 31-37, 50-54, 62-63. To make this contention, however, Petitioner must first concede that while Choudhary utilizes RSSI filtering, it does not teach the claimed "transmitting, to an access point, a probe request frame" of claim 1 or "receiving, from a station, a probe request frame" of claim 9 or similar requirements of claims 10 and 11—each requiring a probe request from the station that *includes* “information on a signal strength.” *Id*. Nor could Petitioner make such a contention since Choudhury merely measures RSSI at the AP and never suggests modifying a probe request frame to include any information on a signal strength.

Instead, Petitioner turns to Hasty to supply the missing station-side information on a signal strength, stating that “Hasty describes an improved technique in which link quality is evaluated by both the RSSI and a transmit power level.” Pet., 32-33, 52. This is a fundamental misapplication of Hasty’s disclosure. Hasty is directed to routing logic for nodes that have already accessed the network. This routing logic is designed to optimize data transport across multiple alternative paths in a dynamic ad-hoc mesh network. As a result, this multi-path maintenance logic is architecturally incompatible with the infrastructure-based network of the ’556 patent or Choudhary, which each utilize a fixed, single-path connection between a station and an Access Point.

Though Petitioner acknowledges that the ’556 patent is directed to an “access point scan method. . . in a wireless LAN system” (Pet., 8), it utterly fails to explain why a POSITA would transplant a multi-path routing metric into a single-path active scan sequence of the claimed invention. Nor does it explain why a POSITA would combine it with Choudhary to remedy the latter’s Access Point active probing shortcomings. Because Hasty’s logic serves to rank and select among many nodes already part of a mesh, it provides no technical insight into the ’556 patent’s or Choudhary’s specific problems of how a station identifies, verifies, and accesses a single Access Point.

Strikingly, the Petition fails to demonstrate that Hasty discloses any structure analogous to a “probe request frame,” let alone a probe request frame that has embedded the “information on a signal strength.” Instead, Hasty is directed to “an ad-hoc packet-switched wireless communications network” that “uses the available per-packet receive signal strength indication (RSSI) . . . combined with the per-packet transmitted power level [the “TPL” value] to evaluate the path loss along a link for a packet sent within the network.” Ex. 1006, 4:40-44. In Hasty, “[t]he per-packet path loss is used as a metric that determines the integrity of a link between two 802.11-compliant nodes . . . as well as the probability that future packets will be successfully transmitted on the link between the two nodes.” *Id*., 4:46-54. As shown in the example below, Hasty computes path loss between an origination node (N0) and a destination node (N3), with intermediate nodes (N1, N2) providing two distinct routes between N0 and N3. *Id*., 4:55-64.

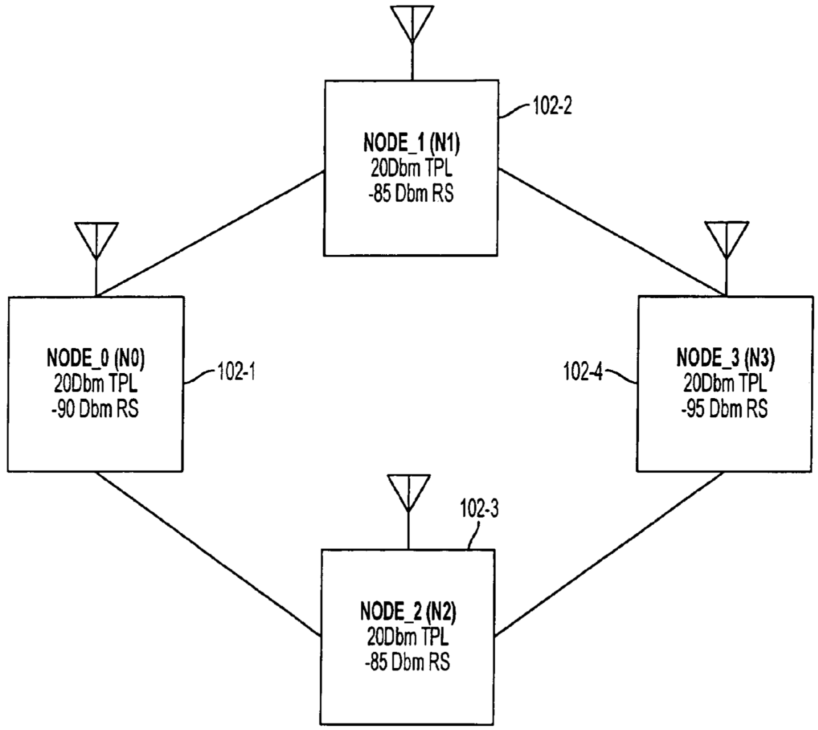



FIG. 3

Ex. 1006, Fig. 3.

In the ad hoc network of Hasty, each node N0 and N3 "periodically broadcasts routing advertisements to other nodes within its broadcast range," which includes "information in its header pertaining to the" TPL value. *See* Ex. 1006, 4:44-5:8. These routing advertisements are used to evaluate the integrity of links between peers already established in a mesh. *Id*. This disclosure is architecturally focused on managing multiple alternative paths across a web of nodes already in the mesh network to find the most efficient route for data traffic. But there is no disclosure that Hasty teaches or suggests that these broadcast routing advertisements would in any way be understood by a POSITA as a "probe request frame" used in a single-path infrastructure-based network.

Hasty's routing advertisements are used to update routing tables so an origination node can navigate a multi-hop mesh, whereas the '556 patent requires an active scan station-to-AP interaction specifically to facilitate "transmitting the probe request frame to access points" and "receiving a probe response frame," which ultimately results in the station performing an access to the access point. Because Hasty's logic is designed to solve the complexity of multi-path routing, its periodic broadcasts do not suggest application to the claimed single-path active scan process.

In Choudhary, there is only one direct path between the station and a candidate access point; therefore, the multi-path optimization and route-ranking logic of Hasty is technically irrelevant. In this single-path context of Choudhary, applying Hasty's path-loss considerations would serve only to prevent a probe response from being sent even when the measured RSSI is sufficient. Because no alternative path exists in this infrastructure, such a modification would effectively deny the station access to the AP altogether, directly subverting Choudhary's core objective of facilitating a connection based on a sufficiently high RSSI alone.

Worse yet, Petitioner contends inaccurately that because path loss and link quality ratio (LQR) are (purportedly) derived from RSSI that a POSITA would have included the TPL value in a probe request. This is a leap not supported by any of the references and is clearly based only in hindsight reconstruction of the claim. Foremost, the TPL value is clearly not derived from RSSI. The TPL value is the energy (in dBm) with which the node (in Hasty) transmits its signal—in Hasty, *the sender* provides its TPL value with each packet in the header. The RSSI is the signal's energy measured by *the receiver*. Path loss is the difference between the TPL reported by the sender and the RSSI measured by the receiver. LQR normalizes the path loss against the receiver's sensitivity (RS) such that the closer to one (1) the LQR of a certain path is, the higher the quality of the link along that path with minimal path loss, i.e., the "higher integrity level" and "higher probability that future packets taking this route will have better success than if they took" a path with a lower LQR. Thus, the RSSI and the TPL value are separate inputs that are required for calculation of path loss and LQR. But neither path loss nor LQR could be calculated solely from RSSI or any RSSI derived metric.

The Petitioner's expert, Dr. Hansen, attempts to bridge this gap by incorrectly characterizing path loss as a known metric "derived from RSSI." Pet., 19-21 (citing Ex. 1003, ¶¶47-55). This is a mathematical impossibility. In the wireless physics of both Hasty and the '556 patent, RSSI is a raw measurement of power received at the Access Point, whereas the TPL is a static value representing power transmitted by the station. Without having access to both of these values, path loss cannot be calculated.

A simple analogy demonstrates why Choudhary's RSSI measurements are much different than Hasty's path loss and path loss cannot be derived from RSSI without information on a signal strength provided by the station. For example, *how well one hears a sound does not reveal how loudly it was originally spoken*. A faint sound heard (i.e., a low measured RSSI) could be the result of a whisper nearby or a shout from a great distance. Without knowing the original volume (i.e., the TPL value), the listener cannot determine the sound's signal degradation over the distance traveled (i.e., the path loss).

Put plainly, there is no way for the Access Point of Choudhary to "derive" path loss from RSSI alone any more than a listener can derive a speaker's distance based on the perceived volume of the speaker measured by the listener alone. The listener must know the original volume spoken.

Mathematically, path loss (i.e., TPL - RSSI) requires two independent variables. It cannot be "derived" from RSSI without also knowing the TPL value. Because Hasty's path loss calculation relies on station-side information fundamentally absent from Choudhary's non-informative probe requests, Petitioner's theory requires the AP in Choudary to perform a calculation for which it lacks the necessary data. Thus, the incorporation of Hasty's path loss calculation into Choudhary cannot be done without modification of a probe request frame to include information on a signal strength. But this modification is not disclosed by

Choudhary and, because Hasty does not disclose probe request frames, it also cannot support such a modification. Thus, Petitioner's proposed combination is rendered impossible and unsupported by the prior art.

As a result, Petitioner fails to offer evidence that modifying Choudhary based on Hasty's disclosure would credibly render the inclusion of "signal information of the station" in a probe request frame to be obvious. *See DSS Tech. Mgm't v. Apple Inc.*, 885 F.3d 1367, 1374-75 (Fed. Cir. 2018) (rejecting "ordinary creativity" as a basis for overcoming a missing limitation); *K/S HIMPP v. Hear-Wear Techs.*, LLC, 751 F.3d 1362, 1366 (Fed. Cir. 2014). It is undisputed that there is no disclosure in Choudhary of a station including its TPL value in a probe request. Second, Hasty's "path loss" and LQR computation is mathematically impossible to perform using only the information available to an access point in Choudhary, i.e., the RSSI. As a consequence, a POSITA would have to not only combine Choudhury and Hasty to achieve the claimed invention but also invent a new packet structure for the probe request that includes TPL data—a step that neither Hasty (focusing on data packets) nor Choudhary (focusing on RSSI) suggests for the active scanning phase.

### F. A POSITA Would Not Have Combined Choudhary and Hasty.

Even if Hasty were analogous art, the Petition fails to provide articulated reasoning with some rational underpinning as to why a POSITA would have combined the selected elements in the same way as the claimed invention. *See Dish*

*Network L.L.C. et al v. Entropic Communications, LLC*, IPR2024-00560, Paper 11 at 14 (PTAB Aug. 15, 2024) (citing *Johns Manville Corp. v. Knauf Insulation, Inc.*, IPR2018-00827, Paper 9 at 10 (PTAB Oct. 16, 2018) (informative)). Petitioner relies on a classic hindsight-driven reconstruction, using the '556 patent as a roadmap to pluck disparate elements from Choudhary and Hasty which operate in fundamentally different topologies and address different problems—a fact that the Petition and Dr. Hansen completely fail to address.

#### 1. A POSITA Would Not Have Been Motivated to Subvert Choudhary's RSSI-Filtering Logic with Hasty's Incompatible Mesh-Routing Architecture.

The Petitioner's reliance on Dr. Hansen's testimony (Ex. 1003) is legally insufficient because it offers only conclusory assertions that Hasty's metrics "would be suitable for filtering" probe requests in Choudhary. Pet., 19-21. This ignores the fundamental difference in the nature of the communications involved.

While Choudhary (Ex. 1005) generally mentions that RSSI filtering might utilize "some metric derived from RSSI," this statement does not serve as an invitation to import the complex path-loss formulas or Link Quality Ratio (LQR) found in Hasty (Ex. 1006), which both critically are based on a TPL value, and neither of which is an RSSI-derived metric. Choudhary is focused on air-time optimization via an active probing process. Ex. 1005, 2:63-3:7. Choudhary's stations seek to join an infrastructure-based wireless network via *one direct communication* *path that exists between the station and an AP*. Ex. 1005, 7:4-35. In contrast, Hasty is directed to *post-association maintenance* within an established mesh network where nodes are already synchronized and actively managing *multi-hop data flows*. Ex. 1006, 1:23-34; 4:1-64. Thus, the objective of Hasty's use of path loss and LQR is very different from the objective of Choudhury in filtering probe requests.

Hasty's "per-packet path loss" is a specialized maintenance tool designed to select the most efficient route among multiple alternative paths *already established* in a mesh network. *Id*., 4:65-5:23. This multi-path logic is architecturally incompatible with the single-path infrastructure of Choudhary. In an infrastructure-based WLAN environment, performing a network access is a one-to-one interaction between a station and an AP; there are no intermediate nodes to navigate and no alternative routes to evaluate. Because Hasty is designed specifically to resolve which of many potential paths is "best," it provides no utility in a scenario where only a single, direct path exists. In this single-path context, the only implication of adopting Hasty's path-loss considerations would be to prevent a probe response from being sent even when the RSSI is sufficiently high, contrary to Choudhary's express teachings. Since no alternative path exists in this architecture, the station would be denied access to the network entirely, subverting the primary goal of the active scan process.

In Choudhary's active probing environment, there is no ongoing data flow, no multi-path topology to manage. The objective is simply to identify a viable link using RSSI filtering at the AP. Because Hasty's logic is a maintenance tool for an active conversation rather than a tool for starting one, a POSITA would have no reason to transplant Hasty's routing-layer math into Choudhary's active probing. Put plainly, these two references address different network contexts and would not suggest to a POSITA that they would be combinable.

#### 2. The Proposed Combination Would Subvert Choudhary's Principle of Operation and Render It Inoperable.

Importing Hasty's mesh-routing logic into the active probing environment of Choudhary would not only be technically non-sensical but would actually negate Choudhary's primary purpose. *See In re Ratti*, 270 F.2d 810, 813 (CCPA 1959) (a combination is improper where it changes the basic principles of operation); *Plas-Pak Indus. v. Sulzer Mixpac AG*, 600 Fed. App'x 755, 759 (Fed. Cir. 2015) ("a change in a reference's 'principle of operation' is unlikely to motivate a person of ordinary skill to pursue a combination with that reference").

Choudhary is rooted in a filtering mechanism designed to hide APs based on whether the station's measured RSSI is below a specific "RSSI_hi" threshold. Ex. 1005, 8:26-57. The primary objective is to facilitate immediate connections for any station meeting this power-based criteria.

Plucking the path-loss measurement from Hasty and inserting it into Choudhary's air-time optimization methods would fundamentally subvert this principle of operation from Choudhary. Under Petitioner's proposed modification, an AP would no longer respond based solely on Choudhary's RSSI threshold; instead, it would be forced to deny a response to a mobile unit (one with an RSSI above the threshold) simply because its calculated path loss was too high. This is a direct contradiction of Choudhary's teachings, which seek to maximize connections to any station providing sufficient signal strength.

Furthermore, as established, such a calculation is mathematically impossible because the AP in Choudhary lacks the mobile unit's TPL. This modification would result in a broken system where the AP lacks the necessary context to verify link quality, yet is prohibited from responding to the stations Choudhary was specifically designed to serve. Because this combination would render the primary reference "inoperable for its intended purpose," a POSITA would have no motivation to pursue it. *See Plas-Pak*, 600 Fed. App'x at 760 (modifying on reference "to accommodate" another reference would render that reference "inoperable for its intended purpose and a person of ordinary skill would thus not have been motivated to pursue the combination"); *In re Gordon*, 733 F.2d at 902.

### 3. Petitioner's Proposal to Perform Path-Loss Calculations Without Station-Side TPL Data Is a Hindsight Reconstruction That Contradicts Technical Reality.

Petitioner's other assertion (at page 21) that a POSITA would be motivated to use Hasty's path loss calculation to "facilitate[] providing service to a station that is nearby" but "has a low-power transmitter" is merely a flawed hindsight reconstruction that contradicts the technical reality of the cited references. Specifically, Petitioner contends that a POSITA would find it advantageous to distinguish between a nearby station with a low-power transmitter (yielding a low measured RSSI) and a distant station with a high-power transmitter (potentially also yielding a low measured RSSI)—a distinction that RSSI alone cannot provide. *See* Pet., 21-22. In any event, this theory fails because it ignores the fundamental architectural and mathematical disconnects between the cited references. *See Ruiz v. A.B. Chance Co.*, 357 F.3d 1270, 1275 (Fed. Cir. 2004) ("This form of hindsight reasoning, using the invention as a roadmap to find its prior art components, would discount the value of combining various existing features or principles in a new way to achieve a new result - often the very definition of invention.").

First, Petitioner ignores the topological network mismatch between the references. Hasty's path-loss formula is a specialized tool for multi-path routing; it is designed to rank and select among several available intermediate nodes to find the most efficient route for data packets already flowing through an established mesh network. In contrast, Choudhary is directed to the single-path infrastructure active scan phase, where an AP must decide whether to respond to a probe request from a station that has not yet joined the network. In a single-path environment, there are no alternative routes to rank, and Hasty's multi-path optimization logic provides no technical utility.

Second, Petitioner's argument relies on a mathematical impossibility. As established, path loss (Path Loss = TPL - RSSI) requires two independent variables. In Choudhary, the AP measures and utilizes one variable, RSSI. It is further undisputed that neither Choudhary nor Hasty suggests including the source node's TPL value in a probe request frame. Petitioner's expert vaguely argues that using path loss would help an AP distinguish between a "nearby low-power station" and a "distant high-power station," yet he fails to explain *how* the AP could possibly perform that calculation without the very TPL value that is missing from any probe request of the cited prior art.

By assuming, with no supporting evidence, that the AP has access to the station's TPL during an active scan, Petitioner is not combining prior art based on any rational underpinning provided by the references themselves. Instead, Petitioner is using the '556 patent as a roadmap to retroactively rewrite not only the prior art's frame structures to include frames and/or data they do not contain but also to rewrite how the station and AP interact to associate the station to the network. Because

Hasty's routing math is technically useless in Choudhary's single-path active probing environment—and mathematically impossible to perform without the claimed station-side information on a signal strength—Petitioner's proposed combination is a product of hindsight bias rather than ordinary creativity.

### G. Petitioner Improperly Relies on Non-Cited IEEE Standards to Fill Evidentiary Gaps in its Sole Ground.

Beyond the technical deficiencies of Choudhary and Hasty, Petitioner attempts to salvage its deficient mapping of the "information on a signal strength" limitation by pointing to general IEEE 802.11 standards (Ex. 1008 and Ex. 1009). Petitioner asserts that these standards already provided frame structures containing a "transmit power level" field. *See* Pet., 22-24; Ex. 1003, ¶¶55-58. However, Petitioner's reliance on these exhibits is procedurally improper and should be disregarded.

First, Petitioner did not identify Ex. 1008 or Ex. 1009 as prior art references combinable with Choudhary, Hasty, and Chen, to form its proposed ground for unpatentability. Under 37 C.F.R. § 42.104(b)(2) and (4), a Petition must specify the art on which the challenge is based and "specify where each element of the claim is found in the prior art." Petitioner's sole ground on which it challenges the patentability of the claims is explicitly limited to the combination of Choudhary, Hasty, and Chen. *See* Pet., 15. Petitioner cannot retroactively expand its sole ground to include the disclosure in two additional IEEE standards to fill a material gap in its primary references. The Board has repeatedly held that a Petitioner may not use its expert declaration or background exhibits to supply a missing limitation that was not articulated in the specific grounds of the Petition. *See*, *e.g.*, *Netflix, Inc. v. DivX, LLC*, 84 F.4th 1371, 1379 (Fed. Cir. 2023) ("While the Board should review a petition holistically, it is not obligated to cobble together assertions from different sections of a petition or citations of various exhibits in order to infer every possible permutation of a petitioner's argument.") (internal quotations omitted).

Second, even if these standards were properly before the Board, they do not remedy the deficiencies of Petitioner's sole ground. In fact, the Petitioner's reference to "Link Measurement Request" frames (citing 802.11k in Ex. 1009) and "TPC Reports" (citing 802.11h in Ex. 1008) only further highlights the lack of a reasonable expectation of success in any proposed combination. *See* Pet., 22-24.

The "Link Measurement Request" frames (citing 802.11k in Ex. 1009) are "Action frames" used for post-association link maintenance. Specifically, these Link Measurement Request frames are used for radio resource management between nodes that are already associated in "an infrastructure BSS," a network controlled by an Access Point, as in Choudhury. *See* excerpt of 802.11k below from Ex. 1009 at 110 (restricting Class 3 frames, including Action frames, to State 3).

c) Class 3 frames (if and only if associated; allowed only from within State 3):
  2) Management frames
    i) Withinan infrastructure BSS, all Action frames except Public Action frames ~~QoS, DLS, and Block Ack Action~~
  3) Control frames
    i) Power save (PS)-Poll
    ii) Block Ack (BlockAck)~~Action: Within an infrastructure BSS, action frames are Class 3~~
    iii) Block Ack Request (BlockAckReq)~~Block Ack (BlockAck)~~
    ~~iv) Block Ack Request (BlockAckReq)~~

Ex. 1009, 110.

Based on the above, a POSITA would have known that an AP in State 1—which is precisely where Choudhury's filtering occurs—is architecturally prohibited from processing Class 3 Action frames. Simply put, Petitioner's proposal to use Class 3 Action frames to satisfy a State 1 process is a fundamental protocol violation that renders the proposed combination architecturally inoperable, and certainly not the result of an obvious modification. While Action frames might be available in State 1 "within" Hasty's ad-hoc IBSS (see excerpt below), they are strictly forbidden in Choudhury's infrastructure BSS, further highlighting that a POSITA would not be motivated to so profoundly alter Choudhury's principle of operation, from relying on one protocol framework for infrastructure BSS to one that did not exist and was prohibited by that protocol.

a) Class 1 frames (permitted from within States 1, 2, and 3):
  2) Management frames
    i) Probe request/response
    ii) Beacon

iii) Authentication: Successful authentication enables a STA to exchange Class 2 frames. Unsuccessful authentication leaves the STA in State 1.

iv) Deauthentication: Deauthentication notification when in State 2 or State 3 changes the STA's state to State 1. The STA shall become authenticated again prior to sending Class 2 frames. Deauthentication notification when in State 3 implies disassociation as well.

v) Announcement traffic indication message (ATIM)

vi) Public Action~~Spectrum Management Action: Within an IBSS, action frames are Class 1.~~

vii) Within an IBSS, all Action frames

Ex. 1009, 109-110.

The TPC Report frames also would be used for post-association link maintenance—but not in the context of a pre-association active scan process. As shown below, while the "TPC Report element contains transmit power," such information is "sent in response to a TPC Request element." This TPC Report element is "included in a Beacon frame or Probe Response frame," critically "without a corresponding request." Ex. 1008, 12. Thus, there is no indication that the transmit power of this TPC Report element would have been included in any active scan probe request.

**7.3.2.18 TPC Report element**

The TPC Report element contains transmit power and link margin information sent in response to a TPC Request element. A TPC Report element is included in a Beacon frame or Probe Response frame without a corresponding request. The format of the TPC Report element is shown in Figure 46d.

| | Element ID | Length | Transmit Power | Link Margin |
|---|---|---|---|---|
| **Octets:** | 1 | 1 | 1 | 1 |

**Figure 46d—TPC Report element format**

By plucking fields from non-cited standards to bolster its deficient combination, Petitioner is not demonstrating obviousness. Instead, it is engaging in the very type of hindsight reconstruction the Federal Circuit prohibits. *See Ruiz*, 357 F.3d at 1275. Because Petitioner failed to include Ex. 1008 or Ex. 1009 in its articulated grounds, and because these exhibits do not suggest modifying an active scan probe request frame in a single-path infrastructure network, they cannot support a finding of unpatentability. Petitioner's sole obviousness ground fails for at least this additional reason.

### H. Chen's "Fast Scan" Messages Cannot Remedy the Structural Absence of Station-Side Information on a Signal Strength.

Chen also fails to supply the fundamental technical advancement of the '556 patent: an improved active scan scheme in, for example, a WLAN system that utilizes a probe request frame carrying the information on a signal strength to an available AP, whereby the information on a signal strength is used by the AP to determine whether to send a probe response based on that information, and upon receiving a probe response from the AP, the station accesses the AP without further delay. Like Choudhary and Hasty, Chen's "fast scan" messages do not solve the primary deficiency of Petitioner's sole ground because those messages lack the "information on a signal strength" required to trigger the claimed access decision. Significantly, Chen's messages contain only MAC and IP addresses—not the station-side information on a signal strength context required by the ’556 patent. Ex. 1007, 5:60-6:4. Because Chen’s candidate access points receive these messages without any station-side information on a signal strength, they are also incapable of “transmitting the probe response frame” based on the “information on the signal strength” from the probe request itself. Consequently, adding Chen to the combination cannot remedy the prior art’s failure to disclose the integrated probe request/response exchange and access-granting requirements of the challenged claims.

### I. Because the Petition Has Not Shown the Independent Claims to be Obvious, the Challenge to their Dependent Claims Fail Also.

The Petition’s analysis for dependent claims 2-4 does not cure the deficiencies for independent claim 1. Thus, for the at least the same reasons stated above for independent claims 1, 9, 10, and 11, Petitioner fails to make a prima facie case of obviousness for their dependent claims. The Board should deny institution as to all challenged claims.

## VII. CONCLUSION

This Preliminary Response demonstrates that Petitioner has not met its burden with respect to any of the challenged claims of the ’556 patent. For those reasons, Patent Owner requests that the Board find that the Petitioner has not shown a reasonable likelihood that any of the challenged claims of the ’556 patent will be found unpatentable under the sole ground presented and, accordingly, deny institution.

Dated: April 13, 2026 Respectfully submitted,

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## CERTIFICATE OF SERVICE

The undersigned hereby certifies that this document has been served via electronic mail on April 13, 2026, to Petitioner at the email addresses Theodore M. Foster at ipr.theo.foster@haynesboone.com; David L. McCombs at david.mccombs.ipr@haynesboone.com, Gregory P. Huh at gregory.huh.ipr@haynesboone.com and Calmann J. Clements at calmann.clements.ipr@haynesboone.com, pursuant to Petitioner's consent in its Petition at p. 66.

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**CERTIFICATE OF COMPLIANCE**

As required by 37 C.F.R. § 42.24, the undersigned hereby certifies that the foregoing Preliminary Response contains 11,141 words, excluding those portions identified in 37 C.F.R. § 42.24(a)(1), as measured by the word-processing system used to prepare this paper.

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