

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ACTIVISION BLIZZARD, INC.,
ELECTRONIC ARTS INC.,
TAKE-TWO INTERACTIVE SOFTWARE, INC.,
2K SPORTS, INC., and
ROCKSTAR GAMES, INC.,
Petitioners

v.

ACCELERATION BAY, LLC,
Patent Owner

Case No. IPR2016-00747
Patent 6,732,147 B1

**PATENT OWNER PRELIMINARY RESPONSE TO PETITION
PURSUANT TO 37 C.F.R. §42.107**

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37 C.F.R. § 42.104(b)2

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PATENT OWNER'S EXHIBIT LIST

	Description
Exhibit-2001	Declaration of Michael Goodrich, Ph.D.
Exhibit-2002	Andrew Tanenbaum, Computer Networks, Third Edition (1996)(Excerpts)

I. INTRODUCTION

On March 12, 2016, Petitioners filed a Petition for *inter partes* review of claim 1–16 of U.S. Patent No. 6,732,147 B1 (Ex. 1001, the “‘147 Patent”), which issued to The Boeing Company on May 4, 2004, based on an application filed in the USPTO on July 31, 2000. Acceleration Bay LLC (“Acceleration Bay” or “Patent Owner”) requests that the Board not institute *inter partes* review because Petitioners have not demonstrated a reasonable likelihood that it would prevail in showing unpatentability of any of the challenged claims on the grounds asserted in its Petition as required under 37 C.F.R. § 42.108(c).

The ‘147 Patent is one of several patents obtained by Boeing directed to novel computer network technology, developed by inventors Fred Holt and Virgil Bourassa more than sixteen years ago, that solved critical scalability and reliability problems associated with the real-time sharing of information among multiple widely distributed computers. This innovative technology enabled large-scale, online collaborations with numerous participants continually joining and leaving—with applications ranging from aircraft design development to multi-player online games. A core feature of the patented technology claimed in the ‘147 Patent is the manner in which a node or participant is removed from a network, which involves a first computer sending a disconnect message to a second computer, which includes a list of the departing computer's neighbors, and

the second computer broadcasting a connection port search message to find one of the first computer's neighbors to which it can connect in order to maintain an m-regular graph.

The references cited in Grounds 1–4 of the Petition do not disclose the approach to joining or leaving a network disclosed in the '147 Patent. For example, and in addition to further deficiencies, Petitioners have failed to meet its burden under 37 C.F.R. § 42.104(b) to demonstrate that the cited references disclose:

- when the second computer receives the disconnect message from the first computer, the second computer broadcasts a connection port search message on the broadcast channel to find a third computer to which it can connect in order to maintain an m-regular graph, said third computer being one of the neighbors on said list of neighbors; (claims 1 and 11); and
- when the attempt to send the message is unsuccessful, broadcasting from the first computer a connection port search message indicating that the first computer needs a connection (claim 6).

Additionally, a person of ordinary skill in the art at the time of the '147 Patent would not have combined the cited references to arrive at the claimed invention.

Although there are a variety of reasons why the '147 Patent is valid over Petitioners' asserted prior art references, this Preliminary Response focuses on only limited reasons why *inter partes* review should not be instituted. *See*

Travelocity.com L.P. v. Conos Techs., LLC, CBM2014-00082, Paper No. 12 at 10 (P.T.A.B. Oct. 16, 2014)(“[N]othing may be gleaned from the Patent Owner’s challenge or failure to challenge the grounds of unpatentability for any particular reason.”). Regardless, the deficiencies of the Petition noted herein, however, are more than sufficient for the Board to find that Petitioners have not met its burden to demonstrate a reasonable likelihood that it would prevail in showing unpatentability of any of the challenged claims.

II. THE ‘147 PATENT

As discussed in the Background of the Invention section of the ‘147 Patent (the “Background”), point-to-point network protocols, such as UNIX pipes, TCP/IP, and UDP, allow processes on different computers to communicate via point-to-point connections. ’147 Patent at 1:46-48. However, the interconnection of *all* participants using point-to-point connections, while theoretically possible, does not scale well as the number of participants grows. *Id.* at 1:48-51. Because each participating process needs to manage its direct connections to all other participating processes, the number of possible participants is limited to the number of direct connections a given machine, or process, can support. *Id.* at 1:51-59.

On the other end of the connectivity spectrum are client/server middleware systems that have a single server that does not communicate with any other server

and coordinates all communications between various clients who are sharing the information. *Id.* at 1:60-62. These systems rely on the sole server to function as a central authority for controlling all access to shared resources. *Id.* at 1:62-64. Such systems are also not well suited to sharing of information among many participants (*id.* at 1:67-2:2), but for different reasons than point-to-point networks. When a client stores information to be shared at the server, every other client must poll the server to determine that the new information is being shared, which places a very high overhead on the communications network. *Id.* at 2:2-6. Alternatively, each client can register a callback with the server, which the server then invokes when new information is available to be shared. *Id.* at 2:6-8. However, such callback techniques create a performance bottleneck. A single server needs to effect a callback to each and every client whenever new information is to be shared. *Id.* at 2:9-11. In addition, the reliability of the entire information sharing depends upon that of a single server; failure at the single server prevents all communications between *any* clients. *Id.* at 2:11-15.

The '147 Patent is one of several patents obtained by Boeing directed to its novel computer network technology that solved the central bottleneck problem of client/server networks, as well as the problems of management complexity and limited supported connections of point-to-point networks. More particularly, the '147 Patent describes using a broadcast channel that overlays a point-to-point

network where each node, or participant, is connected to some—but not all—neighboring participants. For example, Fig. 2 of the '147 Patent, reproduced below, shows a network of twenty participants, where each participant is connected to four other participants:

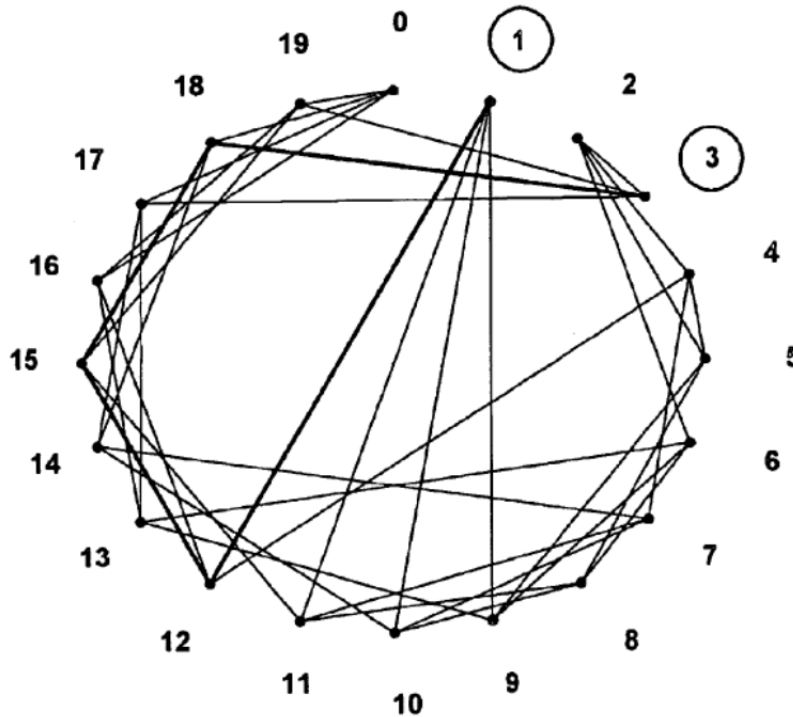


Fig. 2

Id. at Fig. 2. Such a network arrangement, where each node in the network, is connected to the same number of other nodes, is known as an ***m-regular network***.

Id. at 4:40-41. That is, a network is *m*-regular when each node is connected to *m* other nodes at least some of the time, and a computer would become disconnected from the broadcast channel only if all *m* of the connections to its neighbouring

nodes fail. *Id.* at 4:41-44. In Fig. 2 above, $m=4$ because each node is connected to four other nodes of the network. A network is said to be ***m-connected*** when it would take a failure of m computers to divide the graph into disjoint sub-graphs, i.e., separate broadcast channels. *Id.* at 4:44-47. The '147 Patent also describes a computer network in which the number of network participants N (in Fig. 2, this is twenty) is greater than the number of connections m to each participant (in Fig. 2, this is four). *Id.* at Fig. 2. This network topology, where no node is connected to every other node, is known as an ***incomplete graph***.

The incomplete graph topology relies on participants to disseminate information to other participants. *See id.* at 1:60-2:15. As described in the '147 Patent, to broadcast a message, the originating computer sends the message to each of its neighbors using the overlay network. *Id.* at 7:30-35. Each computer that receives the message then sends the message to its neighbors using the network. *Id.* at 7:36-48. In this way, the message is propagated to each computer of the overlay network using the underlying network, thus broadcasting the message to each computer over a logical broadcast channel.

The invention claimed in the '147 Patent focuses on a process for removing nodes, or participants, from an existing network. A computer connected to the network can leave in either a planned or unplanned manner. *Id.* at 8:66-67. If the disconnect happens in a planned manner, the disconnecting computer sends a

message to each of its neighbors that includes a list identifying the disconnecting computer's neighbors. *Id.* at 8:67–9:4. When a neighbor receives the message it attempts to connect to one of the computers on the list. *Id.* at 9:4–6. If any one of the neighboring computers cannot connect with a computer on the list, it will broadcast a message seeking to connect to another computer in the network. *Id.* at 9:9–17.

Fig. 5A of the '147 Patent, reproduced below, illustrates the procedure for disconnecting a computer in a planned manner. In particular, Fig. 5A shows an exemplary procedure for disconnecting computer ***H*** from the network. Computer ***H*** sends a message informing its neighbors, computers ***I***, ***A***, ***E***, and ***F***, that it intends to disconnect and then disconnects. *Id.* at 9:19–23. The message includes the identities of computers ***I***, ***A***, ***E***, and ***F***. When the neighboring computers receive the message from computer ***H***, they establish connections between each other. *Id.* at 9:23–26. In the example shown in Fig. 5, the dashed lines indicate that computer ***A*** connects to computer ***I***, and computer ***E*** connects to computer ***F***.

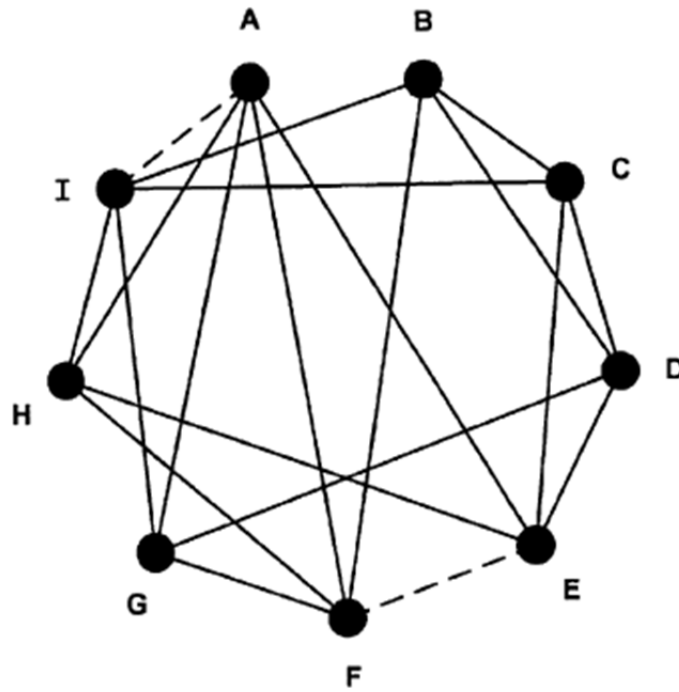


Fig. 5A

‘147 Patent, Fig. 5A.

If a computer leaves the network in an unplanned manner—such as in the event of a power failure—its neighbors are notified of the computer’s absence when each attempts to send a message to the disconnected computer. *Id.* at 9:27–31. When a computer detects that one of its neighbors is disconnected, it broadcasts a port connection request over the broadcast channel indicating that it has an open port that needs a connection and identifying the call-in number for the port. *Id.* at 9:33–38. When the port connection request is received at another computer connected to the broadcast channel that has an open port, the other

computer contacts the requesting computer to establish a connection. *Id.* at 9:38–42.

Fig. 5B of the '147 Patent, reproduced below, illustrates the procedure for disconnecting a computer in an unplanned manner. In particular, Fig. 5B shows an exemplary procedure for computer **H**'s neighboring computers to establish new connections when they discover that computer **H** has disconnected in an unplanned manner (*e.g.* without sending a list of its neighboring computers). *Id.* at 9:42–45. When each of computer **H**'s neighbors discovers that **H** has disconnected, it broadcasts a port connection request indicating that it needs to fill an empty port. *Id.* at 9:45–48. In the example shown in Fig. 5B, the dashed lines indicate that computers **F** and **I** respond to each other's request and form a connection, and computers **A** and **E** respond to each other's request and form a connection. *Id.* at 9:48–51.

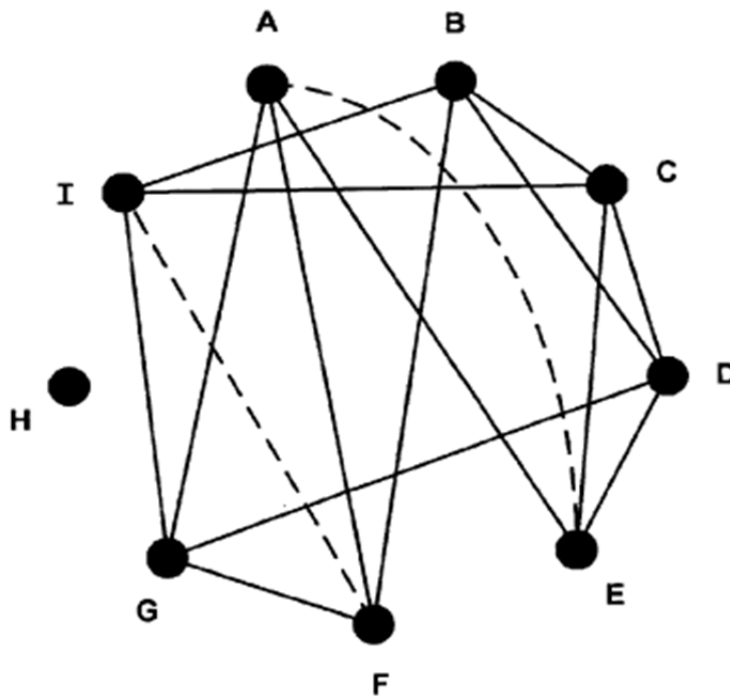


Fig. 5B

'147 Patent, Fig. 5B.

III. CLAIM CONSTRUCTION

Patent Owner respectfully submits, without prejudice, that, for purposes of this Patent Owner Preliminary Response, it is not necessary to construe any term in the claims of the '147 Patent.

IV. SPECIFIC REASONS WHY THE CITED REFERENCES DO NOT INVALIDATE THE CLAIMS, AND WHY *INTER PARTES* REVIEW SHOULD NOT BE INSTITUTED

Petitioners' proposed Grounds rely on four references: (1) Peter J.

Shoubridge et al., *Hybrid Routing in Dynamic Networks*, IEEE International

Conference on Communications (Ex. 1005, "Shoubridge"); (2) Tamás Denes, *The*

“Evolution” of Regular Graphs of Even Order by their Vertices, Matematikai Lapok, 27, 3–4 (Ex. 1017, “Denes”);¹ (3) Jose Rufino *et al.*, *A Study on the Inaccessibility Characteristics of ISO 8802/4 Token-Bus LANs*, IEEE INFOCOM ’92: The Conference on Computer Communications (Ex. 1011, “Rufino”); and (4) Hirviniemi, U.S. Patent No. 5,802,285 (Ex. 1021, “Hirviniemi”); (5) Balph *et al.*, U.S. Patent No. 4,700,185 (Ex. 1022, “Balph”); and (6) T. Todd, *The Token Grid Network*, IEEE/ACM Transactions on Networking, 2.3, 279–287 (Ex. 1019, “Todd”).

Petitioners’ Ground 1 proposes that claims 1–16 of the ‘147 Patent are obvious under pre-AIA 35 U.S.C. § 103(a) over Shoubridge in view of Denes and Rufino. Ground 2 proposes that claims 4, 5, 14, and 16 of the ’147 Patent are obvious, in the alternative, over Shoubridge in view of Denes and Rufino and further in view of Hirviniemi. Ground 3 proposes that claims 8 and 13 are obvious, in the alternative, over Shoubridge in view of Denes and Rufino and further in view of Balph. Ground 4 proposes that claims 1–16 are obvious, in the alternative, over Shoubridge in view of Denes and Rufino and further in view of Todd.

¹ Patent Owner reserves its right to object to the accuracy of the English language translation of Ex. 1016, provided as Ex. 1017 (“Denes”).

There are several reasons, however, that the Board should decline to institute *inter partes* review of the '147 Patent, including that the proposed combinations of Shoubridge, Denes, Rufino, and Todd do not teach the subject matter of independent claims 1 and 14, and that a POSITA would not have combined the cited references in the manner suggested at the time the '147 Patent was invented.

A. Ground 1: Claims 1–16 are Patentable Over Shoubridge in view of Denes and Rufino

Independent claims 1, 6, and 11 recite the invention of the '147 Patent in terms of two distinct scenarios for disconnecting a computer from a network. In particular, claims 1 and 11 recite a method and computer-readable medium, respectively, for disconnecting a computer from a network in a planned manner. Claim 1 is illustrative and recites, accordingly:

1. A method of disconnecting a first computer from a second computer, the first computer and the second computer being connected to a broadcast channel, said broadcast channel forming an m-regular graph where m is at least 3, the method comprising:

when the first computer decides to disconnect from the second computer, the first computer sends a disconnect message to the second computer, said disconnect message including a list of neighbors of the first computer; and

when the second computer receives the disconnect message from the first computer, the second computer broadcasts a connection port search message on the broadcast channel to find a

third computer to which it can connect in order to maintain an m-regular graph, said third computer being one of the neighbors on said list of neighbors.

‘147 Patent, claim 1 (emphasis added).

On the other hand, claim 6 recites a method for disconnecting a computer from a network in an unplanned manner:

6. A method for healing a disconnection of a first computer from a second computer, the computers being connected to a broadcast channel, said broadcast channel being an m-regular graph where m is at least 3, the method comprising:

attempting to send a message from the first computer to the second computer; and

when the attempt to send the message is unsuccessful, broadcasting from the first computer a connection port search message indicating that the first computer needs a connection; and

having a third computer not already connected to said first computer respond to said connection port search message in a manner as to maintain an m-regular graph.

‘147 Patent, claim 6.

1. Shoubridge in view of Denes and Rufino Fails to Disclose “a broadcast channel, said broadcast channel forming an m-regular graph where m is at least 3” (claims 1, 6, and 11)

Petitioners rely solely on Shoubridge as allegedly teaching “a broadcast channel, said broadcast channel forming an m-regular graph where m is at least 3.”

See Petition at 19–21 (“Shoubridge discloses a dynamic network forming a broadcast channel, said broadcast channel forming an m -regular graph where m is at least 3.”); *see also id.* at 29–30 (repeating the same assertion regarding independent claim 6); *id.* at 42 (repeating a similar assertion regarding independent claim 11). However, Shoubridge fails to show or suggest “a broadcast channel” as the term is understood in the context of the ‘147 Patent. As defined in the ‘147 Patent, a broadcast channel is “implemented using an underlying network system (e.g., the Internet) that allows each computer connected to the underlying network system to send messages to each other connected computer using each computer’s address.” ‘147 Patent at 4:17-21. In other words, “a broadcast channel *overlays* a point-to-point communications network.” *Id.* at 4:5-6 (emphasis added).

Petitioners fail to identify any teaching in Shoubridge that corresponds to a “broadcast channel” as the term is used in the context of the ‘147 Patent. Indeed, neither Petitioners nor Petitioners’ expert, Dr. Karger, provides any discussion whatsoever regarding how Shoubridge allegedly teaches a broadcast channel. Rather, Petitioners ignore the term “broadcast channel” and focuses on only on whether Shoubridge discloses an m -regular graph where m is at least 3. *See* Petition at 20 (citing Shoubridge at 1383, ¶ 2 (“A 64 node network with connectivity of degree 4 is modeled as G . The network is a large regular graph forming a manhattan grid network that has been wrapped around itself as a torus to

avoid edge effects.”)). Because Petitioners fail to give any weight to the term “broadcast channel” it has not met its burden to “specify where each element of the claim is found in the prior art patents or printed publications relied upon.” *See* 37 C.F.R. § 42.104(b)(4).

The term “broadcast channel” has a particular meaning in the context of the ‘147 Patent in that it overlays a point-to-point communications network. *See* ‘147 Patent at 4:5-7 (“A broadcast technique in which a broadcast channel overlays a point-to-point communications network is provided.”); *see also id.* at 4:25-28 (“The broadcast technique overlays the underlying network system with a graph of point-to-point connections (i.e., edges) between host computers (i.e., nodes) through which the broadcast channel is implemented.”). Accordingly, the hallmark of a broadcast channel is that it overlays a point-to-point communications network, not that it is simply a network that supports broadcast data. The Petition fails to identify any teaching in Shoubridge that corresponds to such an overlaid broadcast channel.

For at least the foregoing reasons, Petitioners have not established a reasonable likelihood that Shoubridge, Denes, and Rufino renders obvious independent claims 1, 6, and 11 of the ‘147 Patent. Patent Owner respectfully requests, therefore, that the Board decline to institute trial on Petitioners’ proposed Ground 1.

**2. Shoubridge in view of Denes and Rufino Fails to Disclose
“said disconnect message including a list of neighbors of the
first computer” (claims 1 and 11)**

Petitioners fail to identify any teaching in Shoubridge, Denes, or Rufino that corresponds to “said disconnect message including a list of neighbors of the first computer.” Petitioners have, therefore, not met their burden to “specify where each element of the claim is found in the prior art patents or printed publications relied upon.” *See* 37 C.F.R. § 42.104(b)(4). At best, Petitioners map Rufino’s disclosure of a leaving station in a token ring setting a *set_successor* frame to the claimed “disconnect message.” *See* Petition at 22 (“Rufino discloses a method for a leaving station (first computer) in a token bus network to leave the logical ring in an orderly way by sending a *set_successor* frame (a disconnect message) to its predecessor station (second computer).”).

Petitioners appear to acknowledge, however, that this “*set_successor* frame” does not include a “list of neighbors of the first computer,” but rather only “a single neighbor” (*i.e.* “the future successor”). Petition at 22. That is, although the station that sets the “*set_successor* frame” has two neighbors, the *set_successor* frame only “carr[ies] the address of its future successor,” rather than all of its neighbors:

An orderly leave from a logical ring is only possible when that station holds the token. Station withdrawal is achieved through a ring patch between its predecessor and successor stations. For that purpose, the

leaving station before passing the token issues a *set_successor* frame, addressed to its predecessor, and ***carrying the address of its future successor.***

Rufino at 962, right col., ¶ 3 (emphasis added).

Simply informing a predecessor station of the address of a successor station is suitable for token rings, such as the one disclosed in Rufino, where each station is only connected to a predecessor and successor. However, this *set_successor* procedure breaks once m-regular graphs where m is greater than 2 are considered because outside of the token ring context m-regular networks have no clearly defined predecessors and successors. Consequently, the '147 Patent teaches a technique in which a computer disconnecting in a planned neighbor “sends a disconnect message to each of its four neighbors” where “[t]he disconnect message includes a list that identifies the four neighbors of the disconnecting computer.” ‘147 Patent at 8:66–9:4. That is, the disconnecting computer sends a message to each of its neighbors, and the message contains a list of each of its neighbors. This technique allows the neighbors, which otherwise have no knowledge of one another, to find each other to establish new connections. *See id.* at 9:4–17 (describing how the neighbors attempt to connect to other computers on the list of neighbors); *see also id.* at 13:25–28 (“One advantage of the broadcast channel, however, is that no computer has global knowledge of the broadcast channel. Rather, each computer has local knowledge of itself and its neighbors.”).

In contrast Rufino's *set_successor* frame at best provides the address of one of its two neighbors (*i.e.* the successor station) to the other one of its neighbors and does not, therefore, disclose a "disconnect message including a list of neighbors of the first computer." *See* Rufino at 962, right col., ¶ 3 (emphasis added).

For at least the foregoing reasons, Petitioners have not established a reasonable likelihood that Shoubridge, Denes, and Rufino renders obvious independent claims 1 and 11 of the '147 Patent. Patent Owner respectfully requests, therefore, that the Board decline to institute trial on claims 1–5 and 11–16 under Petitioners' proposed Ground 1.

3. **Shoubridge in view of Denes and Rufino Fails to Disclose "when the second computer receives the disconnect message from the first computer, the second computer broadcasts a connection port search message on the broadcast channel to find a third computer to which it can connect in order to maintain an m-regular graph, said third computer being one of the neighbors on said list of neighbors" or "a component that, when the computer receives a disconnect message from another computer, the computer broadcasts a connection port search message on the broadcast channel to find a computer to which it can connect in order to maintain an m-regular graph, said computer to which it can connect being one of the neighbors on said list of neighbors" (claims 1 and 11).**

Petitioners fail to identify any teaching in Shoubridge, Denes, or Rufino that corresponds to "when the second computer receives the disconnect message from the first computer, the second computer broadcasts a connection port search message on the broadcast channel to find a third computer to which it can connect

in order to maintain an m-regular graph, said third computer being one of the neighbors on said list of neighbors” or “a component that, when the computer receives a disconnect message from another computer, the computer broadcasts a connection port search message on the broadcast channel to find a computer to which it can connect in order to maintain an m-regular graph, said computer to which it can connect being one of the neighbors on said list of neighbors,” as affirmatively recited in claims 1 and 11, respectively.

These claim features require that a computer “broadcasts a connection port search message on the broadcast channel” to find one of the other neighbors on the list of neighbors included in the disconnect message after a disconnect message is received at the computer. In other words, when a computer executes a *planned* disconnect from the broadcast channel and sends a disconnect message to its neighbors, a neighbors receiving the disconnect message broadcasts a connection port search message in order to find a new neighbor to connect to. *See* ‘147 Patent at 8:66–9:9 (disclosing the claimed technique for disconnecting a computer from the broadcast channel in a planned manner).

Petitioners rely solely on Rufino as disclosing this claim feature despite that reference being silent with respect to broadcasting a port search message after receiving a disconnect message. *See* Petition at 23–26 (discussing claim 1); *see also id.* at 47–50 (discussing claim 11). In particular, Petitioners attempt to rely on

Rufino's disclosure of a "*who_follows*" frame as allegedly teaching the "connection port search message [] on the broadcast channel to find the successor (the neighbor) of the disconnected station." Petition at 25; *see also id.* at 48. But as Petitioners note, this *who_follows* frame only occurs "when a station cannot successfully send a message to its successor (because of an unplanned disconnect of the successor)." Petition at 25; *see also id.* at 48. That is, Rufino's *who_follows* procedure only takes place in the event of an "abrupt" leave of a station from the token ring, not in the case where a station leaves in an orderly manner by setting a *set_successor* frame, which Petitioners have mapped to the claimed disconnect message. *See* Rufino at 962, col. 2–963, col. 1 (discussing orderly and abrupt station leaves, using the *set_successor* frame in the case of orderly leaves, and using the *who_follows* frame in the case of abrupt leaves); *see also* Petition at 22 (mapping the *set_successor* frame to the claimed "disconnect message").

These claim features also require broadcasting a "connection port search message on the broadcast channel" and "maintain[ing] an m-regular graph." One of skill in the art at the time understood that token rings, such as those discussed in Rufino, are not a "broadcast medium, but a collection of individual point to point links that happen to form a circle." *See* Ex. 2001 ("Goodrich Decl.") at ¶ 31 (citing Ex. 2002, Tanenbaum at 292 (explaining how one of the many attractive features of ring networks "is the fact that a ring is not really a broadcast

medium, but a collection of individual point to point links that happen to form a circle.”)). In contrast to the claimed computers of the “broadcast channel,” more than one station of the token ring cannot send messages (e.g. disconnect or connection port messages). Rather token rings rely on token passing where only one station can transmit at a given instant, namely because there is only one token. *See* Goodrich Decl. at ¶ 31(citing Rufino at 0959 (“Access control is performed by a token passing protocol, which establishes a logical ring over the physical bus. Access to the shared broadcast medium for data transmission is only granted to the station which currently holds the token.”); *see also* Ex. 2002, Tanenbaum at 293 (“When a station wants to transmit a frame, it is required to seize the token and remove it from the ring before transmitting. .. Because there is only one token, only one station can transmit at a given instant...”). As such, Rufino is discussing a token-passing bus that is essentially a wire that each station is holding on to, if one station puts electricity on this wire, the rest of the stations in the ring feel the jolt. If one station in the ring has the "token" and is sending a message on this wire, the rest of the stations in the ring all get it immediately. As such, there is no need for broadcasting information as recited in the claims. *See* Goodrich Decl. at ¶ 31 (“The token-ring part is just so that we can perform computations that require that we “take turns” by moving an imaginary token around a “ring.” For example, what if ten of us around a ring have ten numbers we want to add up? The token

ring part is a great way to do this, using a traveling message that stores a partial sum. On the other hand, no POSITA would use the teachings of the prior art to make the claimed system as the prior art teaches that it is “not really a broadcast medium.”). *See* Goodrich Decl. at ¶ 31 (citing Ex. 2002, Tanenbaum at 292 (“Among their many attractive features is the fact that a ring is not really a broadcast medium, but a collection of individual point to point links that happen to form a circle.”)).

Moreover, Rufino, teaches away from the specialized graphs solutions proposed by Shoubridge and Denes by stating because these solutions are “costly and complex.” *See* Goodrich Decl. at ¶ 32 (citing Rufino at 0958 (criticizing specialized graph solutions such as “costly and complex.”)). Thus, these three systems operate in fundamentally different ways that would completely redesign Rufino’s system to be contrary to its stated goals.

For at least the foregoing reasons, Petitioners have not established a reasonable likelihood that Shoubridge, Denes, and Rufino renders obvious independent claims 1 and 11 of the ‘147 Patent. Patent Owner respectfully requests, therefore, that the Board decline to institute trial on claims 1–5 and 11–16 under Petitioners’ proposed Ground 1.

**4. Shoubridge in view of Denes and Rufino Fails to Disclose
“attempting to send a message from the first computer to
the second computer” (claim 6)**

Petitioners fail to identify any teaching in Shoubridge, Denes, or Rufino that corresponds to “attempting to send a message from the first computer to the second computer,” as affirmatively recited in independent claim 6. Petitioners rely solely on Rufino as allegedly disclosing this claim element. *See* Petition at 30–33. However, the portion of Rufino cited by Petitioners in support of their conclusion only refers the failure to *pass a token* from one computer to its successor. *See id.* at 32 (citing Rufino at 962, col. 2 ¶ 9– 963, col. 1 ¶ 1 (“If a station is failed, the token passing operation will not succeed. After the token pass checking period (one slot time) has elapsed a recovery strategy is tried.”)).

Token rings like the one disclosed in Rufino operate by passing a token around the ring. The passage of a token does not send or receive any type of disconnect message between stations but rather only “establishes a logical ring over the physical bus.” *See* Rufino at 959, ¶ 1 (“Access control is performed by a token passing protocol, which establishes a logical ring over the physical bus.”). Accordingly, Petitioners’ reliance on Rufino’s disclosure regarding “when a station cannot send a message to its successor (because of an unplanned disconnect of the successor)” only refers to the inability to pass a token from a computer to its

successor, not “attempting to send a message from the first computer to the second computer.”

For at least the foregoing reasons, Petitioners have not established a reasonable likelihood that Shoubridge, Denes, and Rufino renders obvious independent claim 6 of the ‘147 Patent. Patent Owner respectfully requests, therefore, that the Board decline to institute trial on claims 7–10 under Petitioners’ proposed Ground 1.

5. A Person of Skill in the Art Would Not Have Combined Shoubridge, Denes, and Rufino in the Manner Suggested in the Petition

Shoubridge, Denes and Rufino are disparate systems that one of skill in the art would not have been motivated to combine. Here, Petitioners merely offer boilerplate reasons that do not connect to any specific claim limitation. To the contrary, the law is clear, “Petitioner must show some reason why a person of ordinary skill in the art would have thought to combine particular available elements of knowledge, as evidenced by the prior art, *to reach the claimed invention.*” *Heart Failure Techs., LLC v. CardioKinetix, Inc.*, IPR2013-00183, Paper No. 12 at 9 (P.T.A.B. July 31, 2013)(citing *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 418 (2007))(original emphasis removed, emphasis added).

Generally, Shoubridge is about a hybrid routing algorithm. The network identified by Petitioners is a simulated network that is not based on a real-world

network. Shoubridge at 1383. Neither Denes nor Rufino are about routing algorithms, modifying a simulation of a network, nor do either have any suggestions on improving a simulation of a network. Goodrich Decl. at ¶¶ 29-32. Shoubridge simulates the adding and removal of a network by modifying the link value and distributing the changes evenly. Goodrich Decl. at ¶ 30; Shoubridge at 1383 (“Changes in network topology are evenly distributed across all links.... If a link failure event is scheduled to occur, a link (i,j) is randomly selected from the L possible links in G, using a uniform distribution.”). Neither Denes nor Rufino discuss link values or even distributions of network topologies changes. A POSITA would not have thought to combine Shoubridge, Denes, and Rufino because they are unrelated. Goodrich Decl. at ¶¶ 30-31.

For claim 1(b), Petitioners assert that “it would have been obvious to modify Shoubridge in view of Denes to include the orderly leave in Rufino, with the step of broadcasting a who follows query (connection port search message) on the broadcast channel.” Petition at 25. Rufino does not cure the deficiencies of Denes as Rufino does not address receiving disconnect messages in the context of maintaining an m-regular non-complete topology, as required by claim 1(b). As Petitioners concede, “Rufino relates to a token ring which is a 2 regular topology.” Petition at 59. Thus, Rufino is directed towards 2-regular systems not “a broadcast

channel, said broadcast channel forming an m-regular graph where m is at least 3.”

Goodrich Decl. at ¶ 31.

Furthermore, Petitioners never explain how this combination of three different references operate to disclose claim 1(b), which recites “when the second computer receives the disconnect message from the first computer, the second computer broadcasts a connection port search message on the broadcast channel to find a third computer to which it can connect in order to maintain an m-regular graph, said third computer being one of the neighbors on said list of neighbors.”

‘147 Patent at 28:61-67. In other words, Petitioner provides no reason why a person of ordinary skill in the art would have thought to combine particular available elements of Shoubridge, Denes and Rufino, “to reach the claimed invention.” See *Heart Failure Techs., LLC v. CardioKinetix, Inc.*, IPR2013-00183, Paper No. 12 at 9 (citing *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. at 418 (“Petitioner must show some reason why a person of ordinary skill in the art would have thought to combine particular available elements of knowledge, as evidenced by the prior art, to reach the claimed invention.”)). Rather, Petitioners merely reference previous boilerplate reasons that are unspecific to the language recited in claim 1(b). See Petition at 26 (“A POSITA would have been motivated to combine the teachings of Shoubridge, Denes, and Rufino for the reasons discussed above...”). At most, Petitioners argue that it would have been obvious to combine

because “Shoubridge teaches the use of its network in a dynamic setting, and Denes and Rufino address the problem of dynamic networks.” Petition at 17. This proffered motivation is insufficient as a matter of law, as arguing that the cited references describe dynamic networks is just another way of saying that they are in the same field- which is not sufficient motivation to combine these three references. *OpenTV, Inc. v. Cisco Tech., Inc.*, IPR2013-00328, Paper No. 13 at 21-22 (P.T.A.B. Nov. 29, 2013)(“The mere fact that [the cited references] describe similar [] systems is not, by itself, a sufficient rationale for a person of ordinary skill in the art to have made the asserted combination.”). In fact, Rufino teaches away from point-to-point graphs such as Denes because Rufino teaches that such solutions are “costly and complex.” *See* Goodrich Decl. at ¶ 32; Rufino at 0958 (discussing specialized solutions such as “point-to-point graphs [6] or multiple LANs [7]. These solutions are however costly and complex.”). Thus, one of skill in the art would not look to or combine Denes and Rufino because they are directed to completely different technologies and technical problems.

B. Ground 2: Claims 4, 5, 14, and 16 are not Obvious Over Shoubridge in view Denes, Rufino, and Hirviniemi

Claims 4, 5, 14, and 16 depend from independent claims 1 or 11, which are not obvious over the combination of Shoubridge in view of Denes, and Rufino. *See* § IV.A, *supra*. Petitioners do not argue that Hirviniemi cures any of the deficiencies noted with respect to Ground 1 and, therefore, claims 4, 5, 14, and 16

are not obvious over the combination of Shoubridge, Denes, Rufino, and Hirviniemi for at least the same reasons. Patent Owner respectfully requests, therefore, that the Board not institution *inter partes* review of the '147 Patent under Petitioners' proposed Ground 2. Moreover, a POSITA would not have thought to combine Shoubridge, Denes, Rufino, and Hirviniemi because they are unrelated as discussed above and Hirviniemi does not add any additional information that the Shoubridge authors did not already know. Goodrich Decl. at ¶¶ 33-34.

C. Ground 3: Claims 8 and 13 are not Obvious Over Shoubridge in view Denes, Rufino, and Balph

Claims 8 and 13 depend from independent claims 1 and 11, which are not obvious over the combination of Shoubridge in view of Denes, and Rufino. *See* § IV.A, *supra*. Petitioners do not argue that Balph cures any of the deficiencies noted with respect to Ground 1 and, therefore, claims 8 and 13 are not obvious over the combination of Shoubridge, Denes, Rufino, and Balph for at least the same reasons. Patent Owner respectfully requests, therefore, that the Board not institution *inter partes* review of the '147 Patent under Petitioners' proposed Ground 3.

D. Ground 4: Claims 1–16 are not Obvious Over Shoubridge in view Denes, Rufino, and Todd

As described above, Shoubridge in view Denes and Rufino fail to teach the invention claimed in the '147 Patent (*see infra*). For Ground 4, Petitioners propose

adding a fourth reference (Todd) to the proposed combination to cure the previously noted deficiencies of Rufino, namely modifying Rufino “from a 2-regular topology to a 4-regular topology.” Petition at 59. But Todd suffers from the same deficiencies as Rufino. In particular, Rufino, does not disclose disconnecting from an m -regular graph where m is at least 3. At most, Petitioners assert that Rufino’s token ring is 2-regular. Petition at 24 (“Rufino discloses broadcasting messages on the broadcast channel to maintain a 2-regular graph.”). In contrast, the claim language is clear that “ m -regular graph” requires “where m is at least 3.” *See* ‘147 Patent at claims 1 and 11 (reciting “an m -regular graph where m is at least 3”). Similarly, Todd makes clear that “each station is two-connected” in the resulting token grid system proposed by Todd. Todd at 1, Col. 1 (“In this paper, a token grid network is introduced where media access is performed over a two-dimensional mesh. In the resulting system, each station is two-connected and has the same transmission hardware and small station latency as in a dual token ring.”). Thus, Todd’s token grid network does not cure Rufino’s failure to disclose disconnecting from an “ m -regular graph where m is at least 3.”

Just like Rufino, Todd also makes clear that its token grid network relies on token rings, including “the same transmission hardware and small station latency as in a dual token ring.” Todd at 1, Col. 1. As described above, one of skill in the art at the time understood that token rings are not a “broadcast medium, but a

collection of individual point to point links that happen to form a circle.” Goodrich Decl. at ¶¶ 35-36; Ex. 2002, Tanenbaum at 292 (explaining how one of the many attractive features of ring networks “is the fact that a ring is not really a broadcast medium, but a collection of individual point to point links that happen to form a circle.”) In contrast to the claimed computers of the “broadcast channel,” each station of token ring cannot send messages (e.g. disconnect or connection port messages). Rather token rings rely on token passing where only one station can transmit at a given instant, namely because there is only one token. Rufino at 0959 (“Access control is performed by a token passing protocol, which establishes a logical ring over the physical bus. Access to the shared broadcast medium for data transmission is only granted to the station which currently holds the token.”); *see also* Ex. 2002, Tanenbaum at 293 (“When a station wants to transmit a frame, it is required to seize the token and remove it from the ring before transmitting.... Because there is only one token, only one station can transmit at a given instant...”). Thus, Todd fails to cure the previously noted deficiencies of Rufino because Todd relies on token rings and thus suffers from the same deficiencies as Rufino. Furthermore, Petitioners provide insufficient motivation to combine these four references. For the alleged motivation to combine, Petitioners improperly fail to provide *any* reason why one would have been motivated to apply Todd to the teachings of Shoubridge and Denes. Rather, Petitioners solely assert that assert

that a POSITA would be motivated to modify Rufino because it “can be done in ‘a very simple fashion’ by overlapping token rings.” Petition at 60. To the contrary, modifying Rufino to apply Todd would be very complex. Here, Petitioners take the quote ‘very simple fashion’ out of context, as Todd only states that “couplings between the rings are implemented by the user stations in a very simple fashion and under token control.” Goodrich Decl. at ¶ 38. In order for transmissions to occur using these multiple LANs, Todd requires a convoluted Token Grid Protocol as shown below:

PROTOCOL 1: BASIC TOKEN GRID PROTOCOL	
Column Token j Arrives To Station (i, j) :	
1.	Capture the token.
2.	If a packet is available, transmit onto Column Ring j .
3.	Hold Column Token j . Wait for Row Token i .
4.	Done.
Row Token i Arrives To Station (i, j) :	
1.	Capture the token if a packet is available for Row Ring i or if Column Token j is being held.
2.	Transmit onto Row Ring i if a packet is available.
3.	If the station is not holding Column Token j then release Row Token i and go to 5.
4.	Enter the SR state. Generate and release Row/Column Token i, j .
5.	Done.
Row/Column Token i, j Arrives To Station (i, k) :	
1.	Capture the token if a packet is available for Row/Column Ring i, j or if $k = j$.
2.	If a packet is available then transmit onto Row/Column Ring i, j .
3.	If $k \neq j$ then release the token and go to 5.
4.	Generate and release Column/Row Token i, j .
5.	Done.
Column/Row Token i, j Arrives To Station (k, j) :	
1.	Capture the token if a packet is available for Column/Row Ring i, j or if $k = i$.
2.	If a packet is available then transmit onto Column/Row Ring i, j .
3.	If $k \neq i$ then release the token and go to 5.
4.	Enter the DR state. Regenerate and release Column Token j and Row Token i .
5.	Done.

See Todd at 3 (Protocol 1); *see also* Todd at 3 (Transmission to a station on a different row and column can only be accomplished when a ring merge has occurred...A formal description of the basic algorithm is shown in Protocol 1.”) Requiring such a complex protocol is contrary to the goal of Rufino. In fact,

Rufino, teaches away from such specialized solutions using multiple LANs because these solutions are “costly and complex.” *See* Rufino at 0958 (discussing specialized solutions such as “point-to-point graphs [6] or multiple LANs [7]. These solutions are however costly and complex.”

Petitioners also assert that Todd has been available “no later than 1980.” Petition at 59. Thus, Petitioners assert that Todd was available nearly twenty years before the ‘147 Patent was filed, yet there is no evidence that anyone sought to modify Rufino using Todd to reach the claimed invention. Indeed, this considerable time lapse suggests instead that the Petitioners only traverses the obstacles to this inventive enterprise with a resort to hindsight. *See Leo Pharm. Prods., Ltd. v. Rea*, 726 F.3d 1346, 1356-57 (Fed. Cir. 2013)(“The elapsed time between the prior art and the ’013 patent’s filing date evinces that the ’013 patent’s claimed invention was not obvious to try. Indeed this considerable time lapse suggests instead that the Board only traverses the obstacles to this inventive enterprise with a resort to hindsight . . . Indeed ordinary artisans would not have thought to try at all because they would not have recognized the problem.”)

Moreover, Petitioners improperly failed to explain how the references would be modified by Todd to reach the claimed invention. At most, the Petition states that “Ground 4 simply proposes an alternative ground for independent claims 1, 6 and 11 (which require m to be at least 3)” without explaining how Todd provides

an alternative mapping of the charted claim elements in Ground 1. Petition at 60.

Thus, Petitioners' tactic of attempting to establish a motivation to combine with no focus on "how specific references could be combined, which combination(s) of elements in specific references would yield a predictable result, or how any specific combination would operate or read on the asserted claims" is insufficient as a matter of law. *ActiveVideo Networks, Inc. v. Verizon Commc'ns, Inc.*, 694 F.3d 1312, 1327 (Fed. Cir. 2012).

V. PETITIONERS' OBVIOUSNESS ARGUMENTS FAIL AS A MATTER OF LAW BECAUSE THEY DID NOT CONDUCT A COMPLETE OBVIOUSNESS ANALYSIS

The Petition relies solely on obviousness to challenge the '147 Patent yet Petitioners make no effort to present a complete obviousness analysis.

Specifically, both the United States Supreme Court and the Federal Circuit have repeatedly stated that any obviousness analysis must address (1) the scope and content of the prior art, (2) the differences between the prior art and the claims at issue, (3) the level of ordinary skill in the pertinent art, and (4) relevant secondary considerations of non-obviousness. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). Failure to address any one of these criteria is fatal to a challenger's obviousness argument as a matter of law. *See, e.g., Apple Inc. v. Int'l Trade Comm'n*, 725 F.3d 1356, 1365–66 (Fed. Cir. 2013) (vacated and remanded ITC's ruling of obvious, as ITC failed to consider all obviousness factors, including

objective evidence of secondary considerations); *see also Ruiz v. A.B. Chance Co.*, 234 F.3d 654, 662-64 (Fed. Cir. 2000) (vacated a conclusion of obviousness because the fact-finder failed to make *Graham* factor findings). Petitioners' failure to present the Board with a complete obviousness analysis in the Petition is, as a matter of law, enough to deny the institution of a trial on all presented grounds.

In this case, Petitioners' failure to even consider the objective indicia of nonobviousness in support of their obviousness allegations is fatal to their obviousness arguments. *Plantronics, Inc. v. Aliph, Inc.*, 724 F.3d 1343, 1355 (Fed. Cir. 2013)(“This court has consistently pronounced that all evidence pertaining to the objective indicia of nonobviousness must be considered before reaching an obviousness conclusion.”). In fact, the Federal Circuit dictates that “[w]hether before the Board or a court, . . . consideration of the objective indicia is *part* of the whole obviousness analysis, not just an afterthought.” *Leo Pharm. Prods., Ltd. v. Rea*, 726 F.3d 1346, 1357–58 (Fed. Cir. 2013)(emphasis in original). In other words, objective indicia of nonobviousness must always be considered as it “serve[s] to resist the temptation to read into the prior art teachings of the invention in issue.” *Plantronics*, 724 F.3d at 1355 (citing *In re Cyclobenzaprine Hydrochloride Extended–Release Capsule Patent Litig.*, 676 F.3d 1063, 1076 (Fed. Cir. 2012)). Indeed, Petitioners' failure to consider objective indicia of nonobviousness only serves to further highlight the fact that Petitioners' proposed

combinations were colored by hindsight. *Leo Pharm.*, 726 F.3d at 1358 (quoting *Crocs, Inc. v. Int'l Trade Comm'n*, 598 F.3d 1294, 1310 (Fed. Cir. 2010))("Here, the objective indicia of nonobviousness are crucial in avoiding the trap of hindsight when reviewing, what otherwise seems like, a combination of known elements.").

The fact that Petitioners do not address this important component of the obviousness analysis, and chose to provide the Board with incomplete obviousness analyses, is basis alone for denying the Petition. *See Rambus Inc. v. Rea*, 731 F.3d 1248, 1257 (Fed. Cir. 2013)(overturning Board because it failed to consider objective indicia of nonobviousness).

VI. CONCLUSION

Petitioners have not established a reasonable likelihood that it will prevail in establishing that claims 1–16 of the '147 Patent are invalid. Patent Owner accordingly requests that the Board deny institution of *inter partes* review of the '147 Patent on Petitioners' proposed grounds.

Respectfully submitted,

Dated: June 27, 2016

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Patent Owner's Preliminary Response
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CERTIFICATE OF COMPLIANCE WITH 37 C.F.R. § 42.24

This paper complies with the type-volume limitation of 37 C.F.R. § 42.24.

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e), the undersigned certifies that a true and correct copy of the foregoing Patent Owner's Preliminary Response to Petition Pursuant to 37 C.F.R. § 42.107 was served on June 28, 2016, by filing this document through the Patent Review Processing System as well as delivering via electronic mail upon the following counsel of record for Petitioner:

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