

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SANDVINE CORPORATION and SANDVINE INCORPORATED ULC,
Petitioner,

v.

PACKET INTELLIGENCE, LLC,
Patent Owner.

Case IPR2017-00450
Patent 6,771,646 B1

Before ELENI MANTIS MERCADER, JUSTIN T. ARBES, and
WILLIAM M. FINK, *Administrative Patent Judges*.

ARBES, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
37 C.F.R. § 42.108

Sandvine Corporation and Sandvine Incorporated ULC (collectively, “Petitioner”) filed a Petition (Paper 2, “Pet.”) requesting *inter partes* review of claims 1–3 and 7–20 of U.S. Patent No. 6,771,646 B1 (Ex. 1001, “the ’646 patent”) pursuant to 35 U.S.C. § 311(a). Patent Owner Packet Intelligence, LLC filed a Preliminary Response (Paper 6, “Prelim. Resp.”) pursuant to 35 U.S.C. § 313. Pursuant to 35 U.S.C. § 314(a), the Director may not authorize an *inter partes* review unless the information in the petition and preliminary response “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.” For the reasons that follow, we have decided not to institute an *inter partes* review.

I. BACKGROUND

A. The ’646 Patent¹

The ’646 patent discloses a network activity monitor with a cache subsystem. Ex. 1001, col. 1, l. 42–col. 3, l. 14. The ’646 patent explains that there was a need in the art for “a real-time network monitor that can provide details as to the application programs being used.” *Id.* at col. 1, ll. 42–47. The disclosed monitor receives packets passing in either direction through its connection point on the network and “elucidate[s] what application programs are associated with each packet” by extracting information from the packet, using selected parts of the extracted information to “build[] a signature for identifying the conversational flow of

¹ Petitioner challenges patents related to the ’646 patent in Cases IPR2017-00451, IPR2017-00629, IPR2017-00630, IPR2017-00769, IPR2017-00862, and IPR2017-00863.

Figure 3 depicts various components of network packet monitor 300, including parser subsystem 301, analyzer subsystem 303, and database of known flows 324. *Id.* at col. 7, ll. 36–58. Parser subsystem 300 “parses the packet and determines the protocol types and associated headers for each protocol layer that exists in the packet 302,” “extracts characteristic portions (signature information) from the packet 302,” and builds the “unique flow signature (also called a ‘key’) for this flow.” *Id.* at col. 8, l. 5–col. 9, l. 28, col. 27, l. 66–col. 29, l. 61 (describing an example of how the disclosed monitor builds signatures and flow states in the context of a Sun Remote Procedure Call (RPC), where, after all of the required processing, “KEY-2 may . . . be used to recognize packets that are in any way associated with the application ‘a²’”), Fig. 2.

Analyzer system 303 then determines whether the packet has a matching flow-entry in database of flows 324 (looking in the cache first), and processes the packet accordingly, including, for example, determining whether the packet belongs to an existing conversational flow or a new (i.e., not previously encountered) flow and, in the case of the latter, performing state processing to determine whether the conversational flow has been “fully characterized” and should be finalized. *Id.* at col. 9, l. 45–col. 12, l. 34, col. 19, l. 46–col. 20, l. 2, col. 30, l. 13–col. 36, l. 28, Fig. 11. The ’646 patent discloses that

[f]uture packets that are part of the same conversational flow have their state analysis continued from a previously achieved state. When enough packets related to an application of interest have been processed, a final recognition state is ultimately reached, i.e., a set of states has been traversed by state analysis to completely characterize the conversational flow. The signature for that final state enables each new incoming packet

of the same conversational flow to be individually recognized in real time.

In this manner, one of the great advantages of the present invention is realized. Once a particular set of state transitions has been traversed for the first time and ends in a final state, a short-cut recognition pattern—a signature—can be generated that will key on every new incoming packet that relates to the conversational flow. Checking a signature involves a simple operation, allowing high packet rates to be successfully monitored on the network.

Id. at col. 11, l. 67–col. 12, l. 17.

B. Illustrative Claim

Claim 1 of the '646 patent² recites:

1. A packet monitor for examining packets passing through a connection point on a computer network, each packet conforming to one or more protocols, the monitor comprising:

(a) a packet acquisition device coupled to the connection point and configured to receive packets passing through the connection point;

(b) a memory for storing a database comprising flow-entries for previously encountered conversational flows to which a received packet may belong, a conversational flow being an exchange of one or more packets in any direction as a result of an activity corresponding to the flow;

(c) a cache subsystem coupled to the flow-entry database memory providing for fast access of flow-entries from the flow-entry database;

(d) a lookup engine coupled to the packet acquisition device and to the cache subsystem and configured to lookup whether a received packet belongs to a flow-entry in the

² Claims 1, 6, 7, 12, and 13 of the '646 patent were corrected in Certificates of Correction dated September 21, 2004, November 16, 2004, and October 15, 2013.

flow-entry database, the looking up being via the cache subsystem; and

(e) a state processor coupled to the lookup engine and to the flow-entry-database memory, the state processor being to perform any state operations specified for the state of the flow starting from the last encountered state of the flow in the case that the packet is from an existing flow, and to perform any state operations required for the initial state of the new flow in the case that the packet is not from an existing flow.

C. The Prior Art

Petitioner relies on the following prior art:

U.S. Patent No. 5,530,834, issued June 25, 1996 (Ex. 1011, “Colloff”);

U.S. Patent No. 5,793,954, issued Aug. 11, 1998 (Ex. 1012, “Baker”);

U.S. Patent No. 6,115,393, filed July 21, 1995, issued Sept. 5, 2000 (Ex. 1007, “Engel”);³ and

U.S. Patent No. 6,182,146 B1, filed June 27, 1997, issued Jan. 30, 2001 (Ex. 1010, “Graham-Cumming”).

D. The Asserted Grounds

Petitioner challenges claims 1–3 and 7–20 of the ’646 patent on the following grounds:

References	Basis	Claims Challenged
Engel and Colloff	35 U.S.C. § 103(a) ⁴	1–3, 7–9, 12, and 15–20

³ Engel references Appendices I–VI filed with the originally filed application. *See, e.g.*, Ex. 1007, col. 1, ll. 10–15, col. 5, l. 52–col. 6, l. 3; Ex. 1008 (Appendices I–V); Ex. 1009 (Appendix VI).

References	Basis	Claims Challenged
Engel, Colloff, and Baker	35 U.S.C. § 103(a)	10 and 11
Engel, Colloff, and Graham-Cumming	35 U.S.C. § 103(a)	13 and 14

E. Claim Interpretation

The Board interprets claims in an unexpired patent using the “broadest reasonable construction in light of the specification of the patent in which [they] appear[.]” 37 C.F.R. § 42.100(b); *see also Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard). Under this standard, we interpret claim terms using “the broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art, taking into account whatever enlightenment by way of definitions or otherwise that may be afforded by the written description contained in the applicant’s specification.” *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997).

We presume that claim terms have their ordinary and customary meaning. *See Trivascular, Inc. v. Samuels*, 812 F.3d 1056, 1062 (Fed. Cir. 2016) (“Under a broadest reasonable interpretation, words of the claim must be given their plain meaning, unless such meaning is inconsistent with the specification and prosecution history.”); *In re Translogic Tech., Inc.*, 504

⁴ The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. § 103. Because the challenged claims of the ’646 patent have an effective filing date before the effective date of the applicable AIA amendment, we refer to the pre-AIA version of 35 U.S.C. § 103.

F.3d 1249, 1257 (Fed. Cir. 2007) (“The ordinary and customary meaning is the meaning that the term would have to a person of ordinary skill in the art in question.” (internal quotation marks omitted)). A patentee, however, may rebut this presumption by acting as his own lexicographer, providing a definition of the term in the specification with “reasonable clarity, deliberateness, and precision.” *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). The parties provide proposed interpretations for various claim limitations, and cite a district court decision construing certain limitations. *See* Pet. 2–8; Prelim. Resp. 20–31; Ex. 2005. For purposes of this Decision, however, we conclude that only one term requires interpretation: “conversational flow.”

Claim 1 recites “a memory for storing a database comprising flow-entries for previously encountered conversational flows to which a received packet may belong, a conversational flow being an exchange of one or more packets in any direction as a result of an activity corresponding to the flow.” Claim 7 recites “a memory for storing a database of one or more flow-entries for any previously encountered conversational flows, each flow-entry identified by identifying information stored in the flow-entry.” Claim 16 recites “looking up a flow-entry database comprising none or more flow-entries for previously encountered conversational flows, the looking up using at least some of the selected packet portions and determining if the packet is of an existing flow, the lookup being via a cache.”

Petitioner argues that “conversational flow” should be interpreted to mean “‘the sequence of packets that are exchanged in any direction as a result of an activity,’ where a ‘conversational flow’ is distinguished from a ‘connection flow’ in that some of the conversational flows ‘involve more

than one connection’ or ‘involve more than one exchange of packets between a client and server.’” Pet. 3–4. Petitioner acknowledges that the claims “require more than identifying and classifying ‘only connection flows,’” citing statements made by the patentees during prosecution of the ’646 patent and a related application, as well as the following disclosure in related U.S. Patent No. 6,651,099 B1 (Ex. 1003, “the ’099 patent”):

Some prior art packet monitors classify packets into connection flows. The term “connection flow” is commonly used to describe all the packets involved with a single connection. A conversational flow, on the other hand, is the sequence of packets that are exchanged in any direction as a result of an activity—for instance, the running of an application on a server as requested by a client. It is desirable to be able to identify and classify conversational flows rather than only connection flows. The reason for this is that some conversational flows involve more than one connection, and some even involve more than one exchange of packets between a client and server.

Pet. 3–4 (quoting Ex. 1003, col. 2, ll. 34–45) (emphases omitted).

Relying on the same disclosure from the ’099 patent, Patent Owner argues that the term “conversational flow” is expressly defined as

the sequence of packets that are exchanged in any direction as a result of an activity—for instance, the running of an application on a server as requested by a client—and where some conversational flows involve more than one connection, and some even involve more than one exchange of packets between a client and server.

Prelim. Resp. 23–25. Patent Owner further notes that Petitioner agreed to the above interpretation in the related district court case, and the district court adopted it. *Id.* at 24–25 (citing Ex. 2005, 6).

The parties’ proposed interpretations are nearly identical. We agree with Patent Owner that the term “conversational flow” is expressly defined

in the excerpt of the '099 patent quoted above, and that the definition applies to the term as used in the '646 patent.⁵ Patent Owner's proposed interpretation also is consistent with how the term is used in the context of the challenged claims. For example, claim 1 recites "a conversational flow being an exchange of one or more packets in any direction as a result of an activity corresponding to the flow," which is consistent with the "as a result of an activity" language in Patent Owner's proposed interpretation. Accordingly, for purposes of this Decision, we interpret "conversational flow" to mean the sequence of packets that are exchanged in any direction as a result of an activity (for instance, the running of an application on a server as requested by a client), where some conversational flows involve more than one connection, and some even involve more than one exchange of packets between a client and server.

II. DISCUSSION

A. Obviousness Ground Based on Engel and Colloff

Petitioner contends that claims 1–3, 7–9, 12, and 15–20 are unpatentable over Engel and Colloff under 35 U.S.C. § 103(a), citing the testimony of Bill Lin, Ph.D., as support. Pet. 12–54 (citing Ex. 1006).

⁵ The '646 patent states that the '099 patent is incorporated by reference. Ex. 1001, col. 1, ll. 12–18, col. 1, l. 66–col. 2, l. 7. Also, the '646 and '099 patents both claim the benefit of U.S. Provisional Patent Application No. 60/141,903, and have some of the same disclosure in their written descriptions. *See Trustees of Columbia Univ. v. Symantec Corp.*, 811 F.3d 1359, 1369 (Fed. Cir. 2016) ("where multiple patents 'derive from the same parent application and share many common terms, we must interpret the claims consistently across all asserted patents'" (citation omitted)).

We are not persuaded that Petitioner has established a reasonable likelihood of prevailing on its asserted ground for the reasons explained below.

1. Engel

Engel is directed to monitoring communications “in a network of nodes, each communication being effected by a transmission of one or more packets among two or more communicating nodes, and each communication complying with a predefined communication protocol.” Ex. 1007, Abstract. “The contents of packets are detected passively and in real time, [and] communication information associated with multiple protocols is derived from the packet contents.” *Id.* Such communication information “is associated with multiple layers of at least one of the protocols.” *Id.* at col. 2, ll. 27–30. A network monitor “collects packets on the network and performs some degree of analysis to search for actual or potential problems and to maintain statistical information for use in later analysis.” *Id.* at col. 6, ll. 52–65, Fig. 1. A Real Time Parser (RTP) performs layer-by-layer protocol parsing with appropriate routines. *Id.* at col. 11, ll. 25–30, col. 19, ll. 53–67, col. 21, ll. 15–30. “As each layer is parsed, the RTP invokes the appropriate functions in the statistics module (STATS) to update those statistical objects which must be changed.” *Id.* at col. 11, ll. 35–37.

Figure 4 of Engel is reproduced below.

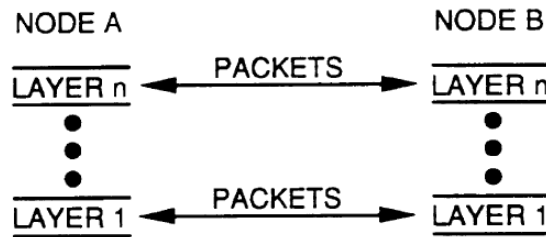


FIG 4

Figure 4 “illustrates the different layers of a communication between two nodes.” *Id.* at col. 4, ll. 45–46. In Figure 4, “Nodes A and B are exchanging packets and are engaged in multiple dialogs.” *Id.* at col. 9, ll. 31–33.

“[A] dialog is a communication [at any layer] between a sender and a receiver, which is composed of one or more packets being transmitted between the two” and often “involve[s] exchanges in both directions.” *Id.* at col. 9, ll. 19–24. As shown in Figure 4, “Layer n of Node A is having a dialog with Layer n of node B. For the sake of the example, one could state that this is an application layer dialog which deals with virtual terminal connections and response rates.” *Id.* at col. 9, ll. 37–41. Engel discloses keeping a dialog record that contains, *inter alia*, “the addresses of both ends of the dialog concatenated together to form a single address.” *Id.* at col. 18, l. 63–col. 19, l. 4.

2. Colloff

Colloff describes a memory system comprising a main memory and cache memory. Ex. 1011, Abstract. Colloff explains that

[t]he aim of a cache is to keep the most useful data of a large amount of data in a small, fast memory in order to avoid having

to retrieve the data from the larger, slower main memory. If the required data is in the cache, it is said that a “hit” has occurred; otherwise a “miss” has occurred. The percentage of misses is called the “miss rate.”

Id. at col. 1, ll. 22–28.

3. Level of Ordinary Skill in the Art

Section 103(a) forbids issuance of a patent when “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.”

KSR Int’l Co. v. Teleflex Inc., 550 U.S. 398, 406 (2007) (quoting 35 U.S.C. § 103(a)). Petitioner argues that a person of ordinary skill in the art at the time of the ’646 patent would have had

at least a bachelor’s degree, or equivalent, in electrical engineering, computer engineering, computer science, or a related field or an equivalent number of years of working experience, and one to two years of experience in networking environments, including at least some experience with network traffic monitors, analyzers, and/or firewalls or other intrusion detection systems.

Pet. 2 (citing Ex. 1006 ¶¶ 20–22). Patent Owner argues that a person of ordinary skill in the art would have had “the equivalent of a four-year degree from an accredited institution (usually denoted as a B.S. degree) in computer science, computer engineering or the equivalent and experience with, or exposure to, packet analysis techniques,” as well as “approximately 1–2 years of professional experience with packet network communication protocols.” Prelim. Resp. 22–23 (citing Ex. 2001 ¶ 24). The parties’ proposed definitions are very similar. For example, experience with

“network traffic monitors [and] analyzers” in “networking environments” (Petitioner’s proposed definition) likely would include experience with “packet network communication protocols” and “packet analysis techniques” (Patent Owner’s proposed definition). Based on this record, including our review of the ’646 patent and the types of problems and solutions described in the ’646 patent and cited prior art, we conclude that a person of ordinary skill in the art would have had a bachelor’s degree in electrical engineering, computer engineering, computer science, or a related field (or its equivalent), and one to two years of experience working in networking environments, including at least some experience with network traffic monitors and/or analyzers.⁶ We apply this level of ordinary skill in the art for purposes of this Decision.

4. Analysis

Petitioner relies on Engel as allegedly teaching the majority of the limitations of independent claim 1, and relies on Colloff solely for the “cache subsystem” aspect of claim 1. Pet. 14–37. We focus on one limitation in particular, which is dispositive of Petitioner’s asserted ground. Claim 1 recites “a memory for storing a database comprising flow-entries for previously encountered conversational flows to which a received packet may belong, a conversational flow being an exchange of one or more packets in any direction as a result of an activity corresponding to the flow.” For this limitation, Petitioner argues that Engel’s STATS database is a flow-entry

⁶ We do not include in the definition experience with “firewalls or other intrusion detection systems,” as Petitioner proposes, because the relevant art is network monitoring and analysis. *See, e.g.*, Ex. 1001, col. 1, ll. 35–39.

database that stores “statistics relating to stations and dialogs encountered by the network monitor.” *Id.* at 15. Petitioner contends that, through its packet processing and use of the STATS database, Engel monitors “conversational flows” in two different ways: via “Application Level Dialogs” and “Application-Specific Server Statistics.” *Id.* at 13, 15–27.

At the outset, we note that Petitioner’s arguments are premised on its position that related U.S. Patent No. 6,839,751 B1 (Ex. 1002, “the ’751 patent”)⁷ “provides conversational flow examples where flows are determined and metrics reported ‘for a given application *and either* a specific Client-Server Pair *or* a specific Server and all of its clients.’” Pet. 16 (quoting Ex. 1002, col. 34, ll. 58–60). As Patent Owner points out, however, the cited portion of the ’751 patent relates to tracking various statistics and does not mention conversational flows. *See* Prelim. Resp. 48–49; *see* Ex. 1002, col. 31, l. 52–col. 49, l. 65 (describing “how the monitor of the invention can be used to monitor the Quality of Service (QOS) by providing QOS Metrics”). The specific language quoted by Petitioner pertains to one such metric, “CSTraffic,” which “contains information about the volume of traffic measured for a given application and either a specific Client-Server Pair or a specific Server and all of its clients.” Ex. 1002, col. 34, ll. 55–60. However, we do not see how this language supports Petitioner’s position. Monitoring statistics is not the same as monitoring a conversational flow, which necessarily identifies a “sequence

⁷ The ’646 patent states that the application that issued as the ’751 patent is incorporated by reference. Ex. 1001, col. 1, ll. 25–29. Also, the ’646 and ’751 patents both claim the benefit of U.S. Provisional Patent Application No. 60/141,903, and have some of the same disclosure in their written descriptions.

of packets,” under our interpretation. *See supra* Section I.E. In other words, tracking statistics for a given application between a particular client and server, or between a particular server and all of its clients, is not sufficient in and of itself; a conversational flow identifies a sequence of packets exchanged between two nodes as a result of specific activity (e.g., a “sequence of packets that are exchanged in any direction as a result of an activity”).

We now turn to Petitioner’s two arguments as to how Engel allegedly teaches conversational flows. First, Petitioner contends that Engel teaches “Application Level Dialogs.” Pet. 16–21. Petitioner argues that Engel “considers the nature of the communication (e.g., the application program being invoked) in addition to the Client-Server Pair involved in the communication in identifying an application level dialog, rendering such dialog a conversational flow within the meaning of the ’751 Patent.” *Id.* at 16–17 (citing Ex. 1007, col. 9, l. 27–col. 10, l. 3). Petitioner relies on Engel’s definition of “dialog” as “the exchange of messages and the associated meaning and state that is inherent in any particular exchange at any layer.” *Id.* at 17 (quoting Ex. 1007, col. 9, ll. 24–27). According to Petitioner, Engel discloses “creating and maintaining dialogs” and collecting associated statistics at different layers. *Id.* In particular, Petitioner asserts that the dialog at the application level “is an exchange of one or more packets in any direction between two nodes as a result of an activity (e.g., [a Network File System (NFS)] mount request).” *Id.* (citing Ex. 1007, col. 9, l. 58–col. 10, l. 3). Petitioner concludes that tracking an application level dialog constitutes tracking a conversational flow. *Id.* at 18–19 (citing Ex. 1007, Fig. 7C, showing dialog records that point to dialog statistics data

structures in the STATS database, and corresponding portions of the source code in Ex. 1009).

Petitioner further relies on Dr. Lin's testimony to assert that, to the extent that conversational flows require the tracking of multiple connections, "Engel's application level lookup_dialog routines search for existing dialogs based on application and the client-server IP address pair of the communication." *Id.* at 20 (citing Ex. 1006 ¶ 86). Petitioner also contends, based on Dr. Lin's testimony, that "Engel's deallocation routines deallocate dialog records when the period of inactivity for a dialog address pair (measured from the last time an application-specific packet (e.g., NFS) between the IP address pair of the dialog was seen) has exceeded a defined application-specific threshold." *Id.* at 20–21 (citing Ex. 1007, col. 17, ll. 2–16; Ex. 1006 ¶¶ 106–107).

Patent Owner responds that Engel's dialogs are different from conversational flows because they are merely "collections of statistics for each [Open Systems Interconnection (OSI)] layer across packets (regardless of application origin)" and do not relate packets that are the result of an application activity. Prelim. Resp. 47–48 (citing Ex. 1007, col. 4, ll. 23–32; Ex. 2001 ¶¶ 78–79). For example, noting Petitioner's statement that "[e]ach application level dialog tracks all application activity between the client-server pair occurring on any connections until the dialog data structures are deallocated for reuse," Patent Owner contends that relating all application activity between a client and server is insufficient because a conversational flow requires relating flows for specific application activities. *Id.* at 51–52 (quoting Pet. 20; citing Ex. 2001 ¶¶ 80–81). We agree with Patent Owner.

Engel explains that a “dialog” is

a concept which provides a useful way of conceptualizing, organizing and displaying information about the performance of a network—for any protocol and for *any layer* of the multi-level protocol stack.

As noted above, the basic unit of information in communication is a packet. A packet conveys meaning between the sender and the receiver and is part of a larger framework of packet exchanges. The larger exchange is called a dialog within the context of this document. That is, a dialog is a communication between a sender and a receiver, which is composed of one or more packets being transmitted between the two. There can be multiple senders and receivers which can change roles. In fact, most dialogs involve exchanges in both directions.

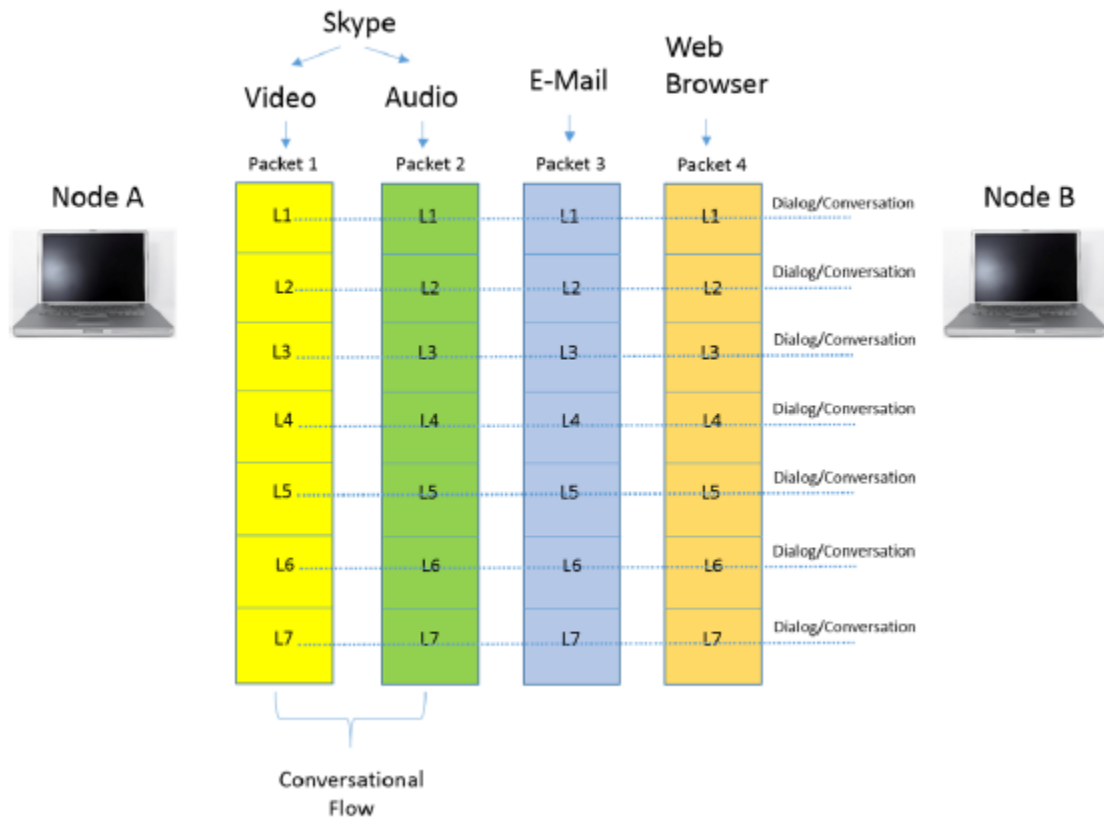
Stated another way, a dialog is the exchange of messages and the associated meaning and state that is inherent in any particular exchange at *any layer*. It refers to the exchange between the peer entities (hardware or software) in any communication. In those situations where there is a layering of protocols, any particular message exchange could be viewed as belonging to multiple dialogs. For example, in FIG. 4 Nodes A and B are exchanging packets and are engaged in multiple dialogs. Layer 1 in Node A has a dialog with Layer 1 in Node B. For this example, one could state that this is the data link layer and the nature of the dialog deals with the message length, number of messages, errors and perhaps the guarantee of the delivery. Simultaneously, Layer n of Node A is having a dialog with Layer n of node B. For the sake of the example, one could state that this is *an application layer dialog which deals with virtual terminal connections and response rates*. One can also assume that all of the other layers (2 through n-1) are also having simultaneous dialogs.

Ex. 1007, col. 9, ll. 9–43 (emphases added).

As shown in Figure 4 (reproduced above in Section II.A.1), Nodes A and B engage in a dialog at each layer (e.g., the application layer). Thus,

Engel monitors communications exchanged between the nodes at a particular layer, and tracks statistics for all communications at that layer (to assist in diagnosing network problems and improving network performance). *See, e.g., id.* at col. 4, ll. 24–32 (Engel “organizes and presents network performance statistics in terms of dialogs which are occurring at any desired level of the communication”). Petitioner, however, does not point to any disclosure in Engel indicating that its disclosed system relates information from one packet to another as pertaining to a specific application activity. In other words, in Engel there is exchange of packets in the application layer constituting a dialog (*see, e.g., id.* at col. 9, ll. 37–43) and collection of respective statistics for that dialog (*see, e.g., id.* at col. 4, ll. 24–32). However, even if application activity causes the dialog to be created, Petitioner does not direct us to teachings or disclosure of identifying a sequence of packets as being part of a specific application activity. Moreover, Patent Owner notes that in Engel “[k]eeping statistics for protocol layers may be temporarily suspended when parsing and statistics gathering is not rapid enough to match the rate of packets to be parsed,” which further suggests Engel does not relate sequences of packets to applications because some packets may be lost. Prelim. Resp. 38 (quoting Ex. 1007, col. 3, ll. 12–14; Ex. 2001 ¶ 74).

Patent Owner provides the following illustration on page 43 of its Preliminary Response:



The figure above depicts four packets exchanged between Nodes A and B, with each row representing a layer of the OSI model. Engel treats each layer separately. For example, packets 1 and 2 may both result from the same application (e.g., video and audio traffic using Skype), but Engel would not link them as being part of a single conversational flow. *See id.* at 43–44, 51–52 (“Engel is not concerned with which application a specific packet originated from or which packets relate to one another based on the application that generated them.”). Patent Owner’s explanation is consistent with the disclosure of Engel and is supported by the testimony of its declarant, Kevin C. Almeroth, Ph.D. *See, e.g.,* Ex. 1007, col. 9, ll. 9–43 (“a dialog is a communication between a sender and a receiver, which is

composed of one or more packets being transmitted between the two,” where, for example, “Layer n of Node A is having a dialog with Layer n of node B”); col. 9, l. 67–col. 10, l. 3 (“If in fact there exists more than one communication thread between Nodes A and B, then these would represent separate, different dialogs.”); Ex. 2001 ¶¶ 65–85.

Petitioner’s position appears to be that conversational flows exist in Engel simply because communications exist at the application layer and because those communications result from some application activity. See Pet. 16–21. As explained in connection with Patent Owner’s illustration above, however, we do not see—and Petitioner does not point to—anything in Engel indicating that it links communications by application (as opposed to by layer and client-server pair) as our interpretation of “conversational flow” above requires. See *supra* Section I.E; Ex. 1003, col. 3, ll. 48–51 (“What distinguishes this invention from prior art network monitors is that it has the ability to recognize disjointed flows as belonging to the same conversational flow.”). Petitioner argues that “Engel’s application level lookup_dialog routines search for existing dialogs *based on application and the client-server IP address pair* of the communication,” citing Dr. Lin’s testimony as support, but Dr. Lin only explains in the cited paragraph how Engel searches for existing dialogs based on the client-server IP address pair, not based on application.⁸ See Pet. 20 (emphasis added); Ex. 1006

⁸ We also note that Dr. Lin explains in his declaration how Engel’s disclosed system works, but does not opine that the reference teaches “conversational flows” or explain how any of the limitations of the claims are taught by Engel. See Ex. 1006 ¶¶ 51–108 (Dr. Lin stating that he “was asked to review Engel and the source code found in Engel’s Appendix VI and to provide an overview of the operation of the Engel packet monitor as

¶ 86. Indeed, Petitioner acknowledges that Engel’s application level dialogs track “all application activity between the client-server pair,” without pointing to any specific disclosure in Engel of tracking activity by application. *See* Pet. 20. Nor are we persuaded by Petitioner’s argument regarding deallocation. *See id.* at 20–21. Engel deallocates dialog records after a period of inactivity “for a dialog address pair,” which does not support Petitioner’s contention that Engel links communications by application (as opposed to simply by layer and client-server pair). *See id.* (citing Ex. 1007, col. 17, ll. 2–16); Prelim. Resp. 52.

Second, Petitioner argues that Engel teaches “Application-Specific Server Statistics.” Pet. 21–27. According to Petitioner, “Engel recognizes disjointed flows as belonging to the same conversational flow by tracking statistics for a given application and a specific Server and all of its clients.” *Id.* at 22. Petitioner argues that

Engel discloses tracking application-specific server statistics (i.e., metrics for a given application and a specific Server and all of its clients). . . . Each application-specific server record includes a dialog link queue with a linked list of all application dialogs in which the server has participated (i.e., dialogs for a given application and a specific Server and all of its clients), and therefore recognizes and links disjointed exchanges associated with a particular application, even if the clients were not the same.

Id. at 22–27 (citing Ex. 1007, Fig. 7B (item 160), col. 18, ll. 41–62, col. 17, l. 32–col. 18, l. 40; Ex. 1009, 179, 245–248; Ex. 1006 ¶¶ 62–69).

disclosed in the Engel patent and the Appendix VI source code”); Prelim. Resp. 46–47. Thus, we determine that Dr. Almeroth’s testimony that Engel does *not* teach “conversational flows” does not create a genuine issue of material fact (which would be viewed in the light most favorable to Petitioner pursuant to 37 C.F.R. § 42.108(c)).

As explained above, however, Petitioner has only shown that Engel links packets (and tracks corresponding statistics) by layer and client-server pair, not by application. Thus, we are not persuaded that Engel links communications “associated with a particular application” as Petitioner contends. *See id.* We agree with Patent Owner and Dr. Almeroth that

[b]ecause Engel considers dialogs unique and does not relate subsequent packets with previously seen packets, Engel is user-agnostic—no effort is made to relate packets to specific application activities. Rather, all packet dialogs at a given OSI level are treated uniformly and are indistinct from one another; any context of who sent the packets or for what purpose is lost under Engel. In essence, each dialog is placed into a single bucket and Engel does not recognize or establish relationships among the dialogs.

Prelim. Resp. 53 (citations omitted); *see* Ex. 2001 ¶ 83.

Engel discloses that in a connection-oriented protocol, once a connection is established, Nodes A and B may have simultaneous *unique* dialogs. Ex. 1007, col. 9, ll. 51–57, Fig. 4. Engel further discloses that in a connectionless protocol, once the communication has begun, it is possible to determine the action requested. *Id.* at col. 9, ll. 58–67. However, if there are multiple communication threads between Nodes A and B, they would be *separate and different* dialogs. *Id.* at col. 9, l. 67–col. 10, l. 3. We see no disclosure in Engel of linking these disjointed dialogs into a “conversational flow.” Petitioner’s cited portions of Engel shed no light on such connections. *See* Pet. 24–25 (citing Ex. 1007, col. 18, ll. 41–62, col. 17, l. 32–col. 18, l. 40). Keeping statistics relating to separate dialogs does not extend to linking unique dialogs, let alone linking them based on a specific application.

For the reasons set forth above, we are not persuaded by Petitioner's arguments as to how Engel allegedly monitors "conversational flows" using the STATS database and, therefore, are not persuaded that Engel teaches "a memory for storing a database comprising flow-entries for previously encountered conversational flows to which a received packet may belong, a conversational flow being an exchange of one or more packets in any direction as a result of an activity corresponding to the flow." Thus, Petitioner has not shown a reasonable likelihood of prevailing on its assertion that claim 1 is unpatentable over Engel and Colloff.

Similar to claim 1, independent claims 7 and 16 each recite a database of flow-entries for previously encountered "conversational flows,"⁹ and Petitioner refers to its analysis of claim 1. *See id.* at 43, 52–53. For the same reasons set forth above for claim 1, we are not persuaded that Engel teaches "conversational flows." Accordingly, Petitioner has not shown a reasonable likelihood of prevailing on its assertion that independent claims 1, 7, and 16, as well as claims 2, 3, 8, 9, 12, 15, and 17–20, which depend from the independent claims, are unpatentable over Engel and Colloff.

⁹ We note that although claim 16 recites "looking up a flow-entry database comprising *none or more flow-entries* for previously encountered conversational flows" (emphasis added), the claim requires "conversational flows" at least due to the language of limitations (d) and (e). Limitation (d) covers the situation where there is an "existing" conversational flow and limitation (e) covers storing a new flow-entry in the database for a "new" conversational flow.

*B. Obviousness Grounds Based on Engel, Colloff, and Baker,
and Engel, Colloff, and Graham-Cumming*

Petitioner contends that claims 10 and 11 are unpatentable over Engel, Colloff, and Baker, and claims 13 and 14 are unpatentable over Engel, Colloff, and Graham-Cumming, under 35 U.S.C. § 103(a). Pet. 54–65. Claims 10, 11, 13, and 14 depend, directly or indirectly, from independent claim 7. Petitioner does not contend that either Baker or Graham-Cumming teaches the “conversational flows” limitation of claim 7. *See id.* Thus, we are not persuaded that Petitioner has established a reasonable likelihood of prevailing on its asserted grounds for the reasons explained above with respect to parent claim 7. *See supra* Section II.A.4.

C. Conclusion

We conclude that Petitioner has not demonstrated a reasonable likelihood of prevailing with respect to at least one claim of the ’646 patent challenged in the Petition. Therefore, we do not institute an *inter partes* review on any of the asserted grounds as to any of the challenged claims.

III. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that the Petition is denied as to all challenged claims of the ’646 patent.

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