

United States District Court,
N.D. California.

3COM CORP,
Plaintiff.

v.

D-LINK SYSTEMS, INC,
Defendant.

and

Realtek Semiconductor Corp,
Intervenor.

3Com Corp,
Plaintiff.

v.

D-Link Systems, Inc,
Defendant.

Nos. C 03-2177 VRW, C 05-0098 VRW

Jan. 26, 2007.

Background: Patentee brought action for infringement of its network-interface-technology patents.

Holdings: The District Court, Walker, Chief Judge, held that:

- (1) "buffer" or "buffer memory" meant a memory for temporary storage of data;
- (2) phrase "coupled with the buffer memory and including a host system alterable threshold store for storing a threshold value" would not be interpreted according to the statutory means-plus-function provision;
- (3) "alterable storage location" meant storage location whose value was changeable;
- (4) "indication signal" meant a signal that indicated a subsequent interrupt;
- (5) term "from the buffer" meant while the packets were in the buffer;
- (6) "logic" limitation was not means plus function limitations; and
- (7) "logic" meant circuitry.

Claims construed.

5,732,094. Cited.

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ORDER

WALKER, Chief Judge.

On April 14, 2006, the court held a claim construction hearing pursuant to *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996). Based on the parties' arguments at the hearing and their submissions, the court issues the following claim construction order, which applies to both of the above-captioned matters.

In the 03-2177 action, plaintiff 3Com Corporation (3Com) originally asserted six network-interface-technology patents against defendant D-Link Systems, Inc (D-Link) and intervening-defendant Realtek Semiconductor Corporation (Realtek): United States patents 5,307,459, 5,434,872, 5,732,094, 6,327,625, 6,526,446 and 6,570,884. 3Com and D-Link have since settled claims in the 03-2177 action, leaving as the Realtek sole defendant in that action. In the 05-0098 action, 3Com asserts the '625 and '884 patents against D-Link. Claims in the '625 patent were construed in conjunction with summary judgement in a prior order. Doc # 206 (05-0098) at 6-15.

As the court writes principally for the parties, it will not discuss the details of the inventions or define terms well-known to those skilled in the art, except as is necessary to construe the claims of the patents.

I

[1] [2] [3] [4] The construction of patent claims is a question of law to be determined by the court. *Markman*, 517 U.S. 370, 116 S.Ct. 1384. The goal of claim construction is "to interpret what the patentee meant by a particular term or phrase in a claim." *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1249 (Fed.Cir.1998). In determining what a patentee meant by a term or phrase, the court looks first to the claim itself:

The claims of the patent provide the concise formal definition of the invention. They are the numbered paragraphs which "particularly [point] out and distinctly [claim] the subject matter which the applicant regards as his invention." 35 USC s. 112. It is to these wordings that one must look to determine whether there has been infringement. Courts can neither broaden nor narrow the claims to give the patentee something different [from] what he has set forth. No matter how great the temptations of fairness or policy making, courts do not rework claims. They only interpret them.

E. I. du Pont de Nemours & Co. v. Phillips Petroleum Co., 849 F.2d 1430, 1433 (Fed.Cir.1988).

[5] [6] [7] "[T]he claims define the scope of the right to exclude; the claim construction inquiry, therefore, begins and ends in all cases with the actual words of the claim." *Renishaw*, 158 F.3d at 1248. "The words used in the claims are examined through the viewing glass of a person skilled in the art." *Brookhill-Wilk 1*,

LLC v. Intuitive Surgical, Inc., 326 F.3d 1215, 1220 (Fed.Cir.2003). The court may, if necessary, consult a variety of sources to determine the ordinary and customary meaning of a claim term, including "the words of the claims themselves, the remainder of the specification, the prosecution history and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms and the state of the art."
Innova/Pure Water, Inc. v. Safari Water Filtration Systems, Inc., 381 F.3d 1111, 1116 (Fed.Cir.2004).

[8] [9] [10] The court begins its construction of claim terms by consulting intrinsic evidence of the meaning of disputed claim terms, which includes the claims, other portions of the specification and the prosecution history. Lacks Industries, Inc. v. McKechnie Vehicle Components USA, Inc., 322 F.3d 1335, 1341 (Fed.Cir.2003). "If upon examination of this intrinsic evidence the meaning of the claim language is sufficiently clear, resort to 'extrinsic' evidence, such as treatises and technical references, as well as expert testimony when appropriate, should not be necessary." Digital Biometrics, Inc., v. Identix, Inc., 149 F.3d 1335, 1344 (Fed.Cir.1998). "[I]f after consideration of the intrinsic evidence there remains doubt as to the exact meaning of the claim terms, consideration of extrinsic evidence may be necessary to determine the proper construction." Id. Although extrinsic evidence such as expert and inventor testimony, dictionaries and learned treatises can shed useful light on the relevant art, extrinsic evidence is "less significant than the intrinsic record in determining 'the legally operative meaning of claim language.'" Phillips v. AWH Corp., 415 F.3d 1303, 1317 (Fed.Cir.2005) (en banc), quoting C R Bard, Inc. v. United States Surgical Corp., 388 F.3d 858, 862 (Fed.Cir.2004).

[11] "[A] court may constrict the ordinary meaning of a claim term in at least one of four ways": (1) "if the patentee acted as his own lexicographer and clearly set forth a definition of the disputed claim in either the specification or prosecution history;" (2) "if the intrinsic evidence shows that the patentee distinguished that term from prior art on the basis of a particular embodiment, expressly disclaimed subject matter or described a particular embodiment as important to the invention;" (3) "if the term chosen by the patentee so deprives the claim of clarity as to require resort to other intrinsic evidence for a definite meaning;" and (4) "if the patentee phrased the claim in step- or means-plus-function format," then "a claim term will cover nothing more than the corresponding structure or step disclosed in the specification, as well as equivalents thereto." CCS Fitness, Inc. v. Brunswick Corp., 288 F.3d 1359, 1366-67 (Fed.Cir.2002) (internal citations and quotation marks omitted).

[12] [13] [14] Limitations from the specification, such as from the preferred embodiment, cannot be read into the claims absent an express intention to do so. Teleflex, Inc. v. Ficosa North America Corp., 299 F.3d 1313, 1326 (Fed.Cir.2002) ("The claims must be read in view of the specification, but limitations from the specification are not to be read into the claims."). And "a construction that excludes a preferred embodiment 'is rarely, if ever, correct.'" C R Bard, Inc. v. United States Surgical Corp., 388 F.3d 858, 865 (Fed.Cir.2004), quoting Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1583 (Fed.Cir.1996).
Conversely:

Where the specification makes clear that the invention does not include a particular feature, that feature is deemed to be outside the reach of the claims of the patent, even though the language of the claims, read without reference to the specification, might be considered broad enough to encompass the feature in question.

SciMed Life Systems, Inc. v. Advanced Cardiovascular Systems, Inc., 242 F.3d 1337, 1341 (Fed.Cir.2001).

[15] "[C]laims should be construed to preserve their validity" only in "cases in which 'the court concludes,

after applying all the available tools of claim construction, that the claim is still ambiguous.' " Phillips, 415 F.3d at 1327, quoting *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 911 (Fed.Cir.2004).

With these legal principles in mind, the court construes the disputed claim language of the patents.

III

Every patent in this litigation relates to network-interface technology, which facilitates the transfer of data between a host device (such as a personal computer) and a network. Data transferred between the host and a network must first be formatted into data "packets" or "frames," which are bits of data that have been packaged for transmission according to standardized network protocols. Network-interface devices that are the subject of the patents contain buffer memory for temporarily storing packets that are being received from the host and transmitted to a network (or vice versa). A particular type of buffer memory that receives, stores and transmits data packets in the order they are received from the host or network is known as a "first-in, first-out" or "FIFO" buffer.

A

The '872 and '094 Patents

The court finds it appropriate to consider these patents together because the '094 patent is a continuation of the '872 patent and because the same terms are disputed in each of these patents. Since the '872 and the '094 patents have nearly identical specifications, the court will cite only the '872 patent to avoid redundancy. The '872 and '094 patents disclose a network-interface with improved buffer memory.

The prior art includes two types of buffers: transmit buffers and FIFO buffers. Transmit buffers can efficiently handle transmission failures because if transfer of a frame fails then "data may be retained in the transmit data buffer until the sending system initiates a second attempt to transmit the frame." '872 patent at 1:44-47. Transmit buffers, however, "suffer[] from the disadvantage that transmission of a frame is delayed until the entire frame has been downloaded into the buffer." Id at 1:58-61. FIFO buffers have relatively high throughput because a data frame can be transmitted out even as it is being received in, but the "data in FIFOs cannot be retained and reused" in case of a transmission failure. Id at 1:49-50. The goal of both inventions is "to provide the advantages of a transmit data buffer, while maintaining the communications throughput available from the simpler FIFO based systems." Id at 2:7-10. The '872 and '094 patents attempt to achieve the advantages of both transmit buffers and FIFO buffers by allowing high throughput as well as efficient retransmission of frames.

1. "buffer" or "buffer memory"

[16] These terms are located in several claims in both the '872 patent and the '094 patent. Doc # 81 at 13-14. The parties dispute whether these terms should be ascribed their ordinary meaning. 3Com proposes the dictionary-derived construction "a memory for temporary storage of data." Id at 13, 19. Realtek proposes the construction "a memory that (1) stores frame data such that the frame data can be retrieved independently of the order in which the frame data were stored and the frame data can always be retained and reused; and (2) is not a first-in-first-out (FIFO) system." Id at 13-14, 19. The primary issue before the court is whether the specification rebuts the presumption that the terms should be ascribed their ordinary meaning.

[17] [18] Realtek contends that the patentee disclaimed FIFO-based systems in the specification.

Specifically, Realtek argues that the specification "explains the shortcomings and problems of prior FIFO-based systems." Doc # 333 at 12. An inventor "may use the specification [intentionally] to [] disclaim or disavow the broad scope of a claim. However, this intention must be clear." *Conoco, Inc. v. Energy & Environmental Intern.*, L C, 460 F.3d 1349, 1357 (Fed.Cir.2006) (internal citations omitted). While the specification does highlight the shortcomings of FIFO-based systems, the specification also lauds the "communications throughput available from the simpler FIFO-based systems." '872 patent at 2:8-10. The specification's mix of praise and criticism is not a "clear disavowal" of FIFO technology.

Realtek further argues that prosecution history supports its proposed construction. Doc # 333 (03-2177) at 15-16. Realtek relies on a statement differentiating the Firoozmand reference from the claimed invention. 3Com stated that the claimed application described a "much more sophisticated control environment than that required by the FDDI system of Firoozmand." Doc # 339 (Gutman decl) (03-2177) Ex F at 5. Realtek argues that this statement distinguishes the claimed invention from a "FIFO-based scheme." Doc # 333 (03-2177) at 16. 3Com argues that this statement, read in context, describes a "CSMA/CD network (such as Ethernet) as more sophisticated than a token ring network" and does not address "the relative sophistication of a FIFO buffer." Doc # 340 (03-2177) at 8. The paragraph in question discusses details related to CSMA/CD networks such as frame transmission, collisions and backoff. Doc # 339 (Gutman decl) (03-2177) Ex F at 5. Viewed in context, the court finds that this statement is unrelated to buffer or buffer memory and has no bearing on construction of the terms "buffer" or "buffer memory."

In addition, Realtek points to the "Vulcan" document the patentee used to "swear behind" the Firoozmand reference. Doc # 333 (03-2177) at 16-17. Realtek concedes that the Vulcan document "shows that the inventors once contemplated using the prior FIFO-based technique of transmitting early a packet once the amount of data in [FIFO] reached a threshold." Doc # 333 (03-2177) at 17. According to Realtek, "understanding that the FIFO disclosed in the Firoozmand and Vulcan prior art could not retain and reuse data frames, the inventors replaced the FIFO with a transmit buffer in order to avoid the major disadvantage of a FIFO." *Id.* As 3Com points out, however, the purpose of "swearing behind" was to show an earlier invention date. Doc # 340 (03-2177) at 8. If the Vulcan document showed a different invention than the claimed invention, the Vulcan document could not be used to prove an earlier date of invention. Rather than disclaiming FIFO-based devices, the prosecution history confirms that use of FIFO buffers in the claimed invention was specifically contemplated by the patentee.

[19] Realtek argues that construing the claims as 3Com suggests would render the claims invalid as reading on prior art or being unsupported by written description. Doc # 333 (03-2177) at 14. Realtek further argues that "[o]ne of the well-established maxims of claim construction is that the claims should not be so broadly interpreted as to read on prior art." *Id.* But the court only applies this claim construction maxim if the disputed claim term is ambiguous.

While we have acknowledged the maxim that claims should be construed to preserve their validity, we have not applied that principle broadly, and we have certainly not endorsed a regime in which validity analysis is a regular component of claim construction. Instead, we have limited the maxim to cases in which "the court concludes, after applying all the available tools of claim construction, that the claim is still ambiguous."

Phillips, 415 F.3d at 1327, quoting *Liebel-Flarsheim*, 358 F.3d at 911. The claim terms at issue are not ambiguous. Both the plain meaning and the prosecution history support the construction that 3Com proposes.

For the reasons stated above, the court adopts 3Com's proposed construction "a memory for temporary storage of data."

2. "falls behind" or "underrun"

The parties initially disputed the meaning of these terms but agreed to a mutually acceptable construction at the Markman hearing. Doc # 360 (03-2177) at 45:22-25; Doc # 340 at 15. The court adopts "a condition in which the receiving of data into the buffer is not keeping up with the transmitting of data out of the buffer."

3. "optimizing the threshold"

[20] This term is found in claim ten of the '872 patent and claim twenty-one of the '094 patent. '872 patent at 31:36-37; '094 patent at 30:32. 3Com proposes "attempting to make the transmission of frames more efficient." Doc # 81 (05-0098) at 17, 23. This proposal is insufficient because it fails to give effect to the "threshold" portion of the term under construction. Realtek adds "dynamically" and "by the host system" to the otherwise appropriate construction "dynamically changing the threshold value by the host system to make it as perfect, effective or functional as possible." Id at 17, 23.

Realtek contends that "dynamically" is required because "using the status information as feedback for the threshold value would be thwarted" if "altering the threshold could be a one-time event." Doc # 333 (03-2177) at 24. Realtek, however, does not argue that altering the threshold a single time would render either claim ten of the '872 patent or claim twenty-one of the '094 patent inoperative. Nor does the specification require multiple alterations, although 3Com could have easily drafted a claim that did require multiple alterations of the threshold value. A person of ordinary skill in the art would conclude the patentee did not intend "optimizing the threshold" to mean altering the threshold value multiple times.

Realtek also includes the term "by the host system," pointing out that the status information is "for use by the host system." Doc # 333 (03-2177) at 24. Again, Realtek does not argue the claims in question are inoperable without this limitation, nor does the specification require usage by the host system. This argument is similarly unpersuasive.

3Com objects to Realtek's language as too "absolutist." Doc # 340 (03-2177) at 14. 3Com argues that "each optimization step is simply an attempt to make the transmission of frames more efficient rather than a dynamic change * * * to make it as perfect, effective or functional as possible." Id at 15 (quotations omitted). When the term is viewed in context, there is no practical difference between these positions. More fully, claim ten recites "feedback for optimizing the threshold." The context of the term clarifies that "optimizing" merely indicates a direction of progress and that perfection need not be achieved. It is irrelevant whether the purpose of the feedback is to make transmission "more efficient" or to "make it as perfect, effective or functional as possible." Both formulations produce the same effect, so 3Com's "absolutist" fears are unjustified. 3Com's objection to Realtek's proposal is unpersuasive.

Aside from the issues noted above, the court finds D-Link's proposal otherwise acceptable. Accordingly, the court adopts the modified construction, "changing the threshold value to make it as perfect, effective or functional as possible."

4. "altering the threshold"

[21] This term is offered for construction only for purposes of the '094 patent and appears in claim forty-

seven. '094 patent at 32:58. The dispute centers not on the phrase as a whole but on the term "altering." 3Com proposes "changing." Doc # 81 (03-2177) at 26. Realtek proposes "dynamically changing." Id.

As discussed above, Realtek suggests "dynamically" to capture the repeated nature of the operation. Doc # 333 (03-2177) at 23-25. Although the specification contemplates practicing the method multiple times, there is no evidence that the specification *requires* practicing the method multiples times or that the method is inoperative if practiced only once.

Because Realtek's construction is flawed and 3Com has not provided any reason why this seemingly simple term must be construed, the court declines to construe the term "altering."

5. "means, coupled with the buffer memory and including a host system alterable threshold store for storing a threshold value, for monitoring the transferring of data of a frame to the buffer memory to make a threshold determination of an amount of data of the frame transferred to the buffer memory"

[22] This term appears only in claim ten of the of the '872 patent. ' 872 patent at 31:16-22. The parties dispute whether "coupled with the buffer memory and including a host system alterable threshold store for storing a threshold value" should be interpreted according to 35 USC s. 112(6). 3Com again argues that s. 112(6) should not apply to this portion of the limitation. Doc # 81 (05-0098) at 53-54. Realtek again argues that s. 112(6) should apply to the entire limitation.

Paragraph six of s. 112 applies to functional language "without the recital of structure, material, or acts in support thereof." 35 USC s. 112. While the claim is somewhat unusual in form, it does appear that the language set off by commas does define structure. The terms "coupled," "buffer memory" and "alterable threshold store" are all structural rather than functional elements. Accordingly, the court holds that "coupled with the buffer memory and including a host system alterable threshold store for storing a threshold value" should not be interpreted according to s. 112(6).

B

The '459 Patent

The '459 patent discloses a "Network Adapter with Host Indication Optimization." The parties dispute four terms in this patent, all of which appear in independent claim 1, which states in full (with the disputed terms underlined):

An apparatus for transferring a data frame between a network transceiver, coupled with a network, and a host system which includes a host processor and host memory, the apparatus generating an *indication signal* to the host processor responsive to the transfer of the data frame, with the host processor responding to the *indication signal* after a period of time, comprising:

a *buffer memory* for storing the data frame;

network interface logic for transferring the data frame between the network transceiver and the *buffer memory*;

host interface logic for transferring the data frame between the host system and the *buffer memory*;

threshold logic for allowing the period of time for the host processor to respond to the *indication signal* to occur during the transferring of the data frame, wherein the threshold logic includes,

a counter, coupled to the *buffer memory*, for counting the amount of data transferred to or from the *buffer memory*;

an *alterable storage location* containing a threshold value; and

means for comparing the counter to the threshold value in the alterable storage location and generating an indication signal to the host processor responsive to a comparison of the counter and the alterable storage location.

'459 patent at 42:42-68.

1. "buffer" or "buffer memory"

Both parties assert that this term should be given the same construction as for the '872 and '094 patents. Realtek argues that the '459 patent "includes the same transmit buffer" and "operates in the same way in the '872 and '094 patents." Doc # 333 at 17. 3Com proposes "a memory for temporary storage of data," the same construction the court applied to the '872 and '094 patents. Doc # 81 (05-0098) at 3; see section III A, supra. The court adopts the same construction as the '872 and '094 patents, "a memory for temporary storage of data."

2. "alterable storage location"

[23] The parties dispute whether this term should be ascribed its ordinary meaning. 3Com offers the dictionary-derived construction "a storage location whose value is changeable." Doc # 81 (05-0098) at 1. Realtek argues that "alterable" does not mean simply "changeable," but rather "*dynamically* changeable." Doc # 333 (03-2177) at 19-21. Realtek thus proposes the construction "a storage location whose value is dynamically changeable." Doc # 81 (05-0098) at 1.

Realtek once again suggests "dynamically" to capture the repeated nature of the operation. For example, Realtek quotes a passage in the specification that status information "may be used by the host processor as feedback for optimizing the threshold value in the alterable storage location." Doc # 333 (03-2177) at 20. Realtek, however, fails to show that repeated nature is *required* by the specification. The word "may" in the quoted passage undermines Realtek's argument by declaring that usage of the status information is optional. Accordingly, the court declines to add "dynamically" to the construction.

Realtek argues that "claims should not be interpreted so broadly as to read on prior art." Doc # 333 (03-2177) at 21. The Federal Circuit has explicitly "limited the maxim to cases in which 'the court concludes, after applying all the available tools of claim construction, that the claim is still ambiguous.'" Phillips, 415 F.3d at 1327, quoting Liebel-Flarsheim, 358 F.3d at 910. Claim one is not ambiguous. Accordingly, the court adopts "storage location whose value is changeable."

3. "indication signal"

[24] 3Com proposes "a signal that indicates a subsequent action, such as an interrupt." Doc # 81 (05-0098) at 7. Realtek proposes "a signal that is not an interrupt but may be used by the host system to generate an

interrupt." *Id.* The dispute revolves around what the indication signal indicates.

In order to evaluate the parties' proposed constructions, it is useful first to understand "interrupt." In the context of computer technology, an interrupt is a "signal to a computer that stops the execution of running program so that another action can be performed." *American Heritage Dictionary of the English Language* (4th ed 2000). It is clear from the specification of the '459 patent that the patentee used the term interrupt in this manner. See '459 patent at 1:49-54. With this ordinary meaning in mind, the court turns to the language of the claims.

Realtek argues that claim five shows that "the indication signal cannot be the interrupt signal; otherwise, the interrupt signal of claim five would have no meaning." Doc # 333 (03-2177) at 18. Claim five reads:

The apparatus of claim 1, wherein the network interface logic includes:

control means for generating an interrupt signal to the host processor responsive to the indication signal and posting status information which may be used by the host processor as feedback for optimizing the threshold value.

'459 patent at 43:31-38. This language shows that the indication signal and interrupt signal are different things. Nothing about this language, however, excludes the possibility that the indication signal and interrupt signal could both be interrupts. Accordingly, the court rejects Realtek's proposed construction.

3Com proposes "a signal that indicates a subsequent action, such as an interrupt." Doc # 81 (05-0098) at 7. The intrinsic evidence shows not only that the indication signal heralds the arrival of a subsequent action, but that this action is an interrupt. Claims five and twenty-two recite "generating an interrupt signal to the host processor responsive to the indication signal." '459 patent at 43:34-46; 44:46-69. Claim thirty-four includes an "indication signal, which reduces host processor interrupt latency." *Id.* at 45:62-63. Claim forty-four, fifty and fifty-two recite "generating an interrupt signal to the host processor, responsive to the early transfer indication signal, which reduces host processor interrupt latency." *Id.* at 47:35-38; 48:31-34. In addition, the specification discloses that it is "desirable to provide a network adapter with an optimized indication signal * * * which reduces interrupt latency." *Id.* at 2:22-25.

Intrinsic evidence demonstrates a sole purpose for the indication signal: indicating the arrival of a subsequent interrupt. Accordingly, the court adopts the construction "a signal that indicates a subsequent interrupt."

4. "means for comparing the counter to the threshold value in the alterable storage location and generating an indication signal to the host processor responsive to a comparison of the counter and the alterable storage location"

[25] The parties dispute whether "generating an indication signal to the host processor responsive to a comparison of the counter and the alterable storage location" should be construed as a "means-plus-function" limitation under 35 USC s. 112(6). 3Com contends that "generating an indication signal to the host processor responsive to a comparison of the counter and the alterable storage location" should not be governed by s. 112(6). Doc # 81 (05-0098) at 53. Realtek contends that s. 112(6) should apply to the entire limitation. *Id.*

[26] The court finds that s. 112(6) applies to "generating" for two reasons. First, "generating" is a function, not a structure. Paragraph six of s. 112 applies to functional language "without the recital of structure, material, or acts in support thereof." In the absence of defined structure, "generating" must fall under s. 112(6). Second, the grammatical structure of the claim suggests generating is to be considered part of single element. Patents, including the '459 patent, are structured with a series of elements separated by semicolons. The patentee could have inserted a semicolon before "generating" to indicate the start of a new element. While not dispositive, the absence of a semicolon suggests that a single limitation prefaced by "means" was intended. "A claim limitation that actually uses the word 'means' invokes a rebuttable presumption that s. 112(6) applies." CCS, 288 F.3d at 1369. Accordingly, the court finds that s. 112(6) applies to the entire term identified above.

C

The '446 Patent

The '446 patent relates to an improved network controller. Network controllers send and receive data over a computer network using standardized network protocols.

Modern network protocols, such as Ethernet, allow participants of a network to send data over the network in bundles known as "frames." These frames represent discrete bundles of data transmitted over a physical wire connection. Frames are often limited in size; network transmissions that exceed this size must be broken up into multiple frames through a process known as segmentation. The ' 446 patent teaches an improved approach to segmentation.

One method of segmentation is to allow the central processing unit (CPU) of the host computer to perform the segmentation in main memory. '446 patent at 1:38-63. This scheme requires the CPU to break a larger chunk of data into smaller chunks for transmission. The advantage of this scheme is that the network interface can be very simple and inexpensive. The disadvantage of this approach is that the segmentation process becomes a bottleneck to performance, preventing high network speeds. Another method of segmentation is to allow the network interface to perform the segmentation in a network buffer. Id at 1:64-2:14. The '446 patent discloses an "improved method and system for providing significantly improved data throughput of a network connection which is used with a high speed network." Id at 2:22-25.

The parties dispute three terms in this patent, two of which appear in independent claim 1, which states in full (with the disputed terms underlined):

A circuit for implementing transmission control protocol segmentation, said circuit comprising:

a segment circuit coupled to receive a descriptor from a host device which corresponds to data, said segmentation circuit utilizes said descriptor to generate a *frame segment descriptor*;

a *data download circuit* coupled to said segmentation circuit to receive said *frame segment descriptor*, said *data download circuit* retrieves said data from a memory; and

a medium access control circuit coupled to said *data download circuit* to receive said data in a frame segment.

'446 patent at 14:13-22. The remaining disputed term, "a descriptor signal which corresponds to data stored

within memory," appears in claim 26. *Id.* at 14:16-17.

1. "frame segment descriptor"

[27] 3Com's proposal of "a descriptor for a frame segment" is of little help, merely reordering the words of the term to be construed. Doc # 81 (05-0098) at 35. Realtek proposes "a descriptor identifying where the corresponding segment is in the host memory." *Id.*

Upon review of the intrinsic evidence, Realtek's proposal appears to describe the frame segment descriptor accurately. "The segmentation circuit utilizes the descriptor to generate other descriptors that describe each frame segment." '446 patent 2 :29-31. This shows that the frame segment descriptors are created from a higher level descriptor. "[D]escriptor queue 206 serves an empty flag along with the stored descriptors to TCP segmentation state machine 208." '446 patent 6 :48-50. If the descriptor must be segmented into frames, the "TCP segmentation state machine 208 creates another set of descriptors wherein each descriptor describes a fragment or a segment of the data file." '446 patent 6 :59-61. Although not described explicitly as "frame segment descriptors" the "set of descriptors" mentioned above are created from higher level descriptors served to the TCP segmentation state machine and are created only when segmentation into frames is required. Accordingly, this "set of descriptors" must be a set of "frame segment descriptors." Each frame segment descriptor "describes a fragment or segment of the data file." '446 patent 6 :60-61. The frame segment descriptors include "pointers to where the data file (payload) is stored within host memory." '446 patent 7 :4-5. Because the intrinsic evidence is consistent with Realtek's proposal, the court adopts "a descriptor identifying where the corresponding segment is in the host memory."

2. "data download circuit"

[28] 3Com proposes "a circuit that retrieves data from memory." Doc # 81 (05-0098) at 31. Realtek proposes "the circuitry that downloads data corresponding to the frame segment descriptor." *Id.* The court looks to intrinsic evidence to ascertain the meaning.

The specification discloses that the "data download circuit [is] coupled to the segmentation circuit to receive the frame segment descriptors." '446 patent at 2:31-33. The specification also discloses that the "data download circuit uses the frame segment descriptor to retrieve the data from memory." '446 patent at 10:60-61. Given this evidence, a person of ordinary skill in the art would interpret the coined term "data download circuit" to refer to a structure that downloads data corresponding to the frame segment descriptor.

3Com objects to Realtek's narrow proposed construction because "sometimes the data download circuit downloads data that corresponds to descriptors that are not frame segment descriptors". Doc # 340 at 19. But claim 26 requires the data download circuit to download data corresponding to a descriptor signal. '446 patent at 14:13-22. If the data download circuit downloads other data, it would not be within the method described by claim 26. Accordingly, the court adopts Realtek's proposed construction "the circuitry that downloads data corresponding to the frame segment descriptor."

3. "a descriptor signal which corresponds to data stored within memory"

[29] 3Com proposes "a descriptor signal which describes data stored within host memory." Doc # 81 (05-0098) at 34. Realtek proposes "a signal indicating where the corresponding data is in the host memory." Doc # 81 (05-0098) at 34.

3Com argues that this term should be given its ordinary meaning. Doc # 340 (03-2177) at 15. Realtek, however, criticizes 3Com's proposal as "so broad as to be meaningless." Doc # 333 (03-2177) at 28. The court agrees that this definition is likely too broad to be helpful.

Realtek argues that "the specification uses 'descriptor signal' and 'descriptor' as synonyms." Doc # 333 (03-2177) at 26. Realtek compares claim twenty-six's statement of "using said descriptor signal to generate a frame segment descriptor using a segmentation circuit" with claim one's statement that "said segmentation circuit utilizes said descriptor to generate a frame segment descriptor." '446 patent at 12:51-53; 14:18-19. This evidence shows that the "descriptor" and "descriptor signal" are closely related. It is not, however, sufficient to show that the "descriptor" and "descriptor signal" are synonyms.

3Com argues that the "first signal" from claim fifteen is the same as the "descriptor signal." Doc # 340 at 16. Given the common designation "signal," the lack of any other signal and the similar function performed by these two signals, the court finds this argument is persuasive. Further, 3Com's position that the "descriptor signal indicates where a descriptor is stored within the host memory" is consistent with the observation above that the descriptor signal and descriptor are closely related. '446 patent at 13:35-36. 3Com's argument, however, appears to support Realtek's proposal. If the "descriptor signal indicates where a descriptor is stored within the host memory," the descriptor signal surely corresponds to the descriptor. Further, the descriptor is stored in host memory. Accordingly, the descriptor signal is "a signal indicating where the corresponding data are in the host memory."

The court is, therefore, in the strange position of accepting 3Com's argument and Realtek's proposal. The court adopts the construction "a signal indicating where the corresponding data are in the host memory."

E

The '884 Patent

The '884 patent discloses a "Receive Filtering for Communication Interface." The parties dispute three terms in this patent, all of which appear in independent claim 1, which states in full (with the disputed terms underlined):

An interface in which packets are received having a plurality of variant formats, and transferred to a host system, comprising:

a first port on which incoming data is received at a data transfer rate;

a buffer, coupled to the first port, storing received packets;

a second port, coupled with the buffer, through which transfer of packets to the host is executed;

a packet filter, coupled to the first port, which identifies packets being stored in the buffer having one of the plurality of variant formats;

first logic coupled with the buffer and the second port, to transfer packets from the buffer to the second port; and

second logic coupled with the buffer, and responsive to the packet filter to read and process data in the

identified packets from the buffer, and to produce a data value dependant on contents of the packet prior to transfer of the identified packets to the second port by the first logic.

'884 patent 11 :8-27.

1. "a buffer, coupled to the first port, storing received packets"

[30] The parties dispute whether the '884 patent is limited to embodiments with a buffer large enough to store more than one packet at a time. 3Com offers the construction "a temporary storage device connected to the first port for received packets." Doc # 81 (05-0098) at 37. D-Link propounds the construction "a temporary storage device connected to the first port that is of sufficient size to store a plurality of received packets." Id at 37-38. Realtek does not propose a specific construction. Id.

D-Link advances several considerations to support its construction. First, D-Link makes much of the fact that the '884 specification usually refers to packets in the plural. See, for example, '884 patent, 1 :66-2 :5 ("In particular, the present invention provides an interface that comprises the first port on which incoming data is received at the data transfer rate of the network, a buffer coupled to the port that stores received *packets*, and a second port coupled with the buffer through which transfer of *packets* to the host is executed." (emphasis added)). The specification's repeated references to "packets" in the plural are simply too tenuous a basis for limiting the scope of claim one. Whether this usage reflects the patentee's intent to claim only embodiments with buffers large enough to store multiple packets at once is, at the very best, ambiguous. For, as 3Com posits, it could be that " 'packets' refers to the obvious fact that multiple packets will go through the claimed device, not to the capacity of a particular component therein to hold more than one packet at once." Doc # 88 at 6.

Accordingly, the court adopts "a temporary storage device connected to the first port for received packets."

2. "read and process data in the identified packets from the buffer"

[31] Only the meaning of "from the buffer" is in dispute. 3Com posits that this term requires no construction because it means precisely what it says, "from the buffer." Doc # 330 (03-2177) at 28. D-Link and Realtek both propose "while the packets are in the buffer." Doc # 81 (05-0098) at 42. The dispute, then, turns on whether data must be processed while in the buffer.

3Com argues that "from the buffer" needs no construction. The word "from" in this claim shows that the buffer is the source of the data to "read and process." 3Com's contends that the term covers "a packet that was once in the buffer." Doc # 340 at 22. D-Link, however, argues that 3Com clearly disclaimed such a broad meaning. D-Link relies upon 3Com's characterization of the invention in the prosecution history that:

The present invention is directed to a network interface which has logic to process packets *in the frame buffer* that are identified by a packet filter as having a particular format, before the packets are transferred to the host processor to which they are addressed.

Doc # 339 (Gutman decl) (03-2177) ex L at 2 (emphasis added). Notably, this is a characterization of the invention as a whole and not an attempt to distinguish a prior art reference. 3Com identifies this statement as referring "to the packets from the packet filter claim element." Doc # 88 (05-0098) at 8. 3Com's argument runs counter to the plain meaning of the statement. In this statement, the packet filter merely identifies packets to be processed. The frame buffer, by contrast, is the disclosed location where processing occurs.

One of ordinary skill in the art would read the characterization of the invention in the statement above as a clear indication that the disclosed invention will "process packets in the frame buffer."

In light of '884 patent's prosecution history, the court construes "from the buffer" to mean "while the packets are in the buffer."

3. "second logic coupled with the buffer, and responsive to the packet filter to read and process data in the identified packets from the buffer, and to produce a data value dependent on contents of the packet prior to transfer of the identified packets to the second port by the first logic"

[32] The dispute turns on the applicability of 35 USC s. 112(6) to this limitation. D-Link contends that the term "logic" fails to recite sufficient structure such that s. 112(6) should apply notwithstanding the presumption against its applicability due to the absence of the words "means for." Doc # 78 (05-0098) at 23-24.

[33] "A claim limitation that actually uses the word 'means' invokes a rebuttable presumption that s. 112(6) applies. By contrast, a claim term that does not use 'means' will trigger the rebuttable presumption that s. 112(6) does not apply." *CCS Fitness*, 288 F.3d at 1369 (internal citations omitted). This presumption is "a strong one that is not readily overcome." *Lighting World, Inc. v. Birchwood Lighting, Inc.*, 382 F.3d 1354, 1358 (Fed.Cir.2004).

D-Link can overcome this presumption by showing that the claim limitation "fails to recite sufficiently definite structure." *Apex Inc. v. Raritan Computer, Inc.*, 325 F.3d 1364, 1372 (Fed.Cir.2003) (quotations omitted). This structure need not be "a single well-defined structure." *Greenberg v. Ethicon Endo-Surgery, Inc.*, 91 F.3d 1580, 1583 (Fed.Cir.1996).

[34] It is appropriate to consult dictionaries in connection with this inquiry. *Linear Technology Corp. v. Impala Linear Corp.*, 379 F.3d 1311, 1320 (Fed.Cir.2004); see also *Apex*, 325 F.3d at 1373. Technical dictionary definitions suggest that the term "logic" itself connotes some structure. See *McGraw-Hill Dictionary of Scientific and Technical Terms*, 1231 (6th ed 2003) (defining "logic" as a "[g]eneral term for various types of gates, flip-flops and other on/off circuits used to perform problem-solving functions in a digital computer"); *IBM Dictionary of Computing*, 396 (10th ed 1994) (defining "logic" as "[t]he systematized interconnection of digital switching functions, circuits or devices").

The Federal Circuit addressed the similar issue of whether "circuit" conveys sufficient structure in *Linear Technology*. 379 F.3d 1311. The limitation at issue was "a first circuit for monitoring a signal from the output terminal to generate a first feedback signal." *Id* at 1320. The Linear court found this limitation to recite "the respective circuit's operation in sufficient detail to suggest structure to persons of ordinary skill in the art." *Id* at 1320-21. The Linear court further stated that when "structure-connoting term 'circuit' is coupled with a description of the circuit's operation, sufficient structural meaning generally will be conveyed to persons of ordinary skill in the art." *Id* at 1320. Because of both the similarity between "logic" and "circuit" and the similarity of the subsequent functional language, the analysis in *Linear* is highly relevant to the construction of claim one.

The difference between the Linear term "circuitry" and the "logic" term in this case is not significant. As previously noted, several technical dictionaries define "logic" in terms of circuits. See *McGraw-Hill Dictionary of Scientific and Technical Terms*, 1231 (6th ed 2003) (defining "logic" as a "[g]eneral term for

various types of gates, flip-flops, and other on/off circuits used to perform problem-solving functions in a digital computer"); *IBM Dictionary of Computing*, 396 (10th ed 1994) (defining "logic" as "[t]he systematized interconnection of digital switching functions, circuits, or devices").

In addition, there is no significant difference between the additional functional language. In the Linear claim, the circuitry is "for monitoring a signal from the output terminal to generate a first feedback signal." Claim one states that the logic is "to read and process data in the identified packets from the buffer, and to produce a data value dependent on contents of the packet prior to transfer of the identified packets to the second port by the first logic." Both claims include specific functional language.

Because of the similarities between the claim addressed in Linear and claim one, the court can see no reason to diverge from the Linear analysis. The term "logic" defines some structure and additional functional language. This functional language is sufficiently detailed "to suggest structure to persons of ordinary skill in the art." *Id.* at 1320-21; see also *PCTEL, Inc. v. Agere Systems, Inc.*, 2005 WL 2206683 (N.D.Cal.2005) ("[S]election logic" did not fall under paragraph six.). Accordingly, the court finds that "logic" does not fall within 35 USC s. 112(6).

[35] Having found that s. 112(6) does not apply, the court turns next to construing the term "logic." 3Com proposes "circuitry and/or programming." Doc # 81 (05-0098) at 48. D-Link proposes "processing resources configured to perform binary tasks where the processing resources operate at speeds slower than the stream of the incoming packet stream." *Id.* at 48-49. Realtek has not submitted a specific proposal.

The specification discloses a network interface:

with limited intelligence, implemented using a relatively slower, and lower cost embedded processor, supported by dedicated hardware logic for the purposes of intercepting certain packets being received via the network. In particular, the present invention provides an interface that comprises the first port on which incoming data is received at the data transfer rate of the network, a buffer coupled to the port that stores received packets, and a second port coupled with the buffer through which transfer of packets to the host is executed.

'884 patent 1 :63-2 :5. This language suggests that the first port and buffer are "dedicated hardware." Claim one discloses that the buffer is "coupled to the first port," suggesting that "coupled" is a hardware-to-hardware connection. *Id.* at 1:13. Claim one also states that the second logic is "coupled with the buffer." *Id.* at 1:22. Use of the word "coupled" with the second logic suggests the second logic is also a hardware component.

Although the invention relates to a "lower cost embedded processor," no such processor is explicitly recited by claim one. The second logic is described in claim one as being used "to process data," suggesting that the second logic is indeed a low-cost processor. Claim two supports this view by stating that the second logic comprises "a general purpose processor module." In viewing all of the intrinsic evidence, 3Com's proposal is impermissibly broad.

While 3Com's proposal is too broad, D-Link's proposal is too narrow. The specification discusses a low-cost processor but does not disclose that such a processor is required. Even if a processor were required, there is no support for a specific performance limitation such as "speeds slower than the stream of the incoming packet stream" as D-Link's proposal imposes.

Although the evidence weighs heavily against a construction of "programming," a construction of "circuitry" was perfectly consistent. Accordingly, the court adopts the modified proposal, "circuitry."

IV

The court has construed all disputed claim terms and phrases of the patents-in-suit. Notwithstanding any further orders the court may make regarding claim construction, this order shall be deemed to be the "claim construction order" for scheduling purposes. The parties shall appear for a case management conference on February 6, 2007, at 2:00 pm.

SO ORDERED.

N.D.Cal., 2007.

3Com Corp. v. D-Link Systems, Inc,

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