Stephen E. Blightman as joint inventors. The application originally was classified in class 364, subclass 200 and assigned to Group Art Unit 237 for examination. The application was filed with 8 original apparatus claims, including independent claims 1 and 4 directed to a "[n]etwork server apparatus for use with a data network and mass storage device," independent claims 5 and 6 directed to "[a] data control unit for use with a data network," independent claim 7 directed to "[a] network node for use with a data network and mass storage device," and independent claim 8 directed to "[a] network file server for use with a data network and a mass storage device."

In a September 8, 1989 Information Disclosure Statement, the applicants brought four U.S. patents to the PTO's attention, indicating that such references may disclose aspects of the prior art apparatus of Figure 1 of the present application.

In a February 22, 1991 Information Disclosure Statement, the applicants brought four further U.S. patents to the PTO's attention.

In a June 11, 1991 Office Action, the Examiner rejected originally filed claims 1-8 as being indefinite in that they contained functional language not supported by the recitation in the claims of sufficient structure to warrant its presence.

The Examiner further rejected claims 1-8 under 35 U.S.C. §103 as being unpatentable over Shipley (U.S. Patent No. 4,819,159). The Examiner found that:

> Shipley discloses a distributed multiprocessor transaction processing system very similar to Applicant's claimed file server processing system. Shipley discloses the various processors, network controller (SIB 240), file controller (UPU 220), storage processor (IOP 230), host processor (RTP 210) and also discloses the buffer memory (cache 444) and DMA (DMA engine 502). It is noted that Shipley does not disclose of the exact same system interconnections as are claimed. However, Shipley does disclose of comparable system interconnection which result in an overall system which functions the same as the claimed system. Such exact interconnections are considered design choices in

> implementing such a disclosed system of Shipley by one of ordinary skill in the art of computer network system design. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to implement the system of Shipley with various interconnection design choices maintaining the function of the system, and thus form a system on which the claims read based on the disclosure of the Shipley reference.

June 11, 1991 Office Action at page 3.

In a December 11, 1991 Information Disclosure Statement, the applicants brought nine further prior art patents to the Examiner's attention.

In a December 11, 1991 Response, the applicants amended claims 2 and 5 and added new claims 9-67. In the Response Remarks, the applicants identified alleged hardware and software support in the application for the claimed subject matter. Additionally, the applicants challenged the legal basis for the Examiner's indefiniteness rejection based upon "functional language."

With respect to the Examiner's prior art rejection under 35 U.S.C. §103, based upon Shipley, the applicants argued that:

> Shipley's system is enormously different from a system according to Applicants' invention which is directed at network file server applications rather than fault tolerant transaction processor applications. Applicants' invention is therefore most useful with a sophisticated network protocol stack, such as NFS (network file system) and RPC (remote procedure calls). Accordingly, Applicants' invention handles the extensive protocol processing requirements which do not even exist in Shipley's system. Since many of the aspects claimed in the present application concern features for handling the protocol stack processing with much greater efficiency and performance than has ever been available before, it will not be surprising that all of Applicants' claims call for elements which Shipley neither discloses nor has any use for.

December 11, 1991 Response at page 38.

The applicants presented various additional arguments as to why Shipley does not disclose the features of various identified claims.

In a March 27, 1992 Final Rejection, the Examiner rejected claims 1-38 under 35 U.S.C. §112, second paragraph, as being indefinite on the same "functional language" ground previously identified in the first Office Action. The Examiner suggested that the applicants insert "means for . . ." for each subfunction to more clearly support the functional language.

The Examiner rejected claims 39, 40, 48 and 51 under 35 U.S.C. §102 as being anticipated by Weisshaar et al. (U.S. Patent No. 4,914,583). The Examiner found that:

> Weisshaar et al. discloses the claimed file server apparatus including a requesting unit capable of issuing calls in a device-independent form (col. 12, line 26), file controller with means to convert to a device-specific form (file management level col. 12, lines 57-68) and a storage processor (disk management level and physical disk layer, col. 12, lines 34-56).

March 27, 1997 Office Action at page 3.

Additionally, the Examiner rejected claims 1, 6, 8, 9 and 31 under 35 U.S.C. §103 as being unpatentable over Johnson et al. The Examiner concluded that:

> Johnson et al. disclose a System and Method For Accessing Remote Files in a Distributed Networking Environment very similar to Applicant's claimed file server processing system. Johnson discloses the various processors, network controller/client node (Client Node B, fig. 5) and interface processed host computer (Server Node A, fig. 5). Note that Johnson teaches a means in client for detecting and satisfying requests in a first classification and for delivering messages and accessing files from a server processing system in response to a second classification. See col. 28, lines 13-51. It is noted that Johnson does not disclose of the exact same system interconnections as are claimed. However, Johnson does disclose of comparable system interconnection which result in an overall system which functions the same as the claimed system. Such exact interconnections are considered design choices in implementing such a disclosed system of Johnson by one of ordinary skill in the art of computer network system design. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to implement the system of Johnson with various interconnection design choices maintaining the function of the system, and thus form a system on which the claims read based on the disclosure of the Johnson reference.

Id. at pages 3 and 4.

Further, the Examiner found that claims 54-67 are allowable, and that claims 2-5, 7, 10-30, 32-38, 41-47, 49, 50, 52 and 53 would be allowable if rewritten in independent form or amended to overcome rejections under 35 U.S.C. §112.

In a June 16, 1992 Response, claims 1-9, 12, 13, 15-17, 21, 31, 33, 34, 36, 39, 48 and 51 have been amended. The applicants indicated that they amended claims 1-7, 13, 15-17, 21, 33, 34, and 36 to address the 35 U.S.C. §112, second paragraph, in the manner requested by the Examiner.

With respect to the prior art rejection based on Weisshaar, the applicants argued that:

> [t]he Examiner states that the Weisshaar apparatus includes a requesting unit capable of issuing calls in a device-independent form, a file controller represented by a 'file management level', a storage processor represented by a 'disk management level' and a 'physical disk layer'. In Weisshaar, however, these four elements are all merely software processes. While Weisshaar indicates that different processes can run on different hardware in the network, Weisshaar contains no suggestion that these particular processes should run on different hardware.
>
> By contrast, one of the primary features of Applicants' invention is that these processes do run on different hardware. As set forth at many points in the subject application, Applicants identified certain specific tasks of a network file server which can be separated to run on different processors running in parallel with each other to thereby greatly enhance file server performance over prior art servers which do not separate such tasks or do not separate such tasks in the same manner.

June 16, 1992 Response at page 36.

Further, with regard to Weisshaar the applicants argued that:

> [t]hus, it is the separation of these processes onto different hardware which yields the performance advantages of Applicants' invention, not the separation of these tasks into different software processes. In Weisshaar, without Applicants' invention, all the bottlenecks

of network protocol processing and file and data transfer processing (referred to at pages 19-20 of the subject application) remain unabated.

Weisshaar, therefore, clearly does not disclose any aspect of Applicants' invention. Weisshaar describes many different types of processes which can run on the various nodes in his network, and indicates that different processes can run on different nodes. That is a far cry from a suggestion that the particular processes selected by Applicants in making the invention, should run on different nodes as the Examiner states.

Id. at page 37.

With respect to the Examiner's rejection based on Johnson, the applicants argued that:

Johnson describes a distributed services program installed on each of a plurality of data processing systems in a network which allows the processors to access data files distributed across the various nodes of the network. If a client node desires to access a file which is located on a server node, then the file is classified dependent upon which nodes have the file open, which processes at each of the nodes have the file open for writes, and which processes at each of the nodes have the file open for reads. Depending on the file classification, the client node will access the file either directly on the server node, or through a client cache within the client operating system. Johnson does not describe the hardware of each node on the network, except possibly to say that they may be conventional personal computers. Johnson, col. 1, 1. 57.

Applicants' invention, by contrast, concerns the structure and operation of a particular one of the nodes which might be attached Johnson's network, in particular, a server node. Thus, Applicants' claim 1, for example, calls for, among other things, a network server which has an interface processor unit which is coupleable to the network; a host processor unit which is also in the network server; and means in the interface processor unit for transmitting certain of the messages received over the network, but not others, to the host processor unit for processing. Johnson neither discloses nor suggests any such separation of duties between two hardware elements such as an interface processor unit and a host processor unit in a server node attached to his network.

Id. at pages 39-40.

In a July 6, 1992 Notice of Allowability, the Examiner allowed claims 1-67.

The '131 patent formally issued on November 10, 1992.

B. PROSECUTION HISTORY OF THE '453 PATENT

The '453 patent was filed on October 13, 1992 as U.S. application Serial No. 07/959,746, naming Row et al. as joint inventors. The application was filed as a continuation of the above-described '131 patent. The application included the eight original claims of the above-described parent application and was assigned for examination in group art unit 2317.

In an October 13, 1992 Preliminary Amendment, the applicants cancelled claims 1-8 and added new claims 9-37, including independent claim 9 relating to a "network server apparatus for use with a data network and mass storage device, independent claim 13 directed to a "network node for use with a data network and a mass storage device," and various claims directed to a network server/network file server.

In October 13, 1992, December 22, 1992 and June 8, 1993 Information Disclosure Statements, the applicants brought certain prior art patents/publications to the PTO's attention.

In June 30, 1993 and September 30, 1993 Information Disclosure Statements, the applicants brought further prior art to the PTO's attention.

In September 27, 1993 and September 29, 1993 telephone interviews, an agreement was reached with respect to claims 9-37. The Examiner informed the applicant that claims 9-37 would be rejected on obviousness-type double patenting grounds over the '131 patent. The applicant agreed to file a Terminal Disclaimer in compliance with 37 C.F.R. §1.321(b) to overcome this rejection. When an application claims an invention which is not patentably distinct from an invention claimed in a

commonly owned patent, a double patenting rejection such as was referenced by the Examiner is appropriate. However, a judicially created double patenting obviousness-type double rejection may be obviated by filing a terminal disclaimer in accordance with § 1.321(c). In a terminal disclaimer, the applicants disclaim the terminal portion of the subject patent term which would have extended beyond the expiration date of the commonly owned, earlier issued patent.

On October 1, 1993, a Terminal Disclaimer was filed.

In a January 12, 1994 Office Action, the Examiner rejected claims 9, 14, 31, 32 and 37 under 35 U.S.C. §102(a) as being anticipated by Osadzinski, the Network File System. The Examiner found that Osadzinski disclosed the claimed network file server which performs protocol processing up through the NFS layer as is claimed. The Examiner found that claims 13 and 15-30 are allowable and that claims 10-12 and 33-36 would be allowable if rewritten in independent form.

In a March 30, 1994 Response, the applicants amended claims 9 and 14, cancelled claim 37 and added new claims 38-47. In the Response Remarks, the applicants indicated that claim 37 was cancelled in favor of new claims 38-47. With respect to the Osadzinski reference and the new claims, the applicants indicated that:

> In connection with these claims, the Examiner's attention is respectfully drawn to page 46, col. 1, line 20 of Osadzinski, where it is stated explicitly that in the conventional arrangement which Osadzinski teaches, 'NFS is integrated with the kernel of Sun's operating system, which is derived from the University of California at Berkeley's 4.2BSD version of the UNIX operation system.' Thus, as in conventional NFS installations, Osadzinski fails to teach the negatives called for in claims 38, 42, 44 and 46.

March 30, 1994 Response, at page 21.

In a June 8, 1994 Notice of Allowability, the Examiner allowed claims 9-36 and 38.

The '453 patent formally issued on October 11, 1994.

In a May 23, 1997 Disclaimer, the applicants disclaimed and dedicated to the public claims 33, 35 and 37 of the '453 patent.

C. PROSECUTION HISTORY OF U.S. APPLICATION SERIAL NO. 08/320,451 (WHICH MATURED INTO THE '366 PATENT)

The '366 patent was filed on October 11, 1994, as application Serial No. 08/320,451, naming Edward J. Row, Laurence R. Boucher, William M. Pitts, and Stephen E. Blightman as joint inventors. The application was filed as a continuation of the above-described application Serial No. 07/959,746, which matured into the '453 patent, which is a continuation of application Serial No. 07/404,959, which matured into the '131 patent. The application was classified in class 395 and was assigned to Group Art Unit 2317 for examination. The application was filed with the same eight original claims described above filed in conjunction with the original '131 patent parent application.

In two January 23, 1995 Information Disclosure Statements and a February 10, 1995 Information Disclosure Statement, the applicants brought various prior art references to the attention of the PTO.

In a March 1, 1995 Preliminary Amendment, originally claims 1-8 were cancelled and new claims 9-25 were added. Independent claim 9 was directed to "apparatus for use with a data network and mass storage device" comprising a combination of "first and second processing units." Independent claims 13 and 18 were directed to a

"network file server," and independent claim 22 was directed to a "method for processing requests from a data network, for use by a network file server."

In an August 1, 1995 Supplemental Preliminary Amendment, new claims 26-28 were added.

In an March 15, 1996 Office Action, claims 9-28 were rejected on obviousness type double patenting grounds in light of claims 1-38 of the '453 patent and claims 1-67 of the '131 patent.

In a May 20, 1996 Response, the applicants submitted a Terminal Disclaimer to disclaim the portion of the term of the subject application which would have extended beyond the expiration of the '453 patent and a Terminal Disclaimer for disclaiming the terminal portion of the subject application which would have extended beyond the term of the '131 patent.

In a May 29, 1996 Supplement Response, claims 18 and 25 were amended.

In a June 13, 1996 Notice of Allowability, the Examiner allowed claims 9-28.

In a January 10, 1997 Communication from the PTO, prosecution was reopened.

In a January 22, 1997 Office Action, claims 9-26 were rejected on obviousness-type double patenting grounds over claims 8 and 10-13 of U.S. Patent No. 5,485,579. The Examiner found that:

> [a] comparison of claims 9-26 of the instant application with for example claims 8 and 10-13 of the '579 Patent reveals the overlapping patent coverage being extended by the application claims. Claims 13 and 16 of the instant application for example recite 'a network file server' which has overlapping coverage with claims 8 and 10-13 of the '579 Patent. The Patent claims cover the more specific application claims because of the 'comprising' and 'including' format of the claims and common disclosures of the Patent and application. The 'means for encoding and decoding' recited in claims 13 and 16 of the instant application are covered by the recitation of 'network means' in claims 8 and 10-13 of the '579 Patent

because the 'comprising' format of claims 8 and 10-13 of the '579 Patent includes the more specific limitations disclosed in the application but not specifically recited in the patent claims.

The '579 Patent discloses encoding and decoding as a means for sending and receiving messages.

Claims 8 and 10-13 of the patent for example broadly recite an 'network means', 'storage means' and 'file system means' which also covers the more specific recitations in claim 26 of the application directed to 'a network interface', 'a file server processor' and a 'mass storage device'. The patent claims cover the more specific claim 26 because of the 'comprising' format of the claims and common disclosures of the Patent and application. The '579 patent in claim 8 recites the 'network interface means' for processing data packets (requests).

The '579 disclosure in regard to the network interface means is the same as the instant application in regard to messaging and requests.

In the '579 patent, the client requests can go directly to a file controller independently of the Unix host. This is one of the claimed features of the instant application which is also broadly claimed in the '579 patent.

The claims in both the patent and the application are directed to the **same disclosed embodiments**. Claims 27 and 28 of the instant application are directed to an embodiment not disclosed in the Patent and as such are not subject to a double patenting rejection. The 'parallel bus' **which couples the network interface to the dedicated file server processor**, does not appear in the '579 Patent.

January 22, 1997 Office Action at pages 3 and 4.

The Examiner concluded that the subject matter recited in the claims of the instant application is fully disclosed in the patent and covers the same subject matter covered by claims 8 and 10 - 13 of the patent.

In a July 21, 1997 Response, the applicants submitted a Terminal Disclaimer to obviate the Examiner's double patenting rejection.

In a September 3, 1997 Notice of Allowability, the Examiner allowed claims 9-28.

The '366 patent formally issued on September 1, 1998.

V. PROSECUTION HISTORY OF APPLICATION SERIAL NO. 08/902,790 (WHICH MATURED INTO THE '918 PATENT)

The '918 patent was filed on July 30, 1987 as U.S. application Serial No. 08/902,790, naming Row et al. as joint inventors. The application was filed as a continuation of parent application Serial No. 08/320,451 (which matured into the '366 patent) and included the same eight original claims as were filed therein.

In a July 30, 1997 Preliminary Amendment, original claims 1-8 were cancelled and new claims 9-24 were added including apparatus and method claims related to a "network file server".

In a June 2, 1998 Office Action, the Examiner rejected claims 9-24 on obviousness-type double patenting grounds in light of claims 1-38 of the U.S. Patent No. 5,355,435 and/or over claims 1-67 of U.S. Patent No. 5,136,131. Additionally, claims 9-24 were provisionally rejected on obviousness-type double patenting grounds over claims 1-20 of copending application Serial No. 08/320,451.

In a September 22, 1998 Response, the applicants submitted a Terminal Disclaimer to obviate the Examiner's obviousness-type double patenting rejections.

In a November 18, 1998 Office Action, the Examiner rejected claims 9-24 on the same obviousness-type double patenting grounds as in the prior Office Action. The Examiner noted that the filed Terminal Disclaimer was not proper because it contained no documentary evidence of the chain of title from the original inventors to the Assignee.

In a January 19, 1999 Response, the applicants submitted a Terminal Disclaimer addressing the issues raised by the Examiner.

In a February 3, 1999 Information Disclosure Statement, the applicants brought a prior art Japanese reference to the PTO's attention.

In a February 24, 1999 Notice of Allowability, the Examiner allowed claims 9-24.

The '918 patent formally issued on August 3, 1999.

VI. DUTY OF DISCLOSURE

I may testify about a patent applicant's duty of disclosure owed to the PTO. Dating back at least as early as 1945, the U.S. Supreme Court mandated that a patent applicant has an "uncompromising duty" to disclose material facts bearing on patentability to ensure that a patent springs from a background free from fraud or inequitable conduct. Later, in the 1950's, the then Court of Customs and Patent Appeals emphasized that, in dealing with the PTO, patent applicants must not regard proceedings as adversarial proceedings and that it is essential to the existence of the patent system in this country that patent applicants disclose to the Patent Office material information bearing on patentability. In 1977, such preexisting case law was codified by the PTO and identified as original PTO Rule 56. 37 C.F.R. § 1.56.

Original Rule 56 and Rule 56, as amended in March of 1992 require, *inter alia*, that all persons substantively involved in patent application preparation or prosecution disclose to the PTO "material" prior art or information of which they are aware.

Prior art or information is defined in original Rule 56 as being "material" if there is a substantial likelihood that a reasonable patent examiner would consider it important in deciding whether to allow the patent application to issue. To be "material," prior art or information need not necessarily render any claim unpatentable.

The March 1992 revision to Rule 56 defines prior art or information as being material if, *inter alia*, it establishes, either by itself or in combination with other information, a "prima facie case of unpatentability" of at least one patent claim. In my opinion, revised Rule 56 presents examples of prior art or information which would have been considered important to a reasonable examiner and therefore "material" under original Rule 56 (though original Rule 56 is not restricted to those examples). For example, non-cumulative prior art or information which establishes a "prima facie case of unpatentability" necessarily would have been important to a reasonable patent examiner.

"Material" information is not limited to prior art. Thus, the duty of disclosure embraces both prior art and other information which is material to patentability, e.g., presents a *prima facie* case of anticipation or presents a *prima facie* case of obviousness when considered alone or in combination with other information.

In order for an applicant's duty of disclosure to be triggered, it is only necessary for the prior art or information to be material to one claim in a patent. If a court finds that such material prior art or information was withheld from the PTO resulting from an intent to deceive or mislead the PTO, then the entire patent including all its claims should be held to be unenforceable.

In assessing "materiality," claim language should be given its "broadest reasonable interpretation" consistent with the specification.[1] See current Rule 56. It

[1] During patent examination, pending claims must be interpreted by patent examiners as broadly as their terms reasonably allow. A broad interpretation of a claim by a PTO Examiner is viewed by the PTO as reducing the possibility that the claim, when issued, will be interpreted more broadly than is justified or intended. See Manual

should be understood that the "broadest reasonable interpretation" may differ from the proper claim construction to be applied during a patent infringement litigation. The "materiality" opinions stated herein should not be interpreted as an expression of any opinion on claim construction issues.

The duty of disclosure is owed by each of the applicants, the patent attorney(s) handling the application preparation or prosecution, and any other individuals substantively involved in the preparation or prosecution of a patent application. The duty begins when a patent application is filed and does not end until the patent application issues.

Revised Rule 56 expressly codifies the notion that information is material if it "refutes or is inconsistent with, a position the applicant takes in 1) opposing an argument of unpatentability relied on by the Office or 2) asserting an argument of patentability." A reasonable patent examiner would find such information important in deciding whether to allow a patent application to issue.

An integral part of the duty of disclosure is a duty of reasonable inquiry. Once an attorney or an applicant or any other individual having a duty to disclose has notice that information exists that appears to be material, that person cannot ignore that notice in an effort to avoid his or her duty to disclose.

There can be no question that a non-cumulative prior art reference is "material" (under either of the two above-identified tests for "materiality") if a reasonable patent examiner would have rejected a patent claim based on the prior art reference on either

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of Patent Examining Procedure, SECTION 2111 Claim Interpretation; Broadest Reasonable Interpretation.

"anticipation" grounds under 35 U.S.C. §102, or obviousness grounds under 35 U.S.C. §103.[2]

An examiner should reject a claim under 35 U.S.C. §102 as being anticipated by a prior art reference if the prior art reference discloses each and every element of the claim. The disclosure may be express, but need not be, provided that the elements not expressly disclosed are inherently disclosed.

An examiner should reject a claim under 35 U.S.C. §103 on obviousness grounds if the collective teachings of the prior art would have suggested the claimed invention to a person of ordinary skill in the art. In an obviousness analysis, examiners are required to determine the scope and content of the prior art; ascertain the differences between the prior art and the claims at issue; resolve the level of ordinary skill in the pertinent art; and consider objective evidence of obviousness or non-obviousness.

For the reasons set forth below, I expect to testify that, based in part on my experience as a former PTO examiner and relying in part on BlueArc's technical expert, material prior art or information was not disclosed to the PTO during the prosecution of the applications which ultimately matured into '037 patent-in-suit.

In my opinion, Cheriton, "The V Kernel: A Software Base for Distributed Systems," April 1984 (the 1984 Cheriton article) is material prior art which was not disclosed to the PTO during the '037 patent prosecution history. This article was known to the inventors during the pendency of the '037 patent as evidenced by the citation in

[2] The opinions expressed herein that certain prior art or information is material holds true whether the Court ultimately finds applicable the "materiality" standard of original Rule 56 or the standard of amended Rule 56.

the inventors' article "Using UNIX as One Component of a Lightweight Distributed Kernel for Multiprocessor File Systems" by David Hitz, Guy Harris, James K. Lau and Allan Schwartz, 1990. The Cheriton '84 article was cited in the context of the inventors stating that

> "these principles are by no means new to FMK. Most of the fundamental ideas were originally developed in Thoth, from which the V Kernel and Port are also derived. [Cheriton 79, Cheriton 84]." Hitz et al. at page 290.

The Cheriton '84 article is prior art as a Section 102(b) printed publication. Additionally, the article indicates that the V kernel was in public use more than one year prior to the '037 patent application's effective filing date since is states that the

> "V kernel has been running at Stanford University since September 1982, and has been in operation in several companies and other universities over the past year."

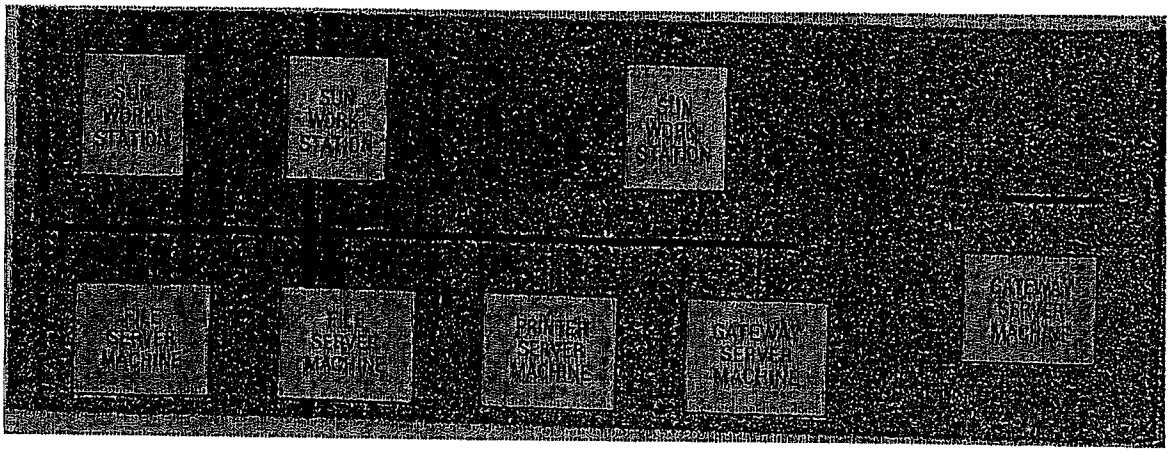
In my opinion, relying in part on the defendant's technical expert, such a disclosure suggests that further documentation, such as an operations manual, describing the details of the V kernel was available for citation to the PTO during the '037 patent prosecution history. In fact, the Cheriton '84 article cites, at page 19 footnote 4 (see the quote below) , Berglund et al., V-System Reference Manual, Computer Systems Laboratory, Stanford University. Further, to the extent that the inventors or any other individual having a duty to disclose were aware of the existence of V-System reference manuals such as the above-cited V-System Reference Manual or the "V-System 6.0 Reference Manual," June 1986 (contributing authors including Berglund and Cheriton), such reference manuals are likewise a material prior art reference which should have been disclosed to the PTO for at least the reasons identified below.

In my opinion, relying in part on the defendant's technical expert, a reasonable patent examiner would have rejected at least claims 1 and 7 of the '037 patent under 35 U.S.C. §102 as being anticipated by the Cheriton '84 article for the exemplary reasons which follow.

Turning to the claim 1 preamble, the Cheriton article describes a "computer system employing a multiple facility operating system architecture" since, at page 19, it indicates that

> the V kernel is used by the Stanford Distributed Systems Group as a base for the distributed V System,[4] which currently supports a fairly complete distributed operating system environment, including printer server, file server, virtual graphics terminal server, Internet server, editors, command interpreter, interactive debugger, and numerous utilities.

With respect to the "plurality of processor units provided to co-operatively execute a predetermined set of operating system peer-level facilities," relying in part on BlueArc's technical expert, as shown in the Figure 1 block diagram below, the Cheriton article describes a computer system having a plurality of processor units, e.g., a file server, printer server and gateway server machines.



Relying in part on the defendant's technical expert, each processor executes "a predetermined set of operating system peer-level facilities," since each server includes facilities for performing its respective file server, printer server or gateway server tasks. Further, the Cheriton article indicates that "the V kernel is referred to as *distributed* because its facilities are available uniformly and transparently across multiple machines connected by a local network . . . having each machine run a separate, complete copy of the kernel." *Id.* at page 20.

Relying on defendant's technical expert, the V domain of local network-connected machines shown in Figure 1 results in each processing unit being "associated with a respective one of said operating system peer-level facilities and not another of said operating system peer-level facilities, and wherein each of the operating system peer-level facilities constitutes a respective separately executed software entity having a respective distinct set of peer-level facility related functions." Such is the case since, for example, the file server includes peer-level facilities relating to file server functionality while the printer server includes printer server related functions which are separate and distinct from the file server functions performed by the file server machine.

With respect to each processor being "capable of executing a control program" and including "a memory store capable of storing said control program," relying in part on defendant's technical expert, the V Kernel includes such processors and memory since as described in the Cheriton article "[t]he V kernel implements transparent message-based communication between processes executing on machines....is implemented on a collection of MC68000-based Sun workstations interconnected by a 3M-byte or 10M-byte Ethernet." *Id.* at page 19.

With respect to the claim 1 limitation of "storage of a first control program portion that includes a one of respective distinct sets of operating system peer-level facility related functions," relying in part on the defendant's technical expert, the V kernel-based system described in the Cheriton article inherently includes such a control program having operating system peer-level facility related functions by virtue of the operating system software necessary for managing file server related application programs executed by the Figure 1 file server or, the operating system software necessary for managing printer server-related application programs for controlling printing operations executed by the Figure 1 printer server.

With respect to the "second control program portion that provides for the implementation of a multi-tasking interface function," as stated in the Cheriton article, each of the machines shown in Fig. 1 runs "a separate complete copy of the kernel." *Id.* at page 20. The Cheriton article indicates that "the kernel has three major components: interprocess communication, kernel server and device server." *Id.* Relying on the defendant's technical expert, the claimed "multi-tasking interface functionality" corresponds to the "interprocess communication" portion of the kernel which is run on each of, for example, the file server machine, and the printer server machine.

The claimed "multi-tasking interface function" is required to be responsive to control messages for selecting for execution a one of the peer-level facility functions. Relying on the defendant's technical expert, in the V kernel system such selection for execution occurs in response to control messages which are sent and received as described in the Cheriton article. As indicated on page 21, in describing the interprocess communication portion of the V kernel, it is indicated that the major

facilities provided by the V kernel are "processes and communication between processes." Relying on defendant's technical expert, interprocess communication involves identifying a process utilizing a control message that includes "a 32 byte globally unique process identifier, or PID." *Id.* at page 21. The Cheriton article indicates that "processes communicate by messages. The sender and receiver of a message are specified by their PIDs." *Id.*

With respect to "selecting for execution a one of said peer-level facility functions for execution," relying on defendant's technical expert, such functionality is accomplished by V kernel interprocess communication which "provides a network transport mechanism suitable for implementing RPC [remote procedure calls]." *Id.* at page 23. The Cheriton article indicates that a server includes a "message interface" which enables a client to invoke "a procedure for a server and waiting for its completion, the server must schedule and respond to multiple concurrent requests." *Id.* at page 24.

Relying on defendant's technical expert, the Cheriton article describes "providing control messages to request or in response to the performance of said predetermined peer-level facility related functions of another operating system peer-level facility." For example, the Cheriton article describes that "often a process needs to discover the PID of a server process that provides a certain service or function." *Id.* at page 26. In describing that, for example, a process may need to locate the file server known as "Diablo" for performance of a file server-related function, the Cheriton article indicates that the process executing as the Diablo file server would register using an ID in the group of file servers. *Id.* Thus, the Cheriton article indicates that

> "a process wishing to locate Diablo sends a message to the server group, specifying Diablo in the message, which prompts the server process to send a

reply identifying itself. Using these techniques, a process can discover both the processes it is to work with as well as the server processes from which it can obtain particular services. *Id.* at page 27.

Relying on the defendant's technical expert, such control messages as are used in the V kernel system permit one operating system peer-level facility to request the performance of, for example, a file server related function from a file server, i.e., another operating system peer level facility.

With respect to the claimed "communication bus" that provides for the interconnection of said plurality of processor units, relying on defendant's technical expert, Cheriton's Figure 1 local network bus corresponds to this communication bus. In addition, the Cheriton article indicates that the collection of Sun workstations which may be used to implement transparent message-based communication are interconnected via an Ethernet network. *Id.* at page 19.

Relying in part on the defendant's technical expert, the analysis above applied to claim 1 is likewise applicable to the '037 independent claim 7, where the plurality of processors correspond to, for example, the Figure 1 file server and printer server and the multi-facility operating system having a kernel and providing for the message- based cooperative operation of said plurality of processors corresponds to the distributed V kernel with its interprocess communication as described above.

THE CHERITON 1984 ARTICLE IS ALSO MATERIAL SINCE PATENTABILITY ARGUMENTS MADE TO THE PTO COULD NOT HAVE BEEN MADE WITH RESPECT TO THIS ARTICLE

In addition to the 1984 Cheriton article being material to the '037 patent because it presents a *prima facie* case of unpatentability (and, hence, also would have been important to a reasonable examiner), it is also material because it "refutes or is

inconsistent with, a position the applicant takes in 1) opposing an argument of unpatentability relied on by on the Office or 2) asserting an argument of unpatentability." See Rule 56, March 1992.

During the above-described prosecution history of the '037 patent, arguments were presented to the PTO with respect to deficiencies of the prior art that could not have been made with respect to the 1984 Cheriton article. These arguments arose in at least the following contexts.

In a June 26, 1997 Amendment in application Serial No. 08/473,244, in response to the Examiner's December 26, 1996 rejection of claim 1 under 35 U.S.C. §103 as being obvious in view of Johnson in view of Weber, the applicants argued that:

> [c]onversely, claim 1 as now amended calls for a plurality of processor units that execute a predetermined set of peer-level facilities. Each of the processor units 'is associated with [a] respectively distinct peer-level facility and wherein each of said peer-level facilities includes a respective distinct set of peer-level facility related functions.' Thus, for at least the plurality of processors, each performs a mutually exclusive peer-level facility of the operating system itself.
>
> Nothing in Weber, et al. or Johnson, et al. teaches or suggests the execution of distinct operating system peer-level facilities on separate processors to obtain an instantiation of the operating system itself. Thus, neither Johnson, et al. nor Weber, et al. individually or in combination teach or suggest the claimed invention as now set forth in claim 1. Reconsideration of the rejection of claim 1 is therefore respectfully requested.

June 26, 1997 Amendment at page 7.

Similarly, arguments for patentability were made in parent application Serial No. 07/404,885, which was filed on September 8, 1989, regarding the Zave reference as to the absence of peer-level facilities. For example in response to the Examiner's anticipation and obviousness based rejections, the applicants argued that:

> [e]ach processor within the disclosed computer system is required to execute its own complete and substantial operating system. In each instance, the operating system provides for the separate execution of multiple tasks. At least one task is dedicated to the execution of what the reference describes as a 'shared image'. Within the context of the disclosure provided by the reference, it is understood that this shared image constitutes an application layer communications program utilized by each of the processors to communicate, in some form, via the communications bus. The specific nature of the communication does not appear to be described....
>
> Consequently, the individual computer systems of the Zave reference do not implement peer-level facilities, as that term is defined in the present specification. Further, the shared image as described in the reference is not equivalent to the multi-tasking interface function limitation of Claim 1, as that term is defined in the present specification. The multi-tasking interface function exists in lieu of the core portion of an operating system.
>
> Accordingly, Claim 1 is not anticipated under 35 U.S.C. §102(b) in view of the Zave reference.

Serial No. 07/404,885, July 26, 1991 Amendment at pages 12 and 13.

Similarly, with respect to claim 1 and newly added claims, the applicants argued that:

> [n]owhere does Zave teach or in any way suggest the use of peer-level facilities -- instantiations of component portions of an operating system provided as separately executing entities on respective processors.

Id. at page13. Also, see the similar peer-level facilities-related arguments regarding Zave and the *Weisshaar et al* reference during the '579 patent prosecution history.

Relying in part on the defendant's technical expert, these arguments could not have been made with respect to the 1984 Cheriton article since the Figure 1 file server and the printer server each execute distinct peer-level facilities respectively relating to file server and printer server functionality on separate processors. For example, the

Cheriton article describes these servers being used in a "distributed operating system environment" by stating that:

> the V kernel is used by the Stanford Distributed Systems Group as a base for the distributed V System,[4] which currently supports a fairly complete distributed operating system environment, including printer server, file server, virtual graphics terminal server, Internet server, editors, command interpreter, interactive debugger, and numerous utilities.

'84 Cheriton article at page 19.

Similarly, with respect to the patentability of new claim 7 in application Serial No. 08/473,244, the applicants argued that:

> [n]ew claim 7, and its dependant claims, are distinguished from the cited prior art by the specification that 'each of said plurality of facilities implements a multi-tasking interface coupleable between said communications bus and a respective and unique peer-level control function set to permit message transfer between each of said plurality of facilities.' Thus, claim 7 effectively requires an asymmetric implementation of operating system facilities by the plurality of processors. The cited prior art of Johnson, et al., Weber, at al., and Chung clearly fail to in any way suggest or teach anything other than the communication of requests between logically symmetric operating systems instantiated by separate computer systems. This claimed combination is not taught or suggested by the cited prior art.

June 26, 1997 Amendment at page 8.

Relying on the defendant's technical expert, for example, the file server and printer server peer-level facilities involves an asymmetric implementation in the Cheriton V kernel distributed system. For example, relying on the defendant's technical expert, the operating system "process executing as the Diablo file server" referenced at page 26 and 27 of Cheriton would not be symmetrically implemented in each system server, e.g., the printer server. Thus, the '84 Cheriton article is inconsistent with the above claim 7 argument for patentability.

Further, in a July 29, 1999 Response to the Examiner's prior art rejection of claims 1-13 based on Ousterhout, with respect to the patentability of independent claim 1, the applicants argued that :

> [i]n other words, the claim calls for the 'set of peer-level facility related functions' supported on one of the processor units to be distinct from the 'set of operating system peer-level facility related functions' supported on another of the processor units.
>
> Ousterhout's system, on the other hand, describes the complete antithesis of this feature. Throughout Ousterhout's paper, he assumes that all of the workstations on the network which share in certain features of the Sprite operating system such as transparency of the network file system and migration of processes between workstations, all run the same Sprite operating system. This can be seen from a number of specific comments within the document.

July 29, 1999 Response at pages 2-3.

The applicants also argued that

> [t]here is no suggestion anywhere in Ousterhout that different ones of the participating workstations include distinct sets of operating system peer-level facility related functions. *Id.* at page 4.

The applicants also disagreed with the Examiner's conclusion that "it is not clear whether the respective functions in Ousterhout are distinct from each other." Rather, the applicants argued that

> "it is abundantly clear that the sets of operating system functions available on each of the participating workstations in Ousterhout are the same, and not distinct." *Id.*

For the reasons set forth above, relying on the defendant's technical expert, these arguments could not have been made with respect to the 1984 Cheriton article.

VII. OTHER TESTIMONY

To the extent that discovery is not yet complete, it may become necessary to refine and supplement my opinions particularly with respect to the duty of disclosure

section. My opinions may require supplementation in view of any other additional information that may come to light or in view of any expert reports from the Plaintiff. I reserve the right to submit a rebuttal report to address such information. I may also testify about matters: (1) raised on direct or cross-examination at trial; (2) necessary to rebut any other matters that the Court allows the Plaintiff to introduce or rely upon; or (3) otherwise raised at trial by counsel or the Court in relation to matters set forth herein. In addition to the items identified above, my testimony may also be based, in part, upon the trial testimony of fact witnesses and other expert witnesses.

VIII. DOCUMENTS AND INFORMATION CONSIDERED

In formulating the opinions expressed above and in conducting an analysis of the issued discussed herein, I have received, reviewed and/or relied upon the documents listed in Exhibit B.

IX. COMPENSATION

I am being compensated at $540 per hour for my time spent on this case. My compensation is in no way based upon the outcome of this litigation.

X. LISTING OF OTHER CASES IN WHICH TESTIMONY HAS BEEN GIVEN AS EXPERT

The following is a listing of all presently known cases in which I have appeared as an expert, either at trial or by deposition during approximately the last four years:

1) MAMS v. Precision Resp. Corp. (D.Ct., E.D. New York) - May 2000

2) Transonics. v. N.M.T (D.Ct., Utah, Northern Division) Aug. 2001

3) Sun Microsystems v. Kingston Technology (D.Ct., N.D. Cal, San Francisco Division) Jan. 2001

4) Pfizer v. Zenith Goldline et al. (D.Ct., New Jersey) - May 2001

5) C.P.I. v. St. Jude Medical et al. (D.Ct., S.D. of Indiana, Indianapolis Division) - June 2001

6) Aesculap et al. v. Walter Lorenz Surgical, Inc. (D.Ct., N.D. Cal.) - Jan. 2002

7) Geneva Pharmaceuticals et al. v. GlaxoSmithKline PLC, et al. (D.Ct., E.D. Virginia, Norfolk Division) - April 2002

8) Schneider Automation, Inc. and Square D Company v. OPTO 22, Inc. (Central District of California) - March 2003

9) Powerquest v. Quarterdeck et al. (D. Ct. Utah, Central Division) - April 2003

10) Federal Trade Commission v. Rambus, Inc. May 2003

11) V.P. Intellectual Prop. L.L.C. v. Nobel Biocare U.S.A. et al. (D. Ct. N.J.) - Sept. 2003

12) Translogic v. Hitachi (D. Ct. Oregon) - Oct. 2003

13) Proctor & Gamble v. Coca Cola (D. Ct., Southern District, Ohio) - Dec. 2003

14) Abbott Laboratories et al. v. Baxter Pharmaceuticals Products, Inc. et al. (N.D. Ill. Eastern Div.) - Feb. 2004

15) Pinpoint v. Amazon.com et al. (N. D. Ill. Eastern Div.) - July 2004

16) Virginia State Bar v. Lynt (Cir. Ct. Alex.) - Sept. 2004

17) Bosch v. TRW et al. (D. Ct. Ariz.) - Sept. 2004

18) Metrologic Instruments, Inc. v. PSC. (D. Ct. N. J.) - Nov. 2004

19) Software AG v. BEA Systems, Inc. (D. Ct. Del.) – Dec. 2004

20) Rosemarie Ryan-House et a. v. GlaxoSmithKline PLC, et al (E.D. Va.) - Dec. 2004

Respectfully submitted,

Date: March 3, 2005

Mark E. Nusbaum

Mark E. Nusbaum
Nixon & Vanderhye PC
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Arlington, Virginia 22201

Exhibit A

Curriculum Vitae of Mark E. Nusbaum

MARK E. NUSBAUM was born in Washington, D.C. on April 3, 1947 and was admitted to the Virginia bar in 1975. He has been a member of the law firm of Nixon and Vanderhye since July 10, 1986. He specializes in all phases of prosecution of patent applications before the U.S. Patent and Trademark Office in the electronic and computer related art areas. He has served as an expert witness on Patent and Trademark Office practice in many patent infringement litigations.

Mr. Nusbaum served as a member of the U.S. Patent and Trademark Office's Board of Patent Appeals and Interferences from July of 1983 through July 1986 acting in a judicial capacity reviewing adverse decisions of examiners in applications for patents. A decision of the Board constitutes a final agency action and is directly appealable to either the United States Court of Appeals for the Federal Circuit, or the United States District Court for the District of Columbia.

Between November 1980 and July 1983, Mr. Nusbaum served as head of patent examining Art Unit 236 that was responsible for the examination of patent applications in the highly complex data processing system art area. His examining art unit handled patent applications covering computer system architecture and a wide range of systems including a computer, e.g., control systems, communication systems, video game systems, navigation systems, etc.

From July 1969 to November 1980, Mr. Nusbaum served as a patent examiner in the highly complex general and special purpose digital data processing systems arts. He examined patent applications relating to a wide variety of general and special purpose computer systems. The invention claimed in these applications may have, for example, primarily involved a multiprocessor system or any one of the subsystems in a computer system such as the memory subsystem. He achieved a Master's Level rating in this art in 1974 which recognized that this technology for which he was responsible required at least a graduate level degree to understand and that Mr. Nusbaum has mastered this art. Mr. Nusbaum was awarded Full Signatory Authority in 1975 granting him permanent authority to independently finally reject applications or to allow applications to mature into patents. He achieved a Senior Examiner rating in this art in October 1977.

During this time period, Mr. Nusbaum actively participated in the development and clarification of the state of the law regarding the eligibility of computer programs for patent protection. He worked with the Patent and Trademark Office's Solicitor's Office and the U.S. Justice Department in preparing landmark computer program related cases for hearing before the U.S. Supreme Court. In this regard, he served as a technical advisor to the PTO's Solicitor's Office and the U.S. Justice Department in the landmark computer cases, Diamond v. Bradley, Diamond v. Diehr, and In re Chatfield. He participated in drafting the government briefs in Bradley and Diehr.

He served as Chairman of the Patent and Trademark Office's Computer Programming Guidelines Committee, established in 1981 to generate guidelines regarding the eligibility for patent protection of computer programming and mathematical algorithm related inventions. Mr. Nusbaum was the principal author of these guidelines which were incorporated into the Manual of Patent Examining Procedure.

During his career at the U.S. Patent and Trademark Office, Mr. Nusbaum served as a lecturer and instructor on a variety of patent law related topics. Mr. Nusbaum served as a featured speaker during numerous software protection symposiums and during other patent law related programs including those listed below.

1) October 15, 1981 - Computer Law Association, Examination of Computer Software Related Patent Applications

2) February 27, 28 1982 - Oregon and Washington State Patent Law Associations, 35 USC 101 and 35 USC 112, first paragraph issues in computer software related patent applications

3) March 8, 1982 - Commission on Software Use in the 80's, Patent law overview, patent protection for computer software related inventions

4) November 16, 1982 and Dec 3, 1982 - Legal Times' Washington, D. C. and San Francisco Symposiums on Software Protection

5) January 13, 1983 - Annandale High School Business Law class, U.S. Patent System

6) June 1983, Virginia Bar Patent, Trademark, & Copyright Section, Examination

of Computer Related Applications

7) April 1985, Boston Patent Law Association, Computer Related Inventions

Mr. Nusbaum has lectured in Tokyo, Japan on the eligibility of computer programs for the 100th Anniversary Symposium of the Japanese Patent system. Mr. Nusbaum has also served on numerous occasions as the instructor at the Patent Examiner Initial Training course and has served as a lecturer at the Patent Academy. Additionally, during 1981 and 1982, he served as an instructor at the PTO in-house training courses, "Introduction to Computers" and "Designing with Microprocessors".

Mr. Nusbaum's publications include: "Comment, 35 USC 101 Claim Analysis -- The Point of Novelty Approach", 62 JPOS 521 (1980) - cited by Justice Stevens in his dissent in Diamond v. Diehr, 209 USPQ at 15, 19; "Comment, Synopsis of In re Bradley", 61 JPOS 745 (1979); Principal Author, "PTO Guidelines on Computer Inventions", PTCJ, October 1981.

Mr. Nusbaum received numerous awards and citations throughout his career at the U.S. Patent and Trademark Office. He received five Special Achievement Awards for the six month periods ending October 2, 1971; March 31, 1973; June 30, 1974; March 27, 1976 and July 1, 1978. Mr. Nusbaum received an Outstanding Performance Rating for Calendar Year 1976 and fiscal years 1978, 1979, and 1980. Mr. Nusbaum received a quality step salary increase for fiscal year 1979. Additionally, Mr. Nusbaum received the United States Department of Commerce Silver Medal Award for his accomplishments as a Patent Examiner between July 1969 and April 1979. Additionally, he received merit pay cash awards in 1981 and 1982.

Mr. Nusbaum received a Bachelor of Science Degree in Electrical Engineering with honors from the University of Maryland in 1969. He was admitted to Tau Beta Pi and Eta Kappa Nu, the National Engineering and Electrical Engineering Honor Societies. In 1974, he received a Juris Doctor Degree from American University's Washington College of Law.

Exhibit B

DOCUMENTS AND INFORMATION CONSIDERED

- Telephone conversation with BlueArc's technical expert M. Kirk McKusick on February 11, 2005
- File histories for U.S. Patents Nos. 5,163,131, 5,355,453, 5,484,579, 5,802,366, 5,931,918, and 6,065,037
- BlueArc's First Amended Answer and Counterclaims in this action
- BlueArc's Invalidity Contentions in this action and relevant prior art disclosed therein
- Deposition transcript of David Hitz (February 4, 2005)
- V-System 6.0 Reference Manual (BARC 10477-10768)
- V-System 5.0 Reference Manual (October 1984)
- Cheriton, "The V Kernel: A Software Base for Distributed Systems" (BARC 9404-9430)
- Pawlowski, "Network Computing in the UNIX and IBM Mainframe Environment" (BARC 10203-10262)
- Sandberg, "The Sun Network File System: Design, Implementation and Experience" (BARC 447405-447420)
- Tanenbaum, "Distributed Operating Systems" (BARC 10355-10406)
- Cheriton, "Thoth, a Portable Real-Time Operating System" (BARC 9362-9375)
- Cheriton, "Host Groups: A Multicast Extension for Datagram Internetworks" (BARC 9515-9523)
- Cheriton, "The V Distributed Operating System: Principles and Principle Experiences" (BARC 9555-9557)
- Cheriton, "An Experiment Using Registers for Fast Message-Based Interprocess Communication" (BARC 9443-9451)
- Cheriton, "Local Networking and Internetworking in the V-System" (BARC 9395-9402)
- Cheriton, "The V Distributed System" (BARC 9583-9602)
- Cheriton, "Distributed Systems: Concepts and Design" (BARC 447190-447383)

- Cheriton, "NX 200 Network Executive Reference Manual" (BARC 446947-447177)
- Cheriton, "The Distributed V Kernel and Its Performance for Diskless Workstations" (BARC 9383-9394)
- Cheriton, "Multi-Process Structuring and the Thoth Operating System" (NETAPP 10490-10494)
- Hitz, "File System Design for an NFS File Server Appliance" (NETAPP 17337-17349)
- Hitz, "Using Unix as One Component of a Lightweight Distributed Kernel for Multiprocessor File Servers," USENIX 1/90

PROOF OF SERVICE

I am employed in the City and County of San Francisco, State of California in the office of a member of the bar of this court at whose direction the following service was made. I am over the age of eighteen years and not a party to the within action. My business address is Keker & Van Nest, LLP, 710 Sansome Street, San Francisco, California 94111.

On March 4, 2005, I served the following document:

EXPERT REPORT OF MARK E. NUSBAUM

☑ by regular **UNITED STATES MAIL** by placing a true and correct copy in a sealed envelope addressed as shown below. I am readily familiar with the practice of Keker & Van Nest, LLP for collection and processing of correspondence for mailing. According to that practice, items are deposited with the United States Postal Service at San Francisco, California on that same day with postage thereon fully prepaid. I am aware that, on motion of the party served, service is presumed invalid if the postal cancellation date or the postage meter date is more than one day after the date of deposit for mailing stated in this affidavit.

☑ by **E-MAIL VIA PDF FILE**, by transmitting on this date via e-mail a true and correct copy scanned into an electronic file in Adobe "pdf" format. The transmission was reported as complete and without error.

Henry C. Bunsow — bunsowh@howrey.com
Scott Wales — waless@howrey.com
Constance F. Ramos — ramosc@howrey.com
Howrey Simon Arnold & White, L.L.P.
525 Market Street, Suite 3600
San Francisco, CA 94105

Executed on March 4, 2005, at San Francisco, California.

I, declare under penalty of perjury under the laws of the State of California that the above is true and correct.

Lauren Hartz-Lewis