

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC
Petitioner,

v.

LS CLOUD STORAGE TECHNOLOGIES LLC
Patent Owner.

CASE IPR2023-00777
U.S. PATENT NO. 6,549,988

DECLARATION OF JAMES L. MULLINS, PhD

IN SUPPORT OF PETITION FOR *INTER PARTES* REVIEW OF U.S.
PATENT NO. 6,549,988

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2.	Document B: Exhibit 1009. Macklem, Rick., " Not Quite NFS, Soft Cache Consistency for NFS." <i>Proceedings of USENIX Winter 1994 Technical Conference, USENIX Winter 1994 Technical Conference, San Francisco, California, January 17-24, 1994.</i> pages 261-278. ("Macklem")	27
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I, Dr. James L. Mullins, do hereby declare as follows:

I. INTRODUCTION AND ENGAGEMENT

1. I have been retained in this matter by Google LLC in the above-captioned *inter partes* review relating to U.S. Patent 6,549,988 to provide opinions on specific documents.

2. I am presently Dean Emeritus of Libraries and Esther Ellis Norton Professor Emeritus at Purdue University. My career as a professional and academic/research spanned more than 44 years including library positions at Indiana University, Villanova University, Massachusetts Institute of Technology, and Purdue University. Appendix A is a true and correct copy of my curriculum vitae describing my background and experience.

3. In 2018, I founded the firm Prior Art Documentation Librarian Services, LLC, located at 205 St Cuthbert, Williamsburg, VA 23188 after purchasing the intellectual property of and successor to Prior Art Documentation, LLC located at 711 South Race Street, Urbana, IL 61801. Further information about my firm, Prior Art Documentation Librarian Services, LLC (PADLS), is available at www.priorartdoclib.com.

4. I have been retained by Petitioner to offer my opinion on the authenticity and dates of public accessibility of various documents. For this service, I am being paid my usual hourly fee of \$275.00. I have no stake in the outcome of

this proceeding or any related litigation or administrative proceedings, and my compensation in no way depends on the substance of my testimony or the outcome of this proceeding.

II. BACKGROUND AND QUALIFICATIONS

5. I received a Bachelor of Arts degree in History, Religion and Political Science in 1972 as well as a Master of Arts degree in Library Science in 1973 from the University of Iowa. I received my Ph.D. in Academic Library Management in 1984 from Indiana University. Over forty-four years, I held various positions and served as a leader in the field of library and information sciences. My most recent publication was in the Fall, 2022 (see Curriculum Vitae)

6. I am presently Dean Emeritus of Libraries and Esther Ellis Norton Professor Emeritus at Purdue University, and have been since January 1, 2018. I have been previously employed as follows:

- Dean of Libraries and Professor and Esther Ellis Norton Professor, Purdue University, West Lafayette, IN (2004-2017)
- Assistant/Associate Director for Administration, Massachusetts Institute of Technology (MIT) Libraries, Cambridge, MA (2000-2004)
- University Librarian and Director, Falvey Memorial Library, Villanova University, Villanova, PA (1996-2000)

- Director of Library Services, Indiana University South Bend, South Bend, IN (1978-1996)
- Part-time Instructor, School of Library and Information Science, Indiana University, Bloomington, IN (1979-1996)
- Associate Law Librarian, and associated titles, Indiana University School of Law, Bloomington, IN (1974-1978)
- Catalog Librarian, Assistant Professor, Georgia Southern College (now University), Statesboro, GA (1973-1974)

7. I am a member of the American Library Association (“ALA”), where I served as the chair of the Research Committee of the Association of College and Research Libraries (“ACRL”). My service to ALA included service on the editorial board of the most prominent library journal, *College and Research Libraries*. I also served on the Standards Committee, College Section of the Association of College and Research Libraries, where I was instrumental in developing a re-issue of the *Standards for College Libraries* in 2000.

8. I am an author of numerous publications in the field of library science, and have given presentations in library sciences at national and international conferences. During more than 44 years as an academic librarian and library science scholar, I have gained extensive experience with catalog records and online library

management systems (LMS) built using Machine-Readable Cataloging (“MARC”) standards. As an academic library administrator, I have had responsibility to ensure that students were educated to identify, locate, assess, and integrate information garnered from research library resources. I have also facilitated the research of faculty colleagues either directly or through the provision of and access to the requisite print and/or digital materials and services at the universities where I worked.

9. Based on my experience identified above and detailed in my curriculum vitae, which is attached hereto as Appendix A, I consider myself to be an expert in the field of library science and academic library administration. I have previously offered my opinions on the public availability and authenticity of documents in over 100 cases. I have been deposed in one case.

III. BACKGROUND ON PUBLIC ACCESSIBILITY

A. Scope of This Declaration

10. I am not a lawyer, and I am not rendering an opinion on the legal question of whether a particular document is, or is not, a “printed publication” under the law. I am, however, rendering my expert opinion on the authenticity of the document referenced herein and when and how this document was disseminated or otherwise made available to the extent that persons interested and ordinarily skilled

in the subject matter or art, exercising reasonable diligence, could have located the document.

11. I am informed by counsel that an item is considered authentic if there is sufficient evidence to support a finding that the item is what it is claimed to be. I am also informed that authenticity can be established based on the contents of the document itself, such as the appearance, content, substance, internal patterns, or other distinctive characteristics of the item.

12. I am informed by counsel that a given reference qualifies as “publicly accessible” if it was disseminated or otherwise made available such that a person interested in and ordinarily skilled in the relevant subject matter could locate it through the exercise of ordinary diligence.

13. While I understand that the determination of public accessibility under the foregoing standard rests on a case-by-case analysis of the facts particular to an individual publication, I also understand that a printed publication is rendered “publicly accessible” if it is cataloged and indexed by a library such that a person interested in the relevant subject matter could locate it (*i.e.*, I understand that cataloging and indexing by a library is sufficient, though there are other ways that a printed publication may qualify as “publicly accessible”). One manner of sufficient indexing is indexing according to subject matter. I understand that it is not necessary to prove someone actually looked at the printed publication in order to show it was

publicly accessible by virtue of a library's cataloging and indexing thereof. I understand that cataloging and indexing by a single library of a single instance of a particular printed publication is sufficient. I also understand that the cataloging and indexing of information that would guide a person interested in the relevant subject matter to the printed publication, such as the cataloging and indexing of an abstract for the printed publication, is sufficient to render the printed publication publicly accessible.

14. I understand that evidence showing the specific date when a printed publication became publicly accessible is not necessary. Rather, routine business practices, such as general library cataloging and indexing practices, can be used to establish an approximate date on which a printed publication became publicly accessible.

B. Person of Ordinary Skill in the Art

15. In forming the opinions expressed in this declaration, I have reviewed the documents and appendices referenced herein. These materials are records created in the ordinary course of business by publishers, libraries, indexing services, and others. From my years of experience, I am familiar with the process for creating many of these records, and I know that these records are created by people with knowledge of the information contained within the record. Further, these records are created with the expectation that researchers and other members of the public

will use them. All materials cited in this declaration and its appendices are of a type that experts in my field would reasonably rely upon and refer to in forming their opinions.

16. I have been informed by counsel that the subject matter of this proceeding relates to cached data storage systems.

17. I have been informed by counsel that a “person of ordinary skill in the art at the time of the inventions” (POSITA) is a hypothetical person who is presumed to be familiar with the relevant field and its literature at the time of the inventions. This hypothetical person is also a person of ordinary creativity, capable of understanding the scientific principles applicable to the pertinent field.

18. I have been informed by counsel that persons of ordinary skill in this subject matter or art would have included someone with a bachelor’s degree in Computer Science, Computer Engineering, or Electrical Engineering, or an equivalent course of study, as well as 2 or more years of academic or industry experience in the field of computer networking, computer architecture and storage management. More education can supplement practical experience, and vice versa.

19. It is my opinion that such a person would have been actively engaged in academic research and learning through study and practice in the field, and possibly through formal instruction through the bibliographic resources relevant to his or her research. By the 1998 timeframe, such a person would have had access to

a vast array of print resources, including at least the documents referenced below, as well as to a fast-changing set of online resources.

C. Library Catalog Records and Other Resources

20. Some background on MARC (Machine-Readable Cataloging) formatted records, OCLC, and *WorldCat* is helpful to understand the library catalog records discussed in this declaration. I am fully familiar with the library cataloging standard known as the MARC standard, which is an industry-wide standard method of storing and organizing library catalog information.¹ MARC practices have been consistent since the MARC format was developed by the Library of Congress in the 1960s, and by the early 1970s became the U.S. national standard for disseminating bibliographic data. By the mid-1970s, MARC format became the international standard, and persists through the present. A MARC-compatible library is one that has a catalog consisting of individual MARC records for each of its items. The underlying MARC format (computer program) underpins the online public access catalog (OPAC) that is available to library users to locate a particular holding of a library. Today, MARC is the primary communications protocol for the transfer and

¹ The full text of the standard is available from the Library of Congress at <http://www.loc.gov/marc/bibliographic/>.

storage of bibliographic metadata in libraries.² The MARC practices discussed below were in place during the 1990s time frame relevant to the documents referenced herein.

21. Online Computer Library Center (OCLC) is a not-for-profit worldwide consortium of libraries. Similar to MARC standards, OCLC's practices have been consistent since the 1970s through to the present. Accordingly, the OCLC practices discussed below were in place during the time frame discussed in my opinions section. OCLC was created "to establish, maintain and operate a computerized library network and to promote the evolution of library use, of libraries themselves, and of librarianship, and to provide processes and products for the benefit of library

² Almost every major library in the world uses a catalog that is MARC-compatible. See, e.g., Library of Congress, *MARC Frequently Asked Questions (FAQ)*, <https://www.loc.gov/marc/faq.html> (last visited Jan. 24, 2018) ("MARC is the acronym for MACHine-Readable Cataloging. It defines a data format that emerged from a Library of Congress-led initiative that began nearly forty years ago. It provides the mechanism by which computers exchange, use, and interpret bibliographic information, and its data elements make up the foundation of most library catalogs used today."). MARC is the ANSI/NISO Z39.2-1994 (reaffirmed 2009) standard for Information Interchange Format.

users and libraries, including such objectives as increasing availability of library resources to individual library patrons and reducing the rate of rise of library per-unit costs, all for the fundamental public purpose of furthering ease of access to and use of the ever-expanding body of worldwide scientific, literary and educational knowledge and information.”³ Among other services, OCLC and its members are responsible for maintaining the *WorldCat* database (<http://www.worldcat.org/>), used by libraries throughout the world.

22. Libraries worldwide use the machine-readable MARC format for catalog records. MARC-formatted records include a variety of subject access points based on the content of the document being cataloged. A MARC record for a particular work comprises several fields, each of which contains specific data about the work. Each field is identified by a standardized, unique, three-digit code corresponding to the type of data that follows. For example, a work’s title is recorded in field 245, the primary author of the work is recorded in field 100, a work’s International Standard Book Number (“ISBN”) is recorded in field 020, and

³ OCLC Online Computer Library Center, Inc., *Amended Articles of Incorporation of OCLC Online Computer Library Center, Inc.*, Third Article (OCLC, Dublin, Ohio) Revised November 30, 2016, <https://www.oclc.org/content/dam/oclc/membership/articles-of-incorporation.pdf>.

the work's Library of Congress call number (assigned by Library of Congress) is recorded in field 050. Some fields can contain subfields, which are indicated by letters. For example, a work's publication date is recorded in field 260 under the subfield "c."

23. The MARC Field 040, subfield "a," identifies the library or other entity that created the catalog record in the MARC format. The MARC Field 008 identifies the date when this first MARC record was created. The MARC Field 005 identifies the most recent catalog activity including location assignment, by the holding library, that is, the library which owns the book and is identified in the OPAC.

24. MARC records also include several fields that include subject matter classification information. An overview of MARC record fields is available through the Library of Congress at <http://www.loc.gov/marc/bibliographic/>. For example, 6XX fields are termed "Subject Access Fields."⁴ Among these, for example, is the 650 field; this is the "Subject Added Entry – Topical Term" field. See <http://www.loc.gov/marc/bibliographic/bd650.html>. The 650 field is a "[s]ubject added entry in which the entry element is a topical term." *Id.* The 650 field entries "are assigned to a bibliographic record to provide access according to generally accepted thesaurus-building rules (e.g., *Library of Congress Subject Headings*

⁴ See <http://www.loc.gov/marc/bibliographic/bd6xx.html>.

(LCSH), *Medical Subject Headings* (MeSH)).” *Id.* Thus, a researcher can easily discover material relevant to a topic of interest with a search using the terms employed in the MARC Fields 6XX.

25. Further, MARC records include call numbers, which themselves include a classification number. For example, the 050 field is dedicated as the “Library of Congress Call Number”⁵ as assigned by the Library of Congress. A defined portion of the Library of Congress Call Number is the classification number, and “source of the classification number is *Library of Congress Classification* and the *LC Classification-Additions and Changes*.” *Id.* Thus, included in the 050 field is a subject matter classification. As an example: TK5105.59 indicates books on computer networks – security measures. When a local library assigns a classification number, most often a Library of Congress derived classification number created by a local library cataloger or it could be a Dewey Decimal classification number for example, 005.8, computer networks – security measures, it appears in the 090 field. In either scenario, the MARC record includes a classification number in the call number field that represents a subject matter classification.

⁵ See <http://www.loc.gov/marc/bibliographic/bd050.html>.

26. The 9XX fields, which are not part of the standard MARC 21 format,⁶ were defined by OCLC for use by the Library of Congress, processing or holding notes for a local library, and for internal OCLC use. For example, the 955 field is reserved for use by the Library of Congress to track the progress of a new acquisition from the time it is submitted for Cataloging in Publication (CIP) review until it is published and fully cataloged and publicly available for use within the Library of Congress. Fields 901-907, 910, and 945-949 have been defined by OCLC for local use and will pass OCLC validation. Fields 905, 910, 980 etc., are often used by an individual library for internal processing purposes, for example the date of receipt or cataloging and/or the initials of the cataloger.

27. *WorldCat* is the world's largest public online catalog, maintained by the OCLC, a not-for-profit international library consortium, and built with the records created by the thousands of libraries that are members of OCLC. OCLC provides bibliographic and abstract information to the public based on MARC-compliant records through its OCLC *WorldCat* database. *WorldCat* requires no knowledge of MARC tags and code and does not require a login or password. *WorldCat* is easily accessible through the World Wide Web to all who wish to search it; there are no restrictions to be a member of a particular community, etc. The date

⁶ See <https://www.oclc.org/bibformats/en/9xx.html>.

a given catalog record was created (corresponding to the MARC Field 008) appears in some detailed *WorldCat* records as the Date of Entry but not necessarily all. *WorldCat* does not provide a view of the underlying MARC format for a specific *WorldCat* record. In order to see the underlying MARC format the researcher must locate the book in a holding library listed among those shown in *WorldCat*, and search the online public catalog (OPAC) of a holding library. Whereas *WorldCat* records are widely available, the availability of library specific MARC formatted records varies from library to library. When a specific library wishes to make the underlying MARC format available there will be a link from the library's OPAC display, often identified as a MARC record or librarian/staff view.

28. When a MARC record is created by the Library of Congress or an OCLC member institution, the date of creation for that record is automatically populated in the fixed field (008), with characters 00 through 05 in year, month, day format (YYMMDD).⁷ Therefore, the MARC record creation date reflects the date on which the publication associated with the record was first cataloged. Thereafter, the local library's computer system may automatically update the date in field 005 every time the library updates the MARC record (*e.g.*, to reflect that an item has

⁷ Some of the newer library catalog systems also include hour, minute, second (HHMMSS).

been moved to a different shelving location within the library, or a reload of the bibliographic data with the introduction of a new library management system that creates and manages the OPAC).

D. Monograph Publications

29. Monograph publications including books, theses, dissertations, and technical reports, are written on a single topic, presented at length and distinguished from an article. A library typically creates a catalog record when the monograph is acquired by the library. First, it will search OCLC to determine if a record has already been created by the Library of Congress or another OCLC institution. If a record is found in OCLC, the record is downloaded into the library's LMS (Library Management System) that includes typically the OPAC (online public access catalog by which researchers locate a particular library holding in a user-friendly format), acquisitions, cataloging, and circulation integrated functions. Once the item is downloaded into the library's LMS, the library adds its identifier to the OCLC database so when a search is completed on WorldCat, the library will be indicated as an owner of the title. Once a record is created in a Library's LMS, it is searchable and viewable through the library's OPAC, typically by author, title, and subject heading, at that library and from anywhere in the world through the internet by accessing that library's OPAC. The OPAC also connects with the circulation function of the library, which typically indicates whether the record is available, in

circulation, etc., with its call number and location in a specific departmental/disciplinary library, if applicable. The OPAC not only provides immediate bibliographic access on-site, but it also facilitates the interlibrary loan process, which is when one publication is loaned from one library to another.

E. Periodicals/Serials

30. A library typically creates a catalog record for a periodical/serial publication when the library receives its first issue. When the institution receives subsequent issues/volumes of the periodical or serial publication, the issues/volumes are checked in (often using a date stamp), added to the institution's holding records, and made available very soon thereafter – normally within a few days of receipt or (at most) within a week to ten days after receipt.

31. The initial periodicals record will sometimes not reflect all subsequent changes in publication details (including minor variations in title, frequency, etc.).

F. Cataloging/Indexing

32. A researcher may discover material relevant to his or her topic in a variety of ways. One common means of discovery is to search for relevant information in an index of periodical and other publications. Having found relevant material, the researcher will then normally obtain it online, look for it in libraries, or purchase it from the publisher, a bookstore, a document delivery service, or other provider. Sometimes, the date of a document's public accessibility will involve both

indexing and library date information. Date information for indexing entries is, however, often unavailable. This is especially true for online indices.

33. Indexing services use a wide variety of controlled vocabularies to provide subject access and other means of discovering the content of documents. The formats in which these access terms are presented vary from service to service.

34. Online indexing services commonly provide bibliographic information, abstracts, and full-text copies of the indexed publications, along with a list of the documents cited in the indexed publication. These services also often provide lists of publications that cite a given document. A citation of a document is evidence that the document was publicly available and in use by researchers no later than the publication date of the citing document.

35. **ACM Digital Library** - Association for Computing Machinery. The ACM was founded in 1947 and is the world's largest scientific and educational computing society. The portal has two main sections: the ACM Digital Library and the ACM Guide to Computing Literature. The ACM Digital Library provides access to the journals, newsletters and conference proceedings of the organization. The Guide to Computing Literature is a bibliography of computing literature beginning in the 1950s with more than a million entries. <https://dl.acm.org/>

36. **DASH: Digital Access to Scholarship at Harvard**. DASH enlarges the audience and impact of scholarly works. Authors who deposit in DASH have

access to on-demand metrics and receive monthly reports about their readership. Deposited works receive persistent URLs, are comprehensively indexed by search engines, including Google and Google Scholar, reach academic and non-academic readers who may not have access to the original publications, and are preserved by the Harvard Library. <https://dash.harvard.edu/>

37. **IEEE Xplore** – The Institute of Electrical and Electronics Engineers is the world's largest organization for the advancement of technology with some 430,000 members in 160 countries. Known by its acronym IEEE, it has created a database, IEEE Xplore, that provides access to its hundreds of publications and those of its publishing partners. This includes the content of over 170 journals, more than 1,400 conference proceedings, some 5,100 technical standards, 2,000 eBooks and 400 educational courses. In all, more than 3 million documents, dating from 1872 on, are searchable and available for purchase either through subscription or individually. Many of these records are accessible via Google Scholar. <https://ieeexplore.ieee.org/Xplore/home.jsp>

38. **Wisconsin TechSearch (WTS)** - WTS offers an array of article delivery and research services to individuals and organizations not affiliated with the University of Wisconsin or who need the specialized skills of WTS staff in locating and retrieving information. It is the policy of WTS to keep confidential all material submitted by clients with respect to searches as well as search results. WTS

will not disclose material pertaining to searches to third parties except as required by law. <https://wts.wisc.edu/>.

IV. OPINION REGARDING AUTHENTICITY AND PUBLIC ACCESSIBILITY

- 1. Document A: Exhibit 1018. Srinivasan, V., and Jeffrey Mogul. "Spritely NFS: Experiments with Cache-Consistency Protocols." *ACM SIGOPS Operating Systems Review*, volume 23, number 5, Special Issue, 1989. Pages 44-57. ("Srinivasan")**

A. Authenticity and Public Access

39. I have been asked to opine on an article by V. Srinivasan and Jeffrey Mogul, Exhibit 1018, with the title "Spritely NFS: Experiments with Cache-Consistency Protocols" published in *ACM SIGOPS Operating Systems Review* in volume 23, number 5, "Special Issue" in 1989 on pages 44-57, ("Srinivasan").

40. For the purposes of this declaration Srinivasan will be used to describe the journal in which it was published, *ACM SIGOPS Operating Systems Review*, as well as the article by with the title V. Srinivasan and Jeffrey Mogul with the title "Spritely NFS: Experiments with Cache-Consistency Protocols" originally presented as a paper at the Twelfth ACM Symposium on Operating Systems Principles, held December 3-6, 1989, "The Wigwam", Litchfield Park, Arizona, sponsored by the Special Interest Group on Operating Systems (SIGOPS) of the Association for Computing Machinery (ACM).

41. I have evaluated the Srinivasan reference several ways: (1) by assessing and reviewing Srinivasan, Exhibit 1018, provided to me by counsel; (2) by assessing and reviewing scans of Srinivasan provided to me at my request by Wisconsin TechSearch (WTS) on March 14, 2023, Exhibit 1021, that has a date of receipt by the Library of Congress of February 6, 1990; (3) by retrieving, accessing and reviewing Srinivasan, Exhibit 1022, through the Purdue University Libraries as emeritus professor at this URL:

<https://dl-acm-org.ezproxy.lib.purdue.edu/doi/abs/10.1145/74850.74856>

Srinivasan is available through open access at this URL:

<https://dl.acm.org/doi/pdf/10.1145/74851.74856>

and (4) by accessing and assessing two scholarly papers, Exhibit 1025 and Exhibit 1026 that cite Srinivasan in “References” that were published prior to 1998.

B. Authentication

42. Exhibit 1021 is a scan of Srinivasan from the copy owned by the Library of Congress. This scan was provided to me on March 14, 2023 by Wisconsin TechSearch at my request.

43. Exhibit 1021 includes the bound cover that has a stamp that reads “Operating Systems Review” 23 1989 QA76.6 .O625, and a Library of Congress inventory barcode, as shown below; published issue cover; title page with a stamp that reads “Library of Congress “FEB 06 1990”, as shown below; verso of the title

page (copyright page); table of contents; and the article by V. Srinivasan and Bruce Mogul, titled: “Spritely NFS: Experiments with Cache-Consistency Protocols ” on pages 44-57.



44. As an emeritus professor at Purdue University, I have access to all materials and services provided by the Purdue University Libraries, therefore, I was able to access the *ACM Digital Library* at this URL: <https://dl-acm-org.ezproxy.lib.purdue.edu/doi/abs/10.1145/74850.74856>

45. Exhibit 1022 is the download of Srinivasan I made from the *ACM Digital Library* through Purdue University. Srinivasan is also available through an open access URL: <https://dl.acm.org/doi/pdf/10.1145/74851.74856>

46. Having located Srinivasan in a research library, the Library of Congress, and through the collections and services of a research library, Purdue University Libraries within a publisher database, *ACM Digital Library*, I can verify that Srinivasan is an authentic document published in *Operating Systems Review* in 1989. Further confirmation of authenticity will be included in the Public Access section below.

47. I compared Exhibit 1018, with Exhibit 1021 and Exhibit 1022, and there is no difference among them. Therefore, I conclude and affirm that Srinivasan is an authentic document.

C. Public Accessibility

48. Exhibit 1023 is a download from *WorldCat* for holdings of Srinivasan in the District of Columbia. The Library of Congress was second among the 807 libraries shown as holding Srinivasan worldwide. Exhibit 1022 shows that Srinivasan is the document associated with this *WorldCat* entry, as verified by the title: *Operating Systems Review*; and publisher and publication date: ACM Special Interest Group in Operating Systems Principles, beginning publication in 1969.

49. Exhibit 1023, the *WorldCat* record for Srinivasan, could have been located by searching for the title: *Operating Systems Review*; and/or by searching the subject headings;; *Operating systems (Computers)*; and/or *Operating systems*; or using various other language search descriptors.

50. The search discussed above could have been performed anywhere in the world by anyone who accessed *WorldCat* and its predecessor database, *FirstSearch*, through an OCLC institutional member library in the 1990s. Prior to 1998 nearly every university and research library in the United States were OCLC member institutions and the search discussed above could have been performed to locate Srinivasan at any of these libraries.

51. In Exhibit 1021 on the title page is the stamp made by the Library of Congress that shows ownership, Library of Congress, and the date of receipt, February 6, 1990 (as shown below).



This date, February 6, 1990, indicates when Srinivasan was added/cataloged/indexed at the Library of Congress. Assuming a typical time of one week to ten days to

process and have Srinivasan on the shelf, Srinivasan would have been available to a researcher no later than February 16, 1990.

52. Exhibit 1024 is the Library of Congress OPAC (online catalog) record that I downloaded on March 14, 2023. The document cataloged in this record is Srinivasan as verified by the title: *Operating Systems Review*; and publisher: ACM Special Interest Group in Operating Systems Principles; and publication dates: “began with v.3, no. 4 (Dec. 1969).

53. I also compared the LC Classification (call number): QA76.6 .O625 on Exhibit 1023 with that shown on the spine of the bound volume of Srinivasan in Exhibit 1021. It is the same on both.

54. Srinivasan could have been located by searching on the Library of Congress OPAC for the title: *Operating Systems Review*; and/or by searching the subject headings; *Operating systems (Computers) – Periodicals*; *Operating systems (Computers)*; and/or *Computers*. or using various other language search descriptors.

55. From my professional experience, the typical time to process an acquisition to a library would be ten days, and this would be typical for the Library of Congress. Therefore, Srinivasan would have been accessible in the Library of Congress by February 16, 1990.

56. Once Srinivasan was entered into the general collection of the Library of Congress, members of the public could access Srinivasan by having it brought to either the Jefferson or Adams Reading Rooms. The collections of the Library of Congress are searchable by subject matter, author, or title such that a skilled researcher could find works in which they were interested. Members of the public could read, study, and make notes about a selected work in the Reading Rooms. Further, members of the public were permitted to make photocopies of portions of the works while in the Reading Rooms. Accordingly, a copy of Srinivasan was accessible to the general public when it was available at the Library of Congress.

57. A citation to a published article is evidence that the article was publicly accessible. Below are two publications that cited Srinivasan in “References”.

58. Exhibit 1025 is an article by Y. Shinjo and Y. Kiyoki, titled "The Object-Stacking Model for Structuring Object-Based Systems," published in the *Proceedings of the Second International Workshop on Object Orientation in Operating Systems*, September 24-25, 1992, held in Dourdan, France, pages 328-340. (“Shinjo”)

59. As an emeritus professor at Purdue University, I have access to all materials and services provided by the Purdue University Libraries. Therefore, I retrieved Shinjo from the *IEEE Xplore* database on March 16, 2023 at this URL: <https://ieeexplore-ieee-org.ezproxy.lib.purdue.edu/document/252964>. Shinjo is

available for a fee at this URL:

<https://ieeexplore.ieee.org/abstract/document/252964>

60. In “References” on page 340, number 21 is a citation to Srinivasan, as shown below:

[21] V.Srinivasan and J.C.Mogul: "Spritely NFS: Experiments with Cache-Consistency Protocols", Proc. 12th ACM Symp. on Operating System Principles, ACM Operating System Review, Vol.23, No.5, pp.45-57, 1989.

61. Therefore, Srinivasan was known and publicly accessible as of the date, September 24-25, 1992, of the *Second International Workshop on Object Orientation in Operating Systems*, held in Dourdan, France.

62. Exhibit 1026 is an article by R. Y. Wang and T. E. Anderson, titled "xFS: A Wide Area Mass Storage File System," published in the *Proceedings of IEEE 4th Workshop on Workstation Operating Systems. WWOS-III*, Napa, CA, USA, October 14-15, 1993, pages 71-78. (“Wang”)

63. As an emeritus professor at Purdue University, I have access to all materials and services provided by the Purdue University Libraries. Therefore, I retrieved Wang from the *IEEE Xplore* database on March 16, 2023 at this URL: [https://ieeexplore-ieee-org.ezproxy.lib.purdue.edu/stamp/stamp.jsp?tp=&arnumber=348169`](https://ieeexplore-ieee-org.ezproxy.lib.purdue.edu/stamp/stamp.jsp?tp=&arnumber=348169)

Wang is available for a fee at this URL:

<https://ieeexplore.ieee.org/abstract/document/348169>

64. In “References” on page 78, of Wang number 19 is a citation to Srinivasan, as shown below:

19] V. Srinivasan and J. Mogul. Spritely NFS: Experience with Cache Consistency Protocols. *Proceedings of 12th Symposium on Operating Systems Principles*, pages 45-57, December 1989.

65. Therefore, Srinivasan was known and publicly accessible as of the date, October 14-15, 1993, of the *IEEE 4th Workshop on Workstation Operating Systems. WWOS-III*, Napa, CA, USA when Wang presented the paper.

D. Conclusion

66. I conclude that Srinivasan, Exhibit 1018, is authentic, as documented in Exhibit 1021 and Exhibit 1022, and would have been publicly accessible in the Library of Congress as of February 16, 1990, as documented in Exhibit 1021. Srinivasan was publicly accessible and cited as documented in Exhibit 1023, Exhibit 1024, Exhibit 1025 and Exhibit 1026.

2. **Document B: Exhibit 1009. Macklem, Rick., " Not Quite NFS, Soft Cache Consistency for NFS." *Proceedings of USENIX Winter 1994 Technical Conference, USENIX Winter 1994 Technical Conference, San Francisco, California, January 17-24, 1994. pages 261-278. (“Macklem”)***

A. Authenticity and Public Access

67. I have been asked to opine on an article by Rick Macklem, Exhibit 1009, with the title “Not Quite NFS, Soft Cache Consistency for NFS” published in the *Proceedings of USENIX Winter 1994 Technical Conference*, USENIX Winter 1994 Technical Conference, San Francisco, California, January 17-24, 1994, on pages 261-278 (“Macklem”).

68. For the purposes of this declaration Macklem will be used to describe the proceedings in which it was published, *Proceedings of USENIX Winter 1994 Technical Conference* as well as the article by Macklem with the title: ” Not Quite NFS, Soft Cache Consistency for NFS” originally presented as a paper at the USENIX Winter 1994 Technical Conference, San Francisco, California, January 17-24, 1994.

69. I have evaluated the Macklem reference several ways: (1) by assessing and reviewing Macklem, Exhibit 1009, provided to me by counsel; (2) by assessing and reviewing scans of Macklem provided to me at my request by Wisconsin TechSearch (WTS) on March 14, 2023, Exhibit 1027, from the collections of the University of Wisconsin – Madison Libraries. Exhibit 1027 has a date of receipt by the University of Wisconsin – Madison Libraries of February 29, 1996; (3) by retrieving, accessing and reviewing Macklem, Exhibit 1028, through the Purdue University Libraries as emeritus professor at this URL: <https://dl-acm-org.ezproxy.lib.purdue.edu/doi/pdf/10.1145%2F74851.74856>

Macklem is available through open access at this URL:

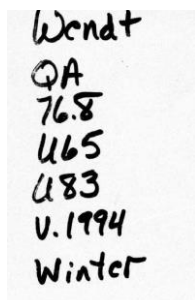
https://www.usenix.org/legacy/publications/library/proceedings/sf94/full_papers/macklem.pdf

and (4) by accessing and assessing two scholarly papers, Exhibit 1031 and Exhibit 1032, that cite Macklem in “References” that were published prior to 1998.

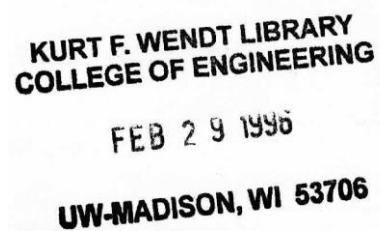
B. Authentication

70. Exhibit 1027 is a scan of Macklem from the copy owned by the University of Wisconsin – Madison Libraries. This scan was provided to me at my request on March 14, 2023 by Wisconsin TechSearch (WTS).

71. Exhibit 1027 includes the cover that has a handwritten call number that reads: “Wendt QA768 U65U83 v.1994 Winter”, as shown below; title page with a stamp that reads “Kurt F. Wendt Library College of Engineering FEB 29, 1996 UW-Madison, WI 63706”, as shown below; verso of the title page (copyright page); table of contents; and the article by Rick Macklem, titled: “Not Quite NFS, Soft Cache Consistency for NFS Spritely NFS” on pages 261-278.



Wendt
QA
76.8
U65
U83
v.1994
Winter



KURT F. WENDT LIBRARY
COLLEGE OF ENGINEERING
FEB 29 1996
UW-MADISON, WI 53706

72. As an emeritus professor at Purdue University, I have access to all materials and services provided by the Purdue University Libraries, therefore, I was able to access the *ACM Digital Library* to retrieve Macklem at this URL: <https://dl-acm-org.ezproxy.lib.purdue.edu/doi/abs/10.1145/74850.74856>

73. Exhibit 1028 is the download of Macklem I made from the *ACM Digital Library* through Purdue University. Macklem is also available through an open access URL: <https://dl.acm.org/doi/pdf/10.1145/74851.74856>

74. Having located Macklem, *Proceedings of USENIX Winter 1994 Technical Conference*, in a research library, the University of Wisconsin – Madison Libraries, and through the collections and services of a research library, Purdue University Libraries, within a publisher database, *ACM Digital Library*, I can verify that Macklem is an authentic document published in 1994. Further confirmation of authenticity will be included in the Public Access section below.

75. I compared Exhibit 1009, with Exhibit 1027 and Exhibit 1028, there is no difference among them, therefore, I conclude and affirm that Macklem is an authentic document.

C. Public Accessibility

76. Exhibit 1029 is a download from *WorldCat* for holdings of Macklem in Wisconsin. The University of Wisconsin – Madison General Library System is first among the 83 libraries shown as holding Macklem worldwide. Exhibit 1029 shows

that Macklem is the document associated with this *WorldCat* entry, as verified by the title: *Proceedings of USENIX Winter 1994 Technical Conference* and publisher: The Association [of Computing Machinery].

77. Exhibit 1029, the *WorldCat* record for Macklem, could have been located by searching for the title: *Proceedings of USENIX Winter 1994 Technical Conference*; and/or by searching the subject headings: *Computer networks*; *Computer Networks Congresses*; *Computer programming*; and/or *Computer Programming Congresses*.

78. The search discussed above could have been performed anywhere in the world by anyone who accessed *WorldCat* and its predecessor database, *FirstSearch*, through an OCLC institutional member library in the 1990s. Prior to 1998 nearly every university and research library in the United States were OCLC member institutions and the search discussed above could have been performed to locate Srinivasan at any OCLC member library.

79. On the title page in Exhibit 1027 is the stamp made by the University of Wisconsin – Madison Libraries that shows ownership, and the date, February 29, 1996 (as shown below).

KURT F. WENDT LIBRARY
COLLEGE OF ENGINEERING
FEB 29 1996
UW-MADISON, WI 53706

80. This date, February 29, 1996, indicates when Macklem was added/cataloged/indexed at the University of Wisconsin – Madison Libraries. Assuming a typical time of one week to ten days to process and have Macklem on the shelf, Macklem would have been available to a researcher no later than March 11, 1996.

81. Exhibit 1030 is the University of Wisconsin – Madison OPAC (online catalog) record that I downloaded on March 18, 2023. The document cataloged in this record is Macklem as verified by the title: *Proceedings of USENIX Winter 1994 Technical Conference* and publisher: The Association [of Computing Machinery]; and publication date: 1987- . The note shown below indicates that UW-M Libraries holds the *Proceedings of the USENIX Conferences* that includes 1994 Winter.


Verona Shelving Facility
 Number of Items 17 items

Details

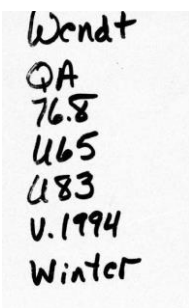
Location by request only
Call Number QA76.8 U65 U83
Count 17 items

This Location Has

1987-1994

1995:season Winter

82. I also compared the LC Classification (call number): QA76.8 .U65 U83 on Exhibit 1030 with that shown on the cover of Macklem in Exhibit 1027, as shown below. It is the same on both, with the addition of the holding library, Wendt and the indication of v.1994 Winter for the specific volume.



Wendt
 QA
 76.8
 U65
 U83
 v.1994
 Winter

83. From my professional experience, the typical time to process an acquisition to a library would be one week to ten days, and this would be typical for the University of Wisconsin – Madison Libraries. Therefore, Macklem would have been accessible in the University of Wisconsin – Madison Libraries by March 11, 1996.

84. A citation to a published article is evidence that the article was publicly accessible. Below are two publications that cited Macklem in “References”.

85. Exhibit 1031 is a white paper authored by J. Bradley Chen, H.T. Kung, and Margo Seltzer, with the title “MOSS: A Mobile Operating System Substrate”, Harvard Computer Science Group Technical Report TR-14-95 (Chen) published by the Center for Research in Computing Technology, Harvard University, Cambridge, Massachusetts, 1995.

86. I retrieved Chen on March 19, 2023 from “Dash” – Digital Access to Scholarship at Harvard. Dash is an open source digital repository curated by the Harvard University Library. Chen is accessible at this URL:
<https://dash.harvard.edu/bitstream/handle/1/25620449/tr-14-95.pdf?sequence=1&isAllowed=y>

87. In “Bibliography” in Chen on page 14, number 17 is a citation to Macklem, as shown below:

[17] Macklem, R., “Not Quite NFS, Soft Cache Consistency for NFS, “*Proceedings of the 1994 Winter Usenix Technical Conference*, January 1994.

88. Therefore, Macklem was known and publicly accessible as of 1995, the date of publication/release of Chen by the Harvard Computer Science Group Technical Report, TR-14-95, by the Center for Research in Computing Technology, Harvard University, Cambridge, Massachusetts

89. Exhibit 1032 is a thesis by Antonio Cortés Rosselló, titled, “Cooperative Caching and Prefetching in Parallel/Distributed File Systems. Quoting (“Cortés Rosselló”) from the title page, it reads: “A Thesis Submitted in Fulfillment of the Requirements for the Degree, Doctor en Informàtica. UPC. Universitat Politècnica de Catalunya, Departament d'Arquitectura de Computadors, Barcelona (Espanya).” On the upper right hand corner is a stamp that reads: “UPC Universitat Politècnica de Catalunya”, as shown below.



90. Cortés Rosselló is accessible and retrieval at this URL:

<https://upcommons.upc.edu/bitstream/handle/2117/93323/TTCR2de2.pdf>

91. In “References” on page 162 is a citation to Macklem, as shown below:

[Mac94] MACKLEM, R. Not quite NFS, soft cache consistency for NFS. In *Proceedings of the Winter Technical Conference*. USENIX Association, 1994.

92. After a thorough review of Cortés Rosselló, “Cooperative Caching and Prefetching in Parallel/Distributed File Systems”, I was unable to locate a date of acceptance of the thesis or publication. Therefore, I searched the online catalog of the Libraries of UPC Universitat Politècnica de Catalunya.

93. Exhibit 1033 is the screen capture of the OPAC (library online catalog record) from the Bibliotecnica, UPC Universitat Politècnica de Catalunya. This record has one date: “1997-12-12” and in the catalog record the date of one year “1997.” The “1997-12-12” is the date of cataloging and the “1997” is the year the thesis was presented and accepted by the Universitat Politècnica de Catalunya, Departament d'Arquitectura de Computadors, Barcelona (Espanya).

94. Therefore, the date that is consistent in the record is 1997. This verifies that Macklem was known by Cortés Rosselló when cited in his thesis in 1997.

D. Conclusion

95. I conclude that Macklem, Exhibit 1009, is authentic, as documented in Exhibit 1027 and Exhibit 1028. Macklem would have been publicly accessible in the University of Wisconsin – Madison Libraries no later than March 11, 1996 as documented in Exhibit 1027. Macklem was publicly accessible and cited as documented in Exhibit 1031-1033 in 1995 and 1997.

V. AVAILABILITY FOR CROSS-EXAMINATION

96. In signing this Declaration, I recognize that this Declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the U.S. Patent and Trademark Office. I also recognize that I may be subject to cross-examination in the case and that cross-examination will take place within the United

States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

VI. RIGHT TO SUPPLEMENT

97. I reserve the right to supplement my opinions in the future to respond to any arguments that the Patent Owner raises and to take into account new information as it becomes available to me.

VII. SIGNATURE

98. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

99. I declare under penalty of perjury that the foregoing is true and correct.

Dated: March 22, 2023


Dr. James L. Mullins