

**DECLARATION OF FREDERICK R. WARREN-BOULTON
IN SUPPORT OF AN APPLICATION FOR A PRELIMINARY INJUNCTION**

I, Frederick R. Warren-Boulton, pursuant to 28 U.S.C. §1746, declare as follows:

I. QUALIFICATIONS AND CONCLUSIONS

1. My name is Frederick R. Warren-Boulton. I am a Principal with MiCRA (Microeconomic Consulting and Research Associates, Inc.), a Washington-based economics consulting and research firm specializing in antitrust and regulatory matters.

A. Professional Qualifications

1. I hold a B.A. degree from Yale University, a Master of Public Affairs from the Woodrow Wilson School of Public and International Affairs at Princeton University, and a Ph.D. in Economics from Princeton University.

2. From 1972 to 1983, I was an Assistant and then Associate Professor of Economics at Washington University in St. Louis. From 1983 to 1989, I served as the chief economist for the Antitrust Division of the U.S. Department of Justice, first as the Director of its Economic Policy Office and then as the Deputy Assistant Attorney General for Economic Analysis. Since leaving the Department of Justice, I have served as a Resident Scholar at the American Enterprise Institute, a Visiting Lecturer of Public and International Affairs at the Woodrow Wilson School at Princeton University, and a Research Associate Professor of Psychology at The American University.

3. My area of specialization is in the economics of industrial organization. I have authored numerous publications, primarily in the application of industrial organization economics to antitrust and regulatory issues, including a number of papers dealing with aspects of the computer industry. A complete description of my background and papers can be found in my Curriculum Vita, a copy

of which is attached to this testimony as Exhibit 1.

4. I have been asked by a group of State Attorneys General to perform an economic analysis of certain actions by Microsoft Corporation (“Microsoft”) with respect to the market for Internet browser software. In conducting that analysis, I have, in addition to my prior work in this area, had access to sworn statements and various other documents.

5. Based on the information currently at my disposal, I have reached the following preliminary conclusions:

- First, operating systems (OSs) for the x86 architecture personal computer, or Personal Computer (PC), comprise a relevant antitrust market within which Microsoft has, and has exercised, monopoly power.
- Second, given my understanding that Internet browser products and operating system products have been and could continue to be provided separately, Internet browsing functionality and PC operating systems constitute separate product markets.
- Third, Microsoft has bundled Internet browser functionality with its OSs, where bundling means that the two products have been distributed together for a single price, so that the incremental cost of the browser functionality to the licensee is zero.
- Fourth, Microsoft has tied contractually the two products by requiring OEMs to accept both products from Microsoft.
- Fifth, given Microsoft’s monopoly power in PC operating systems, OEM’s have no economically meaningful choice but to accept the bundle and the tie.
- Sixth, this bundling and tying constitute exclusionary conduct with a dangerous probability that Microsoft will gain monopoly power in the Internet browser functionality market.

- Seventh, the resulting loss in browser competition may preclude or inhibit the emergence of effective alternatives to the Microsoft operating system and thus permit Microsoft to maintain its operating system monopoly.
- Eighth, once Microsoft has achieved monopoly power over the Internet browser technology, Microsoft will be able to use its power to attempt to monopolize the market for server operating systems.

II. OPERATING SYSTEMS FOR x86 ARCHITECTURE PERSONAL COMPUTERS ARE A RELEVANT ANTITRUST MARKET

A. Operating Systems Are Necessary to the Operation of Every PC

14. Personal computers are computers designed to be used by one person at a time. Personal computers include desktop and laptop models. Personal computers are actually computer systems, and like other computer systems, they are made up of many components, each of which must be technically compatible with the others for the system to function properly. A typical personal computer includes at least one CPU (“Central Processing Unit”), dynamic memory, a hard disk drive, a floppy drive, a keyboard and monitor, and an operating system. The operating system (OS) is “the software that controls the allocation and usage of hardware resources such as memory, central processing unit time, disk space, and peripheral devices. The operating system is the foundation on which applications are built.”¹

15. For purposes of this affidavit, I distinguish an Operating System (“OS”) from an Operating System Product (“OSP”). The latter represents the “product” sold to consumers and may include

¹ Microsoft Press Computer Dictionary (Third Edition, 1997, Microsoft Press).

software that is not part of the operating system. For example, Microsoft's Windows 95 OSP includes a software Solitaire card game. Solitaire is not part of the Windows 95 OS. Operating System Software ("OSS") is software that can be part of the operating system (i.e., either substitutable for part of the OS, or closely related to the functioning of the OS – for example, a hard disk clean-up utility is closely related to the OS and would be OSS.) OSS may be sold as a product.

16. Applications products are software programs separate from the OS that perform useful functions such as spreadsheet analysis, word processing, and database management. Applications products are said to "run on top" of the operating system. In particular, applications software must communicate with the operating system to request services from the operating system. Applications software does this using (or "calling") the operating system's application programming interfaces (APIs).

17. Desktop computers having CPUs compatible with Intel's x86 family of microprocessors are referred to here as "PCs."

18. The components of PCs are assembled by computer makers, referred to as original equipment manufacturers (OEMs). The great majority of operating systems installed on PCs are installed on new machines by OEMs.² The OEM stage of the PC industry is workably competitive, as indicated by the large number of computer makers, the absence of a dominant firm, and thin profit margins.

19. Both businesses and households purchase PCs. Businesses and households have different preferences and make different purchase decisions.

² In 1997, 87.6% of all copies of Microsoft's Windows 95 program were installed by OEMs, while 7.3% were sold through retail channels as upgrades. Windows 95 is available at retail only as an upgrade from a Microsoft licensed operating system. See Appendix B to Microsoft's Responses to Interrogatories, March 23, 1998.

20. IBM introduced the original PC in November, 1981 and selected Microsoft's DOS as its operating system. Since then, Microsoft Corporation has become the leading supplier of operating systems for PC OEMs. In the early 1990's, Microsoft began to enjoy widespread acceptance of its "Windows" operating environment product. Windows and DOS were often pre-installed on OEM PCs. In 1995, Microsoft introduced a successor operating system product to DOS and Windows called "Windows 95".³ Microsoft is expected soon to release Windows 98, the successor to Windows 95.

B. Principles of Market Definition

21. Market definition in antitrust cases provides a reality check as to whether obtaining or maintaining a monopoly would be profitable to the monopolist and harmful to consumers. This reality check helps to ensure that the allegations in an antitrust case make sense. The initial step in an antitrust analysis of Microsoft's practices is thus to define the relevant market that encompasses its PC operating systems. I subscribe to the general principles for market definition laid out by the Department of Justice (DOJ) and Federal Trade Commission (FTC) in their Horizontal Merger Guidelines. The first part of the 1992 Merger Guidelines definition of a relevant market is:

... a product or group of products and a geographic area in which it is produced or sold such that a hypothetical profit-maximizing firm that was the only present and future seller of those products likely would impose at least a "small but significant and nontransitory" increase in price, assuming the terms of sale of all other products are held constant. (U.S. DOJ and FTC, 1992: S1.0 at 7)

22. Briefly, a market is a group of products for which a hypothetical monopolist would find it profitable to raise prices by at least a "small but significant" amount. Although this definition was

³ Microsoft also develops and sells other operating systems targeted to more specialized markets, including operating systems for workstations (Windows NT Workstation), for Servers (Windows NT Server) and Windows CE for embedded and special purpose systems.

originally developed for use in merger cases, it can also be used in monopolization cases, with the following distinction. In a merger case one ordinarily would ask whether prices (or the time path of prices) would increase above *current* (or anticipated) levels. In a monopolization case, however, one asks if a monopoly in the relevant market already has resulted (or can be expected to result) in prices above *competitive* levels.

23. Just as it is important to define the market broadly enough to ensure that a monopoly over all the products in that market would cause significant harm, it is also important not to define the market too broadly. Thus the second part of the definition of a relevant market is "...a group of products and a geographic area that is no bigger than necessary to satisfy this test." (*Ibid.*)

24. Referred to as the "smallest market principle," this ensures that the collection of products analyzed is the smallest group that a monopolist would need to control in order for a significant price increase to be profitable. The point is to avoid defining markets so broadly that market power in a significant market escapes notice.

25. When determining the relevant market, any economist ideally would like to have reliable and precise estimates of the own price elasticity for the provisional market.⁴ If these estimates indicated that the provisional market was too narrow, cross price elasticity and diversion ratio estimates could be used to identify the most appropriate candidates to add to that market.⁵ In many cases, including,

⁴ To identify a market, one begins with a group of products that are close substitutes and which comprise a "provisional market" to be tested. The own price elasticity for this group of products is the percentage reduction in the unit sales of this group of products that would result from a one percent increase in the price of all the products in this group, holding all else (e.g., the prices of all products outside this group) constant.

⁵ The cross price elasticity of demand between product A and product B is the percentage increase in product A's unit sales that would result from a one percent increase in the price of product B, holding all else constant. The diversion ratio between A and B is defined as the fraction of A's lost

to my knowledge, this one, such estimates are not available and other information must be used to define the relevant market.

C. PC Operating Systems Comprise a Relevant Market

26. There are two relevant product markets for this case. The first is the market for PC operating systems. The second is the market for Internet browser functionality on the PC. Microsoft participates in both these markets.

27. The demand for an OS, an *input* into a PC system, is derived from the demand for the PC system and therefore is referred to as a *derived* demand. Even absent econometric estimates of the relevant elasticities, I am confident that the own price elasticity of the derived demand for PC operating systems is low enough to put PC operating systems in a separate market from operating systems for other computer platforms.⁶ Four important facts lead me to this conclusion. First, users and independent software vendors (ISVs) have invested significant amounts in skills and applications that are specific to the PC platform. As a result, if users switch to new platforms, they not only incur additional costs but also have a smaller portfolio of applications from which to choose. Second, suppliers of components to the PC other than the operating system (*e.g.*, chip manufacturers) have also incurred large sunk costs in those platforms. Third, an operating system for a PC is both essential and, for all practical purposes, used with the PC system in fixed proportions -- one PC

sales (when its price increases) that is captured by B. Thus, if the diversion ratio is 0.5, B would capture half of any sales A lost when it raised its price.

⁶ A computer platform is the foundation technology -- a combination of hardware and software -- on which applications are developed and run. For example, a PC with Windows 95 is a platform, often referred to as the "Wintel" platform, because it is comprised of the Windows operating system and an Intel x86-compatible CPU.

operating system per PC.⁷ Thus, faced with an increase in the price of PC operating systems, consumers can effectively substitute away from PC-compatible operating systems only by substituting away from the PC platform.⁸ The elasticity of derived demand for PC operating systems will thus be less than the elasticity of demand for PC platforms.⁹ Fourth, the elasticity of derived demand will decline with the share of the cost of the operating system in the total cost of the PC platform to consumers, and, at least currently, the operating system still accounts for only a small fraction of the total cost to consumers of PC systems. Consideration of these four determinants of the elasticity of derived demand¹⁰ for PC operating systems thus supports the conclusion that at competitive prices this elasticity would be well below the critical value at which PC operating systems comprise a separate antitrust market. I conclude that the smallest relevant market that includes Microsoft's PC operating systems is no broader than PC operating systems.

⁷ A very small number of PC users will employ more than one operating system.

⁸ A price increase can result in a decline in unit sales either because consumers switch to competing products or because they simply purchase fewer products. Thus, for example, a price increase for PC operating systems could, in principle, lead some OEMs to ship new PC systems without pre-installing operating systems. Customers who purchased these "naked" PCs could install OSs from their old PCs. An increase in the retail price for OSs also could lead some consumers to forego upgrades.

⁹ For an input that is "used in fixed proportions," the elasticity of derived demand will be simply the elasticity of final demand times the share of the cost of that input in the price of the final product. Thus, if the elasticity of demand for the final product (e.g., PCs) were 5, and the price of the operating system accounted for 10% of the price of the PC, then the elasticity of derived demand would be 0.5 (or even less if co-operant inputs, such as CPUs, were not available in infinitely elastic supply.) In this example, a 10% increase in the price of the OS would result in only a 1% increase in the price of the PC, which would result in a 5% decrease in the number of PCs and in the number of operating systems for those PCs.

¹⁰ See John R. Hicks, The Theory of Wages, 2nd ed., New York: St. Martin's Press, 1964, p. 244.

28. PCs account for upwards of 94% of the installed base of the world's estimated 400 million desktop and laptop computers. The PC, with 92% of all shipments of these computers, shows no signs of losing its dominance. Given Microsoft's monopoly power over operating systems for new PCs, Microsoft's concerns may go beyond preserving its monopoly power within the PC operating system market. As explained below, by reducing the availability of applications for non-PC personal computers or desktop computers, its actions may be aimed at preserving the dominant position of the PC in a wider market for personal computers or for some, as yet to be delivered, alternative platform. The effect would be to increase the demand and lower the elasticity of demand for the PC platform, and thus increase the demand and lower the elasticity of derived demand for PC operating systems, over which Microsoft has an effective monopoly.

III. MICROSOFT HAS MONOPOLY POWER IN THE MARKET FOR PC OPERATING SYSTEMS

A. Microsoft Has an Overwhelming Share of the PC Operating System Market

29. Monopoly power can be defined as the ability of a dominant firm to unilaterally raise market price above the competitive level for an extended period of time or to exclude competition. Microsoft satisfies both parts of this definition.

30. The first step in assessing monopoly power is usually to determine the level and stability of the market share of the dominant firm in the relevant market. According to Microsoft's figures, out of the estimated 209.2 million PCs shipped worldwide since July of 1996, 80.8% included some version of an operating system supplied by Microsoft. During this period, naked systems, i.e., systems shipped without any operating system at all, accounted for 31.5 million units, or 15% of the total PCs

shipped. In other words, of the PCs shipped with an operating system, Microsoft's share was 95.1% (MS700635). Moreover, Microsoft's share of OS sales for PCs continues to climb inexorably year to year.

B. Barriers to Entering the PC Operating System Market Are High

31. There are high entry barriers into the market for PC operating systems which make it very difficult for any actual or would-be entrant to take significant share from Microsoft and thereby discipline its pricing or other practices. First, the fixed costs in software development naturally limit the number of viable substitute products at any one time. Writing and de-bugging program code for any PC operating system that would compete directly for applications designed for Microsoft's OS market would require a huge fixed cost. The competition between two suppliers facing very large economies of scale would likely result in large decreases in prices and profits. Because only a small portion of either the initial fixed development costs and any subsequent negative cash flow would likely be recoverable if the entrant exited the market, these costs would be almost entirely "sunk," making entry very risky.

32. Second, users have a tendency to become "locked into" their operating system. They are reluctant to switch because to do so means they must replace most or all of their application software, convert most or all of their files, and learn how to operate the new software, both applications and operating system. Often, switching operating systems also means replacing or modifying hardware. Businesses can face even greater switching costs as they must integrate PCs using the new operating system and application software within their network and train their employees to use the new software. These switching costs are highest for the operating system, but are also significant for application software. Accordingly, both personal and corporate consumers are extremely reluctant

to change software – even when substitute software is available for free. The software “lock-in” phenomenon creates a barrier to entry for new OS software to the extent that the consumer’s estimate of the switching costs is large relative to the incremental value of the new software.

33. Third, for most users, operating systems are only a necessary means to an end – it is the application software that was designed to work with the operating system that users want.¹¹ Once purchased, users are naturally reluctant to consider an alternate operating system. Unless their current operating system prevents them from using new applications or hardware, they will continue to use their purchased and installed operating system. Users have already paid for the operating system, and software, unlike other goods, does not wear out.¹² Users are reluctant to consider changing operating systems given their satisfaction with the application software. This creates a high barrier to entry for new operating system products.

34. ISVs are reluctant to “port” (or convert) their software onto more than one operating system. To do so, ISVs must learn the interfaces of the additional operating systems and modify their applications to make use of these interfaces. This takes their critical resource – developers – away from enhancing the product to keep up with their competitors. Accordingly, a new operating system faces a high barrier to entry because applications developers may decide not to make applications available for it – particularly in the early stages of the new OS, when the ISV could not expect to

¹¹ As Professor Kenneth Arrow stated “The value of the operating system product is in its capability to run application software. The larger the installed base of a particular os, the more likely it is that independent software vendors will write program that run on the os, and, in this circular fashion, the more valuable the os will be to customers.” Declaration of Kenneth J. Arrow dated January 17, 1995, submitted in *United States v. Microsoft Corporation*, No. 94-1564 (D.C.C. 1995), on behalf of the Government and in opposition to *Amici Curiae*.

¹² Even facing technological obsolescence, operating systems and their applications continue to perform the functions they were designed and purchased for.

generate many sales.

35. Fourth, incumbent operating systems can enjoy a competitive advantage over later entrants that is in direct proportion to the size of the incumbent's installed base or "network." This same "network effect" occurs when a subscriber to a telephone network derives more value as additional subscribers join, because the subscriber can call more people. Network effects are especially prominent in the case of operating system software. First, more compatible application programs are available for the most popular operating systems. Second, books, publications, training, user groups, and news groups for the incumbent OS provide a large sense of community for its users. Third, users can exchange files with other members of the group. Finally, when the incumbent OS is installed at work, it leads users to select the same operating system for use at home. For new products that are not sufficiently compatible with the dominant product to share the benefits from the same installed base, these large network effects create a high barrier to entry.

36. Microsoft and its executives acknowledge the importance of network effects and switching costs. Microsoft works very hard to ensure that users who are "locked in" to a Microsoft operating system will suffer the least switching costs when they are ready to upgrade their PC.

37. Since 1981, when IBM introduced the first PC, several companies have entered the PC OS market to compete with Microsoft's DOS operating system. Rivals have attempted to duplicate the Microsoft operating system user and application programming interfaces in their operating systems, while perhaps adding innovative features (*e.g.*, DR-DOS).¹³ None has succeeded in mounting a

¹³ Indeed, IBM's OS/2 was a competitor to both Microsoft's DOS and DOS with Windows. The failure of IBM, the world's largest computer (and software) company, to make significant inroads against Microsoft's position, even in the corporate arena -- traditionally IBM's home turf -- is strongly indicative of the strength of these barriers to entry.

sustained effective threat to Microsoft's dominance of this market.¹⁴

IV. MICROSOFT HAS EXERCISED ITS MONOPOLY POWER IN THE PC OPERATING SYSTEM MARKET

A. In the Past, Microsoft Has Adopted Exclusionary Practices to Drive Actual and Potential Rivals from the PC Operating System Market

38. Microsoft engaged in exclusionary OEM licensing practices that had the purpose and effect of excluding horizontal competitors to its operating system.¹⁵ Beginning in 1988, Microsoft encouraged OEMs, in exchange for more favorable royalty rates, to sign "per-processor" licenses that required OEMs to pay a unit royalty for each machine they shipped whether or not a Microsoft operating system was pre-installed on the machine. Furthermore, these OEM licenses often required large minimum commitments from the OEM and ran for several years. Individually and collectively, these features had the effect of imposing a tax or penalty on purchases from a competing operating system vendor.

39. Tying has been another tactic used by Microsoft in its dealings with OEMs. When it first became available, Microsoft conditioned Windows 3.x licensing on the licensing of MS-DOS. Microsoft also effected an intertemporal form of tying when it permitted OEMs to "carry forward" any unused licenses for MS-DOS and Windows to subsequent years.

40. In the early 1990's, OEMs became the key distribution channel for operating systems. Microsoft focused its exclusionary practices on its license with OEMs. As indicated above, today the

¹⁴ See Christopher Jones deposition (April 8, 1998), p. 125, line 23 to p. 126, line 4.

¹⁵ See, generally, "Microsoft Plays Hardball: Use of Nonlinear Pricing and Technical Incompatibility to Exclude Rivals in Operating System Software," Kenneth Baseman, Frederick Warren-Boulton and Glenn Woroch, Antitrust Bulletin, XL:2, Summer 1995, 265-315.

overwhelming majority of PCs are sold with a pre-installed Microsoft operating system. Microsoft distributes full versions of its Windows 95 operating system exclusively through OEMs whereas retailers carry only upgrades.

B. The Extent and Expansion of Microsoft's Monopoly Power Is Reflected in the Pattern of OS Prices, in Microsoft's Margins, and in the Market Value of Microsoft Equity

41. While accurate historical data on Microsoft's operating system license fees are not immediately available, it is my understanding that since at least 1987, the operating system has accounted for a steadily increasing share of the cost of a PC. An internal Microsoft document acknowledges that it has increased its OS "prices over the last ten years [while] other components' prices [of PC computers] have come down and continue to come down. This is particularly true of CPU prices." Joachim Kempin to Bill Gates, December 16, 1997 (MS7 007194.)

42. Microsoft's monopoly power in operating systems has translated into supranormal returns. Microsoft's net profit margin is both extraordinarily high and has been increasing over time.¹⁶ Even more telling is Microsoft's extraordinarily high market capitalization. With a price/earnings ratio more than double the S&P 500 average, the financial markets are signaling very optimistic investor expectations regarding Microsoft's future growth in earnings.

V. BROWSER SOFTWARE IS A RELEVANT ECONOMIC MARKET WHICH IS DISTINCT FROM PC OPERATING SYSTEM SOFTWARE

¹⁶ For Microsoft as a whole, net revenue as a percentage of total revenue increased from 20% in FY86 to 26% in FY92, falling to 24% in FY95 before rising again to 30% in FY97 (See Microsoft Annual Reports). Among the Fortune 500 largest U.S. corporations, Microsoft ranks 137th in revenue, 165th in assets, 15th in profits, 7th in growth of earnings per share, 3rd in profits as percentage of assets, 2nd in market value and 1st in profits as a percentage of revenues. Fortune, April 27, 1998.

43. A “browser” is software that enables computer users to navigate and view content on the World Wide Web.¹⁷

44. Competition in browser software for PCs, principally between Microsoft’s Internet Explorer and Netscape’s Navigator and Communicator products,¹⁸ has benefitted consumers significantly.¹⁹ New versions of the browser products have been introduced in rapid-fire succession. Each new version has arrived with expanded functionality and innovative features.

45. Today the typical browser product includes additional related software such as an e-mail program, a web-authoring tool and a news group reader. Browser products support sophisticated security/encryption and the ability to run Java programs.²⁰ Competition has resulted in the porting of the most popular browsers to a variety of desktop platforms.²¹

¹⁷ See, for example, Brad Chase deposition (March 25, 1998), p. 206, lines 12-25.

¹⁸ Other browsers include Lynx, Mosaic, Opera, Web Explorer and WebSurfer.

¹⁹Microsoft itself acknowledges the consumer benefits deriving from the competitive race. In a memorandum entitled “The Internet PC” dated April 10, 1996, Bill Gates noted that Netscape Navigator “led the way with speed and features...Netscape and Microsoft have overlapping visions of the future of the Internet. Each company is working as hard as it can, as fast as it can, to develop software that supports its approach. One consequence of this feature race is that browsers are evolving from relatively simple pieces of software into large programs, enhanced with various extensions...”MS6 6012977-78.

²⁰ Browsers generally also contain a limited set of application programming interfaces (“APIs”) to which software writers can “write ” to extend the functionality of their application products to “Internet-oriented tasks.” This set of API’s is not a substitute for the set of API’s provided by the operating system.

²¹ Netscape Communicator -- Standard Edition is available for almost all Windows products, Mac System 7.5 and above, all major Unix desktop systems and soon for OS/2. See <http://www.netscape.com/navigator/index.html>. Microsoft’s Internet Explorer 4.0 is available on all Windows products, on Macintosh OS 7.1 and above, and on Unix Solaris 2.5 and above and other Unix platforms. See: <http://www.microsoft.com/ie/download/sysreq.html>. See, also, Brad Chase

46. The Microsoft and Netscape browsers constitute more than 98% of the browsers in use in the PC market.²²

47. Browsers can be strong complements to operating systems. Of course, any browser must be compatible with the OS platform. There is a separate demand for Internet browser functionality and for operating systems. This separation of operating system and Internet browser functionality in the eyes of users is reflected in the fact that some purchasers, particularly corporations which desire to use the same browser software throughout their operations, prefer to license the operating system and the browser software separately from different vendors. According to information and statistics contained in Microsoft documents and depositions, the most common way an individual user obtains browser software is through an Internet Service Provider (ISP). Some consumers in the market also acquire browser software separately – at retail, bundled by an OEM, via online download,²³ or bundled as part of an application.

48. The distinctness of demand for the two products is due in part to the fact that major upgrades of browser software have appeared with much greater frequency in the recent past than major upgrades of operating systems. Browser software acquired when a new operating system was introduced might be technologically obsolete well before the next version of the operating system was due out. Obversely, users may not want to have to acquire the latest operating system in order to obtain the most recent browser functionality, either because they are comfortable with their current

deposition (March 25, 1988), p. 98 and Yusuf Mehdi deposition (April 2, 1998), p. 32, lines 3-4; p. 45, lines 2-7.

²² Zona Research, Inc., <http://www.zonaresearch.com/newsrelease/>.

²³ See, for example, Mehdi deposition, pp. 103-04 and Paul Maritz deposition (April 3, 1998), pp. 21-23.

operating system, or because they own a machine that lacks the resources required by the new version. Further proof of the existence of two markets is evidenced by the fact that Microsoft and others track shipments and shares of both operating systems and browser software separately.

49. Just as Microsoft has expanded the functionality of its operating system product beyond the ability to explore the contents of data stored locally and into both local and Internet browsing, so Netscape has expanded the functionality of its browser from just Internet browsing to include local exploring and browsing.²⁴ As the potential for economies of scope between browsing and other functions changes, the efficient boundaries of a separate browser product may continue to move over time. Netscape browser products, for example, could become platforms to which applications are written, thus tending, together with other technologies, to offer an alternative software platform which might exert competitive pressure on Microsoft's conduct in the market for operating system software. More generally, given uncertainty as to the eventual optimal product configuration, a market test that will allow the most efficient configuration to emerge is socially desirable.

VI. MICROSOFT HAS BUNDLED AND TIED INTERNET EXPLORER TO ITS WINDOWS OPERATING SYSTEM

50. Since its introduction in 1995, Microsoft has consistently bundled Internet Explorer with its Windows 95 operating system, both retail upgrades and OEM versions.²⁵ In addition, Microsoft has required computer makers to accept Internet Explorer on each machine they ship with Windows 95

²⁴Indeed, Netscape's expansion into "exploring" may have preceded Microsoft's expansion into Internet browsing.

²⁵ Silverberg deposition (April 14, 1998), p. 133, lines 12-14, p. 134, lines 13-17; Chase deposition, p. 96, and Mehdi deposition, p. 58, lines 9-10.

(which is virtually all PCs they sell) or face the prospect of being denied a license to Windows 95.²⁶ On occasion, OEMs have expressed the desire to choose which browser(s) they pre-install in the PCs they ship.²⁷ They have sought permission from Microsoft to remove the software code constituting Internet Explorer and/or the Internet Explorer icon from the Windows package.²⁸ However, Microsoft, relying on provisions contained in the licenses pursuant to which it grants OEMs the right to distribute its Windows software, generally has refused such requests.

51. Generally, such license provisions provide that the OEM “shall not modify or delete any part of the Product software in any manner.”²⁹ Microsoft sought to impose the same restrictions on OEMs with respect to Internet Explorer 4.0, but it is presently prohibited from doing so by a preliminary injunction this Court issued at the request of the United States Department of Justice. The Government’s motion argued that such conduct violates the anti-tying provision of the 1995 Consent Decree. Even if this injunction is upheld, OEMs would have little incentive to refrain from installing Internet Explorer (except possibly if users viewed the presence of Internet Explorer as a nuisance) because Microsoft has always priced it at zero added cost.

52. ISPs and OSPs together represent the largest distribution channel for browsers. Microsoft

²⁶ Declaration of Eric Browning (Micron Electronics, Inc.), sworn to October 14, 1997.

²⁷ *Ibid.*

²⁸ Deposition of Stephen A. Decker, pp. 17-21.

²⁹ See, e.g., Microsoft License Agreement for Desktop Operating System Products dated November 1, 1997 with Gateway 2000. Additional language provides that the OEM “is not licensed to, and agrees that it will not, modify, in any way, or delete any aspect of the Product software (including, without limitation, any features, shortcuts, icons, Active Desktop components (as described in the OPK), wizards, folders (including subfolders) or programs of Product software as delivered by MS in the Product Deliverables...”

structured licensing arrangements with a number of major ISPs and OSPs, giving them positions in the “Online Services” folder on the Windows Desktop if they distributed Internet Explorer as the default browser to their subscribers and they neither advertised nor promoted alternative browsers. Recently, Microsoft appears to have retreated to some extent from this position. ISPs are now given a position on the Windows Desktop so long as they do not promote alternative browsers more prominently than Internet Explorer. Nevertheless, they must continue to advertise Internet Explorer exclusively to customers who sign up for their service through the Windows’ Desktop.

53. Such exclusive agreements are anticompetitive if (i) Microsoft’s monopoly power in the operating system market gives it an advantage in bargaining for such exclusive distribution agreements with ISPs and the cost to its rivals of reaching those customers directly is prohibitive, and if (ii) in conjunction with other actions by the dominant firm, the effect of the agreements is to foreclose a sufficient number of potential customers from Microsoft’s rivals so as to facilitate the monopolization of the PC browser market or raise entry barriers into other markets, such as operating systems.

VII. MICROSOFT ENGAGED IN TYING WITH THE PURPOSE OF EXCLUDING COMPETITORS IN THE BROWSER MARKET

54. The Internet’s rapid growth led Microsoft to perceive browsers as a threat to the value of its operating system monopoly. At the highest ranks of the organization, the browser and related Internet technology were seen potentially to offer an alternative to the Windows platform.³⁰ The

³⁰ See, for example, “Winning the Internet Platform Battle” (MS65005719) and “IPTD Division Meeting” (MS66008630); Mehdi deposition, pp. 43-44 and 129-30; Silverberg deposition, pp. 20, 30, 65-68 and 70-72, and Chase deposition, pp. 48-53.

browser's range of functionality expanded considerably in a short period of time, with apparent potential for assuming many of the functions of Windows as a development platform.

55. A leading threat to Windows' dominance is found in cross-platform technologies such as Sun Microsystems' Java technology.³¹ Widespread use of Java can make consumers indifferent to the choice of underlying operating systems by making applications portable, with the result that these applications are not "locked in" to the operating system. Accordingly, users are free to choose whatever operating system they want to run their chosen applications. If, later, they wish to switch operating systems, they can do so without replacing their applications.

56. Microsoft saw Java along with the early success of Netscape's Navigator as an especially dangerous threat. With a substantial lead, large installed base, innovative capabilities, and network effects, Navigator would be difficult to displace by ordinary competition on price and quality.³²

57. Microsoft executives recognized the threat that the Internet and its related development technologies posed to its monopoly over PC operating systems; namely, application developers no longer exclusively were developing applications that were locked into the Windows operating system. The threat posed by Internet open standards is that soon the stock of applications written under open standards, and thus compatible with a rival OS, would become large enough to diminish or eliminate the primary barrier to entry facing competing operating systems -- -- incompatibility with a large stock of existing applications. Unable to block the move to Internet standards, Microsoft adopted an "embrace and extend" strategy: Microsoft would support and adopt open Internet standards, but

³¹ See, for example, e-mail, Gates to Kempin, dated December 17, 1997 (MS7007548) and Chase deposition, pp. 44-45.

³² E-mail dated February 24, 1997 (TXAG008175-76).

it also would extend them by supplying proprietary Microsoft Internet technologies, such as ActiveX. Microsoft believes these proprietary technologies might be of significant benefit to individual applications developers, and because of their proprietary nature they would have a “lock-in” effect. The central threat that the presence of an independent browser product posed to Microsoft’s operating system monopoly was that it could block Microsoft’s efforts to induce applications developers to adopt proprietary Internet technologies.

58. An independent browser market threatens Microsoft’s Internet lock-in strategy. With only Netscape Navigator installed on a PC, an application that used Microsoft proprietary Internet technology, such as ActiveX, would not work on that machine, because Netscape refuses to support “non-open standards.”³³ The developer knows that the Netscape Navigator user will not buy his application. Thus application developers will not use ActiveX until Netscape’s share of the installed base is small enough such that the benefits to developers from using ActiveX more than compensate them for the loss of potential customers who cannot use their products. As long as Netscape’s share of the browser installed base is high, no developers are likely to find proprietary Internet technology attractive for shrinkwrap applications.³⁴ Once Netscape’s share of the browser installed base is small, shrinkwrap developers will accept ActiveX and other proprietary Windows-specific Internet technologies. Some developers will never use ActiveX because it is not cross platform – and these

³³ Microsoft did turn over ActiveX to an independent standards body. However, it has received little or no support from other platform providers. See “The Active Platform,” (MS65003700 at 3701) and “ActiveX Stakeholders Choose the Open Group to Drive Direction of ActiveX in the Future,” Open Group Press Release (October 3, 1996).

³⁴ Some business applications developers in corporations that already are committed to using Internet Explorer may accept ActiveX since there is no immediate cost. These businesses, however, will be locked into the Microsoft operating systems.

developers perceive direct benefits in being able to run on multiple platforms. But many corporate customers and other users will be locked in to Windows. Thus, by driving Netscape from the market, Microsoft will block the critical mass of cross-platform applications needed to make other OSs or platforms attractive to a large number of consumers.³⁵

59. Microsoft responded to the potential threat to its operating system monopoly with strategies designed to drive out other browsers and Netscape's Navigator, in particular. The principal tactics were mentioned above: bundling of Windows and Internet Explorer, zero pricing of Internet Explorer and the tying of an ISP's Windows Desktop position to its exclusive promotion of Internet Explorer. In each case, provision of Windows was made conditional on acceptance of Microsoft's Internet Explorer.

VIII. MICROSOFT'S ACTIONS WILL HARM COMPETITION IN THE BROWSER AND OPERATING SYSTEM MARKETS

60. If Microsoft's exclusionary practices are not abated, substantial foreclosure of the browser market will likely result. If OEMs are required to pre-install Microsoft's browser software with Windows 98, for example, Microsoft's own internal studies indicate that few end users of Windows 98 will separately obtain and use any other browser product.

61. Netscape has already lost significant browser market share to Microsoft. Between April 1996 and September 1997, the percentage of users who selected Navigator as their primary browser fell

³⁵ BeOS could decide to support ActiveX at no charge. But if developers began to use other Microsoft proprietary applications such as J/Direct, the cost to operating systems such as BeOS of maintaining compatibility would be enormous.

from 87% to 62%, while the corresponding percentage for IE rose from 4% to 36%.³⁶ Additional loss of market share by Navigator would not be easily regained.

62. Microsoft's monopolization of the browser market will permit it to extend its monopoly into the market for servers, where there is still considerable competition. Microsoft internal documents reveal its plans for the next version of Internet Explorer, Version 5.0. Of course, this new browser will work with servers from other companies such as Sun, Hewlett Packard, and IBM.³⁷ However, Internet Explorer 5.0 "runs best when connected to BackOffice/IIS servers."³⁸ The threat to competition is clear – freed from competition with Netscape and the requirement to adhere to open standards, Microsoft intends to use its monopoly power in the PC operating system market to gain control of the server operating system market.

Frederick R. Warren-Boulton

Dated _____

³⁶ Zona Research, Inc., <http://www.zonaresearch.com/newsrelease/>. See also MS7004718, and "Fighting the Browser Wars: Software Bundling Plays Key Role in Gaining New Users and Market Share," February 25, 1998 Georgia Tech Research News, www.gvu.gatech.edu.

³⁷ These servers are not x86 architecture systems.

³⁸ MS7004613