
Competition in the Network Market: The Microsoft Challenge



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About the Software Publishers Association

The Software Publishers Association is the principal trade association for the computer software industry. With 1,200 members, SPA's companies range from small software firms to industry giants such as Microsoft, Oracle, Novell, IBM, Adobe and others. SPA includes companies from the business, education, consumer, Internet and electronic commerce segments of the software industry.

About this Document

This report was prepared by the staff of the SPA, under the direction of Lauren Hall, chief technologist, with input from many SPA member companies. Because of the sensitive nature of this material presented, no SPA member has been asked to specifically endorse this document. Much of the material contained herein comes from public documents and great effort has been made to ensure the accuracy of the analysis. We recognize, however, that given the highly technical nature of the material presented, it is possible that other analysts may interpret events and conclusions differently. We anticipate that rebuttal documents will be prepared, and we urge competition authorities to consider them as well.

Executive Summary

I. Network Servers and Applications are the Foundation for the Information Age

The network and enterprise markets, fueled by the growth of the Internet, are expanding exponentially. Whereas the desktop computer has been the focus of innovation and advancement in recent years, the future will be dominated by a networked, server-centric infrastructure. As a result, the network server and server-based applications become the next great engine of growth.

II. Microsoft has Targeted the Network Market and Is Aggressively Extending its Reach into the Network

Microsoft recognizes the potential of the \$30 billion enterprise market and has set its sights on developing products in this lucrative market segment. The "Windows Everywhere" strategy is built on a strategy of using the Windows NT operating system on both the server and workstation. Microsoft is pursuing this objective by aggressively moving into the network server and application space. Although there is nothing wrong with pursuing this objective aggressively, there are serious concerns with Microsoft leveraging their desktop monopoly to the server.

III. Microsoft's Desktop Monopoly is Extending into a Server Monopoly

Microsoft's desktop monopoly allows it to extend its monopolistic power to the network server and enterprise application markets as quickly and as decisively as it did on the desktop. Microsoft's strategy has three key elements:

- *Establish Windows NT as the successor to Windows 98*
Windows 98 is being phased out and replaced with Windows NT. As a result of Microsoft's desktop monopoly, even those companies and consumers who choose not to use Windows NT as their network operating system will be forced to adopt Windows NT technologies and standards.
- *Control the network through the desktop*
Microsoft's monopoly on the desktop allows it to dictate which technologies and protocols are supported and implemented. Protocols – a common “language” shared by servers and network clients to facilitate communications – must be open and implemented through close cooperation and collaboration among vendors. Because server application vendors must write programs that support both the server OS and the client OS, even companies that do not directly compete with Microsoft in the server application market (yet) are forced to comply with Microsoft's implementation of network communications. It is a powerful position – through its monopoly on the desktop, Microsoft in fact controls development on the network.
- *Aggressive Marketing of Windows NT*
Aggressive marketing is the hallmark of the software industry in general and Microsoft in particular. Such moves are not necessarily anti-competitive, but when employed by a monopoly, raise concerns about the intent of such practices. In the Microsoft case, such concerns are well-founded. As explained in detail, Microsoft is using its monopolistic power on the desktop to eliminate competition on the network through bundling, predatory pricing, tied pricing,

manipulation of technical standards and a host of other anti-competitive practices.

IV. Anti-Competitive Practices

Microsoft is engaged in a host of anti-competitive practices designed to eliminate competition on the server just as it did on the desktop. These practices include:

- *Leveraging the desktop OS monopoly to establish a server monopoly*
That Microsoft's desktop monopoly is tremendously powerful is obvious – and in recent years, Microsoft has not been shy in using that leverage to shape its own entry into the server market. By tying product certification – and thus market acceptance and commercial viability – for Windows 95/98 to Windows NT, Microsoft has ensured that NT will be just as dominant. Developers who write for the Windows 95/98 monopoly must also ensure that their products run on Windows NT. Products that do not meet Windows NT specifications cannot receive the Windows 95/98 certification. In an industry so reliant upon the network effects of complementary products, the tying of certification for NT to Windows 95/98 has all but made Microsoft's dominance with Windows NT a *fait accompli*.
- *Using monopoly power to control technical standards and specification*
Open standards are critical for the growth of information networks. If disparate systems cannot communicate, then the potential benefits of a wired world are simply unattainable. Microsoft uses its dominant position to ensure that technical standards are drafted to its advantage; in some cases, Microsoft refuses to support industry standards on its bundled products, forcing consumers to adopt Microsoft-proprietary technologies instead. Finally, because Microsoft makes no effort to separate its applications and system development teams, it benefits from shared knowledge, quicker time to market, extensive knowledge of the operating system and details about the intricacies well in advance of other developers.
- *Bundling applications with the OS*
In recent years, the number of products included with Windows NT has grown dramatically; the Windows NT bundle now includes Web, transaction, messaging queue, certificate and index servers. These products, while tightly integrated with Windows NT, are not part of the operating system itself. As these products have become available, Microsoft has released them as stand-alone products. However, because these various servers are built upon the proprietary Common Object Model (COM) technology that is an inherent part of the NT architecture, it is difficult and generally costly to use third-party products instead of the MS-bundled applications. And because these Microsoft products often only work with other NT-compliant products, users who take advantage of these free products find themselves "locked in" to a Microsoft-only environment.
- *Using predatory and tied pricing to eliminate competition*
Microsoft uses pricing schemes to eliminate competition. Because of its constant revenue stream from operating systems, Microsoft is often able to price products far below competitors' offerings or even give products away for free. While many software publishers provide discounts for users who buy a suite of products, few can offer groups of products at discounts as deep as Microsoft. Microsoft ties the purchase of other Microsoft goods to the OS. Competitors are disadvantaged because they cannot use operating system sales to offer similar pricing incentives. Because there is no alternative to the OS, Microsoft is in the unique position of

providing customers the product that they must have (the OS) only when they purchase the products Microsoft wants them to have.

- *Nullifying competition through pre-announcements, vaporware, de-support and claims of incompatibility*

Microsoft uses its tremendous market power to eliminate competition before it even appears on the high-tech scene. Through pre-announcements and vaporware, Microsoft freezes the market for new development – developers, venture capitalists and start-up companies are all unwilling to enter into new markets that Microsoft has identified as potential future avenues for its own products. As a result, third-party developers are relegated to development on the fringes, limited to those areas in which Microsoft does not offer or does not plan to offer a competing product. Further, through refusals to support third-party products – and even its own products when third-party applications are in use – Microsoft undermines the customer base of its competitors. Because users have no option except Microsoft on the desktop OS, customers are unwilling to try third-party products, fearing that Microsoft may simply choose not to support such products in the future.

V. Antitrust Consideration is Appropriate Now

SPA and its member companies applaud Microsoft for its remarkable success – such spectacular growth is the result of strong management, corporate vision and a creative workforce. But at the same time, SPA, as the principal trade association for the software industry, has an inherent interest in preserving competition in this lucrative and growing market that promises to bring benefits to so many consumers.

Given the current investigation into the competitive practices of Microsoft, it is appropriate that antitrust enforcement officials also examine Microsoft's activities in the NT market. Unless competition authorities pursue balance in this market equally aggressively, Microsoft is on a course to eliminate competition in the enterprise markets as quickly as it did on the desktop.

Section One: An Introduction to the Enterprise Market

The Status of the Market

The Rise of Network-Centric Computing

In recent years, the focus of the computing world has shifted from the personal computer to the network server. Servers – computers that provide the centralized storage of data and delivery of services to multiple concurrent users – are the building blocks for the rapidly emerging digital age. In the future, it is the network server and enterprise application markets that will be the engine of growth. Fueled by the expansion of the Internet, private and public networks are increasingly interconnected and integrated. In this emerging paradigm, network servers provide access to server and to enterprise applications for a wide range of clients, linking mainframes to server to desktops and handheld consumer devices. This fundamental shift holds great promise for consumers and businesses alike by providing unprecedented integration and access to data.

The Growth of the Network

In the last twenty years, the way that we as a society learn, communicate, conduct business, purchase goods and services and even play has fundamentally changed. For instance, it has only been in the last few years that consumers could tap into the vast resources available on public networks. And it is only in that short time frame that businesses, schools and universities, governments and individuals have begun to provide a range of services to previously unreachable audiences. Everything that we do – whether we realize it or not – relies upon computers and the software that runs them. The backbone of this new paradigm is the enterprise network.

Virtually every aspect of network computing is growing exponentially. This growth is fueling the need for an ever expanding network of computer servers, server-based applications and technologies that facilitate interoperability. The key component of this growth is the computer server.

For growth to continue, differently configured workstations and servers must be able to communicate with other servers, desktops, handheld and other consumer devices. Implementation of the networked society is not a simple task. It requires a combination of many different network, communication, database, business application and system management packages, all of which are running a variety of operating systems on disparate servers.

Today, computer networks extend seamlessly from the user's desktop to the "back-end" of the company and beyond. On the user's desktop, the network includes the systems to create, access, analyze, present and report information. On the server, the network includes the systems to secure, manage, store and distribute information.

Businesses wanting to exploit technology must be able to manage and integrate different types of information. Today, companies store data either on large dedicated central computers or on smaller machines distributed throughout a company. With networking and communications capabilities built into the operating systems (OS) of all computers, users can access information not only from their own desktops but also from mobile locations using remote workstations, portable PCs and handheld devices.

It is not solely the OS that makes a computer an efficient means of accessing information; applications provide users true ease-of-use tools to accomplish a variety of tasks. Graphics and multimedia applications make information easier to access, understand, manipulate and communicate. High-performance database management systems (DBMSs) ensure that data is easy to file, retrieve, share and protect. And mail and workgroup applications enable efficient communication, coordination and collaboration.

These systems, commonly known as client-server applications, link users (clients) with the server. Client-server programs facilitate the sharing of information between the two – users can enter, retrieve and manipulate information while the server can store, manage and analyze the same data. These complex systems rely on the ability of both to communicate – in effect, they must speak the same “language” to facilitate the proper functioning of the program.

The success of non-Windows networks is attributable to open interfaces and non-proprietary platforms that allow complete integration of information from multiple sources. These open systems allow independent software vendors (ISVs) to develop and market high-productivity easy-to-use tools and applications that integrate seamlessly with the OS.

The Enterprise Software Market

The software market can be divided into two segments – client and enterprise software. In the most basic terms, client software runs on personal computers (PCs) and is designed to serve an individual user. Enterprise software runs on servers designed to provide services to many different users (clients). Clients are connected to servers through a network or over the Internet.

Most users are familiar with typical client software – common applications include word processors, spreadsheets and personal productivity tools. Enterprise software is significantly more complex than client software, since enterprise software must fulfill the needs of hundreds of different users simultaneously. Because enterprise software serves the wide ranging needs of groups of individuals, it must be much more reliable, robust and open than client software.

The enterprise software market is occupied by some of the largest software companies in the world producing applications, development tools, database, Web, messaging and communication servers as well as network operating systems and interfaces. These companies include IBM, Microsoft, Novell, Sun Microsystems, Oracle, Computer Associates and SAP.

Applications (accounting, payroll, human resources, call centers) SAP, Oracle, PeopleSoft, Baan, Vantive, Legato			
Development Tools Sun Java Development Tools, IBM Visual Tools, Microsoft InterDev, Oracle Developer Tools			
Database Servers Oracle, Sybase, Informix, IBM, Microsoft SQL Server	Communications Servers Microsoft SNA Server, IBM SNA Server, Oracle Gateways	Messaging Servers Lotus Notes, Microsoft Exchange, Novell GroupWise	Merchant Servers widely varied – more than 50 merchant server vendors currently
Web Server Systems Netscape Server, Microsoft IIS, Oracle Web Application Server, Apache Server			
Network Operating Systems Novell NetWare, UNIX LAN Server, IBM OS/2, LAN Server			
Operating Systems and User Interface Microsoft Windows NT, UNIX (HP, DEC, Sun, SCO), IBM VM/MVS/OS400, DEC VMS			

Network-Centric Computing Requires Interoperability

Businesses that use client-server technology and enterprise application software operate on many different operating system platforms. For example, the U.S. banking system is actually a network of multiple operating systems running a myriad of diverse enterprise applications. The transparency and ease of use of the banking networks for employees and customers is due exclusively to the openness and the interoperability of both the operating systems and the enterprise applications.

Simple every-day transactions like cashing a check or obtaining money from an ATM often involve entities that have different hardware, different operating systems and application software. For example, check cashing transactions use database management systems –independent of the operating system – to make sure that the transaction is completed across all file systems, operating systems and hardware platforms involved.

Many of these systems rely on mainframes, many run on large servers and most depend on interaction between the two. The mainframes – often developed some time ago and known as “legacy systems” – can communicate with other machines because of open standards that facilitate communication. The success of the networked society, today and in the future, is dependent upon open and interoperable systems. If any one company takes control of the operating system or the enterprise software market, integration of many different established and successful computer systems will be costly and disruptive.

Section Two: The Microsoft Challenge

Antitrust Consideration is Appropriate Now

With Windows NT positioned as the successor operating system to Windows 95/Windows 98, Microsoft intends to use its desktop position to extend its reach into the enterprise market. For Microsoft, the entryway into the lucrative network segment is through the desktop. Without such a compelling advantage, Microsoft would be forced to compete for acceptance in the server market. Given that advantage, competitive pressures that traditionally ensure optimal choice and pricing for customers cannot be expected to occur naturally. The replacement of Windows 95/98 with Windows NT is the critical leverage that Microsoft needs to monopolize the server market.

Microsoft is not entering a new, unfamiliar or unrelated marketplace. Microsoft understands the software market and has been tremendously successful in establishing its dominance. Such success should not be disparaged, but neither should prosperity provide a license to eliminate competition. And while the software industry applauds innovation, success cannot create a dominant environment in which truly innovative companies are unfairly discouraged or discredited.

With Windows NT, Microsoft has set its sights on the network and enterprise application markets. Using a strategy that one economist calls “target, leverage, link and lock,”¹ Microsoft is engaged in a variety of practices designed to ensure that OS competition is eliminated in the server market as quickly and decisively as it was on the desktop. Leveraging its control over the desktop, Microsoft ultimately can control this lucrative market segment because it controls the technologies, protocols and user interface on the desktop.

Some have argued that antitrust regulators should not be concerned about Microsoft’s enterprise strategy because Microsoft’s market share of the enterprise market is not as high as its market share on the desktop. But a firm’s market share is only the starting point for assessing whether it possesses monopoly power; even Microsoft recognizes that such measurements are not the determinant factor in antitrust considerations, as noted in an essay on software competition available on www.microsoft.com:

“Antitrust lawyers and economists are accustomed to thinking about “market shares” as a factor relevant to assessing competitive conditions. In the software industry, however, the significance of a high market share in any particular segment is quite limited because that figure represents only a snapshot of current software shipments.”²

The key issue of this paper provides an analysis of the anti-competitive nature of Microsoft’s enterprise strategy. The Supreme Court has ruled, “If monopoly power can be used to beget monopoly, the [Sherman] Act becomes a feeble instrument indeed.”³ The Supreme Court “has held many times that power gained through some natural and legal advantage such as a patent, copyright, or business acumen can give rise to liability if ‘a seller exploits his dominant position in one market to expand his empire into the next.’”⁴

1 Philip Elmer-Dewitt, “Mine, All Mine,” *Time*, June 5, 1995.

2 <http://www.microsoft.com/corpinfo/doj/1-98whitepaper.htm>

3 *United States v. Griffith*, 334 U.S. 100 (1948).

4 *Kodak*, 504 U.S. at 480 n.29 (quoting *Times-Picayune Publishing Co. v. United States*, 345 U.S. 594 (1953)).

Microsoft's dominant position in the desktop market provides ample opportunity to extend quickly and decisively into the server market as well. In addition, just as Microsoft leveraged control of the desktop to establish a monopoly in the business application market (word processors, spreadsheets, presentation graphics and desktop databases); its growing influence in the server operating system market positions it to monopolize the database, Web, transaction, communications, messaging and electronic commerce server markets as well. Microsoft's control of the desktop business application market with the Microsoft Office Suite has essentially eliminated innovation and competition in that market segment. This same threat now exists in the enterprise software market.

Control of the operating system market by one company brings with it the threat of a closed, proprietary platform for enterprise, Internet and intranet applications. With a closed OS, independent software vendors would be effectively precluded from selling competitive products since Microsoft alone would dictate how non-Microsoft software applications need to be written in order to function properly. Moreover, the convergence of the three operating systems (Windows 95, Windows 98 and Windows NT) into one (Windows NT) provides Microsoft with the power to engage in various exclusionary and predatory practices, including tied pricing schemes, pre-announcements, vaporware and de-support notices. These practices coupled with Microsoft's bundling, integration and time-to-market practices, leave ISVs severely disadvantaged in the NT market.

A sound understanding of the implications of Microsoft's practices in the context of a single, dominant proprietary system in the architecture of next generation computer networks may enable policymakers to identify potential harm to consumers in advance of the deterioration of the competitive forces in the marketplace. Given the rapid growth of Windows NT and Microsoft BackOffice Suite, antitrust consideration is appropriate now, before competition and innovation in the enterprise are stifled.

The remainder of this paper provides our analysis of the anti-competitive nature of Microsoft's enterprise strategy.

Microsoft's Enterprise Strategy

While current antitrust attention has been focused primarily on the desktop market, it is equally important and timely that the server market is closely examined as well. The positioning of Windows NT as the successor operating system to Windows 98 provides ample justification for consideration. As Microsoft Executive Vice President Steve Ballmer noted, "This fight is not about Windows 98...The specific complaint may be 98-related but all principles being challenged apply just as well to NT as to anything else we do."⁵

The Microsoft Strategy

Microsoft's move into the enterprise market has been at the core of the company's plans for some time. The enterprise market, estimated at \$30 billion annually, is lucrative. With growth in the maturing PC market slowing and the growth of network-centric computing rising, Microsoft is aggressively moving to develop enterprise server software and applications.

The Gartner Group summarizes Microsoft's short-term enterprise strategy as follows:

"upgrade the installed base to 32-bit (Windows NT) and attempt to gain control of Internet standards. Market expansion is still fueling profits. When markets saturate, market-dominant companies often change strategies for profit enhancement. As Microsoft grows in relative importance to enterprises, Microsoft will leverage that position to glean higher margins from an inevitably lower-volume business."⁶

According to the Gartner Group, "[enterprise] server software is Microsoft's needed growth engine."⁷ *Fortune* magazine agreed, noting that "When combined with BackOffice, Windows NT is far more profitable, per user, than anything Microsoft has done with Windows."⁸ It is a very profitable move – *Business Week* pointed out that "by selling NT, Office 97, and a suite of networking products called BackOffice, [Microsoft Group VP for Sales and Marketing Jeffrey] Raikes' goal is to increase Microsoft's average annual revenues per corporate computer user from less than \$150 today to more than \$200 in the next two years."⁹

The Impact on Competition and Consumers: Why It Matters

Closer examination of Microsoft's enterprise strategy reveals three key elements: (1) By positioning Windows NT as the successor operating system to Windows 95/98, Microsoft has virtually ensured that every corporation and consumer will adopt NT technologies. (2) Through its control of the technologies and protocols supported on the desktop, Microsoft extends its reach into the network. (3) And by aggressively marketing Windows NT – through bundling, predatory pricing, integration of applications and other anti-competitive practices – Microsoft is making significant headway into the enterprise market. Combined

5 Robert DeMarzo and Lawrence Aragon, "Microsoft Ready for Long Battle," *VAR Business*, May 19, 1998.

6 T. Bittman, *NT Server as an Enterprise Server*, Gartner Group Strategic Analysis Report, July 24, 1997

7 T. Bittman, *NT Server as an Enterprise Server*, Gartner Group Strategic Analysis Report, July 24, 1997.

8 David Kirkpatrick, "He Wants *All* Your Business – And He's Starting to Get It," *Fortune*, May 26, 1997.

9 Steve Hamm, "Microsoft's Future," *Business Week*, January 19, 1998.

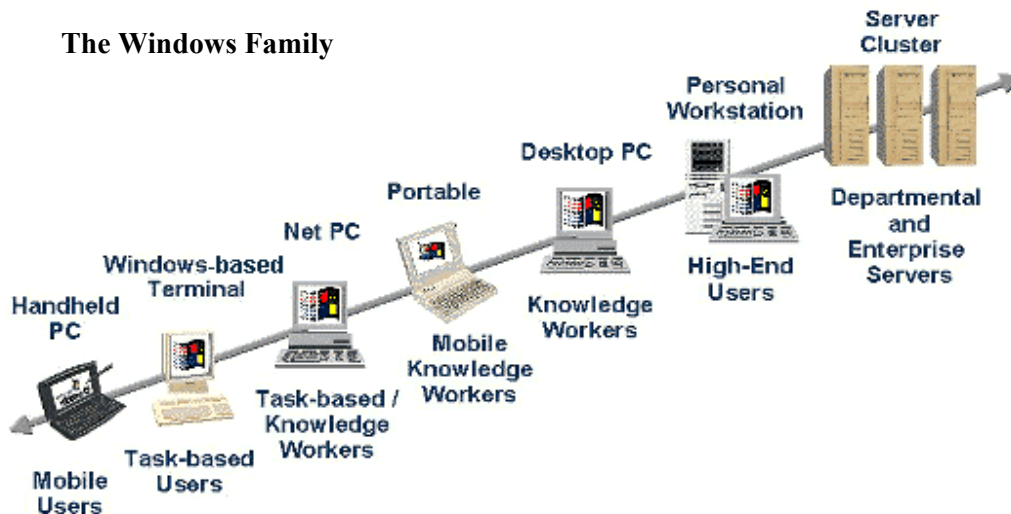
with the deeper analysis of anti-competitive practices described below, continued competition in the enterprise market is tenuous.

Windows NT as the Successor OS to Windows 98

As noted above, Microsoft’s long-term OS strategy has been clear for some time: the Windows 95/98 product line will be abandoned in favor of Windows NT. Windows NT will emerge as an OS for both the server and client platforms. As Bill Gates noted, “NT is the centerpiece of what we are doing.”¹⁰

Nearly everyone in the software industry is familiar with Microsoft’s objective of “Windows Everywhere,” a strategic corporate objective designed to ensure that Microsoft Windows products are deployed from the most robust network server to the simplest consumer devices. Microsoft’s network computing software is built on the Windows family of operating systems that unify the client, the server, peripherals devices and applications through a single set of application programming interfaces¹¹ (APIs), user interface services and development tools. These common elements ensure that Microsoft will be able to better leverage its existing desktop dominance into the server market with Windows NT and into the consumer devices market with Windows CE.

Currently, Microsoft’s primary desktop operating system is Windows 95/98, Windows NT is the network server product. This is rapidly changing. According to Microsoft officials, “Windows NT will be Microsoft’s standard operating system in the future and the company does not plan to update the Windows 95/Windows 98 product line.”¹²



Windows NT is currently available in two broad categories: server and workstation.¹³ The two products are technically equivalent, but the workstation product is limited to ten concurrent network connections, supports only one remote connection and does not come bundled with the variety of add-ons included with each NT Server.¹⁴ NT Workstation is the

¹⁰ David Kirkpatrick, “He Wants *All* Your Business – And He’s Starting to Get It,” *Fortune*, May 26, 1997.

¹¹ APIs are the links to the operating system that developers use to access OS functionality (such as printing or saving files). Developers can build upon APIs when programming, saving the chore of having to repeat work done elsewhere. For more information, see page 13.

¹² Lee Pender, “Microsoft Sorts Out Windows Plans,” *Computer Reseller News*, April 27, 1998.

¹³ Two versions of NT Server are available. See <http://www.microsoft.com/windows/winprodoverview.asp>.

¹⁴ According to Microsoft, NT Server includes some minor modifications to provide better performance for multiple users; however, there is nothing in the architecture of either product that would prevent an application

successor to the Windows 95/98 desktop operating system; NT Server will remain Microsoft's flagship network product.

Microsoft is also working on a "more futuristic" consumer version of Windows NT that will replace Windows 98 on home PCs, the so-called NT Consumer Edition. This affirms Microsoft's plans to phase out the Windows 98 code base.¹⁵ A Microsoft spokesman confirmed that the home version of Windows NT was "a project that is important to Microsoft."¹⁶

The impact of the convergence of Windows 95/98 and Windows NT will be tremendous. Because Windows 95/98 has more than a 90 percent market share of the desktop market, even companies that use alternative network software will be compelled to adopt NT technology. With NT emerging as the desktop standard, companies will have no choice. As a result, Microsoft will be able to penetrate into virtually every corporation and home with Windows NT. This threatens innovation and portends higher prices for consumers.

Controlling the Network through the Desktop

Every electronics manufacturer knows that it must develop products that run on 110-volt circuits, the standard electric interface in the U.S. While a company could build a stereo that combines the best technology available and produces perfect sound, it would not be a commercially viable product unless it was able to run on 110-volt circuits. Unless the goods conform to industry standards, customers have little incentive to purchase the product.

So it is with Windows NT. Network server, server application and other enterprise developers know that if their products are to be commercially viable, they must support Windows-based clients. This gives Microsoft a powerful advantage over enterprise application developers, because Microsoft alone can determine which protocols and technologies are supported and therefore deployed in a corporate environment. This is a critical lever that Microsoft holds over other software publishers.

Protocols are central to the development of networked systems – they are the common language that allows clients and servers to interoperate. In order for network systems to communicate well with clients, two events must occur. First, the network protocols must be fully disclosed and described to ensure that developers are able to write well integrated, stable and robust software. Second, the vendors involved must work together in good faith to ensure that the fine details and subtleties are explored and potential problems resolved. In developing complex systems, full disclosure and cooperation among vendors is critical.

TCP/IP, for example, is the common protocol used for Internet communications. The wide availability and industry acceptance of TCP/IP has allowed the Internet to reach millions of users. TCP/IP is widely understood and has been in use for years. But for deployment to continue to be successful, constant cooperation, discussion and collaboration among industry partners is required. A yearly "Connect-a-thon" allows vendors to ensure interoperability and explore the intricacies of network implementations.

written for one from running equally well on the other. See <http://www.microsoft.com/corpinfo/speeches/paul/pdc.htm>. NT Server comes bundled with Internet Information Server, Internet Explorer and Front Page; NT 5.0 will also include Transaction Server, Message Queue Server, Internet Explorer 4.0 and Active Channels. See "Microsoft Strategy: Fit to Be Untied", *PC Week*, December 22, 1997.

¹⁵ Jim Forbes and John Ruley. "Windows NT Goes Home," *Windows Internet Magazine*, April 1, 1998.

¹⁶ *Ibid.*

This issue is important not only because of the proprietary, anti-competitive nature of a closed Microsoft system. If Microsoft establishes a monopoly on the server, it will be able to substitute its own versions of these protocols that can break interoperability and disadvantage or even disable competitive products. What is ultimately at stake is the interoperability of systems and the architecture of next-generation Internet-based applications.

“Aggressive” Marketing for Windows NT

Microsoft is actively moving its larger accounts and business users to NT, encouraging them to bypass the Windows 98 release. Bob Herbold, Chief Operating Officer for Microsoft, noted in April 1998, “We’re steering Windows NT Workstation towards large accounts.”¹⁷ Microsoft’s Web pages note that “in choosing the best operating system, Microsoft believes that when businesses and organizations have a choice, they are best suited moving today to Windows NT Workstation 4.0.”¹⁸ Microsoft’s aggressive strategy is paying off: by early 1998, Windows NT Workstation had captured more than 50 percent of the lucrative high-end workstation market.¹⁹

Aggressive marketing by a company controlling 93 percent of the desktop OS market necessarily raises serious concerns. When that strategy includes leveraging, bundling and predatory pricing, it cannot simply be dismissed as “aggressive” marketing. It is simply anti-competitive.

17 Speech by Bob Herbold, Chief Operating Officer for Microsoft, before the Hambrecht and Quist Technology Conference, San Francisco, CA, April 27, 1998. See <http://www.microsoft.com/msft/html/herboldhqconference.htm>

18 <http://www.microsoft.com/windows/Windows98/Compare/ChooseOSbus.asp>.

19 “Microsoft’s Contradiction,” *The Economist*, January 31, 1998.

Section Three: An Analysis of Current Marketing Techniques

Anti-competitive Practices

Setting the Rules: Controlling the Platform to Control Competition

Microsoft, as the owner of the dominant operating system, is well-positioned to use the OS as a means to control competition. Generally, the owner of the OS has provided third-party developers with sufficient information to allow software publishers to write stable, efficient and robust programs. Not only has such an arrangement supported interoperability, it is in the long-term interest of a competitive OS owner to encourage application development for its platform. Users are unlikely to buy an OS without a wide range of available applications; having an open OS allows users to benefit from the diversity of programs and increases the value of the OS itself. This is referred to as a “network effect.”

However, once the owner of the OS has established a monopoly, there is little incentive to keep the operating system open, especially when the OS can be manipulated to advantage its own products and disadvantage the products of potential competitors.

The Role of COM

The development of Microsoft’s OS and application development centers around the use of a proprietary Microsoft technology known as the Component Object Model (COM). COM is a mechanism for different software components to communicate with each other. In a very basic sense, COM can be considered the common language that the various parts of the operating system and software programs use to talk to one another.

The most common instance of component-to-component communication is with client-server applications. This communication between components could be within the same server process, between server processes or across the network, also known as a remote procedure call. COM provides a mechanism for components to register their identity with a unique identifier so that components can easily and reliably locate each other. A software component (a client for example) that is looking to communicate with another component (a server) puts in a request to the registry service to locate that server via a unique ID. The registry then sends the location of the server back to the requesting client component so that the client component can directly communicate with the server. Once the connection is established, the client and server can very efficiently communicate with each other. This capability is the underpinnings of the evolving network-centric market.

A good analogy is the phone system. When a telephone number is needed, an individual calls directory assistance. Once one has the telephone number, he or she can call the other person directly. This is far more efficient than having the operator place every call. Similarly – using the above example – COM allows a client to find the correct phone number for the server and contact it directly rather than having to repeatedly query the registry.

Microsoft developed COM in competition with an evolving industry standard called CORBA (Component Object Request Broker). Microsoft has had many opportunities to work with the Object Management Group²⁰ to create a single industry standard that would have widespread

²⁰ The Object Management Group, founded in 1989, was formed to create a component-based software marketplace through the introduction of standardized object software. CORBA is a standard that defines how

benefit for interoperability between vendors across the computer industry. Microsoft has been unwilling to embrace CORBA; COM allows Microsoft to maintain a proprietary advantage.

The Implications of COM on Third-Party Development

The Gartner Group outlined the importance of COM for Microsoft's long-term enterprise strategy:

“COM is the standard desktop infrastructure on Microsoft OSs ... As Microsoft's desktop dominance increases, the interest in desktop cross-platform technologies decreases. Microsoft's future architecture and strategy to extend its control from the desktop to the workgroup and enterprise are based on the evolution of COM ... leveraging COM across platforms, especially server platforms, is a key part of this strategy.”²¹

The COM advantage for Microsoft lies in the tight integration between the technology underpinnings of COM and the NT operating system. NT was built from the ground up to natively use and support the COM protocols for intra-process, inter-process and processor-to-processor communication. NT is now primarily a hosting platform for COM objects that perform the necessary OS functions. While this was not the original design, to enable Microsoft's strategy to migrate everyone to NT, more of these functions have been converted to COM. Many of the critical functions of the OS such as systems management, inter-process communications, systems monitoring, and security are now part of the COM proprietary technology. As a result, effectively integrating with COM at very deep levels is a prerequisite for delivering a competitive product on Windows NT.

Microsoft has licensed to a number of UNIX system vendors parts of the COM libraries necessary to support running these applications on UNIX. Unfortunately the UNIX systems are not built from the ground up to natively support the COM protocols, registry services, security, threading, scheduling, memory management, input/output and other operating system functions. The result is that if a developer deploys an application using COM, the application may be able to run more reliably and faster if it is deployed in an all-Microsoft environment.

An analogy is helpful. A student of foreign languages, despite years of study, will rarely be able to achieve the same command of the language that a native speaker will. While the differences may be subtle, it is difficult, and with some particularly complex languages perhaps impossible to master the inflections, euphemisms and other nuances that come naturally to those who have spoken the language since birth. COM is very much the same. While it may be possible to port COM to other platforms, it is highly unlikely that it will be as effective on a UNIX platform as on the NT platform because of the tight integration with the NT OS.

While porting COM to alternative platforms may help ensure that Microsoft applications are more interoperable and stable on other platforms, UNIX developers will not be able to take advantage of the new features incorporated into COM+ and DCOM, the next-generation

software objects distributed across a network can work together without regard to the OS or programming languages. For more information, see <http://www.omg.org>.

²¹ D. Smith, D. Bosik, *The Internet: Its Role in the Software Revolution and its Impact on Enterprises*, Gartner Group Strategic Analysis Report, July 16, 1997.

versions of the COM technology.²² If Microsoft had agreed on an open standard, then all the vendors would have access to the source code so that they could optimize their products for high performance and interoperability. But then, Microsoft would not be able to have a proprietary advantage.

Since COM is inextricably tied to the Windows NT source code, it is considered Microsoft proprietary. As such, it is impossible for ISVs to get access to all the intricacies of OS interaction and deliver applications that are as integrated as Microsoft's own on the NT platform. Because third-party developers do not have the same level of access to COM as do Microsoft developers, independent vendors' products are always at a disadvantage. This greatly affects areas such as integration with native management utilities, performance and ease-of-use, all critical factors for market acceptance.

In addition, Microsoft makes critical changes to the COM specification with each new OS release without prior notification to ISVs, creating compatibility problems with previously installed products. While this affects existing Microsoft products, Microsoft is able to provide patches and fixes for its own applications at the same time that the OS update is released to the public.

As Microsoft transitions Windows 98 users to NT Workstation, the advantage of using COM in distributed applications in an all NT environment in combination with the leverage of the desktop monopoly, creates the momentum for Microsoft to dominate the enterprise market. It will be able to do this as rapidly as it leveraged the DOS monopoly to dominate the desktop applications market.

Hidden APIs

Application Programming Interfaces are the doorway to the operating system. On the most basic level, developers write their programs to interface with the API, which in turn interfaces with the OS. It is a highly efficient methodology – rather than every application developer having to write the code required to enable printing every time such services are needed, a program can simply request print services from the OS. This allows programmers to take advantage of the OS services without having to repeat thousands or millions of lines of code for similar actions. Without access to the full range of APIs, third-party developers cannot write applications that are tightly integrated with the OS.

The Windows NT API set ostensibly gives all programmers access to the full range of operating system services – reservation of memory space for applications, pre-emptive multitasking threads, networking functions and security features such as event logging. While competitors have been known to collaborate in the establishment of APIs, often the process is only partially open. Microsoft has final veto power under the guise of maintaining the integrity of the operating system.

Microsoft benefits from having a level of access to the OS that third-party developers simply do not have. Microsoft makes no effort to segregate the Windows NT development team from its server application programmers. This is a significant worry for independent software vendors. For years, Microsoft tried to downplay this concern, claiming that it kept its application and system programmers separate. It was a reassurance that other desktop developers needed in order to continue developing for the Windows platform. Without that separation, ISVs knew that Microsoft applications would be unfairly advantaged over other

²² For more information about COM+, DCOM and MS strategy. see <http://www.microsoft.com/com>. See also Mike Ricciuti, "Microsoft Plays Up COM," C|Net, May 21, 1998, <http://www.news.com/News/Item/0.4.22376,00.html>.

products. Microsoft repeatedly assured its competitors that its own applications would compete fairly with theirs.

In 1989, *Business Week* questioned Microsoft executive Steve Ballmer about "unsettling suspicions" that "Microsoft doesn't keep its systems and applications groups as separate as it promises – that that church and state tend to mingle." Ballmer expressly "dispute[d] the charge that his people give their counterparts in applications previews of their upcoming systems products." He argued that because Microsoft "earns more from systems than from applications programs...[it] would be foolish to jeopardize this market just to boost applications sales." Bill Gates repeated that denial a few years later, noting that Microsoft "bend[s] over backward[s] to make sure we're not getting any special advantage." It was not until 1992 that Microsoft executive Mike Maples acknowledged for the first time that no formal division between systems and applications development existed at the company, though he claimed that Microsoft gave no advantage to its applications programs.²³

By combining the two efforts, Microsoft gains from knowing exactly how the OS is constructed. The savings in both personnel and financial resources are enormous. Microsoft can write application code that can run optimally on an operating system, has advance knowledge about future releases, knows which programming method to choose over another and can tweak the OS code prior to final release to advantage its own applications. While Microsoft has continued to deny that it engages in any of these practices, the lack of an open view on the development process does not allow for independent verification.

It is almost impossible to prove the existence of hidden APIs, but it is commonly understood in the software industry that Microsoft applications developers are aware of and take advantage of application interfaces before they are available to the general development community. Anecdotal evidence is widely available. For example, when Microsoft released Internet Information Server (IIS), it significantly outperformed Netscape Server on the NT Platform. Microsoft insisted that its developers had not had any additional access to information than had Netscape developers. Yet after careful review, Netscape developers were able to utilize previously undisclosed information about NT in their own products. Future releases of Netscape Server were competitive with IIS in subsequent testing.

There is evidence that Microsoft has used its control of the APIs as leverage in business dealings with competitors. In the recently filed Memorandum of the United States in support of Motion for Preliminary Injunction, reference is made of a meeting between Microsoft and Netscape in June of 1995. In that meeting, Netscape was offered a deal: if Netscape stayed away from the Windows 95 browsing market, Microsoft would cede to Netscape the non-Windows 95 browser space and allow preferential access to certain Microsoft APIs.²⁴ The fact that Microsoft could use APIs as leverage in its dealings with Netscape indicates that Microsoft believes it can gain a market advantage by withholding certain APIs from competitors.

In the Windows NT applications market, there are indications that Microsoft developers enjoy an advantage over third-party developers because Microsoft programmers have more information about the OS and access to APIs not released to the general development community.

²³ *Crossroads*, Project to Promote Competition in the Digital Era. See <http://www.spa.org>.

²⁴ U.S. Memorandum in Support of Motion for Preliminary Injunction, page 60. See Depositions of Marc Andreessen, at p. 38, lines 7-23. Also, Deposition of Chris Jones, Microsoft's Group Program Manager for Internet Explorer, p. 200, lines 9-18.

A telling example is the inability of third-party applications to fully utilize the Microsoft security structure in Windows NT. While maintaining a single server network is a relatively simple task, system administrators need the ability to share directory information – including security rights and access levels – across multiple servers. Having to maintain multiple security access configurations and user lists throughout the larger network and network devices is time consuming, difficult and because of inevitable human error, leaves companies vulnerable to mistakes that might render their corporate networks insecure.

When making purchasing decisions, administrators look for the simplest, most straightforward applications. Non-Microsoft applications face a competitive disadvantage because they are unable to integrate with the NT network security. Using such products would require multiple administration efforts, a problem for many administrators. Most administrators would prefer to purchase products that minimize administrative overhead, not create it.

Consider a Web server. Microsoft IIS is able to use Windows NT security to control access to Web site areas; access to a given directory, for example, can be assigned to individual users through the NT security structure. When a given user attempts to access information stored in that directory, IIS is able to check his or her security rights stored in the NT security infrastructure.

Third-party products must create their own security infrastructure, forcing system administrators to maintain multiple lists and manage multiple security directories. For a small office, such additional workload may be minimal, but for medium and large sites or corporations, this added overhead serves to render third-party products non-competitive because additional personnel are needed to support the products.

Microsoft makes no secret that its products enjoy this advantage over third-party products. As noted in an NT 4.0 fact sheet, “Only IIS brings the security of Windows NT server to your Web site, without additional configuration, to protect your information with the ease of a single directory and the ability to log on to a network.”²⁵ With regards to the BackOffice Suite, Microsoft notes that “Windows NT user accounts and groups are created once and used by all BackOffice Server components, providing a single user login to all components.”²⁶ Third-party products are unable to leverage NT security because Microsoft has not fully released its security APIs.

One NT development firm summed up the issue in a tech briefing for its customers:

The SAM [System Account Manager] is Microsoft proprietary and the architecture of the accounts database is restricted so that no other application can access the information. That means all apps have to maintain their own user account database.²⁷

Microsoft Exchange is a useful example. Exchange links a user’s mailbox profile to his or her user profile on the NT network server. When a user logs into a Windows NT or 95 workstation on an NT domain, his or her password is verified on the Windows NT server. If the password is correct, the user is successfully logged onto the domain. When the user then logs into Exchange, Exchange is able to validate the user against the domain security database on the NT server without prompting the user for his password again. During the Microsoft

²⁵ <http://www.microsoft.com/NTServer/Basics/Overview/NewFeatures.asp>

²⁶ <http://www.microsoft.com/backofficeserver/comparisons/ibmsuite.asp>

²⁷ NT 5.0 System Admin Tech Briefing, Sunbelt Software, May 22, 1998. See <http://www.sunbelt-software.com>.

Outlook setup (used as a client for Exchange), the administrator has the option of using “network security” rather than forcing the user to enter multiple passwords.

Microsoft touts this unique capability on its product comparison data sheets. “In an Exchange Server environment...a user’s identity is inextricably intertwined with his or her Windows NT account...[in addition] an administrator can enable Web browser access to Exchange server for end users without managing an additional set of passwords.”²⁸

For offices looking to lower their administrative costs or simplify the management of information services, the usability benefits are clear: users have fewer passwords to remember while administrators have fewer security structures to maintain. Other products that compete with Exchange must develop their own security and prompt users for additional passwords because Microsoft won’t let them integrate.

Once again, by controlling the platform and utilizing its proprietary COM technology, Microsoft can advantage its own products and disadvantage products from competitors.

Manipulation of Technical Standards

It is important to differentiate between technical standards and a standard product. At first blush, it may seem economical to develop a standard product capable of handling a wide variety of tasks – such a move might ultimately reduce long-term costs. If such a product could be developed, then overhead for customers and businesses could be diminished through shared expertise, knowledge and personnel.

But such products do not exist and are in fact quite unlikely. The old adage to “use the right tool for the job” is appropriate in the high-tech world. The tasks required of software are so complex and detailed that computers require tailored operating systems in order to handle tasks efficiently and effectively. To ensure interoperability, technical standards are developed to provide common elements and information for all developers. Through standards, disparate systems can communicate, share data, complete transactions and perform the tasks required in an age where so many of our day-to-day activities are controlled by computers. Developers write products that interoperate by supporting the same technical standards. The result is diversity in the development community and in software products. As one journalist observed, “What [Microsoft CEO Bill] Gates understands better than anyone else is that control over the standards that others must adhere to is the great lever of wealth and power in the digital age.”²⁹

Standards are critical for high-tech industries. Without them, consumers would be forced to adopt a single platform for all of their computer-based services – desktop, server, telecommunications and multimedia. This is Microsoft's "Windows Everywhere" strategy. Microsoft offers a proprietary platform rather than a platform that supports open standards. Ultimately, such an approach limits both the software developer and the consumer. There is no reason to believe that a single platform is necessary nor beneficial. There are literally dozens of industries in which the adoption of open technical standards has helped consumers without harming competition.

Perhaps the best example of the success of standards is that of the market for fax machines. Fax machines use standards for communications to ensure that devices manufactured by different companies can still communicate. Without standards, fax machines would be useless – consumers would only be able to fax to those who had machines manufactured by the same

²⁸ See http://www.microsoft.com/exchange/comparisons/system_security.asp.

²⁹ Philip Elmer-Dewitt, “Mine, All Mine,” *Time*, June 5, 1995.

company. Instead, technical standards and open systems allow publishers to write products that interoperate with others, increasing communications, maximizing productivity and reliability and ensuring that both businesses and consumers have access to a wide array of products.

Microsoft Transaction Server (MTS) is an excellent case in point. The growth of the Internet as a mode for electronic commerce is dependent on the ability to perform transactions. Conducting transactions between disparate systems or databases is a difficult task – because transactions are necessarily a two-step process, it is critical that both steps are completed before subsequent processing continues. A customer transferring money from a checking to a savings account, for example, wants to be sure that when his or her checking account is debited that his or her savings account is credited. A reliable transaction server is necessary to ensure the completion and integrity of the entire transaction. Transactions are a requirement not only for consumer – vendor interaction but also as part of the larger issue of supply chain automation.

The industry transaction standard, defined by the industry X/Open Group, is known as XA. Widely deployed, Microsoft has recognized the utility of XA: “XA is important because it has been broadly adopted. It is supported by the leading UNIX transaction processing monitors...[and] it is supported by the leading UNIX databases, including Oracle, Informix, IBM's DB/2 and Sybase.”³⁰

Despite this recognition, MTS utilizes COM, the proprietary Microsoft technology, as its functional API for building transaction-intensive applications. While it does support XA, it only supports it as a *passive* client. As Microsoft's data sheet explains, “Microsoft Transaction Server does not support the X/Open XA interface. However, an XA-compliant resource manager can be enhanced to work with Microsoft Transaction Server. The resource manager's client library must accept OLE Transactions calls [another Microsoft technology that was the predecessor to COM] in place of XA calls.”³¹ In other words, Microsoft does not support industry standards; third-party developers have to modify their products to work with Microsoft's proprietary OLE technology.

The impact is enormous. An XA-compliant client on a non-Microsoft platform cannot initiate a transaction in a Microsoft-centric application; it can only respond. This means that Microsoft software, while simulating support of an open standard, in fact, requires that Microsoft software be used as the controlling platform for all operations. If a vendor chooses to use independent transaction software for its supply chain automation system but the majority of its supply chain uses Microsoft software, the non-Microsoft vendor is forced to implement Windows NT as a part of its infrastructure in order to effectively interoperate with the rest of its supply chain.

Similar problems have arisen with Java, a programming language developed by Sun Microsystems. Java was originally developed as a means to write platform-independent applications – the mantra of “write once, run anywhere” became common in the software industry after Sun first announced the Java product line. Developers embraced this new initiative because it freed them from the constraints of the Windows OS. Whether or not Microsoft released sufficient information about the OS became less important because Java ran independently from the OS itself. With increasingly interconnected computers – through the Internet and internal networks – the attractiveness of being able to write independent applications that ran either on a thin client workstation or the server was clear. As Novell CTO Glenn Ricart noted, “A developer can write for NT, which is the fastest growing server

³⁰ <http://www.microsoft.com/com/mtsfqa/faq11.htm>.

³¹ *Ibid.*

operating system, or for UNIX, which has the largest installed base, or for OS/2 because it's popular in Europe – or he can write in Java and automatically cover all three.”³²

Microsoft has attempted to downplay Java, calling it a “mildly interesting programming language;”³³ it has tried to discredit Java by labeling it a “lowest common denominator” technology.³⁴ Microsoft's own technology, ActiveX, competes with Java for developer's loyalty in writing Internet/intranet-based applications. Microsoft has continued to push ActiveX as a superior product with more robust functionality than Java. As Deborah Willingham, Microsoft VP, quipped, “Sun is squarely in our sights...you'll see us attacking on all fronts.”³⁵

At the same time, Microsoft has also worked to manipulate Java to suit its own purposes. Microsoft's Steve Ballmer remarked in 1997 that “It is very important for us to keep developers focused on our platform....We're helping people use Java to build applications that really target the most popular platform, which is Windows.”³⁶

Microsoft has integrated its Java Virtual Machine (JVM) into Internet Explorer. Microsoft's version of Java is incompatible with Sun's version of Java (commonly referred to as “pure Java”). Microsoft insists its JVM is Java-compliant even though pure Java applications cannot interact with it. When a consumer purchases a PC that has Windows 95 and IE pre-loaded, Microsoft claims that the machine is “Java-ready.” But because of changes that Microsoft has made to the Java libraries, the only Java applications that will run on the Microsoft JVM are applications written to the Microsoft Java variant.³⁷

Vendors who wish to develop on the Java platform must choose to write to either the Microsoft Java variant, pure Java or both. This requires an enormous increase in development resources and time – an obstacle that Microsoft developers are unlikely to face because they have access to the details of Microsoft's variant and are not inclined to write applications for a Sun-owned platform. For vendors who do not have sufficient resources to write to both, the inevitable choice is to write only to the Microsoft JVM. In fact, because everyone uses Windows, developers must write to the Microsoft JVM to ensure that their applications will be commercially viable. Unless Microsoft is forced to uphold its contractual obligations, any software developer building pure Java into its platform strategy is harmed.

If the Microsoft version of Java is allowed to proliferate – which is inevitable if it is allowed to be shipped with the operating system – Microsoft will destroy the pure Java initiative.³⁸

32 David Kirkpatrick, “He Wants *All* Your Business --- And He's Starting to Get It,” *Fortune*, May 26, 1997.

33 Paul Gillin, “Software Bigot: Computerworld Interview with Nathan Myhrvold, Microsoft CTO,” *Computerworld*, May 24, 1998.

34 Sean Gallagher, “Hot Air About Vaporware,” *Information Week*, July 8, 1997.

35 Steve Hamm, “Operation Sunblock: Microsoft Goes to War,” *Business Week*, October 27, 1997.

36 Speech by Microsoft Executive Vice President Steve Ballmer, July 24, 1997, Seattle, Washington. See <http://www.microsoft.com/corpinfo/speeches/steve/finsummit97.htm>.

37 Specifically, Sun claims that “IE 4.0 does not support the Java Native Method Interface (JNI), nor does it support Remote Method Invocation (RMI). However, there are other serious compatibility problems. IE 4.0 adds public API into several 'Java.' packages. Several methods and fields were added to the awt, lang and net packages. In addition, a small number of 'Java.' public methods were removed. Java developers expect that the public API found in any package with a name beginning "Java." is part of the standard Java platform and that this API will be available in all Java Compatible implementations. Because Microsoft has put these additions in the 'Java.* hierarchy,' developers using Microsoft's SDK can create apps or applets which they believe will run anywhere, which will only run in Microsoft Java products.” See <http://java.sun.com/pr/1997/oct/pr971007.html>.

38 This is the foundation of the Sun/Microsoft dispute. In a suit filed in U.S. District Court in October, 1997, Sun Microsystems claimed that Microsoft had failed to live up to its obligations as a licensee of Java to deliver a compatible implementation of Java technology on its products. Sun has won an injunction against Microsoft from using the Java logo pending resolution of the suit.

Both cases are instructive and frightening, because in each Microsoft has used its dominant market power to modify industry standards to the advantage of its own products. By embedding a transaction-enabling product – without additional cost – into its network operating system, Microsoft is ensuring that its proprietary transaction processing methodology becomes pervasive. By embedding its own version of the JVM into its desktop and network operating system through no-cost distribution of IE, it ensures that the clients likely to access network services must also incorporate Microsoft-controlled technologies.

Vulnerability to OS Modifications

While it is clearly within Microsoft's prerogative and interest to make updates and upgrades to the Windows NT operating system, Microsoft's dominant market position allows the company to make changes to the OS without notice to third-party developers. This allows Microsoft to disrupt or even disable the functionality of non-Microsoft products.

Microsoft makes regular changes to the OS through service pack releases. These service updates are available without charge to consumers and are designed to address problems with NT (and other products) between upgrades. Service Packs often replace or update portions of the NT source by replacing problematic .DLLs³⁹ and other files.

The problem is that these upgrades alter the binary code, and by altering the source code on a regular basis, Microsoft disadvantages ISVs who receive little information about service packs before they are released. If a non-Microsoft product is in some fashion affected by the changes to NT, customers who opt to install third-party products are left scrambling to fix "problems" with their applications that were in fact created by Microsoft's changes to the source code. To use a house-building analogy, it's like trying to install a kitchen oven when the builder keeps moving the location of kitchen. It becomes incumbent upon the ISV to remedy the problem in order to resolve customer complaints. The ISV must devote internal resources to fixing the problems created by the Microsoft service pack, thereby driving up costs for future products at the expense of the consumer.

It is only because of Microsoft's dominant OS position that such modifications to the source code can occur. In open systems like UNIX, the OS is subject to far more scrutiny. The UNIX source code is in the public domain, but many flavors are available. Any ISV can release a version of UNIX with specialized extensions to differentiate its product from that of other manufacturers. However, the core APIs must remain intact; these standard interfaces cannot be changed by any one vendor. Any changes to the APIs must be agreed upon by a majority of UNIX licensees, ensuring a common and consistent level of integration with the OS by numerous ISVs. Vendor-specific extensions can be accepted or discarded at the discretion of the individual ISV.

³⁹ Dynamic Link Libraries (.DLLs) are shared files central to the operating system and software applications. .DLLs provide access to common tasks (such as displaying a dialog box in an application or sending data across a telephone line) and are shared by many programs. .DLLs have been central to Windows since its earliest days – when hard disk space was quite expensive, the ability to share files that handled repetitive tasks saved on valuable storage space. More recently, .DLLs have been at the heart of the browser debate. Microsoft claimed that removing the program files for Internet Explorer would remove critical .DLLs that would cause Windows 95 to fail. If all of the files associated with IE were removed, Windows 95 might in fact be unstable. But, it is disingenuous to claim that removing IE requires removing the .DLLs – shared files are not to be deleted by the uninstall of a single program. Using this argument, uninstalling Microsoft Office and all of the .DLLs required for it to run properly would also disable Windows 95. Clearly, though, Office is not part of the operating system, and IE should not be considered as such based on the .DLL argument either.

While UNIX, unlike NT, is in the public domain and not controlled by a single entity, the means by which UNIX is managed is instructive in this discussion. The importance of enterprise systems cannot be overstated – these systems run banking applications, medical facilities, university and college management systems and a whole host of critical applications. It is for this very reason that UNIX has long supported open standards.

Time to Market

It has become almost a cliché to speak about the speed with which the computer industry changes. This rapid rate of change shows no signs of slowing down; indeed, with the rapid growth of the Internet, market momentum seemingly is at an all-time high.

Time to market is critical for application developers. As industries increasingly look to information systems for a competitive advantage, customers are demanding solutions that can be rapidly developed and deployed. Software developers competing for market position are forced to address emerging trends and customer needs rapidly by delivering quality products in a timely manner.

With Microsoft developing both the OS and applications, publishers face an uphill battle trying to deliver their products for NT in a manner as timely as Microsoft itself, placing ISVs at a significant disadvantage. Because Microsoft's internal developers have access to all iterations of the OS as it undergoes development, Microsoft is able to release applications products at the same time as new releases of the OS.

In addition, Microsoft is effectively able to freeze buying decisions for competitive products. Microsoft is able to simultaneously publicize the new features of its next OS release *and* announce how its products will take advantage of this new functionality. The problem is that by failing to provide third-party developers with the same information available to its own programmers in a timely manner, only Microsoft can deliver timely solutions when OS upgrades or modifications are released. In an industry where innovation and time to market are critical, this advantage is not easily overcome. As a result, independent publishers constantly lag behind Microsoft and lose critical time in marketing competitive products.

The Ever Expanding OS: Bundling Applications to Eliminate Competition

Microsoft uses its leverage as the dominant OS provider to force consumers to purchase its complementary products and eliminate competition from independent software publishers. From an economic and legal perspective, bundling is the practice of selling a successful or dominant product with a complementary product at a single price, generally less than the sum of the products sold together. It is a highly effective practice used in virtually every industry.⁴⁰

However, bundling becomes problematic when a monopoly firm uses its position to expand into a new market. When bundling occurs, customers forced to purchase the product for which no viable alternatives exist – the operating system – are also forced to purchase complementary products that they may not want. In effect, the monopoly firm denies the customer its dominant product unless it also accepts its other products.

⁴⁰ An example of bundling in auto manufacturing, for instance, is the practice of selling “option packages.” A consumer who wants an automatic transmission and air conditioning but not power windows on his new car may find that purchasing a package that contains all three features is less expensive than purchasing the two desired products individually.

On its surface, bundling may seem innocuous – consumers get additional products and functionality when purchasing a product that they had to have anyway. This viewpoint is dangerous because it ignores the impact – third party developers are seriously crippled and customers lose the right to choose.

The Role of the OS

The operating system on a computer plays a critical role: much like the foundation of a house, the OS provides the basic services required to make a computer useful. On the most basic level, the OS provides basic functionality, such as accepting input from the keyboard or mouse, controlling display to the monitor and managing files and directories. For network systems, the operating system performs significantly more complex tasks. Much like a traffic cop directing cars during rush hour, the OS ensures that different programs and users using the computer's resources simultaneously do not interfere with each other. The operating system is also responsible for security, ensuring that unauthorized users do not access the system and controlling access to resources by valid users.

Third-party developers rely heavily on the embedded functionality of the OS. And as systems become more complex, the OS necessarily does as well. On enterprise servers, the OS is responsible not only for providing security and interface functions but also the building blocks for communications and networking.

The basic services provided by the OS are critical for reliable enterprise servers, as are many of the applications that comprise the range of enterprise applications for managing corporate computing environments. These applications – including directory services, security management, transaction servers, messaging products and databases – provide the necessary components for the corporate computing community. Microsoft has been successful in rapidly increasing its market share in the network market, in part because of the increasing number of applications now integrated into its server operating system, Windows NT.

Bundling of Discrete Applications

As customers are being compelled to adopt Windows NT, Microsoft requires consumers to accept its add-on products that are bundled with the OS. The free distribution of Microsoft products is often a significant detriment to competitors. Customers are unlikely to purchase additional third-party products when similar Microsoft products are bundled essentially for free with the base OS and marketed to consumers as working seamlessly with the OS. Companies that offer products that compete with bundled Microsoft applications have seen their sales suffer because customers are unwilling to buy redundant programs. The ultimate result is reduced competition, limited innovation and increased prices.

Microsoft fully appreciates the disadvantage that third-party developers face when their products are bundled with Windows NT. In comparing its products to the IBM suite of NT offerings, Microsoft notes that “the IBM offerings duplicate key distributed application services that Microsoft is providing with Windows NT, such as transaction processing, message queuing, and an integrated component model. This not only adds additional cost and complexity, it means that some Windows-based development tools designed for these services may not automatically work with various aspects of the IBM product suite.”⁴¹

Microsoft's own marketing materials state, in essence, that Microsoft's proprietary technology works best with other Microsoft products that share the same technology. Free

⁴¹ <http://www.microsoft.com/backofficeserver/comparisons/ibmsuite.asp>.

products that are bundled with Windows NT obviate the need to purchase similar products from third parties.

Netscape, for example, has faced a tremendous battle with Microsoft for the Web server market. Microsoft began bundling its Internet Information Server (IIS) in 1996 with the release of Windows NT 4.0.⁴² Customers who purchased the NT OS were reluctant to purchase a Web server from another vendor for additional cost. Microsoft not only gained significant market share in Web servers where it previously had none, but also, by including this software with its operating system, made the product into a commodity. Just two years later, IIS is the dominant product in the Web server market with a 55 percent market share.⁴³

Reaching into the Enterprise Market through Bundling

Microsoft has developed the BackOffice suite of enterprise software in order to gain the same sort of dominant market position for the products in this suite that it has been able to achieve with its desktop suite, Microsoft Office.

There is no question that Microsoft is attempting to leverage NT to increase the success of its BackOffice product suite. Bill Gates, Microsoft CEO, said in a May 1997 interview in *Fortune*, "We are a very predictable company. What we did with Windows on the desktop, we're doing with Windows NT on the server. What we did with Office on the desktop, we're doing with BackOffice on the server."⁴⁴

The Microsoft BackOffice software suite includes a variety of servers for different purposes critical to corporate or other large-scale systems, including:

- **SQL Server** – manages database systems;
- **Internet Information Server** (includes Certificate Server) – provides Web server functionality, serving applications and clients on the WWW;
- **Site Server** – facilitates the management and deployment of Internet sites;
- **Exchange Server** – manages electronic mail and scheduling; and
- **Transaction Server and Message Queue Server** – provides services for a variety of vertical and custom applications.

Currently, some of these products are included as part of the Windows NT server bundle while others are currently packaged as stand-alone products that run only on the NT platform.⁴⁵ Microsoft is continuing to bundle these servers into the Windows NT operating systems, creating the same market conditions that occurred when it bundled desktop products such as word processing and spreadsheet applications with Windows.

An analysis of Windows NT vs. Windows NT Enterprise Edition is instructive. The standard Windows NT supports up to four processors on a single server and comes bundled with IIS,

⁴² Previous to the NT 4.0 release, IIS was available as a free product.

⁴³ Steve Hamm, "Microsoft's Future," *Business Week*, January 19, 1998

⁴⁴ David Kirkpatrick, "He Wants *All* Your Business – And He's Starting to Get It," *Fortune*, May 26, 1997.

⁴⁵ For a more complete discussion of BackOffice, see the section on predatory pricing, page 30. Currently, Microsoft Exchange, Proxy, Site, SNA and SQL servers are available as stand-alone products.

Microsoft Index Server and FrontPage,⁴⁶ along with other smaller applications. For customers who need support for more processors – for a large database application, for example – Microsoft requires the purchase of the Windows NT Enterprise Edition. NT Enterprise Edition supports up to eight processors, and comes bundled with IIS, Microsoft Index Server, Front Page, Microsoft Cluster Server Transaction Server and Microsoft Message Queue Server.

Such bundling would perhaps be beneficial if customers who needed the more robust functionality of the Windows NT Enterprise Edition also needed the additional bundled products or if third-party goods were not available. But the choice to run higher-end hardware does *not* necessitate the use of these products. In the end, customers have a pre-designed system, rather than the opportunity to design a system and purchase products appropriate to their unique situation because Microsoft determines which applications are included.

With the forthcoming release of NT 5.0, Microsoft continues its efforts to integrate discrete applications into the OS itself. According to a Microsoft data sheet on new features, Microsoft expects to include directory services, video streaming, certificate servers, Web site management server and increased desktop management capabilities into NT 5.0.

Bundling to Lock-In Customers to Microsoft Solutions

Microsoft uses the practice of bundling to lock customers into Microsoft-based solutions, as it did with Microsoft Internet Information Server and Windows NT Server. IIS was bundled beginning with NT Server 4.0. While other operating systems vendors bundle Web servers with their operating systems, notably Sun and Novell, their respective products support the full range of Internet/CORBA open standards. The manner in which APIs are developed for the UNIX platform provides this flexibility and choice for customers. For most UNIX platforms, one standard set of APIs is developed and then implemented by various vendors. This structure allows a company to switch out one application for another vendor's with minimal disruption.

An analogy is helpful, if not a bit simplistic. Consider the long-distance telephone market. Users can easily switch from one provider to another – say, from MCI to AT&T – with minimal effort and without disruption to long-distance service. Why? A telephone can access all of these services. The local telephone services can provide connections to the long-distance service and provide billing for each, and each of the long distance services are able to offer services built on the same infrastructure.

Microsoft develops its own APIs in a proprietary manner, allowing it to maintain control of the API and ensuring that customers are unable to substitute third-party products with products Microsoft has chosen to bundle with its operating systems. As a result, customers cannot replace bundled applications with alternative products and are instead forced to rely on Microsoft technologies for their internal applications.

IIS on Windows NT requires the use of COM in order to get maximum functionality, effectively tying the Web server to the operating system and eliminating customer choice. To change Web server products after a production system is installed requires significant rewriting of the application. Once a production system is developed on the Microsoft platform, the customer is effectively locked into future development on the NT platform because it is almost impossible to substitute an alternative product.

⁴⁶ A Microsoft product to develop HTML Web pages and manage Web deployments. Also available as a stand-alone product.

Leveraging the Desktop to Penetrate the Network

Tying Development to NT – The Microsoft Certification Program

Microsoft has been aggressive in using its desktop monopoly to penetrate the network. In addition to the evolution of Windows 95/98 into NT, Microsoft has used its Windows 95/98 certification program to require developers to write to both platforms in order to receive certification for either platform.⁴⁷ Microsoft is able to further secure its desktop monopoly while creating a competitive advantage for NT because consumers are more likely to adopt an operating system with a wide variety of applications already available than one with an emerging development community.

A bit of history is helpful. When Windows 95 was first announced, NT was just beginning to generate interest as a viable network operating system for business servers. Known primarily for its desktop applications, Microsoft was not particularly credible in the early 1990s as a network developer; in fact, given the relatively poor performance of LAN Manager when compared to other available network products, there was significant skepticism about Microsoft's ability to compete in this market segment.

Much of the skepticism stemmed from the fact that Windows NT emerged from a desktop operating system; while the architecture has changed significantly, many developers were initially concerned that NT would not be sufficiently robust to handle the multiplicity of tasks demanded of increasingly complex network operating systems.

Much of the initial skepticism has, of course, subsided, but Microsoft faced a significant challenge in encouraging developers to write for this yet untested network platform. As the undisputed dominant leader on the desktop, software developers were eager to write to the new Windows 95 platform (then code-named Chicago) but remained slow in committing to NT.

Windows 95 was a major change to the traditional DOS desktop, and many users, especially corporations, were concerned about backwards-compatibility. For organizations that had spent thousands or millions of dollars developing applications on the DOS/Windows 3.x platform, a fundamental change on the desktop would be expensive and time-consuming. Developers scrambled to migrate their applications and programs.

Releasing a new operating system is a gamble, and to assure customers, Microsoft chose to initiate a certification program for Windows 95 – programs that were certified for Windows 95 could be considered stable for the new desktop platform. In many ways, it was a win-win situation: Microsoft could be assured that Windows 95 compliant applications would be available for its new platform, and developers could assure their customers that product upgrades would run on the new platform.

Microsoft took the opportunity to engage the NT market as well. Long before Windows 95 was released, Microsoft announced that in order to receive Windows 95 certification, third-party products would also have to be written to the Windows NT platform. Developers – even those traditionally focused on the desktop market – could not simply write to the Windows 95 platform; their programs would also have to conform to NT specifications as well.

⁴⁷ For certification requirements and information, see <http://www.microsoft.com/Windows98/Basics/winlogo.asp>.

The program ultimately proved to be somewhat problematic for Microsoft because NT did not fully support many of the telephony features available in Windows 95; approximately 10 percent of products that sought certification received a waiver for the NT requirements.⁴⁸ But the software development community was not particularly eager to seek dual certification. Many desktop publishers complained that their products were purely consumer products and would not be appropriate for the NT environment. Forcing desktop publishers to write for the server or high-end workstation market was simply too expensive for many publishers.

The impact on the market was clear. Publishers that recognized the coming NT dominance or had a potential server market immediately began writing to the emerging Windows networking specification.

The dual-platform requirement fed directly into Microsoft's long-term strategy of merging the desktop and server OS. By forcing developers to write to the NT platform in order to receive Windows 95 approval, Microsoft ensured its dominant position in the OS market with NT users because developers' products would have to be tied to the NT platform.

This practice continues with the upcoming release of Windows 98. Products to be certified for Windows 98 must also be NT 4.0 compliant. Microsoft argues that because Windows 98 is migratory step toward NT, encouraging developers to write code compliant to both platforms ensures that both customers and developers are prepared for future releases. In fact, this strategy ensures Microsoft a continued monopoly on the desktop and eliminates competition on the server.

Exploiting the Existing Installed Base with Misleading Information

Because Microsoft has a monopoly on the desktop and Windows 98 includes key elements of NT, Microsoft is, in fact, successfully using its desktop monopoly to control the server market.

Microsoft has been aggressive in using its desktop dominance to improve server sales. Microsoft regularly notes that NT Workstation, the desktop version, is optimized for management by Windows NT Server. While Microsoft may have developed functionality on the server or workstation that would improve management features, such capabilities should be available to third-party developers if the OS is truly open and all technical information has been fully disclosed.

Desktop management products for other networks have been widely available for other platforms. For example, literally hundreds of developers have written management utilities for Novell NetWare's product line; with the open network operating system (NOS), developers have sufficient information to successfully develop a wide range of tools that function effectively and efficiently.

Many companies have introduced NT network management tools as well; many are quite popular and have received positive reviews from the software community. Microsoft may have in fact provided sufficient information about the OS to ensure that third-party utilities work well. But if this is true, Microsoft cannot claim that NT Server is a better product than others for managing NT Workstations deployed in an organization.

⁴⁸ Microsoft notes in its current certification requirements for Windows 98/NT 4.0 that "In exceptional cases, when a product cannot run on both the Windows NT and Windows 98 platforms, a Windows 98-only logo will be issued." See <http://www.microsoft.com/Windows98/Basics/winlogo.asp>.

Microsoft's sales literature that argues that NT Workstation is optimized for NT Server is a direct tie-in and is certain to reduce competition in the network operating system market. Customers, especially individual consumers, who are familiar with the Microsoft product line on the desktop or server may find it easy to believe that an all-Microsoft solution would improve their network management capabilities, but with a truly open OS Microsoft should hold no advantage over third-party developers. While Microsoft should have some flexibility in its product promotion, claiming an advantage for one's own products is deceptive, especially when there is some question whether other developers have had the same access as Microsoft developers.

Maximizing Microsoft Profits: Pricing Products to Eliminate Competition

Predatory Pricing

Through its brisk sales and remarkable growth rates, Microsoft has been able to sell its products below cost or to give them away for free. This practice, known as predatory pricing, occurs when a company sells its products at a price too low to cover its development costs. In practice, predatory pricing serves to drive out competitors.

Microsoft often introduces new products and later incorporates them into the operating system or as part of a bundled package. Initially, these components are passed on to the consumer for free or at minimal cost. Microsoft uses this tactic not only to exert full control over its own platform but to undermine its competitors by eliminating the profitability of selling their Windows products independently. Once competition has been neutralized or eliminated, prices for the base products are often increased.

Such is the case with Microsoft Site Server, introduced in early 1998. Site Server is a management tool that helps system administrators manage the development, deployment and support of Intranets. There are numerous competing products that range in price from several hundreds to thousands of dollars. As Intranets become increasingly complex and mission-critical for businesses, the market for such management tools is growing.

Microsoft is able to ensure that its products dominate in part through predatory pricing and bundling with other application suites. For customers who have purchased Microsoft BackOffice, Site Server is available free of charge; it is slated for integration into the BackOffice Suite in the future.⁴⁹ What incentive do customers have to purchase third-party products when Microsoft is able to give its products away for free, especially as they are bundled with the OS.

BackOffice includes the following products:

- NT Server 4.0
- Index Server
- Transaction Server
- Front Page
- SNA Server
- Site Server
- Internet Information Server
- Certificate Server
- Messaging Queue Server
- Exchange
- SQL Server
- System Management Server

⁴⁹ See <http://www.microsoft.com/backofficeserver/guide/siteserver.asp> for details.

The BackOffice Suite is available with five client access licenses for \$2,499.50. If the same suite of products was purchased separately, the total would be \$7,222 – a difference of \$4,723. While many companies offer deep discounts for suites or application packages, few companies can compete with a pricing scheme that consistently offers all bundled products at a 70 percent discount.

If in fact such discounts are not predatory – that is, if the bundled price for BackOffice allows Microsoft to recover its development costs – there still remains the question about the leveraging of one product to encourage the purchase of another. Closer examination of the pricing of the individual components reveals that if a customer wishes to purchase only two or three of the 12 products that comprise BackOffice, it is still less expensive to purchase the entire BackOffice suite.⁵¹

Recently, Microsoft started offering free copies of Windows NT, Proxy Server and the NT Option Pack to small Internet service providers (ISPs) if the ISPs could persuade 500 subscribers to switch to Microsoft's Internet Explorer Web browser.⁵² ISPs typically generate very small profit margins, and smaller ISPs face enormous competitive challenges. For many, the promise of thousands of dollars of free software is too enticing to pass up. For Microsoft, the offer accomplishes two objectives: reaching deeper into the ISP enterprise market and expanding the market share of its Internet browser software.

Tied Pricing

Microsoft has been able to use its desktop monopoly to influence buying decisions by tying the purchase of one good to another. Because of its dominant position in the operating system market, it is able to offer incentives unavailable to other publishers.

Many software publishers offer volume discounts for their products – such pricing schemes are beneficial to customers who face large software expenses – as a means to increase the competitiveness and develop customer loyalty. Microsoft enjoys an advantage that other publishers do not. Microsoft is able to leverage the sale of the operating system, for which there is no feasible non-Microsoft alternative, with the purchase of Microsoft applications. While other companies can offer discounts for customers who commit to buying multiple copies of a product, no other company can provide equally competitive incentives because Microsoft maintains its OS monopoly.

Perhaps the best example of tied pricing is that of the Microsoft Select program. Microsoft Select allows customers to combine their different product purchases to achieve pricing incentives. Customers who purchase large quantities of software from Microsoft can reduce the costs associated with acquiring, maintaining and managing it by as much as 50 percent through the Microsoft Select volume purchasing program. The primary appeal is the variable license, which allows large-size customers to pool projected purchases of Microsoft products worldwide over a two-year period in each of three product categories and receive volume-based pricing based on the cumulative total per category.

⁵⁰ For pricing information quoted here, see <http://www.microsoft.com/products> for more information. Suggested retail pricing was used with the minimum number of client access licenses in all cases.

⁵¹ For example, a customer that wishes to purchase only Microsoft Exchange (\$999), Site Server (\$1239) and Proxy Server (\$999) finds that it is less expensive to purchase the entire BackOffice Suite rather than the individual applications (\$3237 vs. \$2499).

⁵² Alex Lash, "Microsoft Buys IE Users with NT," C|Net, April 10, 1998. See <http://www.news.com/News/Item/0,4,209,78,00.html>.

Nullifying Competition: Pre-Announcements, Vaporware, De-support and Claims of Incompatibility

Because of its dominant OS position in the marketplace, Microsoft is able to significantly influence the purchasing decisions of millions of consumers and business through its communications about future product strategy and corporate focus.

Pre-announcements and Vaporware

Software companies regularly announce their long-term objectives and new product lines. At trade shows, industry events and company promotions, new products are launched weeks or months before they are available for general release. These announcements provide other companies and customers with valuable information about the future direction of products.

Such information is helpful. It allows customers to plan, enables third-party developers to begin planning their own new products and provides investors with critical information about corporate strategy. But for a company with Microsoft's market dominance, the impact of pre-launch announcements on the software industry can be chilling and detrimental. Because of Microsoft's size and potential impact, developers are reluctant to commit valuable research and development resources to a product that will compete with a forthcoming Microsoft product. As one observer notes, "If potential entrants and innovators are warned that any product that they may develop will be copied...and then offered for free and tied to a monopoly product, they will find something better to do with their energy, time and money. Result: a stifling of innovation."⁵³

It is not uncommon in the software industry that, when a software publisher announces a new program or a new version of an existing program, sales of the old version and sales of competing products slow until the new product is publicly available. Consumers want to know what the new product will be like before they make their purchasing decisions. Microsoft uses this phenomenon of announcing new products or new versions of existing products in order to chill the market until it can release its product. Competition is stifled during the announcement period.

For start-up companies, the effect can be disastrous. Venture capitalists are reluctant to provide financing to companies whose products will compete with Microsoft – potential funding recipients must have a 'Microsoft strategy.' As one financier pointed out, "You have to ask the dreaded 'M' question. How will this work with Microsoft's view of the world? To the extent that it's complementary, ...that's great. To the extent that it's competitive, we think long and hard" before providing funding.⁵⁴

The problem is compounded by the fact that the announcement period can be quite long, a precedent that Microsoft has set with its own delivery schedule. Microsoft is well known for making product announcements, freezing the market, then failing to deliver products for months or even years. There are countless examples. Windows 95, originally announced in 1991, was delivered almost two years behind schedule. Windows NT, first announced in 1991, was not on the commercial market until mid-1993. In 1996, Microsoft announced it was planning to develop an Internet search engine product; no beta has been released and little information is available about this product.⁵⁵

⁵³ Irwin Stelzer, "Why Janet Reno vs. Bill Gates is Good for Capitalism," *The Weekly Standard*, December 1, 1997.

⁵⁴ Steve Hamm, "Why Startups Can't Avoid the Dreaded 'M' Question," *Business Week*, January 19, 1998.

⁵⁵ Kathy Rebello, "Inside Microsoft," *Business Week*, July 15, 1996.

Even updates to Microsoft's own operating system products are often delayed. Plug-and-Play support for Windows NT was originally included in the specifications for future releases of Windows NT; the May/June 1995 *Microsoft Developer Network News* notes that "the next major release of Windows NT (also known as Cairo) will include full Plug and Play support."⁵⁶ Just 18 months later, after the release of Windows NT 4.0, Microsoft executives declared Cairo complete and promised that a beta of NT 5.0 would be available in the first quarter of 1997.

Plug and Play capabilities were *not* included in the next release of Windows NT; NT 5.0 has yet to be released. As one trade magazine reported, "you won't get the promised Cairo: no object-oriented file system, Kerberos-style security or Plug-and-Play installations. In fact, there's no mention of Cairo in the reviewer's guide or release notes, although some features, such as Plug-and-Play, are listed as 'features deferred to a 1997 release.'"⁵⁷

While Microsoft, like any other software developer, should be free to announce its strategy and delay release of products to ensure that its goods work well and reliably, such pronouncements from the dominant firm freezes the market for competitive products.

An instructive example is that of Microsoft's Active Directory. Active Directory is Microsoft's offering in the directory services arena, an area critical to the development of enterprise systems. Several vendors have competing products; Novell's NDS product is perhaps the best-known and most widely-accepted. Microsoft's Active Directory was first announced in 1994 but is still not available. Microsoft expects to include Active Directory with NT 5.0, which is not anticipated until 1999. As a result, Active Directory will not be available until fully five years after its original announcement.

The result has been to slow sales for Novell NDS and other directory services products. Microsoft continues to tout its directory but still has no product available. Microsoft has been able to manipulate the purchasing decisions of consumers based solely on its pre-announcement practices.

The problem has become so pervasive that many analysts in the industry comment that in order to figure out what emerging technology will be important tomorrow, one needs only to look at what products Microsoft is discrediting today.⁵⁸ Over time, a *modus operandi* has emerged: Microsoft disparages a new product or technology, then later announces that it will introduce its own version of the product, thereby freezing the market and eliminating competition. As one newspaper executive noted, "Microsoft has a long history of telling the big lie. They say 'We're not going to do this! We're not going to do this!' Up until the point when the whole world knows they're doing it."⁵⁹

Examples are numerous. When IBM integrated voice-recognition technology into OS/2 – a feature not available in Windows – Microsoft ridiculed the decision. In 1997, Microsoft spent \$45 million purchasing speech-recognition technology, now slated to be included in future versions of Windows NT. Microsoft dismissed the consumer-oriented Internet devices as a "very depressing...and small-minded vision," then spent \$425 million for WebTV.⁶⁰

⁵⁶ Lee Fisher, "Win32 Applications Support for Plug and Play," *Microsoft Developer Network News*, May/June 1995.

⁵⁷ John D. Ruley, "Windows NT 4.0 – NT Revs into Fourth Gear," *Windows Internet Magazine*, May, 1, 1996. See <http://www.techweb.com>.

⁵⁸ Nicholas Petreley, "Searching for the Next Windows NT," *NC World Magazine*, March 1998.

⁵⁹ David Kirkpatrick, "Microsoft: Is Your Company Its Next Meal?," *Fortune*, .

⁶⁰ *Ibid.*

Microsoft's reaction to the Network Computer (NC) is also instructive. After downplaying the idea of a network computer as a low-cost alternative to a PC, Microsoft announced its own "Zero Administration Windows" (ZAW) initiative. ZAW would be provided as part of the release of the NT as the ZAW server. In addition, Microsoft announced NetPC and thin client initiatives to compete with the network computer. This effectively stopped all Windows PC manufacturers from entering the market for network computers. At the same time, Microsoft has been slow to fulfill its announcements. Not a single NetPC has been produced. While portions of ZAW are currently available, full implementation will not be available until the release of NT 5.0, expected sometime in 1999.

The effect of a pre-announcement on a competitor's stock price can be devastating. It is difficult to underestimate the importance of a company's stock to both its investors and employees – stock valuation is a critical factor for a software company's growth and success. For many employees, stock options are an important aspect of their overall compensation practices. In an industry where competition for talent is so fierce, stock price stability is crucial.

Microsoft's market power is so dominant that an announcement that Microsoft is pursuing a new market opportunity can cause a significant drop in a competitor's stock price. Citrix Systems saw its stock drop almost 60 percent in February 1997 after it was revealed that Microsoft was developing a competing product. Citrix's flagship product, WinFrame, provides multi-user access to Windows NT servers. When investors learned that Microsoft was developing similar technology to incorporate into Windows NT, Citrix stock dropped from \$15.625 to \$10.625 in a single day.⁶¹

De-Support

Microsoft also exerts control over the market by announcing that it will withdraw or limit support for its own products when customers choose to use products from other vendors.

Such was the case on January 19, 1998, when Microsoft stated that it did not plan to offer technical support to customers of the Windows NT Server operating system on questions stemming from the deployment of Novell NDS. Microsoft's press release noted that the company "can not support Windows NT server running NDS for NT."⁶² Microsoft claimed that Novell's product weakened security, impaired interoperability and would undermine NT service pack functionality. It was unable to support the product, Microsoft said, because Novell NDS installation replaced some of the NT source code.

Immediately after announcing that it would withdraw support for Novell NDS, a Microsoft spokesperson noted that Microsoft would continue "to provide support for *our* customers."⁶³

These claims turned out to be false and misleading. Novell NDS installation procedure replaced a single .DLL which did not impact the NT security structure.⁶⁴ NDS, which allows

61 Reuters, "Microsoft Panic Sinks Citrix," as reported by C|Net, <http://www.news.com/News/Item/0,4,8379,00.html>.

62 *Microsoft Backs down in NT Fray*, C|Net, Jan 26, 1998. See <http://www.news.com/News/Item/Textonly/0,25,18443,00.html>.

63 Reuters, *Microsoft Won't Support NDS*, January 19, 1998. See <http://www.news.com/News/Item/TextOnly/0,25,18256,00.html>.

64 It is interesting to note that Microsoft claimed that Novell NDS would render the NT server as non-C2 certifiable. C2 security certification, as defined by the U.S. Government standards, is an important and respected qualification; many corporations rely on government standards testing when making purchasing decisions. However, nothing in the NDS installation affected security; in fact, any NT server, with or without NDS, on a

NT and NetWare servers to better interoperate, was thoroughly tested for potential problems. By allowing the two disparate networks to better share resources, interoperability was in fact improved. Finally, Novell tested the impact of the .DLL in question on service packs and found no cause for concern.⁶⁵

Microsoft reversed its position a week later on January 26, noting that “we will support Windows NT server shops that have NDS for NT installed...we didn’t handle it well...we could’ve been clearer.”⁶⁶

Microsoft subsequently reversed its position on denying support in both cases and claimed that the notices had been an error. However, the impact of such announcements can be devastating. As one Sun Microsystems executive noted, such comments – even when corrected – are cause for significant concern in the enterprise market. “Unlike the consumer market, [information systems managers] are betting their jobs on their decisions, so their faith in the information they receive has to be high. That’s a fundamental difference in the enterprise market.”⁶⁷

Despite Microsoft’s reversals, the competitive damage is already inflicted when a customer is reminded of its vulnerability to losing Microsoft support for the OS – akin to cutting off oxygen – if the customer uses a non-Microsoft product.

network is not C2-certified. The U.S. Government has only certified NT servers that are configured without a network interface card and are not connected to any network. See http://www.novell.com/lead_stories/98/jan16/bridge.html.

⁶⁵ It should be noted that *any* change in a OS .DLL can impact the functionality of other applications – this has been a problem for Windows since the original version was first introduced. However, Microsoft regularly replaces .DLLs through service pack updates. While Microsoft takes steps to ensure interoperability, the vulnerability of third-party applications to Microsoft updates is clear. Microsoft could disable any product through changes to the source code on which the non-Microsoft product relies.

⁶⁶ Ben Heskett, *Microsoft Backs Down in NT Fray*, C|Net, <http://www.news.com/News/Item/TextOnly/0,25,18443,00.html>

⁶⁷ *Ibid.*

Summary

The exponential expansion of the Internet and global electronic commerce is responsible for the unparalleled market demand for Internet and intranet servers and enterprise software applications. In the very near future, virtually every corporation will sell goods and services directly to consumers through the Internet. By 2001, more than one million new intranet servers will provide the backbone for corporate communications and commerce. These new Intranets combined with the 331 million consumer devices to access the Internet will drive the growth of the enterprise software market. Microsoft's convergence of its desktop and server operating systems virtually assures that all of these systems will run on the Windows NT operating system.

In predicting Microsoft's future actions, one need not rely on announcements, inferences and analogies. To achieve the revenue growth needed to maintain its stock price, Microsoft has no choice – it must expand its presence in the rapidly growing enterprise software market because growth in the desktop market is slowing as the market matures.

Microsoft executives have stated clearly their objective to combine two operating systems into one, thus combining two markets into one, and creating a single operating system for PCs and enterprise servers alike. When this occurs Microsoft will have insurmountable control of the most important segment of networked computing.

Antitrust laws already prohibit any firm from monopolizing or attempting to monopolize any part of interstate commerce. For evidence of monopolization, courts often look to a monopolist's exclusionary or restrictive practices. Existing antitrust laws prohibit tying sales of a monopoly product to the sale of non-monopoly products and generally bar predatory pricing and exclusionary practices. This paper provides an insight into predatory and exclusionary practices within the enterprise software market and Microsoft's intent to dominate the network server market by leveraging its nearly 100 percent monopoly of the desktop into the enterprise market.

The enterprise market presents many of the same competition concerns which have surfaced in the discussion surrounding the desktop software market. A major difference, though, is that structural remedies imposed now to address these problems in the enterprise software market could come in time to avert the erosion of competition in this most significant portion of the computer software market. The time to prevent anti-competitive distortion in the enterprise software market is now, not after Microsoft's merger of the desktop and enterprise operating systems gives it a stranglehold on both markets.

Appendices

Appendix A: Trends in the Network Market

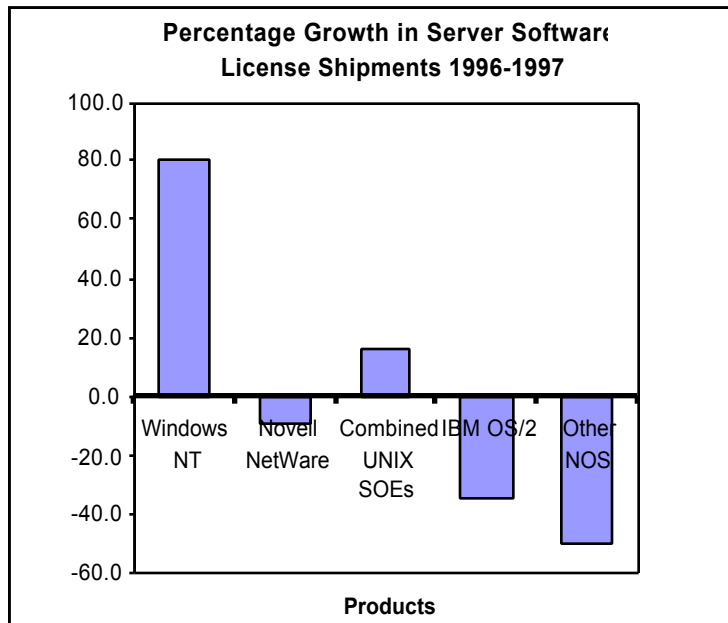
Microsoft's Success to Date

Microsoft's success in promoting Windows NT has been nothing short of spectacular. In 1993, more than 70,000 Windows NT software developer kits (SDK) were already in programmers hands with a reported 62 percent of SDK owners planning to deliver 32-bit applications in the following 12 months. For a product not yet in production, the momentum generated by Windows NT attests to Microsoft's market power.

Windows NT is Rapidly Gaining Market Share in Server Operating Systems

Successive releases of Windows NT have rapidly gathered increasing market share. The rate at which Microsoft has been able to penetrate the UNIX market is astonishing. According to IDC, Windows NT licenses exceeded 1 million units shipped in 1997, surpassing the number of UNIX server operating systems licenses by 32 percent. IDC projects that in the year 2000, Windows NT licenses will comprise approximately 45 percent of all license shipments, significantly outpacing the growth of all different varieties of the UNIX server operating system.

Microsoft has been able to generate increasing Windows NT sales volume, even in the face of slowing growth in the overall server operating environment (SOE) market. In 1997, Windows NT sales grew at eight times the market growth rate for SOEs.⁶⁸



(UNIX SOEs includes products from more than 11 ISVs including Sun, SCO, Digital, HP and IBM)

⁶⁸ Jean S. Bozeman, *Server Operating Environments, Year in Review 1997*, International Data Corporation.

Market research firm Computer Intelligence noted in a April 1998 report that 86 percent of Fortune 1000 firms have already deployed Windows NT Server, a 200 percent increase over the previous year.⁶⁹ For firms that are considering adding additional systems in the coming two years, fully 59 percent plan to use NT Servers; when asked why, the primary reason was that NT was the “*de facto* standard.”⁷⁰

Windows NT and BackOffice are Becoming Pervasive in Enterprise Applications

Microsoft’s suite of enterprise applications, known as BackOffice, is quickly penetrating corporate enterprise environments. The importance for Microsoft is clear: revenue from Microsoft’s Business Systems Division – Windows NT, SQL Server, Microsoft Mail, Exchange, Systems Management Server and SNA Server – will reach \$4 billion in 1998. By 2000, that figure is expected to grow to \$10 billion.⁷¹ Beyond the server market, Microsoft would also like to extend into business applications or Enterprise Resource Planning (ERP).⁷²

The enterprise market is a new market segment for Microsoft – consumers are more familiar with Microsoft’s consumer and new media technologies. But perhaps surprisingly, most of Microsoft’s revenues come from business markets. Fully 77 percent of Microsoft’s revenues in 1996 were derived from business customers versus 28 percent from consumers. Currently, the business market for Microsoft is its desktop operating system offerings (Windows 95/98) and personal or workgroup productivity applications (Word, Excel, Access, PowerPoint and Internet Explorer).

Windows NT and Internet Information Server are Dominant as intranet/Internet Servers

Equally impressive has been Microsoft’s movement into the Internet/intranet server segment. Previous to the release of Windows NT 4.0, Microsoft did not have a presence in the Internet/intranet (Web) server market. IIS, released as a free, separate product in 1996, was incorporated with NT 4.0 and has been bundled with the OS ever since.

At the time of the release of IIS, most Web servers were still UNIX-based; in fact, 55 percent of Web servers were UNIX-based freeware programs (NCSA and Apache).⁷³ Netscape Suite Server was making a strong showing in this market segment. While the Netscape product line accounted for just 15 percent of the market at the time, a trade magazine noted that “Netscape’s share is zooming and is likely to keep rising.” The same article noted that Microsoft IIS was “too new to register as more than blips on the surveys but [is] gaining rapid acceptance.”⁷⁴

IIS was an integral part of the Microsoft enterprise strategy; for Microsoft, it was critical that IIS quickly become the dominant Web server. Microsoft’s decision to give IIS away for free was critical: in the four months after its initial release, more than 90,000 copies had

⁶⁹ <http://www.microsoft.com/windows/dailynews/050798.htm>

⁷⁰ Tom Harris and Dan Kusnetzky, *Windows NT Server Adoption '97: A Look at The Role of Windows NT in Corporate Computing Environments*, IDC Research, 1997.

⁷¹ James Glave, “Microsoft’s Next Ambition: The Net’s Backend,” *Wired*, January 1998.

⁷² Eryn Brown, “The Best Business Bill Gates Doesn’t Own,” *Fortune*, December 1997.

⁷³ Sam Murphy and Bob Doyle, “Web Servers Need Power, Speed and Multimedia Savvy,” *New Media*, June 3, 1996. See http://www.newmedia.com/NewMedia/96/08/td/Web_Servers_Need_Power.html. At the time, Apache was the most popular Web server in the world.

⁷⁴ *Ibid.*

been downloaded.⁷⁵ By 1998, Microsoft had achieved dominance in the Web server market; IIS now accounts for 55 percent of the Web server market.⁷⁶

⁷⁵ Kathy Rebello, "Inside Microsoft," *Business Week*, July 15, 1996.

⁷⁶ Steve Hamm, "Microsoft's Future," *Business Week*, January 19, 1998.