Microsoft Cases

Note: These are monster of a cases, and thus are uploaded for information purposes only. American case begins at page 233. The latter case is edited as analysis of judge's possible lack of impartiality is omitted.

Judgment of the Court of First Instance (Grand Chamber) of 17 September 2007.

Microsoft Corp. v Commission of the European Communities. Case T-201/04

1Microsoft Corp., a company established in Redmond, Washington (United States), designs, develops and markets a wide variety of software products for different kinds of computing devices. Those software products include, in particular, operating systems for client personal computers (client PCs'), operating systems for work group servers and streaming media players. Microsoft also provides technical assistance for its various products.2On 15 September 1998, Mr Green, a Vice-President of Sun Microsystems, Inc. (Sun), a company established in Palo Alto, California (United States) which supplies, in particular, servers and server operating systems, wrote to Mr Maritz, a Vice-President of Microsoft, as follows:

We are writing to you to request that Microsoft provide [Sun] with the complete information required to allow Sun to provide native support for COM objects on Solaris.

We also request that Microsoft provide [Sun] with the complete information required to allow [Sun] to provide native support for the complete set of Active Directory technologies on Solaris.

We believe it is in the industry's best interest that applications written to execute on Solaris be able to seamlessly communicate via COM and/or Active Directory with the Windows operating systems and/or with Windows-based software.

We believe that Microsoft should include a reference implementation and such other information as is necessary to insure, without reverse engineering, that COM objects and the complete set of Active Directory technologies will run in full compatible fashion on Solaris. We think it necessary that such information be provided for the full range of COM objects as well as for the full set of Active Directory technologies currently on the market. We also think it necessary that such information be provided in a timely manner and on a continuing basis for COM objects and Active Directory technologies which are to be released to the market in the future.

3That letter will be referred to below as the letter of 15 September 1998.4By letter of 6 October 1998, Mr Maritz replied to the letter of 15 September 1998. In his letter, he said:

Thank you for your interest in working with Windows. We have some mutual customers using our products, and I think it is great you are interested in opening up your system to interoperate with Windows. Microsoft has always believed in helping software developers, including [its] competitors, build the best possible products and interoperability for [its] platform.

You may not realise that the information you requested on how to interoperate with COM and the Active Directory technologies is already published and available to you and every other software developer in the world via the Microsoft Developer Network (MSDN) Universal product MSDN contains comprehensive information about the services and interfaces of the Windows platform and is a great source of information for developers interested in writing to or interoperating with Windows. In fact, Sun currently has 32 active licenses for the MSDN Universal subscription. Furthermore, as your company has done in the past, I assume you will be sending a significant number of people to attend our Professional Developers Conference in Denver October 11 — October 15, 1998. This will be another venue to get the technical information you are seeking in order to work with our systems technologies. Some of the 23 Sun employees that attend[ed] last year[']s conference should be able to provide you with their comments on the quality and depth of information discussed at these Professional Developers Conferences.

You will be pleased to know that there is already a reference implementation of COM on Solaris. This implementation of COM on Solaris is a fully supported binary available from Microsoft. Source code for COM can be licensed from other sources including Software AG. ...

Regarding the Active Directory, we have no plans to port [it] to Solaris. However, to satisfy our mutual customers there are many methods with varying levels of functionality in order to interoperate with the Active Directory. For example, you can use the standard LDAP to access the Windows NT Server Active Directory from Solaris.

If after attending [the Professional Developers Conference] and reading through all the public MSDN content you should require some additional support, our Developer Relations Group has account managers who strive to help developers who need additional support for Microsoft's platforms. I have asked Marshall Goldberg, the Lead Program Manager, to make himself available should you need it ...

5Mr Maritz's letter of 6 October 1998 will be referred to below as the letter of 6 October 1998.6On 10 December 1998, Sun lodged a complaint with the Commission pursuant to Article 3 of Council Regulation No 17 of 6 February 1962, First Regulation implementing Articles [81 EC] and [82 EC] (OJ, English Special Edition 1959-62, p. 87).7Suns complaint related to Microsoft's refusal to give it the information and technology necessary to allow its work group server operating systems to interoperate with the Windows client PC operating system.8On 2 August 2000, the Commission sent Microsoft a first statement of objections (the first statement of objections), which related in effect to questions concerning the interoperability of Windows client PC operating systems and other suppliers' server operating systems (client/server interoperability).9Microsoft responded to the first statement of objections on 17 November 2000.10In the meantime, in February 2000, the Commission, acting on its own initiative, launched an investigation relating, particularly, to Microsoft's Windows 2000 generation of client PC and work group server operating systems and to the integration by Microsoft of its Windows Media Player in its Windows client PC operating system. The client PC operating system in the Windows 2000 range was intended for professional use and was called Windows 2000 Professional, whereas the server operating systems in that range were presented under the three following versions: Windows 2000 Server, Windows 2000 Advanced Server and Windows 2000 Datacenter Server.11That investigation concluded on 29 August 2001, when the Commission sent Microsoft a second statement of objections (the second statement of objections), in which it reiterated its previous objections concerning client/server interoperability. The Commission also addressed certain questions relating to interoperability between work group servers (server/server interoperability). In addition, the Commission raised a number of questions concerning the integration of Windows Media Player in the Windows client PC operating system.12Microsoft responded to the second statement of objections on 16 November 2001.13In December 2001, Microsoft sent the Commission a report containing the results and the analysis of a survey carried out by Mercer Management Consulting (Mercer).14Between April and June 2003, the Commission conducted a wide-ranging market enquiry, sending a series of requests for information to a number of companies and associations pursuant to Article 11 of Regulation No 17 (the 2003 market enquiry).15On 6 August 2003, the Commission sent Microsoft a third statement of objections, which was, according to the Commission, intended to supplement the two earlier statements of objections and to indicate the remedies it proposed to order (the third statement of objections).16By letter of 17 October 2003, Microsoft responded to the third statement of objections.17On 31 October 2003, Microsoft sent the Commission a report containing the results and the analysis of two further surveys conducted by Mercer.18A hearing was held by the Commission on 12, 13 and 14 November 2003.19On 1 December 2003, Microsoft presented supplemental observations on the third statement of objections.20On 24 March 2004, the Commission adopted Decision 2007/53/EC relating to a proceeding pursuant to Article 82 [EC] and Article 54 of the EEA Agreement against Microsoft Corp. (Case COMP/C-3.37.792 — Microsoft) (OJ 2007 L 32, p. 23; the contested decision).21In the contested decision, the Commission finds that Microsoft infringed Article 82 EC and Article 54 of the Agreement on the European Economic Area (EEA) by twice abusing a dominant position.22The Commission first identifies three separate worldwide product markets and considers that Microsoft had a dominant position on two of them. It then finds that Microsoft had engaged in two kinds of abusive conduct. As a result it imposes a fine and a number of remedies on Microsoft.23The contested decision identifies three separate product markets, namely the markets for, respectively, client PC operating systems (recitals 324 to 342 to the contested decision), work group server operating systems (recitals 343 to 401 to the contested decision) and streaming media players (recitals 402 to 425 to the contested decision).24The first market defined in the contested decision is the market for client PC operating systems. Operating systems are defined as system software' which controls the basic functions of the computer and enables the user to make use of the computer and run application software on it (recital 37 to the contested decision). Client PCs are defined as general-purpose computers designed for use by one person at a time and capable of being connected to a network (recital 45 to the contested decision).25As regards the second market, the contested decision defines work group server operating systems as operating systems designed and marketed to deliver collectively basic infrastructure services to relatively small numbers of client PCs connected to small or medium-sized networks (recitals 53 and 345 to the contested decision).26The contested decision identifies, more particularly, three types of services. These are, first, the sharing of files stored on servers, second, the sharing of printers and, third, the administration of groups and users, that is to say, the administration of the means whereby those concerned can access network services (recitals 53 and 345 to the contested decision). This last type of services is that of ensuring that users have access to and make use of the network resources in a secure manner, first, by authenticating users and second, by checking that they are authorised to perform a particular action (recital 54 to the contested decision). The contested decision states that, in order to provide for the efficient storing and checking of group and user administration information, work group server operating systems rely extensively on directory service technologies (recital 55 to the contested decision). The directory service included in Microsoft's Windows 2000 Server operating system is called Active Directory' (recital 149 to the contested decision).27According to the contested decision, the three types of services described above are closely interrelated in work group server operating systems. They may be broadly described as a single service', but viewed from two different perspectives, namely that of the user (file and print services) and that of the network administrator (group and user administration services) (recital 56 to the contested decision). The contested decision characterises those different services as work group services'.28The third market identified in the contested decision is the streaming media player market. Media players are defined as software products capable of reading audio and video content in digital form, that is to say, of decoding the corresponding data and translating them into instructions for the hardware (for example, loudspeakers or a display) (recital 60 to the contested decision). Streaming media players are capable of reading audio and video content streamed' across the Internet (recital 63 to the contested decision).29As regards the relevant geographic market, the Commission finds in the contested decision, as stated at paragraph 22 above, that it has a worldwide dimension for each of the three product markets (recital 427 to the contested decision).30In the contested decision, the Commission finds that Microsoft has had a dominant position on the client PC operating systems market since at least 1996 and also on the work group server operating systems market since 2002 (recitals 429 to 541 to the contested decision).31As regards the client PC operating systems market, the Commission relies essentially on the following factors to arrive at that conclusion:

Microsoft's market shares are over 90% (recitals 430 to 435 to the contested decision);

Microsoft's market power has enjoyed an enduring stability and continuity (recital 436 to the contested decision);

there are significant barriers to market entry, owing to indirect network effects (recitals 448 to 464 to the contested decision);

those network effects derive, first, from the fact that users like platforms on which they can use a large number of applications and, second, from the fact that software designers write applications for the client PC operating systems that are the most popular among users (recitals 449 and 450 to the contested decision).

32The Commission states at recital 472 to the contested decision that that dominant position presents extraordinary features in that Windows is not only a dominant product on the market for client PC operating systems but, in addition, is the de facto standard for those systems.33As regards the work group server operating systems market, the Commission relies, in substance, on the following factors:

Microsoft's market share is, at a conservative estimate, at least 60% (recitals 473 to 499 to the contested decision);

the position of Microsofts three main competitors on that market is as follows: Novell, with its NetWare software, has 10 to 25%; vendors of Linux products have a market share of 5 to 15%; and vendors of UNIX products have a market share of 5 to 15% (recitals 503, 507 and 512 to the contested decision);

the work group server operating systems market is characterised by the existence of significant entry barriers, owing in particular to network effects and to Microsoft's refusal to disclose interoperability information (recitals 515 to 525 to the contested decision);

there are close commercial and technological links between the latter market and the client PC operating systems market (recitals 526 to 540 to the contested decision).

34Linux is an open source operating system released under the GNU GPL (General Public Licence). Strictly speaking, it is only a code base, called the kernel, which performs a limited number of services specific to an operating system. It may, however, be linked to other layers of software to form a Linux operating system (recital 87 to the contested decision). Linux is used in particular as the basis for work group server operating systems (recital 101 to the contested decision) and is thus present on the work group server operating systems market in conjunction with Samba software, which is also released under the GNU GPL licence (recitals 506 and 598 to the contested decision).35UNIX designates a number of operating systems that share certain common features (recital 42 to the contested decision). Sun has developed a UNIX-based work group server operating system called Solaris (recital 97 to the contested decision).36The first abusive conduct in which Microsoft is found to have engaged consists in its refusal to supply its competitors with interoperability information and to authorise the use of that information for the purpose of developing and distributing products competing with Microsoft's own products on the work group server operating systems market, between October 1998 and the date of notification of the contested decision (Article 2(a) of the contested decision). That conduct is described at recitals 546 to 791 to the contested decision.37For the purposes of the contested decision, interoperability information is the complete and accurate specifications for all the protocols [implemented] in Windows work group server operating systems and ... used by Windows work group servers to deliver file and print services and group and user administrative services, including the Windows domain controller services, Active Directory services and group Policy services to Windows work group networks' (Article 1(1) of the contested decision).38Windows work group network is defined as any group of Windows client PCs and Windows work group servers linked together via a computer network (Article 1(7) of the contested decision).39A protocol is defined as a set of rules of interconnection and interaction between various instances of Windows work group server operating systems and Windows client PC operating systems running on different computers in a Windows work group network' (Article 1(2) of the contested decision).40In the contested decision, the Commission emphasises that the refusal in question does not relate to Microsoft's source code', but only to specifications of the protocols concerned, that is to say, to a detailed description of what the software in question must achieve, in contrast to the implementations, consisting in the implementation of the code on the computer (recitals 24 and 569 to the contested decision). It states, in particular, that it does not contemplate ordering Microsoft to allow copying of Windows by third parties (recital 572 to the contested decision).41The Commission further considers that Microsoft's refusal to Sun is part of a general pattern of conduct (recitals 573 to 577 to the contested decision). It also asserts that Microsoft's conduct involves a disruption of previous, higher levels of supply (recitals 578 to 584 to the contested decision), causes a risk of elimination of competition on the work group server operating systems (recitals 585 to 692 to the contested decision) and has a negative effect on technical development and on consumer welfare (recitals 693 to 708 to the contested decision).42Last, the Commission rejects Microsoft's arguments that its refusal is objectively justified (recitals 709 to 778 to the contested decision).43The second abusive conduct in which Microsoft is found to have engaged consists in the fact that from May 1999 to the date of notification of the contested decision Microsoft made the availability of the Windows client PC operating system conditional on the simultaneous acquisition of the Windows Media Player software (Article 2(b) of the contested decision). That conduct is described at recitals 792 to 989 to the contested decision.44In the contested decision, the Commission considers that that conduct satisfies the conditions for a finding of a tying abuse for the purposes of Article 82 EC (recitals 794 to 954 to the contested decision). First, it reiterates that Microsoft has a dominant position on the client PC operating systems market (recital 799 to the contested decision). Second, it considers that streaming media players and client PC operating systems constitute separate products (recitals 800 to 825 to the contested decision). Third, it asserts that Microsoft does not give consumers the opportunity to buy Windows without Windows Media Player (recitals 826 to 834 to the contested decision). Fourth, it contends that the tying in question restricts competition on the media players market (recitals 835 to 954 to the contested decision).45Last, the Commission rejects Microsoft's arguments to the effect that, first, the tying in question produces efficiency gains capable of offsetting the anti-competitive effects identified in the contested decision (recitals 955 to 970 to the contested decision) and, second, Microsoft had no interest in anti-competitive' tying (recitals 971 to 977 to the contested decision).46In respect of the two abuses identified in the contested decision, a fine of EUR 497196304 is imposed (Article 3 of the contested decision).47Furthermore, the first paragraph of Article 4 of the contested decision requires that Microsoft bring an end to the infringement referred to in Article 2, in accordance with Articles 5 and 6 of that decision. Microsoft must also refrain from repeating any act or conduct that might have the same or equivalent object or effect to those abuses (second paragraph of Article 4 of the contested decision).48By way of remedy for the abusive refusal referred to in Article 2(a) of the contested decision, Article 5 of that decision provides as follows:

(a)Microsoft ... shall, within 120 days of the date of notification of [the contested decision], make the interoperability information available to any undertaking having an interest in developing and distributing work group server operating system products and shall, on reasonable and non-discriminatory terms, allow the use of the interoperability information by such undertakings for the purpose of developing and distributing work group server operating system products;(b)Microsoft ... shall ensure that the interoperability information made available is kept updated on an ongoing basis and in a timely manner;(c)Microsoft ... shall, within 120 days of the date of notification of [the contested decision], set up an evaluation mechanism that will give interested undertakings a workable possibility of informing themselves about the scope and terms of use of the interoperability information; as regards this evaluation mechanism, Microsoft ... may impose reasonable and non-discriminatory conditions to ensure that access to the interoperability information is granted for evaluation purposes only;

...

49By way of remedy for the abusive tying referred to in Article 2(b) of the contested decision, Article 6 of that decision orders Microsoft to offer, within 90 days of the date of notification of that decision, a full-functioning version of the Windows client PC operating system which does not incorporate Windows Media Player, although Microsoft retains the right to offer a bundle of the Windows client PC operating system and Windows Media Player.50Last, Article 7 of the contested decision provides:

Within 30 days of the date of notification of [the contested decision], Microsoft ... shall submit a proposal to the Commission for the establishment of a suitable mechanism assisting the Commission in monitoring [Microsoft's] compliance with [the contested decision]. That mechanism shall include a monitoring trustee who shall be independent from Microsoft ...

In case the Commission considers [Microsoft's] proposed monitoring mechanism not suitable it retains the right to impose such a mechanism by way of a decision.

51In parallel with the Commissions investigation, Microsoft was the subject of an investigation for violation of the United States antitrust legislation.52In 1998, the United States of America, 20 States and the District of Columbia brought proceedings against Microsoft under the Sherman Act Their complaints concerned the measures taken by Microsoft against Netscape's Internet Navigator and Suns Java technologies. The States concerned also brought actions against Microsoft for violation of their own antitrust legislation.53After the United States Court of Appeals for the District of Columbia Circuit (the Court of Appeals), on appeal by Microsoft against the judgment of 3 April 2000 of the United States District Court for the District of Columbia (the District Court), had given its judgment on 28 June 2001, Microsoft reached a settlement with the United States Department of Justice and the Attorneys General of nine States (the United States settlement) in November 2001, in which two types of commitment were given by Microsoft.54First, Microsoft agreed to draw up the specifications of the communication protocols used by the Windows server operating systems in order to intemperate, that is to say, to make them compatible with the Windows client PC operating systems and to grant third parties licences relating to those specifications on specific conditions.55Second, the United States settlement provides that Microsoft must allow original equipment manufacturers (OEMs) and end users to activate or to eliminate access to its middleware. Windows Media Player is one of the products in that category, as defined in the United States settlement Those provisions are intended to ensure that suppliers of media software can develop and distribute products that function properly with Windows.56Those provisions were confirmed by a judgment of the District Court of 1 November 2002.57On 30 June 2004, the Court of Appeals, on appeal by the State of Massachusetts, affirmed the judgment of the District Court of 1 November 2002.58Pursuant to the United States settlement, the Microsoft Communications Protocol Program (the MCPP) was set up in August 2002.59By application lodged at the Registry of the Court of First Instance on 7 June 2004, Microsoft brought the present action.60By separate document lodged at the Court Registry on 25 June 2004, Microsoft lodged an application under Article 242 EC for suspension of operation of Article 4, Article 5(a) to (c) and Article 6(a) of the contested decision.61By order of 22 December 2004 in Case T-201/04 R Microsoft v Commission [2004] ECR II-4463, the President of the Court dismissed that application and reserved the costs.62By order of 9 March 2005, the President of the Fourth Chamber of the Court granted the following associations and companies leave to intervene in the proceedings in support of the form of order sought by Microsoft:

The Computing Technology Industry Association, Inc. (CompTIA);

DMDsecure.com BV, MPS Broadband AB, Pace Micro Technology pic, Quantel Ltd and Tandberg Television Ltd (DMDsecure and Others);

Association for Competitive Technology, Inc. (ACT);

TeamSystem SpA and Mamut ASA;

Exor AB.

63By the same order, the President of the Fourth Chamber of the Court granted the following associations and companies leave to intervene in the proceedings in support of the form of order sought by the Commission:

Software & Information Industry Association (SUA);

Free Software Foundation Europe eV (FSFE);

Audiobanner.com, trading as VideoBanner;

RealNetworks, Inc.

64By letters of 13 December 2004, 9 March, 27 June and 9 August 2005, Microsoft requested that certain confidential matters in the application, the defence, the reply, Microsoft's observations on the statements in intervention and the rejoinder not be communicated to the interveners. The applicant produced a non-confidential version of those procedural documents and only those non-confidential texts were furnished to the interveners referred to in paragraphs 62 and 63 above. Those interveners raised no objections in that regard.65The interveners referred to in paragraphs 62 and 63 above lodged their own statements in intervention within the prescribed period. The main parties submitted their observations on those statements in intervention on 13 June 2005.66By order of 28 April 2005 in Case T-201/04 Microsoft v Commission [2005] ECR II-1491, the President of the Fourth Chamber granted the European Committee for Interoperable Systems (ECIS) leave to intervene in the proceedings in support of the form of order sought by the Commission. As that association's application to intervene was lodged after expiry of the period referred to in Article 116(6) of the Rules of Procedure of the Court, it was ordered to submit its observations during the oral procedure, on the basis of the Report for the Hearing, with which it was provided.67By decision of the Plenary Conference of 11 May 2005, the case was referred to the Fourth Chamber, Extended Composition, of the Court of First Instance.68By decision of the Plenary Conference of 7 July 2005, the case was referred to the Grand Chamber of the Court of First Instance and assigned to a new Judge-Rapporteur.69By order of the President of the Grand Chamber of 16 January 2006, RealNetworks was removed from the case as intervener in support of the form of order sought by the Commission.70On 1 February 2006, the parties were invited by the Court to attend an informal meeting before the President of the Grand Chamber and the Judge-Rapporteur with a view to finalising the arrangements for the hearing. That meeting took place at the Court on 10 March 2006.71Upon hearing the Judge-Rapporteur, the Court of First Instance (Grand Chamber) decided to open the oral procedure and, pursuant to Article 64 of its Rules of Procedure, invited the main parties to produce certain documents and to answer a series of questions. They complied with those requests within the prescribed period.72The parties presented oral argument and their answers to the questions put by the Court at the hearing on 24, 25, 26, 27 and 28 April 2006.73At the hearing, Microsoft was requested by the Court to lodge a copy of the requests for information sent by the Commission in connection with the 2003 market enquiry, concerning the question of media players, and of the answers to those requests for information, and also of the reports containing the results and analysis of the surveys conducted by Mercer (the Mercer reports). Microsoft produced those various documents within the prescribed periods.74By letter from the Court of 3 May 2006, Microsoft was requested to produce a copy of the other requests for information issued by the Commission in connection with the 2003 market enquiry and of the replies to those requests. Microsoft complied with that request within the prescribed period.75The President of the Grand Chamber closed the oral procedure by decision of 22 June 2006.76Microsoft claims that the Court should:

annul the contested decision;

in the alternative, annul or substantially reduce the fine;

order the Commission to pay the costs;

order SIIA, FSFE and Audiobanner.com to pay the costs relating to their intervention.

77The Commission contends that the Court should:

dismiss the action;

order Microsoft to pay the costs.

78CompTIA, ACT, TeamSystem and Mamut claim that the Court should:

annul the contested decision;

order the Commission to pay the costs.

79DMDsecure and Others claim that the Court should:

annul Article 2(b), Article 4, Article 6(a) and Article 7 of the contested decision;

order the Commission to pay the costs.

80Exor claims that the Court should:

annul Articles 2 and 4, Article 6(a) and Article 7 of the contested decision;

order the Commission to pay the costs.

81SIIA, FSFE, Audiobanner.com and ECIS contend that the Court should:

dismiss the action;

order Microsoft to pay the costs.

82It is appropriate to examine, first of all, the pleas relating to the forms of order seeking annulment of the contested decision and, next, those relating to the forms of order seeking annulment or a reduction of the fine.83The pleas in law which Microsoft puts forward in support of its application for annulment of the contested decision are centred on three issues, namely, first, the refusal to supply and authorise the use of interoperability information; second, the tying of the Windows client PC operating system and Windows Media Player; and, third, the obligation to appoint an independent monitoring trustee responsible for ensuring that Microsoft complies with the contested decision.84In its written pleadings, the Commission raises a number of issues relating to the extent of review by the Community Courts and the admissibility of a number of annexes to the application and the reply.85The Commission claims that the contested decision rests on a number of considerations involving complex technical and economic assessments. It submits that, according to the case-law, the Community Courts can carry out only a limited review of such assessments (Case C-269/90 Technische Universität München [1991] ECR I-5469, paragraph 13; Joined Cases C-204/00 P, C-205/00 P, C-211/00 P, C-213/00 P, C-217/00 P and C-219/00 P Aalborg Portland and Others v Commission [2004] ECR I-123, paragraph 279; and Case T-28/03 Holcim (Deutschland) v Commission [2005] ECR II-1357, paragraphs 95, 97 and 98).86Microsoft, citing by way of example Case T-62/98 Volkswagen v Commission [2000] ECR II-2707, paragraph 43, responds that the Community Courts do not refrain from conducting searching inquiries into the soundness of the Commissions decisions, even in complex cases'.87The Court observes that it follows from consistent case-law that, although as a general rule the Community Courts undertake a comprehensive review of the question as to whether or not the conditions for the application of the competition rules are met, their review of complex economic appraisals made by the Commission is necessarily limited to checking whether the relevant rules on procedure and on stating reasons have been complied with, whether the facts have been accurately stated and whether there has been any manifest error of assessment or a misuse of powers (Case T-65/96 Kish Glass v Commission [2000] ECR II-1885, paragraph 64, upheld on appeal by order of the Court of Justice in Case C-241/00 P Kish Glass v Commission [2001] ECR I-7759; see also, to that effect, with respect to Article 81 EC, Case 42/84 Remia and Others v Commission [1985] ECR 2545, paragraph 34, and Joined Cases 142/84 and 156/84 BAT and Reynolds v Commission [1987] ECR 4487, paragraph 62).88Likewise, in so far as the Commission's decision is the result of complex technical appraisals, those appraisals are in principle subject to only limited review by the Court, which means that the Community Courts cannot substitute their own assessment of matters of fact for the Commission's (see, as regards a decision adopted following complex appraisals in the medico-pharmacological sphere, order of the President of the Court of Justice in Case C-459/00 P(R) Commission v Trenker [2001] ECR I-2823, paragraphs 82 and 83; see also, to that effect, Case C-120/97 Upjohn [1999] ECR I-223, paragraph 34 and the case-law cited; Case T-179/00 A Menarini v Commission [2002] ECR II-2879, paragraphs 44 and 45; and Case T-13/99 Pfizer Animal Health v Council [2002] ECR II-3305, paragraph 323).89However, while the Community Courts recognise that the Commission has a margin of appreciation in economic or technical matters, that does not mean that they must decline to review the Commission's interpretation of economic or technical data. The Community Courts must not only establish whether the evidence put forward is factually accurate, reliable and consistent but must also determine whether that evidence contains all the relevant data that must be taken into consideration in appraising a complex situation and whether it is capable of substantiating the conclusions drawn from it (see, to that effect, concerning merger control, Case C-12/03 P Commission v Tetra Laval [2005] ECR I-987, paragraph 39).90It is in the light of those principles that the Court must examine the various pleas which Microsoft puts forward in support of its application for annulment of the contested decision.91The Commission, supported on this point by SIIA, claims that in a number of annexes to the application and to the reply Microsoft relies on arguments not found in the actual body of those pleadings. On various occasions, moreover, Microsoft makes a general reference to reports annexed to its pleadings. The Commission further criticises the fact that certain expert opinions produced by Microsoft are based on information to which neither the Commission nor the Court had access, and contends that the Court cannot take account of those arguments, reports or expert opinions.92Microsoft asserts that the relevant passages of [the] application contain the essential matters of fact and of law on which the action is based. According to the case-law, specific points in the text of the application can be supported and completed by references to specific passages in documents attached (order in T-56/92 Koelman v Commission [1993] ECR II-1267, paragraph 21). Furthermore, the applicant submits that it took a deliberate decision to limit the number of annexes as it did not wish to make the file too bulky, that it is under no obligation to submit every document referred to in the footnotes in its annexes, that the Commission has copies of all the documents lodged during the administrative procedure and that it cannot be disputed that Microsoft is entitled to provide information to its experts.93At the informal meeting of 10 March 2006 (see paragraph 70 above), the Judge-Rapporteur drew Microsoft's attention to the fact that in certain annexes to its pleadings it seemed to rely on arguments not expressly set out in the actual body of those pleadings and questioned Microsoft on that point. As recorded in the minutes of that meeting, Microsoft replied that it was not claiming reliance on arguments ... which would not be expressly referred to in the application or in the reply.94The Court recalls that, under Article 21 of the Statute of the Court of Justice and Article 44(1) (c) of the Rules of Procedure of the Court of First Instance, each application is required to state the subject-matter of the proceedings and a summary of the pleas in law on which the application is based. According to consistent case-law it is necessary, for an action to be admissible, that the basic matters of law and fact relied on be indicated, at least in summary form, coherently and intelligibly in the application itself. Whilst the body of the application may be supported and supplemented on specific points by references to extracts from documents annexed thereto, a general reference to other documents, even those annexed to the application, cannot make up for the absence of the essential arguments in law which, in accordance with the abovementioned provisions, must appear in the application (Case C-52/90 Commission v Denmark [1992] ECR I-2187, paragraph 17; orders in Koelman v Commission, cited in paragraph 92 above, paragraph 21, and Case T-154/98 Asia Motor France and Others v Commission [1999] ECR II-1703, paragraph 49). Furthermore, it is not for the Court to seek and identify in the annexes the pleas and arguments on which it may consider the action to be based, since the annexes have a purely evidential and instrumental function (Case T-84/96 Cipeke v Commission [1997] ECR II-2081, paragraph 34, and Case T-231/99 Joynson v Commission [2002] ECR II-2085, paragraph 154).95That interpretation of Article 21 of the Statute of the Court of Justice and Article 44(1)(c) of the Rules of Procedure of the Court of First Instance also applies to the conditions for admissibility of a reply, which according to Article 47(1) of the Rules of Procedure is intended to supplement the application (see, to that effect, Joined Cases T-305/94 to T-307/94, T-313/94 to T-316/94, T-318/94, T-325/94, T-328/94, T-329/94 and T-335/94 Limburgse Vinyl Maatschappij and Others v Commission [1999] ECR II-931, paragraph 40, not set aside on that point by the Court of Justice, on appeal, in Joined Cases C-238/99 P, C-244/99 P, C-245/99 P, C-247/99 P, C-250/99 P to C-252/99 P and C-254/99 P Limburgse Vinyl Maatschappij and Others v Commission [2002] ECR I-8375).96In the present case, the Court finds that in a number of documents annexed to the application and the reply, Microsoft puts forward legal or economic arguments not limited to supporting or supplementing matters of fact or of law expressly set out in the body of those procedural documents, but which introduce fresh arguments.97Furthermore, on a number of occasions Microsoft supplements the text of the application and of the reply on specific points by references to attached documents. However, certain of those references to an attached document are in general terms and therefore do not permit the Court to identify precisely the arguments that might be regarded as supplementing the pleas in law developed in the application or in the reply.98The Court notes, however, that while the Commission considers that there is no need to take account of the developments in those various annexes, it none the less comments on those developments in notes annexed to its own pleadings.99In accordance with the case-law referred to at paragraphs 94 and 95 above and with Microsoft's statement at the informal meeting of 10 March 2006 (see paragraph 93 above), the annexes referred to at paragraphs 96 to 98 above will be taken into consideration by the Court only in so far as they support or supplement pleas or arguments expressly set out by Microsoft or the Commission in the body of their pleadings and in so far as it is possible for the Court to determine precisely what are the matters they contain that support or supplement those pleas or arguments.100As regards the Commissions criticisms of the fact that Microsoft has not provided the information underlying certain expert opinions attached to its pleadings, it is sufficient to state that it is for the Court to appraise, where necessary, whether the assertions in those opinions are without probative value. If, in the absence of access to certain information, the Court should consider that those assertions do not have sufficient probative value, it will not take them into account.101In this first issue, Microsoft relies on a single plea alleging infringement of Article 82 EC. This plea may be broken down into three parts. In the first part, Microsoft claims that the criteria which permit an undertaking in a dominant position to be compelled to grant a licence, as defined by the Community judicature, are not satisfied in this case. In the second part, Microsoft claims that Sun did not request access to the technology that the Commission ordered Microsoft to disclose and that the letter of 6 October 1998 cannot in any event be interpreted as containing an actual refusal on its part. Last, in the third part, Microsoft claims that the Commission does not properly take account of the obligations imposed on the Communities by the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) of 15 April 1994 (Annex 1 C to the Agreement Establishing the World Trade Organisation (WTO)) (the TRIPS Agreement).102It may be useful first in this place to give a general outline of the positions taken by the main parties on the issue of the refusal to supply and authorise the use of interoperability information.103According to the contested decision, Microsoft abused its dominant position on the client PC operating systems market by refusing, first, to supply Sun and other competitors with the specifications for protocols implemented in Windows work group server operating systems and used by the servers running those systems to deliver file and print services and group and user administration services to Windows work group networks and, second, to allow those various undertakings to use those specifications in order to develop and market work group server operating systems.104The Commission contends that the information to which Microsoft refuses access is interoperability information within the meaning of Council Directive 91/250/EEC of 14 May 1991 on the legal protection of computer programs (OJ 1991 L 122, p. 42). It claims, in particular, that that directive envisages interoperability between two software products as being the ability for them to exchange information and mutually to use that information in order to allow each of those software products to operate in all the ways contemplated (see, in particular, paragraph 256 of the first statement of objections, paragraph 79 of the second statement of objections and paragraph 143 of the third statement of objections). The Commission maintains that the concept of interoperability which Microsoft advocates is inaccurate (recitals 749 to 763 to the contested decision).105The Commission finds, on the basis of a series of factual and technical factors, that the proper functioning of a Windows work group network relies on an architecture of client/server and server/server interconnections and interactions, which ensures a transparent access to the core work group server services (for Windows 2000/Windows 2003, this Windows domain architecture can be termed an Active Directory domain architecture) and that [t]he common ability to be part of that architecture is an element of compatibility between Windows client PCs and Windows work group servers (recital 182 to the contested decision). The Commission describes that compatibility in terms of interoperability with the Windows domain architecture (recital 182 to the contested decision) and maintains that such interoperability is necessary for a work group server operating system vendor in order to viably stay on the market (recital 779 to the contested decision).106The Commission further contends that in order that Microsoft's competitors can develop work group server operating systems capable of achieving such a degree of interoperability when the servers on which they are installed are added to a Windows work group, it is essential that they have access to information relating to interoperability with the Windows domain architecture (recitals 183 and 184 to the contested decision). It maintains, in particular, that none of the five methods described by Microsoft of ensuring interoperability between operating systems supplied by different vendors constitutes a sufficient substitute for the disclosure of that information (recitals 666 to 687 to the contested decision).107Last, the Commission asserts that, according to the case-law, while undertakings are, as a rule, free to choose their business partners, under certain circumstances a refusal to supply by an undertaking in a dominant position may constitute an abuse of a dominant position within the meaning of Article 82 EC. It maintains that the present case presents a number of exceptional circumstances which show that Microsoft's refusal to supply was an abuse, even on the strictest hypothesis — and therefore the one most favourable to Microsoft — that the refusal is regarded as a refusal to supply to third parties a licence relating to intellectual property rights (recitals 190 and 546 to 559 to the contested decision). The Commission maintains that it is entitled to take account of exceptional circumstances other than those identified by the Court of Justice in Joined Cases C-241/91 P and C-242/91 P RTE and ITP v Commission [1995] ECR I-743 (Magill) and approved by the Court of Justice Case C-418/01 IMS Health [2004] ECR I-5039, but that in any event those exceptional circumstances are present in this case.108Microsoft has argued since the beginning of the administrative procedure that the concept of interoperability employed by the Commission in the present case is not consistent with the concept of full interoperability envisaged by Directive 91/250 and that it does not correspond to the way in which undertakings organise their computer networks in practice (see, in particular, paragraphs 151 to 157 of the response of 16 November 2001 to the second statement of objections and pages 29 and 30 of the response of 17 October 2003 to the third statement of objections). It claims, in particular, that full interoperability is available to a developer of server operating systems when all the functionality of his program can be accessed from a Windows client operating system (paragraph 143 of the response of 17 November 2000 to the first statement of objections; see also, to the same effect, pages 29 and 63 of the response of 17 October 2003 to the third statement of objections). Microsoft thus adopts what the Commission describes as a one-way definition, whereas the Commission relies on a two-way relationship (recital 758 to the contested decision).109In Microsoft s submission, the full interoperability referred to above may be achieved through the disclosure of interface information which it already provides, notably by its MSDN product or the conferences which it organises for Professional Developers or through certain other methods available on the market (see, in particular, paragraphs 12, 57 to 63, 73 to 83 and 147 of the response of 17 November 2000 to the first statement of objections; paragraphs 6, 72, 94 to 96, 148 and 149 of the response of 16 November 2001 to the second statement of objections; and page 31 of the response of 17 October 2003 to the third statement of objections).110Microsoft claims that the Commission's concept of interoperability means, on the other hand, that its competitors' operating systems must function in every respect as a Windows server operating system. That situation could be achieved only if those competitors were allowed to clone' its products, or some of their features, and if information on the internal mechanisms of its products were communicated to those competitors (see, in particular, paragraphs 7, 20, 27, 144 to 150 and 154 to 169 of the response of 17 November 2000 to the first statement of objections; paragraphs 158 to 161 of the response of 16 November 2001 to the second statement of objections; and pages 10 and 20 of the response of 17 October 2003 to the third statement of objections).111Microsoft maintains that a requirement that it disclose such information would amount to an interference with the free exercise of its intellectual property rights and with its incentive to innovate (see, in particular, paragraphs 162, 163 and 176 of the response of 16 November 2001 to the second statement of objections and pages 3, 10 and 11 of the response of 17 October 2003 to the third statement of objections).112Last, Microsoft submits that the present case must be appraised in the light of Magill and IMS Health, cited in paragraph 107 above, since the refusal must be analysed as a refusal to grant third parties a licence relating to intellectual property rights and because, accordingly, the contested decision implies compulsory licensing. It maintains, however, that none of the criteria which in its submission were exhaustively accepted by the Court of Justice in those judgments is satisfied in the present case. Microsoft concludes that the refusal at issue cannot be characterised as abusive and that the Commission cannot therefore order it to disclose the interoperability information. In the alternative, Microsoft relies on Case C-7/97 Bronner [1998] ECR I-7791 and submits that the criteria laid down in that judgment are not satisfied in the present case either.113In the second place, it is appropriate to describe the way in which Microsoft structures its argument in the first part of the plea and the way in which the Court will examine that argument.114Thus, before developing its actual reasoning (see title (d) of the first part, below), Microsoft puts forward a number of considerations concerning interoperability, which may be summarised as follows. First, it claims that there are five methods of achieving interoperability between Windows client PC and server operating systems and competing server operating systems. Second, it criticises the degree of interoperability required by the Commission in the present case (and claims, in essence, that the Commissions real intention is to allow Microsoft's competitors to clone' its own products or certain of their features) and also the scope of the remedy prescribed in Article 5 of the contested decision.115In addition to those various considerations, Microsoft puts forward a series of arguments in order to demonstrate that the communication protocols which it is required to disclose to its competitors pursuant to the contested decision are technologically innovative and that those protocols, or their specifications, are covered by intellectual property rights.116Microsoft's actual reasoning in the first part of this plea may be set out as follows:

the present case must be appraised in the light of the various circumstances recognised by the Court of Justice in Magill, paragraph 107 above, and approved in IMS Health, cited in paragraph 107 above;

the circumstances in which a refusal by an undertaking in a dominant position to grant third parties a licence covering intellectual property rights may be characterised as abusive are, first, where the product or service concerned is indispensable for carrying on a particular business; second, where the refusal is liable to exclude all competition on a secondary market; third, where the refusal prevents the emergence of a new product for which there is potential consumer demand; and, fourth, where the refusal is not objectively justified;

none of those four circumstances is present in this case;

as a subsidiary point, the criteria applicable are those recognised by the Court of Justice in Bronner, cited in paragraph 112 above, which correspond to the first, second and fourth circumstances referred to above and identified in Magill and IMS Health, cited in paragraph 107 above;

nor, accordingly, is any of the three Bronner criteria, cited in paragraph 112 above, satisfied in the present case.

117The Court will begin by examining Microsoft's allegations concerning the varying degrees of interoperability and the scope of the remedy prescribed in Article 5 of the contested decision. The applicants arguments relating to the existence of five methods of achieving interoperability between its operating systems and its competitors' systems will be analysed when the Court examines what is claimed to be the indispensable nature of the interoperability information. The Court will then deal with Microsoft's arguments concerning the intellectual property rights which in its submission cover its communication protocols or the specifications for those protocols. Finally, the Court will appraise the actual reasoning which Microsoft develops in the first part of the plea and determine, first, the circumstances by reference to which Microsoft's impugned conduct must be analysed and, second, whether those circumstances are present in this case.118Microsoft maintains, in essence, that the concept of interoperability on which the Commission bases its conclusion that the refusal to supply interoperability information constitutes an abuse of a dominant position and which serves as the basis for the remedy prescribed in Article 5 of the contested decision is incorrect.119Microsoft emphasises that interoperability occurs along a continuum and that it is not an absolute standard.120While [t]here may well be a minimum level of interoperability that is required for effective competition, that level is not difficult to achieve and there are various ways to achieve interoperability in the sense of having operating systems supplied by different vendors work well together.121Microsoft contends that in the contested decision the Commission adopts a wholly different concept of interoperability from the one set out in Directive 91/250 and used in practice by undertakings when they organise their computer networks. The Commission imagines that it is possible for a server operating system produced by one of Microsoft's competitors to function in all respects like a Windows server operating system (that is to say, to achieve perfect substitutability or plug replaceability). In fact, that level of interoperability could be achieved only if Microsoft's competitors were authorised to clone its products or certain features of those products. Two server operating systems are able to interoperate in the sense of exchanging information with each other or providing services to each other without necessarily having to be exactly the same. It is thus important to distinguish the concept of interoperability from the concepts of cloning or duplication.122In support of its assertions, Microsoft refers to a report by two computer experts which it had attached to its response of 16 November 2001 to the second statement of objections, in which those experts explain the concepts of tight coupling and loose coupling and also explain why efforts to achieve tight coupling with software products from different designers have failed (annex A.9.2 to the application). Those efforts have failed for both technical and business reasons.123Microsoft also states that during the administrative procedure it produced 50 statements from undertakings, both public and private, operating in all industry sectors and from what were then the various Member States. In their statements, those undertakings attest to the high level of interoperability between Windows client and server operating systems and its competitors' server operating systems, due to the use of methods already available on the market. Furthermore, the Mercer reports show that an undertakings choice of server operating system is not dictated by concerns about interoperability with Windows client and server operating systems.124In the reply, when introducing the reasoning designed to show that its communication protocols are protected by intellectual property rights, and also in its answer to one of the written questions put to it by the Court, Microsoft makes a series of allegations concerning the scope of the remedy prescribed in Article 5 of the contested decision. By those allegations, Microsoft also raises the question of the level of interoperability required by the Commission in the present case.125Thus, in the reply, Microsoft claims that there is an inconsistency between the remedy and the standard of interoperability' employed by the Commission in the contested decision for the purpose of assessing the relevance of the alternative means of interoperability'. In its answer to one of the written questions put by the Court, Microsoft asserts that the scope of the disclosure obligation prescribed by Article 5 of the contested decision has been given different interpretations by the Commission.126On that last point, Microsoft observes that, at recital 669 to the contested decision, the Commission states that open industry standards fall short of enabling competitors to achieve the same degree of interoperability with the Windows domain architecture as Windows work group server operating systems do. Microsoft also observes that, at recital 679 to the contested decision, the Commission states that Novell's clientless work group server operating systems cannot use the full capabilities of the Windows client PCs and work group servers in the same way that [Windows] work group server operating systems can. Microsoft concludes from those statements that the Commission initially envisaged interoperability as being the capability for its competitors to make their products work in exactly the same way as Windows server operating systems. The Commission thus envisages that there be a quasi identity between Windows server operating systems and its competitors' server operating systems.127In order for the degree of interoperability thus advocated by the Commission to be achieved (a degree which Microsoft refers to variously as plug replacement, plugreplaceability, drop-in, functional equivalent and functional clone), Microsoft would have to disclose much more information than that referred to in Article 5 of the contested decision, notably information on the internal mechanisms of its server operating systems (including algorithms and decision rules).128Microsoft submits that the Commission adopted a second approach and advocated a narrow interpretation of Article 5, taking the view that that article required the applicant to license to its competitors only on the wire communication protocols. In support of that assertion, Microsoft relies on the fact that at the hearing in the interim measures proceedings the parties which had then been granted leave to intervene in support of the form of order sought by the Commission stated that they were not interested in obtaining access to information about the internal mechanisms of the Windows server operating systems. Furthermore, the Commission confirmed in the defence and the rejoinder that it did not propose to allow Microsoft's competitors to clone' the file and print services or group and user administration services delivered by the Windows server operating systems. However, the thousands of pages of specifications which Microsoft communicated to the Commission pursuant to the contested decision will none the less allow its competitors to copy certain features of its products that it developed through its own research and development efforts. Thus, for example, by having access to the DRS (Directory Replication Service) protocol, third parties would be able to reverse-engineer other parts of the Windows server operating system that use Active Directory.129Taking a third approach, in October 2005, and thus several months after the closure of the written procedure in the present case, the Commission again interpreted Article 5 of the contested decision as meaning that the information that Microsoft was to disclose must allow its competitors to create functional equivalents' of the Windows server operating systems or, in other words, systems that were perfectly substitutable for those systems. Microsoft again asserts that such an interpretation of Article 5 requires that it give access to information on the internal mechanisms of its Windows server operating systems.130At the hearing, Microsoft discussed the multimaster replication mechanism at length and, in that context, submitted arguments to the same effect as those set out above.131Microsoft explained that in the past directory services were executed by a single server which was very large and very expensive. Nowadays those services are generally carried out by a multitude of small, less expensive servers situated in different places and linked in an ensemble which Microsoft illustrated on various slides shown at the hearing by a blue bubble. Microsoft submitted that the software installed on the servers forming part of that blue bubble and involved in supplying directory services must share the same internal logic so that the servers are able to work together as though they were a single unit. Each of those servers must, in effect, presume that the others will react in exactly the same way in response to a given request. Furthermore, the communications between servers operating under a given operating system within the blue bubble are of a very special nature.132The multimaster replication mechanism allows any change made to the data contained on a server acting as a domain controller within the blue bubble (for example, a change in a user s password) to be automatically replicated on all the other servers acting as domain controller and belonging to the same blue bubble.133The first company to succeed in developing such a mechanism was Novell, in 1993. However, the mechanism in its NetWare server operating system allows only a maximum of 150 domain controllers to function in a perfectly synchronised manner within a blue bubble, whereas the mechanism used by Active Directory in the Windows 2000 Server system can deal with several thousand domain controllers simultaneously.134With further reference to the multimaster replication mechanism, Microsoft reiterated that the contested decision was designed to allow its competitors to develop server operating systems containing functional equivalents of its own Windows server operating systems. The decision intended, in particular, that servers implementing directory services on which a non-Microsoft server operating system is installed would be able to replace, within a blue bubble, existing servers on which a Windows server operating system using Active Directory is installed. In order for such a result to be capable of being achieved, however, non-Microsoft server operating systems would have to function in exactly the same way — and therefore share the same internal logic — as Windows server operating systems using Active Directory. That would be possible only if Microsoft's competitors had information relating to the internal mechanisms of its server operating systems, including certain algorithms, namely information going well beyond interoperability information within the meaning of the contested decision.135Multimaster replication could not therefore intervene between servers operating under operating systems from different suppliers. For example, a server on which a Sun operating system is installed could not be placed within a blue bubbl containing servers operating under a Novell operating system or using Active Directory. Microsoft explained, however, that since Active Directory relies on standard protocols such as LDAP (Lightweight Directory Access Protocol), it is capable of functioning, within the same computer network, with the directory services provided by its competitors' server operating systems. It makes no difference whether that interoperability operates between two separate servers or between one server and a group of servers within a blue bubble.136The Commission rejects Microsoft's claims.137It begins by referring to the definition of interoperability information and protocols in Article 1(1) and (2) of the contested decision. According to the decision, Microsoft is required to provide technical documentation, called specifications, which describes those protocols in detail. The specifications show how to format the messages, when to originate them, how to interpreter them, cope with incorrect messages, etc.. It is essential to distinguish that technical documentation from the source code of Microsoft's products, and a competitor wishing to write a server operating system which understands Microsoft's protocols will have to ensure that its product includes source code that implements the protocol specifications. However, two programmers implementing the same protocol specifications will not write the same source code and their programs will perform differently (recitals 24, 25, 698 and 719 to 722 to the contested decision). From that point of view, protocols may be compared with a language whose syntax and vocabulary are the specifications, in so far as the mere fact that two persons learn the syntax and vocabulary of the same language does not guarantee that they will use it in the same way. Furthermore, the fact that two products provide their services through compatible protocols says nothing about how they provide the services.138The Commission asserts that Microsoft advocates a narrow definition of the concept of interoperability, and one that is incompatible with Directive 91/250. It refers to recitals 749 to 763 to the contested decision and observes that Microsoft adduces no new argument by comparison with the assertions already made during the administrative procedure. At the hearing, the Commission stated that it had relied on that directive not only in order to demonstrate the importance of interoperability in the software sector, but also for the purpose of appraising the concept of interoperability.139The Commission also recognises that there is a whole range of possible degrees of interoperability between PCs running Windows and work group server operating systems and that some interoperability' with the Windows domain architecture is already possible. It did not fix a priori a given level of interoperability which is indispensable to the maintenance of effective competition on the market but, following its investigation, it established that the degree of interoperability that competitors could achieve using the available methods was too low to enable them to remain viably on the market. The Commission refers to the section of the contested decision in which it shows that interoperability is the key factor driving the uptake of Microsoft's work group server operating systems (recitals 637 to 665 to the contested decision) and observes that it became apparent that those methods did not permit the level of interoperability required by customers [to be achieved] in an economically viable manner.140In the rejoinder, the Commission contends that, in the contested decision, it does not conclude that it is indispensable that Microsoft's competitors be allowed to reproduce its interoperability solutions. What matters is that they are able to achieve an equivalent degree of interoperability by their own innovative efforts.141Last, the Commission submits that, contrary to Microsoft's contention, the contested decision is not designed to enable non-Microsoft server operating systems to function in all respects like a Windows server operating system and, consequently, to permit its competitors to clone' the features of its products. The contested decision is in fact intended to enable those competitors to develop products which w[ould] function differently [but would be] able to understand the messages conveyed by Microsoft's relevant products. Furthermore, the interoperability information that Microsoft must disclose to its competitors under the contested decision will not enable them to create exactly the same products as Microsoft's products.142On that point, the Commission stated at the hearing that it was necessary to distinguish the concept of functional equivalent from that of functional clone. A functional equivalent is not a system operating identically to the Windows work group server operating system which it replaces but rather a system that can provide the appropriate response to a specific request under the same conditions as that Windows operating system and can make a Windows client PC or server react to its messages in the same way as if they came from that Windows operating system.143The Commission submits that tight coupling and loose coupling are not clearly-defined technical terms, especially in the field of operating systems software. In any event, it does not agree that the tightly-coupled interface details referred to in the report in annex A.9.2 are innovative.144The Commission has already discussed the customer statements submitted by Microsoft during the administrative procedure, at recitals 357, 358, 440 to 444, 511, 513, 595, 602, 628 and 707 to the contested decision. Those statements, which date back to 2000 and 2001, relate in essence to undertakings which had to a large extent adopted Windows as the standard for their work group networks. As for the Mercer reports, the Commission submits that it has already stated at recital 645 to the contested decision that the data analysed in those reports suggest precisely the opposite of what Microsoft claims.145The Commission proceeds to reject the argument which Microsoft derives from the alleged inconsistency between the remedy prescribed in Article 5 of the contested decision and the standard of interoperability used in the decision to appraise the relevance of the alternative means of interoperability'.146The Commission professes to find it difficult to understand the meaning of that argument In the excerpts from recitals 669 and 679 to the contested decision which Microsoft cites, the Commission does not reject certain alternatives to disclosure of interoperability information on the ground that those alternatives do not permit the cloning' of Microsoft's products, or certain features of those products, but merely notes that those alternatives provide a lesser degree of interoperability with Microsoft's dominant products (a lesser ability to access the features of [those] products) than Microsoft's own offering enjoys. What is at stake, therefore, is the ability to work with' the Windows environment.147It is clear from recitals 568 to 572, 740 and 749 to 763 to the contested decision, moreover, that the decision concerns only disclosure of interface specifications. Microsoft does not substantiate to the requisite legal standard its assertion that, by having access to its communication protocols specifications, third parties would be able to reverse engineer other parts of the Windows server operating system that use Active Directory.148At the hearing, the Commission disputed the merits of the assertions which Microsoft made on the basis of the multimaster replication mechanism. It confirmed that the contested decision was intended to ensure, in particular, that servers running a work group server operating system produced by one of Microsoft's competitors would be able to form part of a blue bubble consisting of servers on which a Windows work group server operating system is installed and that, accordingly, the disclosure obligation prescribed in Article 5 of the contested decision would also cover information on communications between servers within that blue bubble. However, it rejected Microsoft's assertion that that purpose could be achieved only by providing access to information on the internal mechanisms of its products.149SIIA emphasises the crucial role that interoperability plays in the software sector. There is no doubt that consumers place great significance on the fact that computer programs are interoperable with the quasi-monopolistic products represented by Windows client PC operating systems. In normal competitive circumstances, software developers have every incentive to favour interoperability between their products and their competitors' products and to disclose interoperability information. They thus compete on the basis of normal factors such as price and product security, processing speed or innovative functionality. Microsoft, on the other hand, uses its quasi-monopoly position on certain markets to leverage that position into adjacent markets. More specifically, Microsoft restricts its competitors' capacity to achieve interoperability with its quasi-monopolistic products by failing to comply with industry standard protocols, by making minor (and unnecessary) additions to them and by then refusing to disclose information about those extended protocols to its competitors.150SIIA also disputes Microsoft's assertion that the contested decision seeks to allow Microsoft's competitors to develop server operating systems that function in all respects like a Windows server operating system. The purpose of the contested decision is to allow non-Microsoft work group server operating systems to interoperate with Windows client PC and work group server operating systems in the same way as Windows work group server operating systems do.151In the various arguments set out at paragraphs 118 to 135 above, Microsoft raises two main issues: first, the degree of interoperability required by the Commission in the present case; and, second, the scope of the remedy prescribed in Article 5 of the contested decision.152Those two issues are intrinsically linked, since, as is apparent in particular from recital 998 to the contested decision, the purpose of the remedy is to require Microsoft to disclose what in the Commissions contention it has abusively refused to disclose, and to disclose it both to Sun and to its other competitors. The scope of the remedy must therefore be assessed in the light of the abusive conduct in which Microsoft is found to have engaged, which depends in particular on the degree of interoperability envisaged by the Commission in the contested decision.153For the purpose of deciding those issues, the Court will begin by reviewing a series of factual and technical findings made in the contested decision. It was on the basis of its examination of, in particular, the way in which Windows work group networks are organised and the links between the various operating systems within those networks that the Commission evaluated the degree of interoperability required in the present case and thus concluded that access to the interoperability information was indispensable. The Court will also define at the outset the nature of the information at which the contested decision is directed.154At recitals 21 to 59, 67 to 106 and 144 to 184 to the contested decision, the Commission makes a series of factual and technical findings concerning the products and technologies concerned.155The Court notes at the outset that Microsoft does not, in effect, dispute those various findings. To a large extent, moreover, they are based on statements made by Microsoft during the administrative procedure (especially in its responses to the three statements of objections) and also on documents and reports published on its Internet site. Furthermore, the technical presentations by the parties' experts at the hearing, including Microsoft's, confirm the substance of those findings.156In the first place, the Commission, after observing that the word interoperability could be used in different contexts by technicians and lent itself to different uses, cites, first of all, the 10th, 11th and 12th recitals in the preamble to Directive 91/250 (recital 32 to the contested decision).157Those recitals read as follows:

... the function of a computer program is to communicate and work together with other components of a computer system and with users and, for this purpose a logical and, where appropriate, physical interconnection and interaction is required to permit all elements of software and hardware to work with other software and hardware and with users in all the ways in which they are intended to function;

... the parts of the program which provide for such interconnection and interaction between elements of software and hardware are generally known as interfaces;

... this functional interconnection and interaction is generally known as interoperability; ... such interoperability can be defined as the ability to exchange information and mutually to use the information which has been exchanged.

158The Commission then states that Microsoft criticises it for adopting in the present case a concept of interoperability that goes beyond what is contemplated by Directive 91/250. None the less, the Commission and Microsoft are agreed that interoperability is a matter of degree and that various software products in a system interoperate (at least partially) when they are able to exchange information and mutually to use the information which has been exchanged' (recital 33 to the contested decision).159In the second place, the Commission observes that nowadays computers increasingly operate in conjunction with other computers in a network. Depending on the specific tasks that they want to carry out, client PC users use both the computing capability of their own client PC and at the same time the capabilities of the various types of more powerful multi-user computers, namely servers', which they access indirectly through their client PCs (recital 47 to the contested decision). In order to ensure easy and efficient access to network resources, the applications must be distributed across several computers, each of which hosts different components that interoperate, and the computers linked within the network must be integrated into a consistent distributed computing system (recital 48 to the contested decision). Last, [s]uch a system would ideally make the complexity of the underlying hardware and software transparent (that is to say, invisible) to the user and distributed applications alike, so that users and applications can easily find their way through this complexity in order to access computing resources (recital 48 to the contested decision).160In the third place, the Commission emphasises that the present case focuses on work group server services', namely the basic infrastructure services used by office workers in their day-to-day work (recital 53 to the contested decision). It identifies, more particularly, the following three types of services: first, the sharing of files stored on servers; second, the sharing of printers; and, third, the administration of groups and users. The third type of services involves in particular ensuring secure access to network resources and the secure use of those resources, notably, first by authenticating users and then by checking that they have the right to perform a particular action (recital 54 to the contested decision).161Those different services, moreover, are closely interrelated and may in fact to a large extent be regarded as one and the same ... service, but viewed from two different perspectives, namely that of the user (file and print services) and that of the network administrator (group and user administration services) (recitals 56 and 176 to the contested decision). Although Microsoft maintains in its reasoning relating to the elimination of competition that the Commission adopted an artificially narrow definition of the relevant product market by including only the three types of services referred to above (see paragraphs 443 to 449 below), it does not dispute the existence of such links between those services.162In the light of those factors, the Commission defines work group server operating systems' as operating systems designed and marketed to deliver file and print services, and also group and user administration services, collectively to relatively small numbers of client PCs linked together in small to medium-sized networks (recitals 53 and 345 to the contested decision). In order to store and query the group and user administration information effectively, those operating systems generally rely on directory service technologies (recital 55 to the contested decision).163In the fourth place, the Commission examines the way in which interoperability is achieved in Windows work group networks (recitals 144 to 184 to the contested decision), namely group [s] of Windows Client PCs [on which a Windows client PC operating system is installed] and Windows Work Group Servers [on which a Windows work group server operating system is installed] linked together via a computer network (Article 1(7) of the contested decision).164To that end, the Commission focuses on Microsoft's Windows 2000 generation of operating systems, while observing that the essential characteristics of those systems are similar to those of the next generation of systems (namely the Windows XP Home Edition and Windows XP Professional operating systems for client PCs and the Windows 2003 Server operating system for servers) (footnote 182 to the contested decision).165First, the Commission sets out a series of considerations concerning the group and user administration services (recitals 145 to 157 to the contested decision). Within the Windows work group networks, the Windows domains lie at the core of the provision of those services; the Commission characterises those domains as administrative units whereby the Windows work group server operating systems administer client PCs and work group servers (recitals 145 and 146 to the contested decision). In particular, each resource (computer, printer, user, application, etc.) in a Windows domain has one domain account, which defines its identity for the whole domain, and within the same Windows domain there is a single user logon, in the sense that when the user logs on to a domain resource (generally his client PC) he is recognised by all the other resources in the same domain and does not need to enter his name and password again (recital 146 to the contested decision).166The Commission emphasises the importance of the role played within the Windows domains by servers known as domain controllers, in contrast to other servers, which are known as member servers (recital 147 to the contested decision). Domain controllers are responsible for storing domain accounts and the related information. In other words, they act as switchboard operators' of the Windows domain (recital 147 to the contested decision).167The Commission emphasises, more particularly, the key role played by Active Directory and the changes which the introduction of that full-fledged directory service to the Windows 2000 Server operating system has made to the way in which domain controllers relate to each other in Windows 2000 domains by comparison with the earlier Windows operating systems, namely those of the Windows NT generation (recital 149 to the contested decision).168The Windows NT 4.0 operating system had primary domain controllers and backup domain controllers. In that system, changes to domain accounts could be made only by the primary domain controller and were then periodically and automatically propagated to all backup domain controllers. In a Windows 2000 domain, on the other hand, all domain controllers operate as peers, so that it is possible to make changes to domain accounts an any of them, those changes then being automatically propagated to the other domain controllers (recital 150 to the contested decision).

Those operations are carried out by means of new synchronisation protocols, which are different from those used by the Windows NT 4.0 operating system.169Another new feature of Windows 2000 domains is that they can be organised hierarchically, with trees of Windows 2000 domains linked to each other by automatic trust relationships, while several trees can then be linked by trust relationships in a forest (recital 151 to the contested decision). Windows 2000 domain controllers can be set up as global catalog servers, which means that they store not only information on the resources available on the domains which they control but also a summary of all the resources available in the forest, namely the Global Catalog. The data stored in the global catalog are updated by various protocols.170The Commission goes on to explain that the move from Windows NT technology to Windows 2000 technology has also entailed changes with respect to the security architecture of Windows work group networks (recitals 152 to 154 to the contested decision). In particular, in the Windows 2000 domain authentication is based on the Kerberos protocol and no longer on the NTLM (NT LAN Manager) protocol, which provides a series of advantages as regards connection speed, mutual authentication and trust management. The Key Distribution Centre foreseen by the Kerberos protocol is integrated with other Windows 2000 security services running on the domain controller and uses the domain's Active Directory as its security account database (recital 153 to the contested decision). However, the Kerberos protocol implemented in the Windows 2000 Professional and Windows 2000 Server operating systems is not the standard version developed by the Massachusetts Institute of Technology (MIT), but a version extended by Microsoft (recitals 153 and 154 to the contested decision).171Last, the changes brought about by the move from Windows NT technology to Windows 2000 technology and Active Directory include the fact that a number of functions are integrated both in the Windows 2000 Professional operating system and in the Windows 2000 Server operating system, in order to simplify the administration of Windows client PCs in Windows domains (recitals 155 to 157 to the contested decision). Those functions — the Commission cites, more particularly, the Group Policy and Intellimirror functions — are significantly enhanced, or even available solely, in a Windows 2000 domain managed from a Windows 2000 domain controller using Active Directory (recital 156 to the contested decision). The Commission notes that, according to Microsoft, [Group Policy was] a feature of Windows 2000 ... that allow[ed] administrators centrally to manage collections of users, computers, applications and other network resources instead of managing [those] objects on a one-by-one basis. Groups may be defined locally for a given computer or defined for the whole Windows domain, while Intellimirror, which is available only in a Windows 2000 domain, allows users to have their working environment' (data, software, etc.) available with their personal settings, whether they are connected to the network or not and wherever they are on the network (recital 157 to the contested decision).172Second, the Commission sets out a series of considerations concerning file and print services (recitals 158 to 164 to the contested decision).173In particular, modern work group server operating systems provide support for distributed file systems and at the end of the 1990s Microsoft marketed such a system, called Dfs (Distributed File System), in the form of an add-on that could be installed on client and server PCs running Windows NT 4.0. Windows 2000 is the first generation of Microsoft products to include native support for Dfs both on the client PC and the work group server side (recitals 161 to 163 to the contested decision).174Under Windows 2000, Dfs may be installed either in stand-alone mode or domain-based mode, but the latter mode, which provides a number of advantages in terms of intelligent retrieval of the Dfs information from client PCs, is available only in Windows domains and is enhanced by the presence of domain controllers running Active Directory (recital 164 to the contested decision).175Third, the Commission explains that Microsoft has developed its own set of distributed object-based system technologies, encompassing COM (Component Object Model) and DCOM (Distributed Component Object Model) technologies (recital 166 to the contested decision). Those two technologies are closely interrelated and COM, which is implemented in both Windows client PC operating systems and Windows work group server operating systems, links those two operating systems into a consistent platform for distributed applications (recital 166 to the contested decision). In its response to the third statement of objections, Microsoft stated that COM [was] fundamental to the architecture of Windows operating systems, with the result that many interfaces in Windows [were] COM-based (recital 167 to the contested decision). More particularly, many interactions between client PCs and the Active Directory service in Windows work group servers involve COM/DCOM. Furthermore, the DCOM protocol is involved in client/server communications whereby Windows servers deliver authentication services or file services to Windows client PCs (recital 167 to the contested decision).176Fourth, the Commission explains that in many ways Microsoft encourages natural migration from its Windows NT operating systems to its Windows 2000 operating systems, both by its customers and by software developers (recitals 168 to 175 to the contested decision).177Thus, in a Windows domain it is possible to upgrade computers using previous versions of Windows by having them migrate to Windows 2000 without using Active Directory. However, customers can take full advantage of the upgrade only by installing a Windows 2000 domain running Active Directory in native mode, which means that all the domain controllers in the domain concerned migrate to Windows 2000 and

Active Directory. The work group servers of the domain which do not act as domain controllers must also be compatible with Windows 2000 (which assumes, in particular, that they implement the Kerberos protocol, in the version extended by Microsoft). When a Windows 2000 domain is installed in mixed mode (when the primary domain controller has migrated to Windows 2000 but some of the backup domain controllers are still running Windows NT), the user does not benefit from all the advanced features of the Windows 2000 domain. In particular, the user must forego most of the additional flexibility that Active Directory brings to the management of groups of users. Once the user switches his primary controller to native mode he can no longer use as a domain controller a server that is interoperable only with the Windows NT 4.0 generation of Microsoft products (including work group servers running non-Microsoft systems).178Software developers are strongly encouraged by Microsoft to use the new features of the Windows operating systems, in particular Active Directory, notably by means of the certification programmes which it has set up (recitals 171 to 175 to the contested decision).179Fifth, the Commission draws a series of conclusions (recitals 176 to 184 to the contested decision).180It reiterates, first of all, that in Windows technologies file and print services and group and user administration are delivered to users of Windows client PCs as a set of interrelated services'. By way of illustration, the Commission states that, in a Windows 2000 domain, the server message block (SMB) client and server underlying [Dfs], [DCOM], LDAP authentication, ... all use [Microsoft] Kerberos automatically for authentication (recital 176 to the contested decision). Furthermore, besides authentication, the authorisation process depends on the ability to create, modify and interpret Access Control Lists' (ACL), which involves communication with the domain controllers of the domain (recital 176 to the contested decision).181Next, the Commission states that, in order to be able to deliver their services transparently to client PC users, Windows work group servers use specific pieces of software code in the Windows client PC operating system (recital 177 to the contested decision). In that regard, the Commission observes, in particular, that Microsoft stated that Dfs [had] a local component that [would] run even if a Windows 2000 Professional client [PC] [was] operating in standalone mode and that Windows 2000 Professional contain [ed] a client code that [could] be used to access Active Directory (recital 177 to the contested decision). Quoting the author of a work entitled Understanding Active Directory Services published by Microsoft Press, the Commission also states that Active Directory is completely — often invisibly — integrated into the [Windows client PC] (recital 177 to the contested decision).182The Commission emphasises that it is important, however, that the interconnection and interaction involving the Windows 2000 Professional source code should not be viewed solely as being intended to enable a particular Windows work group server to communicate with a particular Windows client PC. It is more accurate to describe that interconnection and that interaction in terms of interoperability within a computer system encompassing several Windows client PCs and several Windows work group servers, all linked together in a network. Interoperability within such a computer system thus has two inseparable components, namely client/server interoperability and server/server interoperability (recital 178 to the contested decision).183In many cases, moreover, there is symmetry between server/server and client/server interconnection and interaction' (recital 179 to the contested decision). The Commission mentions, by way of example, the fact that the same application program interface' (API), namely ADSI (Active Directory Service Interface), is implemented both on Windows 2000 Professional and Windows 2000 Server to handle access to Active Directory domain controllers. A further example given by the Commission is the fact that, in a Windows domain, the Kerberos protocol, as extended by Microsoft, is used for authentication both between a Windows client PC and a Windows work group server and between several Windows work group servers.184In certain circumstances, servers will query other servers on behalf of a client PC' (recital 180 to the contested decision). By way of example, the Commission mentions, in particular, Kerberos delegation, a functionality present in the Windows 2000 Server operating system which allows a server to borrow the identity of a client PC and to request a service from another server on behalf of that client PC. Thus servers quite frequently address requests to other servers and therefore act as client PCs (see also footnote 51 to the contested decision).185Some client/server communications build on the expectation that certain server/server communications have already taken place. In particular, when a client PC running Windows 2000 Professional queries the domain controller in a Windows 2000 domain, the client PC will expect some preparatory coordination to have taken place between the domain controllers running Windows 2000 Server (recital 181 to the contested decision). According to the Commission, [that] includes, for example, both the fact that domain controllers will hold a full copy of the Active Directory data, which are kept updated through synchronisation protocols[,] and the fact that Global Catalog servers are able to store information about computers of the forest that are outside their domain, which is possible through various Global Catalogrelated products (recital 181 to the contested decision). In such a situation, the server/server communication is logically linked to the client/server communication, since it occurs in preparation for the client/server communication.186It follows from all of the foregoing matters — which Microsoft does not substantially contest and the correctness of which was largely confirmed by the technical presentations made at the hearing — that, as the

Commission correctly observes at recital 182 to the contested decision, Windows work group networks rely on an architecture of both client/server and server/server interconnections and interactions and that that architecture — which the Commission characterises as Windows domain architecture — ensures transparent access to the main services provided by work group servers.187Those various factors also show that, as found at various points in the contested decision (see, in particular, recitals 279 and 689 to the contested decision), those interconnections and interactions are closely interlinked.188In other words, the proper functioning of the Windows work group networks relies both on client/server communication protocols — which, by their nature, are implemented both in Windows client PC operating systems and in Windows work group server operating systems — and on server/server communication protocols. As the Commission explained at the hearing, for numerous tasks, server/server communication protocols appear, in fact, as extensions of the client/server communication protocols. In certain cases, a server acts as a client PC vis-à-vis another server (see paragraph 184 above). Likewise, while it is true that certain communication protocols are implemented only in Windows work group server operating systems, the fact remains that, from a functional point of view, they are linked to the client PCs. The Commission refers on that point, without being contradicted by Microsoft, to the Global Catalog-related protocols and to the synchronisation and replication protocols between domain controllers.189The Court therefore finds that the Commission is quite correct to conclude that the common ability to be part of [the Windows domain architecture] is a feature of compatibility between Windows client PCs and Windows work group servers (recital 182 to the contested decision).190Finally, it is necessary to bear in mind the major role played by directory services on the work group server operating systems market. Microsoft itself observes in the reply that on that market the directory service is a key competitive feature responsible in large part for the success of particular products and emphasises, in particular, that Active Directory is ... at the heart of Windows server operating systems', after stating that [f]or both file and print services and user and group administration services, it [is] important to know with precision which user [is] entitled to access which network resources.191Active Directory logs all network object information and allows it to be administered centrally. It fully integrates administration and user authentication and access control functionalities and thus ensures the security of the information. In addition, Active Directory uses the multi-master replication mechanism.192The first abusive conduct in which Microsoft is found to have engaged is its refusal to supply the interoperability information to its competitors and to allow its use for the purpose of developing and distributing work group server operating system products between

October 1998 and the date of the contested decision (Article 2(a) of the contested decision).193By way of remedy for that refusal, the Commission ordered Microsoft, inter alia (Article 5(a) of the contested decision), to do the following:

Microsoft ... shall, within 120 days of the date of notification of [the contested decision], make the interoperability information available to any undertaking having an interest in developing and distributing work group server operating system products and shall, on reasonable and non-discriminatory terms, allow the use of the interoperability information by such undertakings for the purpose of developing and distributing work group server operating system products [...]

194It is appropriate to bear in mind the way in which the Commission defined and assessed the principal concepts of relevance to the present issues.195Thus, in Article 1(1) of the contested decision, it defines interoperability information as the complete and accurate specifications for all the protocols [that are] implemented in Windows work group server operating systems and that are used by Windows work group servers to deliver file and print services and group and user administration services, including the Windows domain controller services, Active Directory services and Group Policy services, to Windows work group networks.196Protocols are described by the Commission as rules of interconnection and interaction between various pieces of software within a network (recital 49 to the contested decision). More specifically, the protocols at issue in the present case are defined as a set of rules of interconnection and interaction between various instances of Windows work group server operating systems and Windows client PC operating systems running on different computers in a Windows work group network' (Article 1(2) of the contested decision).197The Court notes that Microsoft does not contest the Commission's concept of protocols. On the contrary, in the application Microsoft itself describes protocols as enabling computers connected via a network to exchange information to accomplish predefined tasks'. Indeed, in a report by one of its experts, Mr Madnick, annexed to the applicant's observations on the statements in intervention, the applicant draws a distinction between two categories of communication protocols, depending on whether they are simple or complex and mentions the DRS protocol as coming within the second category (annex 1.3 (Madnick, Response to Mr Ronald S. Alepin's Annex on Interoperability and the FSFE's Submission)). However, in making that distinction Microsoft does not seek to challenge the correctness of the definition referred to above, but only to establish that complex protocols govern interactions between various similar elements of a network which deliver a joint service in close coordination and that they reveal much more detailed and more valuable information than simple protocols.198Specifications are not defined in the operative part of the contested decision. However, it is common ground that specifications take the form of detailed technical documentation, which, indeed, reflects the way in which that concept is generally understood in the computer industry.199At recital 24 to the contested decision, the Commission states that it is important to distinguish the concept of specifications' from the concept of implementation, in the sense that [a] specification is a description of what the software product must achieve, whereas the implementation relates to the actual code that will run on the computer (see, to the same effect, recital 570 to the contested decision). In other words, specifications describe the interfaces by means of which a given element of a computer system can use another element of the same system. They describe, in particular, and in a very abstract manner, what functionalities are available and the rules which allow those functionalities to be called up and received.200At recital 571 to the contested decision, the Commission states that it is possible to provide interface specifications without disclosing implementation details, and that it is common practice to do so in the computer industry, especially when open interoperability standards are adopted (see also, on that point, recital 34 to the contested decision). In its statement in intervention, SUA puts forward arguments to the same effect.201A number of factors confirm the correctness of those different assertions. First, the practice to which the Commission refers is supported by a set of examples — not disputed by Microsoft — which are mentioned in the contested decision, namely the POSIX 1 specifications (recitals 42 and 88 to the contested decision), the Java specifications (recital 43 to the contested decision), the specifications of the Kerberos version 5 protocol (recital 153 to the contested decision), the specifications of the NFS (Network File System) protocol developed by Sun (recital 159 to the contested decision) and the CORBA specifications drawn up by the Object Management Group (recital 165 to the contested decision). Second, as the Commission states at recital 571 to the contested decision, under the MCPP set up pursuant to the United States settlement, licensees are not granted access to Microsoft's source code, but to specifications of the relevant protocols.202Nor does Microsoft call in question, other than quite incidentally, the above-mentioned distinction between the concepts of specifications' and implementation, as it merely makes a general reference in footnote 74 to the application to an opinion drawn up by its experts Mr Madnick and Mr Nichols, which was submitted to the Commission during the administrative procedure and is annexed to the application (annex A.12.2 to the application). For the reasons stated at paragraphs 94 and 97 above, the Court considers that it cannot take that opinion into account. Furthermore and in any event, the argument in that opinion is largely based on an incorrect premiss, namely, that the degree of interoperability required by the Commission in the present case means that Microsoft's competitors must be capable of reproducing or cloning Microsoft's products or certain of their functionalities (see paragraphs 234 to 239 below).203The Court notes, moreover, that in the contested decision the Commission expressly states that the abusive refusal to supply imputed to Microsoft concerns only the specifications of certain protocols and not the source code (see, in particular, recitals 568 to 572 to the contested decision).204To the same effect, the Commission emphasises on a number of occasions that it is not its intention to order Microsoft to disclose its source code to its competitors. Thus, at recital 999 to the contested decision, it states that the term specifications makes clear that Microsoft should not be required to disclose its own implementation of [those] specifications, that is to say, its own source code. Likewise, it observes at recital 1004 to the contested decision that the decision does not contemplate compulsory disclosure of Windows source code as [that] is not necessary to achieve the development of interoperable products. At the same recital, the Commission states that [t]he disclosure order should concern the interface specifications only.205In an opinion entitled Innovation in Communication Protocols that Microsoft is ordered to license to its server operating system competitors, enclosed as annex C.4 to the reply, Mr Lees, one of Microsoft's experts, himself draws a distinction between the protocols used for communications between servers and ... the algorithms/decision rules that operate internally on each server, before observing that it is the protocols that have to be disclosed pursuant to Article 5 of the contested decision. In his opinion, Mr Lees focuses on the DRS protocol, used for the multimaster replication mechanism, and states that it represents one of numerous protocols to which Microsoft grants its competitors access in application of the contested decision.206It follows that the information to which the contested decision refers constitutes a detailed technical description of certain rules of interconnection and interaction that can be used within the Windows work group networks to deliver work group services. That description does not extend to the way in which Microsoft implements those rules, namely, in particular, to the internal structure or to the source code of its products.207The Commission adopted a two-stage approach in determining whether the information at issue was indispensable. It first examined the degree of interoperability with the Windows domain architecture that the work group server operating systems supplied by Microsoft's competitors must achieve in order for those competitors to be able to remain viably on the market. It then proceeded to determine whether the interoperability information to which Microsoft refused access was indispensable to the attainment of that degree of interoperability.208The Court will examine below the degree of interoperability required by the Commission in the contested decision. At this stage, however, it will not examine the question as to whether the Commission was justified in concluding that Microsoft's competitors could viably remain on the market only if their products were capable of achieving that degree of interoperability. That question, together with the other aspects of the Commission's reasoning as described above, will be appraised when the Court examines what the Commission alleges to be the indispensable nature of the information at issue (see paragraphs 369 to 436 below).209It is appropriate, first of all, to summarise briefly the arguments of the main parties.210Microsoft shares the Commission's view that interoperability is a matter of degree (recital 33 to the contested decision).211It contends, however, that the degree of interoperability required by the Commission in the present case is inappropriate in that it goes beyond the concept of full interoperability envisaged by Directive 91/250. That concept — which Microsoft also describes as multivendor interoperability — requires only that different developers' operating systems are capable of functioning correctly together.212More specifically, Microsoft claims that the Commission's real intention is that competing operating systems for servers should function in every respect as a Windows server operating system. It refers variously to plug replacement, plug-replaceability, drop-in, functional equivalent and functional clone, and asserts that such a degree of interoperability could be achieved only if it allowed its competitors to clone or to reproduce its products (or features of those products) and communicated to those competitors information on the internal workings of its products.213Last, Microsoft maintains that multivendor interoperability may be achieved by the methods already available on the market.214The Court notes that Microsoft's position as thus described corresponds to the position which it maintained throughout the administrative procedure.215Thus, in its response of 17 November 2000 to the first statement of objections, Microsoft states that the degree of interoperability apparently required by the Commission is not consistent with Community law and does not exist on the market. Relying, more particularly, on the 10th recital (in the English and French versions) to Directive 91/250, the applicant submits that full interoperability is available to a developer of server operating systems when all of the functionality of his program can be accessed from a Windows client operating system (paragraph 143 of the response; see also recital 751 to the contested decision). The applicant maintains that the Commission wrongly defines interoperability much more broadly when it considers that, for there to be interoperability between two software products, all the functionalities of both products must function correctly. That, in Microsoft's contention, is tantamount to requiring plug-replaceability or cloning (paragraph 144 of the response).

Microsoft criticises the fact that the Commission thus subscribes to the position of Sun, according to which it should be possible to replace, within the computer network of an undertaking composed of client PCs running Windows, a server running Windows 2000 by a server with a Solaris operating system, without that entailing a reduction in the functionalities to which users have access (paragraphs 145 and 162 of the response). In order to achieve full interoperability, it is sufficient that Microsoft should disclose the interfaces exposed by the Windows client PC operating systems which developers of competing server operating systems need in order to make the functionalities of those systems available to users of Windows client PCs.216Likewise, in its response of 16 November 2001 to the second statement of objections, Microsoft, reiterating, in effect, the same reasoning which it had developed in its response to the first statement of objections, claims that the Commission's criticisms are based on an incorrect definition of interoperability (paragraphs 149 to 163 of the response). It repeats, in that regard, that Directive 91/250 does not require plug-replaceability but full interoperability, and that the disclosure of information which it already makes is sufficient to achieve that.217In its response of 17 October 2003 to the third statement of objections, Microsoft again adopts the same effective line of reasoning and reiterates that the Commission considers that its competitors must have access to all the information necessary to be able to create copies of the Windows server operating systems' and that it thus treats interoperability in the same way as cloning (pages 29 to 32 of the response). It contends that interoperability contemplates the availability of sufficient information about the interfaces exposed by Windows client [PC] and server operating systems to enable competitors' products to work with those Windows client [PC] and server operating systems in all the ways [in which] the competitors' products were intended to function (page 29 of the response). Likewise, Microsoft states that it has agreed with the Commission from the outset that a competition law issue could potentially arise if competitors were unable to develop server operating systems whose functionality is fully accessible from Windows client [PC] operating systems (page 63 of the response). It claims that the Commission did not, however, establish the existence of such an issue in any of its three statements of objections.218The Commission contends that the concept of interoperability employed in the contested decision is consistent with that envisaged by Directive 91/250. In particular, it rejects Microsoft's one-way interpretation of that concept.219The Commission accepts that a certain degree of interoperability with the Windows domain architecture is already possible, but claims that it is clear from its investigation that the degree of interoperability that can be achieved using the available methods is too low to enable Microsoft's competitors to remain viably in the market (footnote

712 to the contested decision).220In the Windows work group server networks, client/server and server/server interoperability are closely interlinked and, in order that full interoperability can be achieved between a Windows client PC and a non-Microsoft server operating system, Microsoft must give access both to the client/server communication protocols and to the server/server communication protocols (recitals 177 to 182 and 689 to the contested decision), including those which are pure' server/server protocols, that is to say, protocols which are not implemented on the client PC which are but functionally related to the client PC (recitals 277, 567 and 690 to the contested decision).221The Commission denies that the contested decision envisages that Microsoft's competitors should develop products functioning in all respects like a Windows server operating system. In fact, the decision is intended to enable competing products [to] be created that w[ould] function differently, whilst being able to understand the messages conveyed by Microsoft's relevant products'. Thus, the interoperability information at issue will be used by Microsoft's competitors not to develop exactly the same products as Microsoft's, but to develop improved products, with added value.222In the first place, the Court finds that it follows from the foregoing considerations that Microsoft and the Commission disagree as to whether the concept of interoperability employed in the contested decision is or is not compatible with that envisaged by Directive 91/250.223At recitals 749 to 763 to the contested decision, the Commission sets out in detail the grounds on which it believes that Microsoft's one-way interpretation of the concept of interoperability is incorrect.224The Court notes, first of all, that in its written submissions, Microsoft does not advance any argument capable of casting doubt on the Commissions assessment in that regard. It merely asserts, with reference to certain passages in its responses to the second and third statements of objections, that [t]he contested decision adopts a wholly different notion of interoperability [from] the one set forth in ... Directive [91/250] (paragraph 95 of the application).225Next, the Court finds that the concept of interoperability employed in the contested decision — according to which interoperability between two software products means the capacity for them to exchange information and to use that information mutually in order to allow each of those software products to function in all the ways envisaged — is consistent with that envisaged in Directive 91/250.226Thus, as the Commission explains at recitals 752 to 754 and 759 and 760 to the contested decision, the 10th recital to Directive 91/250 — whether in the English or the French version — does not lend itself to the one-way interpretation advocated by Microsoft. On the contrary, as the Commission quite correctly emphasises at recital 758 to the contested decision, the 10th recital to Directive 91/250 clearly shows that, by nature, interoperability implies a two-way relationship in that it states that the function of a computer program is to communicate

and work together with other components of a computer system. Likewise, the 12th recital to Directive 91/250 defines interoperability as the ability to exchange information and mutually to use the information which has been exchanged.227In any event, it must be borne in mind that what is at issue in the present case is a decision adopted in application of Article 82 EC, a provision of higher rank than Directive 91/250. The question in the present case is not so much whether the concept of interoperability in the contested decision is consistent with the concept envisaged in that directive as whether the Commission correctly determined the degree of interoperability that should be attainable in the light of the objectives of Article 82 EC.228In the second place, the Court observes that the Commission assessed the degree of interoperability by reference to what, in its view, was necessary in order to enable developers of non-Microsoft work group server operating systems to remain viably on the market (see, in particular, footnote 712 and recital 779 to the contested decision).229The correctness of that approach is not open to dispute. Article 82 EC deals with the conduct of one or more economic operators involving the abuse of a position of economic strength which enables the operator concerned to hinder the maintenance of effective competition on the relevant market by allowing it to behave to an appreciable extent independently of its competitors, its customers and, ultimately, consumers (Joined Cases C-359/96 P and C-396/96 P Compagnie maritime belge transports and Others v Commission [2000] ECR I-1365, paragraph 34). Furthermore, whilst the finding of a dominant position does not in itself imply any criticism of the undertaking concerned, that undertaking has a special responsibility, irrespective of the causes of that position, not to allow its conduct to impair genuine undistorted competition on the common market (Case 322/81 Michelin v Commission [1983] ECR 3461, paragraph 57, and Case T-228/97 Irish Sugar v Commission [1999] ECR II-2969, paragraph 112). Should it be established in the present case that the existing degree of interoperability does not enable developers of non-Microsoft work group server operating systems to remain viably on the market for those operating systems, it follows that the maintenance of effective competition on that market is being hindered.230It follows from the contested decision that, by adopting that approach and taking as its basis a factual and technical analysis of the products and technologies concerned and also of the way in which interoperability is achieved in Windows work group networks, the Commission concluded that, in order to be capable of competing viably with Windows work group server operating systems, competing operating systems had to be able to interoperate with Windows domain architecture on an equal footing with Windows work group server operating systems (see to that effect, in particular, recitals 182 and 282 to the contested decision).231The interoperability thus required by the Commission has two indissociable components, namely client/server interoperability and server/server interoperability (recitals 177 to 182 and 689 to the contested decision).232The Commission also maintains that when a non-Microsoft work group server operating system is installed on a Windows work group server network, it must be capable not only of delivering all its functionalities to Windows client PCs but also of using all the functionalities offered by those client PCs.233In the light of those various factors, the Commission maintains, in particular, that a server running a non-Microsoft work group server operating system must be capable of acting as a domain controller, and not merely as a member server, within a Windows domain using Active Directory and, accordingly, be capable of participating in the multimaster replication mechanism with the other domain controllers.234The Court finds that, contrary to Microsoft's claim, it cannot be inferred from the degree of interoperability thus required by the Commission that the Commission intends in reality that non-Microsoft server operating systems must function in every respect like a Windows server operating system and, accordingly, that Microsoft's competitors must be in a position to clone' or reproduce its products or certain features of those products.235The assertions thus made by Microsoft are founded on a misreading of the contested decision.236The Court observes, in that regard, that, according to recital 1003 to the contested decision, the objective of the decision is to ensure that Microsoft's competitors can develop products that interoperate with the Windows domain architecture natively supported in the dominant Windows client PC operating system and hence viably compete with Microsoft's work group server operating system.237As the Commission explained in greater detail at the hearing, the attainment of that objective assumes that non-Microsoft work group server operating systems are capable of receiving a specific message from a Windows client PC or work group server operating system and giving the required response to that message on the same conditions as a Windows work group server operating system and also of enabling Windows client PC or work group server operating systems to react to that response just as though it came from a Windows work group server operating system.238In order for such operations to be practicable, it is not necessary that non-Microsoft work group server operating systems should function internally in exactly the same way as Windows work group server operating systems.239Those various considerations are not vitiated by the passages from recitals 669 and 679 to the contested decision cited by Microsoft (see paragraph 126 above). In the first passage, the Commission merely states that the degree of interoperability with the Windows domain architecture that may be achieved by non-Microsoft work group server operating systems using standard protocols is lower than that achieved by Windows work group server operating systems. In the second passage, the

Commission states only that non-Microsoft work group server operating systems are capable of using the functionalities of Windows client PC and work group server operating systems only to a lesser degree than Windows work group server operating systems.240In the same way Microsoft's assertion that the contested decision intends that its competitors should develop exactly the same products as Windows work group server operating systems must be rejected. As the Court will explain in greater detail at paragraphs 653 to 658 below, in its examination of the circumstance relating to the appearance of a new product, the aim pursued by the Commission is to remove the obstacle for Microsoft's competitors represented by the insufficient degree of interoperability with the Windows domain architecture, in order to enable those competitors to offer work group server operating systems which differ from Microsoft's on important parameters such as, in particular, security, reliability, processing speed or the innovative nature of certain functionalities.241The Court also notes that, as Microsoft itself expressly acknowledges in its written submissions (see, for example, paragraphs 14 and 48 of the reply), its competitors will not be in a position to develop products which are clones' or reproductions of Windows work group server operating systems by having access to the interoperability information at which the contested decision is aimed. As stated at paragraphs 192 to 206 above, that information does not relate to Microsoft's source code. In particular, Article 5 of the contested decision does not require Microsoft to disclose implementation details to its competitors.242Furthermore, as will also be explained in greater detail at paragraph 658 below, when the Court examines the circumstance relating to the new product, Microsoft's competitors would have no interest in developing exactly the same work group server operating systems as Microsoft's.243Nor can the Court accept Microsoft's claim that it follows from the undertakings' statements which it produced during the administrative procedure that there is already a high degree of interoperability between Windows client PC and server operating systems and non-Microsoft server operating systems, owing to the use of methods already available on the market.244On that point, it is sufficient to observe that the statements in question have already been fully examined in the contested decision (see, in particular, recitals 357, 358, 440 to 444, 511, 513, 595, 598, 602, 628, 702 and 707 to the contested decision) and that Microsoft puts forward no specific argument capable of establishing that the Commissions assessment of those statements is flawed. In essence, as the Commission states at recital 707 to the contested decision, those statements relate to organisations which had, to a large extent, adopted a Windows solution for their work group networks.245Microsoft's claim that the Mercer reports show that an undertaking's choice of server operating system is not dictated by its interoperability with Windows client PC and server operating systems is incorrect, as will be explained in greater detail at paragraphs 401 to 412 below.246Article 5(a) of the contested decision applies to the complete and accurate specifications of all the protocols implemented in Windows work group server operating systems and used by the servers on which those systems are installed in order to deliver work group services to Windows work group server networks.247As established in the technical and factual findings made at paragraphs 154 to 191 above, the proper functioning of the Windows work group networks relies on an architecture' of both client/server and server/server interconnections and interactions.248Thus the Commission states, at recital 999 to the contested decision, that the disclosure obligation imposed by the decision includes both direct interconnection and interaction between a Windows work group server and a Windows client PC, as well as interconnection and interaction between a Windows work group server and a Windows client PC that is indirect and passes through another Windows work group server.249The specifications that Microsoft is required to draw up and disclose to its competitors relate to client/server communication protocols, which are implemented both in Windows client PC operating systems and in Windows work group server operating systems, and also to server/server communication protocols.250It is clear that the information which Microsoft is required to disclose to its competitors pursuant to Article 5(a) of the contested decision must, in particular, enable computers running non-Microsoft work group server operating systems to assume, within a Windows domain using Active Directory, the role of member server or that of domain controller and, accordingly, to participate in the multimaster replication mechanism. The remedy prescribed by Article 5(a) therefore relates, specifically, to communications between servers within the blue bubble.251The scope of Article 5 of the contested decision, as thus defined, derives from a series of recitals to that decision, notably recitals 194 to 198, 206, 564 and 690 to the contested decision.252Thus, at recitals 194 to 198 to the contested decision, the Commission mentions, among other examples of interoperability information that Microsoft refuses to disclose either to Sun or to its competitors, certain information relating to the replication mechanism used by Active Directory.253At recital 206 to the contested decision, the Commission expressly rejects Microsoft's assertion in its response of 16 November 2001 to the second statement of objections that the replication and Global Catalog features of Active Directory do not bear on interoperability. The Commission explains, on that point, that a domain controller in an Active Directory domain (native mode) replicates the data stored in Active Directory with the data stored in the Active Directory of other domain controllers through certain synchronisation protocols. It also observes that, by means of other protocols whose specifications constitute interoperability information, Global Catalog data are exchanged between domain controllers in the forest.254Likewise, where recital 564 to the contested decision mentions the fact that Microsoft persisted in its refusal' after receiving Sun's complaint and the three statements of objections adopted by the Commission, it refers to recital 194 et seq. to the contested decision.255Furthermore, at recital 690 to the contested decision, the Commission explains that the CPLC does not address the broader issue that is at stake in this case, in particular because it does not cover protocols that are pure server/server protocols but that are functionally related to the client PC, including replication protocols or Global Catalog exchange of data.256In addition, Microsoft interprets Article 5(a) of the contested decision in the same way. Thus, in the application, in order to demonstrate the innovative nature of the communication protocols in respect of which it is required to communicate information to its competitors, it relies specifically on the multimaster replication mechanism used by Active Directory (see, in particular, the opinion of Mr Campbell-Kelly, Commentary on Innovation in Active Directory, in annex A.20 to the application). Likewise, in the reply, it relies mainly, for that purpose, on the DRS protocol, which is used by Active Directory to achieve, inter alia, replication functions (see, in particular, the opinion of Mr Lees cited at paragraph 205 above). In his opinion, Mr Lees explains that the DRS protocol created by Microsoft incorporates a series of new features, namely it can combine updates from many servers simultaneously; it is integrated with the standard Domain Naming Service (DNS) protocol (for naming) and the Kerberos protocol (for mutual authentication); it transmits information describing the way a particular company has architected its directory service; it [transmits] information about the role that particular servers play in managing the directory service; and it automatically communicates directory updates between servers. Mr Lees states that the DRS protocol is just one of many communication protocols that Microsoft is required to disclose to its competitors pursuant to the contested decision. He also identifies the following protocols: Microsoft Remote Procedure Call (MSRPC), Network Authentication (Kerberos extensions), Dfs and File Replication Service (FRS).257Last, the scope as thus defined in Article 5 of the contested decision also covers the information to which Sun had requested access in its letter of 15 September 1998. As the Court will explain in greater detail at paragraphs 737 to 749 below, by its request Sun sought, in particular, that its Solaris work group server operating system should be able to act as a fully compatible domain controller in the Windows 2000 work group networks or as a member server (in particular as a file or print server) that was fully compatible with the Windows domain architecture.258Furthermore, Microsoft's contention that the scope of the remedy prescribed in Article 5(a) of the contested decision is not consistent with the interoperability standard used by the Commission in assessing the relevance of the alternative interoperability methods (see paragraphs 125 to 129 above) must be rejected as unfounded.259That contention is based on the misconception that the Commission considers interoperability to be the capability for Microsoft's competitors to make their work group server operating systems work in exactly the same way as Windows operating systems and seeks to enable those competitors to clone' those systems (see paragraphs 234 to 242 above).260Contrary to Microsoft's assertion, moreover, the position which the Commission defends in its written submissions concerning the degree of interoperability required in the present case and the scope of the remedy prescribed by Article 5(a) of the contested decision is perfectly consistent with the position which it adopted in the contested decision. Nor is Microsoft entitled to rely on any statements which may have been made by the interveners at the hearing in the interlocutory proceedings as the basis for ascribing a specific interpretation of the contested decision to the Commission. It must be borne in mind that, according to the case-law, the lawfulness of a Community measure must be assessed on the basis of the matters of fact and of law existing at the time when the measure was adopted (Joined Cases 15/76 and 16/76 France v Commission [1979] ECR 321, paragraphs 7 and 8, and Joined Cases T-177/94 and T-377/94 Altmann and Others v Commission [1996] ECR II-2041, paragraph 119).261Last, the arguments based on the multimaster replication and the blue bubble which Microsoft put forward at the hearing must also be rejected as unfounded.262By those arguments, Microsoft attempts to show that the objective of the contested decision can be achieved in full only if Microsoft discloses to its competitors certain information on the internal mechanism of its server operating systems and, in particular, of the algorithms, that is to say, information going beyond that defined in that decision. Microsoft's essential argument is that, in order for a domain control running under a non-Microsoft work group server operating system to be capable of being placed in a blue bubble composed of domain controllers using a Windows work group server operating system employing Active Directory, those different operating systems must share the same internal logic.263First, Microsoft fails to demonstrate that, in order to function together within the blue bubble, its work group server operating systems and those of its competitors must necessarily have the same internal logic.264Second, the applicant also fails to demonstrate that even if such identity of internal logic were required, this would necessarily mean that Microsoft had to communicate to its competitors information relating to the internal mechanisms of its products and, in particular, to the algorithms. It must be borne in mind, on that point, that in an opinion annexed to the reply, one of Microsoft's experts, commenting on the DRS protocol used for the multimaster replication mechanism, himself draws a distinction between protocols used for communications between servers' and the algorithms/decision rules that operate internally on each server, before stating that it is the protocols that have to be disclosed pursuant to Article 5 of the contested decision (see paragraph 205 above).265Third, as regards the Intersite Topology algorithm which Microsoft mentioned specifically at the hearing, it is quite possible that, as the Commission also submitted at the hearing, competitors need only be in a position to implement an algorithm giving the same result as that algorithm. In other words, Microsoft would not be required to give any information about the implementation of that algorithm in its work group server operating systems, but could merely give a general description of that algorithm, leaving it to its competitors to develop their own implementation of it.266The Court thus concludes from the foregoing that there is no inconsistency between the scope of Article 5(a) of the contested decision and the interoperability standard required by the Commission in that decision.267Microsoft first of all puts forward a series of arguments designed to demonstrate that its communication protocols are technologically innovative. Communication protocols are often developed in connection with the performance of specific tasks by server operating systems and are intimately linked with the way in which those tasks are performed. Licensing those communication protocols therefore necessarily means providing competitors with information about the internal features of the server operating systems with which those communication protocols are used. In addition, a large number of engineers and significant financial resources are used in developing and improving communication protocols.268Microsoft emphasises, more particularly, the innovative nature of Active Directory, after first observing that directory services constituted an essential aspect of competition on the work group server operating systems market. In that regard, the applicant refers to a note drafted by one of its experts, Mr Campbell Kelly, in which the author describes the innovations which Active Directory presents and, in particular, its method of replicating itself across different server computers in a computing network (annex A.20 to the application). Microsoft also refers to the opinion of Mr Lees, in annex C.4 to the reply (see paragraphs 205 and 256 above), in which the author describes the innovative aspects of one of the protocols used by Active Directory, namely the DRS protocol, in respect of which Microsoft considers that it is required to provide information to its competitors pursuant to the contested decision. Last, Microsoft refers to annex C.8.1 to the reply, in which one of its engineers, Mr Hirst, describes a series of specifications relating to the multimaster replication mechanism used by Active Directory which Microsoft claims it is required to draw up pursuant to the contested decision.269Next, Microsoft puts forward numerous arguments in order to demonstrate that its communication protocols are protected by intellectual property rights.270In the first place, it submits that the innovative aspects of those communication protocols are patentable. Microsoft has obtained several patents for those protocols in Europe and the United States and some 20 patent applications are pending there. Furthermore, two opinions (annex A.21 to the application and annex C.6 to the reply) given by Mr Knauer, a lawyer specialising in patent law, support the assertion that Article 5 of the contested decision requires the compulsory grant of patent licences.271In the second place, Microsoft contends that the specifications of the server/server communication protocols that it is required to draw up and disclose to its competitors in application of the contested decision are copyright.272In the reply, Microsoft examines the question of copyright from two distinct angles. First, it refers to the concepts of forced creation and forced publication, and claims that if the contested decision had not ordered it to do so, it would not have developed the specifications in question or licensed them to its competitors. Second, relying on Article 4 of Directive 91/250, it raises the question of the adaptation or alteration of copyright works'. The applicant maintains, in particular, that a competitor which uses the specifications to make its server operating system interoperate with the portions of Windows server operating systems that provide work group services will not be creating a distinct work.273In the third place, Microsoft claims that the communication protocols are valuable trade secrets. In particular, it makes its client/server communication protocols available only under licence agreements that impose confidentiality and recognise the applicant's status as owner of the technology. It claims that trade secrets are a form of industrial property and that their protection is a matter for national law. Last, it refutes the Commission's notion that an undertaking suffers less damage when it discloses a business secret than when it is required to allow infringement of its patents or copyright.274Microsoft concludes that the requirement that it license the specifications of its communication protocols to its competitors would deprive it of the benefits of its research and development efforts which it devotes to the design and improvement of the communication protocols. It would also reduce the incentive for it and its competitors to invest in communication protocols.275The Commission disputes the various arguments set out at paragraphs 267 to 274 above.276First of all, it rejects Microsoft's assertion that the communication protocols in question are innovative and its assertion that licensing those protocols entails providing information about the internals of its work group server operating systems. In particular, the documents prepared by Mr Lees (annex C.4 to the reply) and Mr Hirst (annex C.8.1 to the reply) do not demonstrate that the information in question includes any intrinsically valuable invention'. The Commission refers to two notes drafted by its consultant, OTR (annexes D.2 and D.3 to the rejoinder), which comment on Mr Lees' and Mr Hirst's documents, and explains why the ideas and principles underlying the applicant's communication protocols are not new.277Next, the Commission rejects Microsoft's argument that, first, the communication protocols are protected by intellectual property rights and, second, the contested decision involves compulsory licensing.278In the first place, the Commission claims that Microsoft does not demonstrate that the alleged innovations presented by the communication protocols in question are covered by a patent. Furthermore, a number of factors demonstrate that Microsoft's refusal was not justified by considerations associated with patent protection. More particularly, it was only at the end of the administrative procedure, or a few weeks before the adoption of the contested decision, and at the Commission's insistence, that Microsoft identified a patent (patent EP 0669020).279In the second place, the Commission rejects Microsoft's assertions concerning copyright. While the specifications at which the contested decision is aimed may, as such, be covered by copyright, it does not follow that the use of the information thus documented when it is implemented in an operating system constitutes a breach of copyright. The implementation of a specification is not a copy, but results in a clearly distinct work. Furthermore, the question whether the specifications are covered by copyright is by nature purely incidental, since what is central to the present case is the obligation imposed on Microsoft to disclose information and to authorise its use, which necessarily involves the drafting of a document. Last, Microsoft put forward two new arguments relating to copyright in the reply (see paragraph 272 above), which, in the Commission's submission, must be declared inadmissible pursuant to Article 48(2) of the Rules of Procedure and are in any event unfounded.280In the third place, the Commission acknowledges that the information that Microsoft is required to disclose pursuant to the contested decision has thus far been kept secret from its competitors on the work group server operating systems market. However, it is by no means obvious that Microsoft is correct to equate those trade secrets' with intellectual property rights created by law. The case-law on compulsory licensing does not as such apply to trade secrets and the protection that such secrets enjoy under national law is normally more limited than that given to copyright or patents. While there may be a presumption of legitimacy of a refusal to license an intellectual property right created by law', the legitimacy under competition law of a refusal to disclose a secret which exists solely as a result of a unilateral business decision depends more on the facts of the case and, in particular, the interests at stake. In the present case, the value of the secret' concerned lies not in the fact that it involves innovation but in the fact that it belongs to a dominant undertaking.281SIIA puts forward essentially the same arguments as the Commission does on this point and contends that Microsoft does not demonstrate that the contested decision infringes its intellectual property rights or entails compulsory licensing.282FSFE claims that the technology which Microsoft refuses to disclose to its competitors is neither new nor innovative. Microsoft has a policy of adopting preexisting protocols and then making minor and pointless changes to them with the aim of preventing interoperability. FSFE refers, in particular, to the following protocols: CIFS/SMB (Common Internet File System/Server Message Block), DCE/RPC (Distributed Computing Environment/Remote Procedure Call), Kerberos 5 and LDAP.283Although the parties devoted lengthy argument, both in their written pleadings and at the hearing, to the question of the intellectual property rights which cover Microsoft's communication protocols or the specifications of those protocols, the Court considers that there is no need to decide that question in order to resolve the present case.284The arguments which Microsoft derives from the alleged intellectual property rights cannot, as such, affect the lawfulness of the contested decision. The Commission did not take a position on the merits of those arguments but adopted the decision on the assumption that Microsoft was able to rely on such rights in the present case. In other words, it proceeded on the premiss that, so far as it relates to the interoperability information, the conduct at issue in the present case might not be a mere refusal to supply a product or a service indispensable to the exercise of a specific activity but a refusal to license intellectual property rights, and thus chose the strictest legal test and therefore the one most favourable to Microsoft (see paragraphs 312 to 336 below). The Commission did not therefore decide whether or not Microsoft's impugned conduct constituted a refusal to grant a licence or whether or not the remedy prescribed by Article 5 of the contested decision entailed compulsory licensing.285Thus, at recital 190 to the contested decision, the Commission states that during the administrative procedure Microsoft relied on the existence of intellectual property rights and the fact that the interoperability information at issue constituted trade secrets. The Commission notes that it is not excluded that Microsoft relied on those rights to prevent Sun from implementing the specifications in question in its own products. It also acknowledges that it is possible that those specifications contain innovations and constitute trade secrets. More generally, the Commission observes that it cannot be excluded that ordering Microsoft to disclose the interoperability information to third parties and to allow them to use it will interfere with the free exercise of its intellectual property rights. It reiterates that last consideration at recital 546 to the contested decision. In footnote 249 to the contested decision, the Commission explains that [i]n any case, since the relevant specifications are not available for scrutiny, it is not possible for the Commission to determine to what extent Microsoft's claims relating to various intellectual property rights are justified.286Furthermore, at recitals 1003 and 1004 to the contested decision, the Commission, in describing the scope of the remedy for Microsoft's refusal, states, first, that the remedy applies only to interface specifications and not to the source code and, second, that the intention is that Microsoft's competitors be authorised to implement the disclosed specifications in their work group server operating systems. Thus, it states, inter alia, that the specifications should also not be reproduced, adapted, arranged or altered, but should be used by third parties to write their own specification-compliant interfaces (recital 1004 to the contested decision). The Commission concludes that, [i]n any event, to the extent that [the contested decision] might require Microsoft to refrain from fully enforcing any of its intellectual property rights, [that] would be justified by the need to put an end to the abuse (recital 1004 to the contested decision).287In its written pleadings, the Commission puts forward arguments to the same effect. Thus, in the rejoinder, it describes as misleading Microsoft's assertion in the reply that the [contested decision] requires [it] to grant a licence to whatever [intellectual property rights] may be necessary to implement the specifications in its own products. The Commission explains, first of all, that the [contested decision] requires Microsoft to grant the right to use the specifications for the purposes of building interoperable products and that [t]o the extent that [that] may limit Microsoft's ability to fully enforce certain of its [intellectual property rights], [it] will be justified by the need to put the infringement to an end. The contested decision does not take a position as to whether Microsoft's [intellectual property rights] are affected or not. The Commission goes on to state that it is not to be inferred, however, that Microsoft's refusal is justified by the exercise of intellectual property rights or that compulsory licensing is involved in the present case. Nor is there any evidence in the case file or in the application that that is so or, in particular, that competitors need a licence to certain Microsoft [intellectual property rights] in order to achieve interoperability with the Windows domain architecture.288Furthermore, the Commission confirmed, in answer to one of the written questions put by the Court, that the contested decision did not establish that the interoperability information was not covered by a patent or by copyright or, on the contrary, that it was. There was no need to decide that issue since, in any event, the conditions for finding an abuse and for imposing the remedy [prescribed by Article 5 of the contested decision] were satisfied whether or not the information is protected by any patent or copyright.289It follows from the foregoing considerations that the appraisal of the merits of the first part of the plea must proceed on the presumption that the protocols in question, or the specifications of those protocols, are covered by intellectual property rights or constitute trade secrets and that those secrets must be treated as equivalent to intellectual property rights.290The central issue to be resolved in this part of the plea therefore is whether, as the Commission claims and Microsoft denies, the conditions on which an undertaking in a dominant position may be required to grant a licence covering its intellectual property rights are satisfied in the present case.291Microsoft, supported by CompTIA and ACT, maintains primarily that the first issue must be assessed in the light of the criteria recognised by the Court of Justice in Magill, cited in paragraph 107 above, and reiterated in IMS Health, cited in paragraph 107 above.292In support of that argument, Microsoft reiterates, in the first place, that Article 5 of the contested decision implies the compulsory licensing of its communication protocols, which are technologically innovative and are covered by intellectual property rights.293In the second place, Microsoft interprets the Commission's argument as set out at paragraph 302 below as meaning that the Commission considers that it is not required to apply those tests where technological tying is involved. In Microsoft's submission, that argument finds no support in Case T-83/91 Tetra Pak v Commission [1994] ECR II-755, upheld on appeal in Case C-333/94 P Tetra Pak v Commission [1996] ECR I-5951 (Tetra Pak II), on which the Commission relies.294In the third place, Microsoft rejects the arguments whereby the Commission seeks to show that the circumstances of the present case can be distinguished from the circumstances of IMS Health, cited in paragraph 107 above.295First, IMS Health involved strong network effects and it was precisely because of those effects that the 1860 brick structure created by IMS Health was considered to be an industry standard. Furthermore, in the contested decision the Commission did not rely on the argument that, by refusing to allow compatibility, Microsoft was acting contrary to the public-policy objectives defined in Directive 91/250. In any event, vague public policy considerations cannot provide a ground for ordering an undertaking to grant licences. Last, Microsoft claims that Directive 91/250 does not establish any positive obligation to disclose information.296Second, Microsoft rejects the Commission's assertion that Microsoft used its market power on the client PC operating systems market to conquer the work group server operating systems market. Neither the contested decision nor the defence indicates clearly what market power Microsoft is supposed to have used or the way in which that power was exercised.297Third, Microsoft contends that the Commissions assertion that Microsoft disrupted previous levels of supply is wrong both in fact and in law and that it fails to take account of the principles laid down in Bronner, cited in paragraph 112 above. The applicant never provided Sun or any other supplier of competing operating systems with a licence on the specifications of its communication protocols. It licensed a network technology to AT&T in 1994 which allowed the development of a product called Advanced Server for UNIX (AS/U) and a number of AS/U-based products were created by leading UNIX suppliers, including Sun s PC NetLink. Although the applicant and AT&T agreed in 2001 not to extend the licensing agreement to include new technology, the AS/U technology and the products based on it remain available. The fact that the applicant thus licensed a specific technology to AT&T more than 10 years ago cannot mean that it is required to license all related technologies, including communication protocols, for the indefinite future.298Fourth, Microsoft observes that, at recital 577 to the contested decision, the Commission states that Microsoft's refusal to supply Sun is part of a broader conduct of not disclosing interoperability information to work group server operating systems vendors. It contends that the pattern of conduct thus attributed to it corresponds to [the application] on a non-discriminatory basis [of] a policy that virtually all technology companies adopt to protect the fruits of their research and development efforts' and that such conduct cannot constitute an exceptional circumstance within the meaning of Magill and IMS Health, cited in paragraph 107 above.299In the alternative, Microsoft, supported by CompTIA and ACT, submits that, should the Court find that no intellectual property right is at stake in the present case, the applicable criteria would be those recognised by the Court of Justice in Bronner, cited in paragraph 112 above, which correspond to the first, second and fourth criteria in IMS Health, cited in paragraph 107 above, as set out at paragraph 116 above.300Last, Microsoft, CompTIA and ACT claim that none of the four criteria of IMS Health, cited in paragraph 107 above, and, consequently, none of the three criteria of Bronner, cited in paragraph 112 above, is satisfied in this case.301The Commission, supported by SIIA and FSFE, contends primarily that, even if the Court should find that the refusal at issue was justified by the exercise of intellectual property rights and that the contested decision entails compulsory licensing, it would not follow that the present problem must automatically be assessed against the criteria established by the IMS Health case-law.302In that connection, the Commission maintains, in the first place, that the exceptional circumstances' rule laid down in the case-law cannot apply as such, and without further qualification to a refusal to disclose trade secrets that has the effect of technologically tying a separate product with a dominant product.303In the second place, the Commission claims that IMS Health, cited in paragraph 107 above, does not establish an exhaustive list of exceptional circumstances. In that judgment, as in Magill, cited in paragraph 107 above, the Court of Justice defined the conditions on which a decision ordering compulsory licensing could be adopted, in the light of the specific circumstances of those cases. Thus, in IMS Health, cited in paragraph 107 above, the Court of Justice merely established a list of criteria which it was sufficient' to satisfy. In reality, in order to determine whether the conduct of an undertaking in a dominant position which refuses to supply constitutes an abuse, the Commission must examine the entire range of factors surrounding that refusal and in particular the economic and regulatory background to it.304In the third place, the Commission lists the factors which distinguish the circumstances of the present case from those of IMS Health, cited in paragraph 107 above, and which permit the conclusion that Microsoft's refusal constitutes an abuse of a dominant position.305First, the Commission observes that the contested decision has the particular feature that it deals with a refusal to supply interoperability information in the software industry. The decision aims to permit the development of products that are compatible with Microsoft's products whereas the precedents cited by Microsoft concern situations in which the protected product was to be incorporated in competitors' products for reasons which went beyond ensuring mere compatibility between two distinct products. Furthermore, those precedents do not concern the specific problems raised in sectors where network effects are pervasive. Unlike the sector concerned in the present case, the economic sectors concerned in those precedents were not sectors where the [legislature] has clearly recognised that compatibility was favourable to society in general. More particularly, the Commission, referring to recitals 745 to 763 to the contested decision, recalls the importance which the Community legislature ascribed to interoperability, notably in the context of Directive 91/250, and also the position taken by the legislature, namely that disclosure of information for interoperability purposes is beneficial for society as a whole.306Second, the Commission invokes the fact that the present issue involves a supplier in a dominant position which uses its market power on a particular market, in this case the client PC operating systems market, to eliminate competition on a neighbouring market, namely the work group server operating systems market, thereby increasing the barriers to entry in its original market and securing an additional monopoly rent. That situation reinforces the harm to consumers that results from the restriction of the development of new products.307Third, the Commission submits that the present issue concerns a supplier in a dominant position which disrupts previous levels of supply (recitals 578 to 584 to the contested decision). Microsoft's initial policy was to disclose interoperability information, not to retain it, which, among other things, helped Microsoft to introduce its own work group server operating systems on the market and did not discourage it from innovating. However, once its server products' were sufficiently established on the market, Microsoft changed its strategy and chose to foreclose its competitors by refusing to give them access to that information (recitals 587, 588 and 637 et seq. to the contested decision).308The Commission maintains that Microsoft cannot deny having disrupted its previous levels of supply. First of all, the agreement between Microsoft and AT&T, which allowed AT&T to develop AS/U, involved the disclosure not only of interoperability information of the type at issue in the contested decision, but also of additional information. Next, the Commission contends that the fact that the AS/U technology is still available is irrelevant. The Commission refers to recitals 580 to 583 to the contested decision and submits that the disclosures made in the context of AS/U are now outdated, as Microsoft modified the relevant protocols in subsequent versions of Windows. Last, the Commission contends that Microsoft's assertion that the fact that it licensed a specific technology to AT&T more than 10 years ago cannot oblige it to license all related technologies for the indefinite future is irrelevant to the approach taken in the contested decision. The question of the disruption of previous levels of supply is treated in that decision not as an abuse in itself but as one factor relevant to the assessment of Microsoft's refusal to supply (recital 578 et seq. to the contested decision).309In the fourth place, the Commission does not claim that the mere fact that a refusal to license an intellectual property right is part of a general pattern of conduct is in itself an exceptional circumstance sufficient to render that refusal abusive. It merely contends that the fact that Sun is not the only competitor to which Microsoft has refused access to the interoperability information is a circumstance relevant to the assessment of the compatibility of Microsoft's conduct with Article 82 EC.310The Commission submits that Microsofts alternative argument, that the present case must be examined by reference to the criteria established in Bronner, cited in paragraph 112 above, cannot be upheld. Bronner concerned access to an infrastructure that had required significant investment, and if it should be established that the information at issue in the present case is not protected by intellectual property rights, but consists of purely arbitrary combinations of messages, that judgment would surely not be a relevant point of comparison.311In the alternative, the Commission, supported by SIIA and FSFE, claims that, even on the assumption that the lawfulness of the contested decision, in so far as it relates to the first issue, must be assessed against the criteria recognised by the Court of Justice in IMS Health, cited in paragraph 107 above, those criteria are satisfied in the present case.312It must be borne in mind that Microsoft's argument is that its refusal to supply interoperability information cannot constitute an abuse of a dominant position within the meaning of Article 82 EC because, first, the information is protected by intellectual property rights (or constitutes trade secrets) and, second, the criteria established in the case-law which determine when an undertaking in a dominant position can be required to grant a licence to a third party are not satisfied in this case.313It must also be borne in mind that the Commission contends that there is no need to decide whether Microsoft's conduct constitutes a refusal to license intellectual property rights to a third party, or whether trade secrets merit the same degree of protection as intellectual property rights, since the strict criteria against which such a refusal may be found to constitute an abuse of a dominant position within the meaning of Article 82 EC are in any event satisfied in the present case (see paragraphs 284 to 288 above).314While Microsoft and the Commission are thus agreed that the refusal at issue may be assessed under Article 82 EC on the assumption that it constitutes a refusal to license intellectual property rights, they disagree as to the criteria established in the case-law that are applicable in such a situation.315Thus, Microsoft relies, primarily, on the criteria laid down in Magill and IMS Health, cited in paragraph 107 above, and, in the alternative, on those laid down in Bronner, cited in paragraph 112 above.316The Commission, on the other hand, contends that an automatic application of the criteria laid down in IMS Health, cited in paragraph 107 above, would be problematic in this case. It maintains that, in order to determine whether such a refusal is abusive, it must take into consideration all the particular circumstances surrounding that refusal, which need not necessarily be the same as those identified in Magill and IMS Health, cited in paragraph 107 above. Thus it explains at recital 558 to the contested decision, that [t]he case-law of the European Courts ... suggests that the Commission must analyse the entirety of the circumstances surrounding a specific instance of a refusal to supply and must take its decision [on the basis of] the results of such a comprehensive examination.317At the hearing, the Commission, questioned on this issue by the Court, confirmed that it had considered in the contested decision that Microsoft's conduct presented three characteristics which allowed it to be characterised as abusive. The first consists in the fact that the information which Microsoft refuses to disclose to its competitors relates to interoperability in the software industry, a matter to which the Community legislature attaches particular importance. The second characteristic lies in the fact that Microsoft uses its extraordinary power on the client PC operating systems market to eliminate competition on the adjacent work group server operating systems market The third characteristic is that the conduct in question involves disruption of previous levels of supply.318The Commission contends that in any event the criteria recognised by the Court of Justice in Magill and IMS Health, cited in paragraph 107 above, are also satisfied in this case.319In response to those various arguments, the Court observes that, as the Commission rightly states at recital 547 to the contested decision, although undertakings are, as a rule, free to choose their business partners, in certain circumstances a refusal to supply on the part of a dominant undertaking may constitute an abuse of a dominant position within the meaning of Article 82 EC unless it is objectively justified.320The Court of Justice thus considered that a company in a dominant position on the market in raw materials which, with the aim of reserving such raw materials for the purpose of manufacturing its own derivatives, refused to supply a customer which was itself a manufacturer of those derivatives, and was therefore likely to eliminate all competition on the part of that customer, abused its dominant position within the meaning of Article 82 EC (Joined Cases 6/73 and 7/73 Commercial Solvents v Commission [1974] ECR 223; see, concerning a refusal to supply a service, Case 311/84 CBEM [1985] ECR 3261).321In Case 238/87 Volvo [1988] ECR 6211, the Court of Justice, on a reference for a preliminary ruling under Article 234 EC, was asked whether the refusal by a car manufacturer which was the proprietor of a design right covering car body panels to license third parties to supply products incorporating the protected design must be considered to be an abuse of a dominant position within the meaning of Article 82 EC. In its judgment, the Court of Justice emphasised that the right of a proprietor of a protected design to prevent third parties from manufacturing and selling or importing, without his consent, products incorporating the design constitutes the very subject-matter of his exclusive right. The Court of Justice concluded (paragraph 8) that an obligation imposed upon the proprietor of a protected design to grant to third parties, even in return for a reasonable royalty, a licence for the supply of products incorporating the design would lead to the proprietor thereof being deprived of the substance of his exclusive right, and that a refusal to grant such a licence cannot in itself constitute an abuse of a dominant position. The Court of Justice added, however, that the exercise of an exclusive right by the proprietor of a registered design in respect of car body panels [might] be prohibited by Article [82 EC] if it involve [d], on the part of an undertaking holding a dominant position, certain abusive conduct such as the arbitrary refusal to supply spare parts to independent repairers, the fixing of prices for spare parts at an unfair level or a decision no longer to produce spare parts for a particular model even though many cars of that model [were] still in circulation, provided that such conduct [was] liable to affect trade between Member States (paragraph 9).322In Magill, cited in paragraph 107 above, the Court of Justice, on appeal, had also been called upon to adjudicate on the question of the refusal by a dominant undertaking to license a third party to use an intellectual property right. That case concerned a decision in which the Commission had found that three television companies had abused their dominant position on the market represented by their respective weekly programme listings and the market for the television guides in which those listings were published by relying on their copyright in those listings to prevent third parties from publishing complete weekly guides to the programmes broadcast by the various different television channels. The Commission had therefore ordered those television companies to supply their advance weekly programme listings to each other and to supply them to third parties on request and on a non-discriminatory basis and to permit reproduction of those listings by those third parties. The Commission had also stipulated that any royalties requested by the television companies should they choose to grant reproduction licences should be reasonable.323In Magill, cited in paragraph 107 above (paragraph 49), the Court of Justice, referring to Volvo, cited in paragraph 321 above, stated that the exclusive right of reproduction form [ed] part of the authors rights, so that refusal to grant a licence, even if it is the act of an undertaking holding a dominant position, cannot itself constitute abuse of a dominant position. Still with reference to Volvo, cited in paragraph 321 above, the Court of Justice explained, however, that the exercise of an exclusive right by the proprietor may, in exceptional circumstances, involve abusive conduct (paragraph 50).324The Court of Justice considered that the following circumstances were relevant for the purpose of establishing that the conduct of the television companies in question was abusive. In the first place, their refusal concerned a product (the television channels' weekly programme listings) the supply of which was indispensable to the exercise of the activity in question (the publication of a complete weekly television guide) (paragraph 53). In the second place, the refusal prevented the appearance of a new product, a comprehensive weekly guide to television programmes, which the television companies in question did not offer and for which there was a potential consumer demand, which constituted an abuse under Article 82(b) EC (paragraph 54). In the third place, the refusal was not justified (paragraph 55). Finally, in fourth place, the television companies, by their conduct, had reserved to themselves a secondary market, the market for weekly television guides, by excluding all competition on that market (paragraph 56).325In Bronner, cited in paragraph 112 above, the Court of Justice, on a reference for a preliminary ruling under Article 234 EC, had been requested to rule on whether the refusal by a press group holding a very large share of the daily newspaper market in Austria, and operating the only nationwide newspaper home-delivery scheme in Austria, to allow the publisher of a rival newspaper to have access to that scheme for appropriate remuneration, or to allow that publisher to purchase certain complementary services from the group, constituted an abuse of a dominant position contrary to Article 82 EC.326In its judgment (paragraph 38), the Court of Justice first of all observed that although in Commercial Solvents v Commission and CBEM, cited in paragraph 320 above, it had held that the refusal by an undertaking holding a dominant position on a given market to supply an undertaking with which it was in competition on a neighbouring market with raw materials and services respectively, which were indispensable to carrying on the rivals business, constituted an abuse, it had done so to the extent that the conduct in question was likely to eliminate all competition on the part of that undertaking.327Next, the Court of Justice stated (paragraph 39) that at paragraphs 49 and 50 of Magill, cited in paragraph 107 above, it had held that the refusal by the owner of an intellectual property right to grant a licence, even if it is the act of an undertaking holding a dominant position, cannot in itself constitute abuse of a dominant position, but that the exercise of an exclusive right by the proprietor may, in exceptional circumstances, involve an abuse.328Last, the Court recited the exceptional circumstances which it had established in Magill, cited in paragraph 107 above, and stated (paragraph 41):

[E]ven if that case-law on the exercise of an intellectual property right were applicable to the exercise of any property right whatever, it would still be necessary, for [that] judgment to be effectively relied upon in order to plead the existence of an abuse within the meaning of Article [82 EC] in a situation such as that which forms the subject-matter of the ... question, not only that the refusal of the service comprised in home delivery be likely to eliminate all competition in the daily newspaper market on the part of the person requesting the service and that such refusal be incapable of being objectively justified, but also that the service in itself be indispensable to carrying on that persons business, inasmuch as there is no actual or potential substitute in existence for that home-delivery scheme

329In IMS Health, cited in paragraph 107 above, the Court of Justice again ruled on the conditions in which a refusal by an undertaking holding a dominant position to grant to a third party a licence to use a product protected by an intellectual property right might constitute abusive conduct within the meaning of Article 82 EC.330The Court of Justice first of all confirmed (paragraph 34), with reference to Volvo, cited in paragraph 321 above, and Magill, cited in paragraph 107 above, that, according to settled case-law, the exclusive right of reproduction formed part of the rights of the owner of an intellectual property right, so that refusal to grant a licence, even if it is the act of an undertaking holding a dominant position, cannot in itself constitute abuse of that position. The Court of Justice also observed (paragraph 35) that it was clear from that case-law that exercise of an exclusive right by the owner might, in exceptional circumstances, involve abusive conduct. Next, after reciting the exceptional circumstances found to exist in Magill, cited in paragraph 107 above, the Court held (paragraph 38) that it followed from that case-law that, in order for the refusal by an undertaking which owns a copyright to give access to a product or service indispensable for carrying on a particular business to be treated as abusive, it was sufficient that three cumulative conditions be satisfied, namely, that that refusal prevents the emergence of a new product for which there is a potential consumer demand, that it is unjustified and that it is such as to exclude any competition on a secondary market.331It follows from the case-law cited above that the refusal by an undertaking holding a dominant position to license a third party to use a product covered by an intellectual property right cannot in itself constitute an abuse of a dominant position within the meaning of Article 82 EC. It is only in exceptional circumstances that the exercise of the exclusive right by the owner of the intellectual property right may give rise to such an abuse.332It also follows from that case-law that the following circumstances, in particular, must be considered to be exceptional:

in the first place, the refusal relates to a product or service indispensable to the exercise of a particular activity on a neighbouring market;

in the second place, the refusal is of such a kind as to exclude any effective competition on that neighbouring market;

in the third place, the refusal prevents the appearance of a new product for which there is potential consumer demand.

333Once it is established that such circumstances are present, the refusal by the holder of a dominant position to grant a licence may infringe Article 82 EC unless the refusal is objectively justified.334The Court notes that the circumstance that the refusal prevents the appearance of a new product for which there is potential consumer demand is found only in the case-law on the exercise of an intellectual property right.335Finally, it is appropriate to add that, in order that a refusal to give access to a product or service indispensable to the exercise of a particular activity may be considered abusive, it is necessary to distinguish two markets, namely, a market constituted by that product or service and on which the undertaking refusing to supply holds a dominant position and a neighbouring market on which the product or service is used in the manufacture of another product or for the supply of another service. The fact that the indispensable product or service is not marketed separately does not exclude from the outset the possibility of identifying a separate market (see, to that effect, IMS Health, cited in paragraph 107 above, paragraph 43). Thus, the Court of Justice held, at paragraph 44 of IMS Health, cited in paragraph 107 above, that it was sufficient that a potential market or even a hypothetical market could be identified and that such was the case where the products or services were indispensable to the conduct of a particular business activity and where there was an actual demand for them on the part of undertakings which sought to carry on that business. The Court of Justice concluded at the following paragraph of the judgment that it was decisive that two different stages of production were identified and that they were interconnected in that the upstream product was indispensable for supply of the downstream product.336In the light of the foregoing factors, the Court considers that it is appropriate, first of all, to decide whether the circumstances identified in Magill and IMS Health, cited in paragraph 107 above, as described at paragraphs 332 and 333 above, are also present in this case. Only if it finds that one or more of those circumstances are absent will the Court proceed to assess the particular circumstances invoked by the Commission (see paragraph 317 above).337Microsoft maintains that the interoperability information required by the contested decision is not indispensable to the activity of supplier of work group server operating systems. A particular technology cannot be characterised as indispensable if it is economically viable for the competitors of the undertaking in a dominant position to develop and market their products without having access to that technology.338Microsoft contends that the contested decision contains an error of law and an error of fact on that point.339It submits, in the first place, that the error of law lies in the fact that the Commission used an inappropriate, extraordinary and absolute standard when examining whether competition could exist. The applicant refers to recitals 176 to 184 to the contested decision and submits that the Commission considers that non-Microsoft server operating systems must be able to communicate with Windows client PC and server operating systems in exactly the same way that Windows server operating systems do: yet the case-law does not require that such optimal access to the market be granted.340In the reply, Microsoft criticises the fact that the Commission assessed the requisite degree of interoperability by reference to what was necessary to enable its competitors to remain viable on the market. The concept of interoperability used by the Commission at recitals 666 to 687 to the contested decision is unreasonable in that it implies Virtual identity' between Windows server operating systems and competing operating systems. Microsoft refers to the passages from recitals 669 and 679 to the contested decision reproduced at paragraph 126 above and submits that, if such a concept had to be accepted, any technology would be indispensable. Furthermore, the only justification put forward in the contested decision for the assertion that such a level of interoperability is required if competitors are to remain in viable conditions on the market is that access to the specifications at issue might enable competitors to avoid having users log on twice (recital 183 to the contested decision). That justification is inadequate, since, first, multiple vendors already provide single sign on solutions; second, having to log on twice is plainly an alternative solution (even if it is marginally less advantageous); and, third, the remedy prescribed in Article 5 of the contested decision goes far beyond what is necessary to resolve that minor problem.341Also in the reply, and after referring to the arguments set out at paragraphs 125 to 128 above and reiterating that the remedy prescribed in Article 5 of the contested decision will not permit its competitors to develop products that are Virtually identical to Windows server operating systems, Microsoft claims that the Commission has failed to show a causal link between the non-availability of specifications for its communication protocols and the supposed inability of competitors to remain viably on the market.342In its observations on the statements in intervention, Microsoft denies that industry and consumers require plug replaceability and asserts that such a requirement goes far beyond the test of indispensability laid down by the Court of Justice in Bronner, cited in paragraph 112 above, and IMS Health, cited in paragraph 107 above. In particular, the applicant's competitors do not need Active Directory, since their server operating systems have their own directory services which can provide work group services to Windows client PC and server operating systems.343In the second place, Microsoft contends that the contested decision is vitiated by an error of fact in so far as the Commission fails to take account of the fact that several work group server operating systems are present on the market. Undertakings in Europe continue to maintain different types of computer networks, in that their operating systems are supplied by different distributors.344During the administrative procedure, Microsoft submitted reports in which computer scientists describe the ways in which interoperability could be achieved in computing networks. The responses to the Commissions requests for information confirm that interoperability between different types of operating systems is common in computer networks in Europe. Thus, 47% of companies which responded to those requests for information stated that they used non-Microsoft server operating systems to supply file and print services to Windows client PC operating systems. Similar proof exists in respect of user and group administration services. Microsoft reiterates that the Mercer reports demonstrate that undertakings do not feel that their choice of servers is constrained by interoperability concerns.345Microsoft also asserts that interoperability between non-Microsoft server operating systems and Windows client PC and server operating systems can be achieved by five different methods. Each of those methods constitutes an alternative to disclosure of the communication protocols at issue and allows those different operating systems to work well together. Admittedly, the perfect substitutability that the Commission considers essential cannot be obtained by those various methods, but they do make it possible to achieve the minimum level of interoperability ... required for effective competition.346The five methods to which Microsoft refers are as follows: first, the use of standard protocols such as TCP/IP (Transmission Control Protocol/Internet Protocol) and HTTP (Hyper Text Transfer Protocol); second, the addition of a software code to a Windows client PC or server operating system in order to allow that operating system to communicate with a non-Windows server operating system using communication protocols specific to that non-Microsoft operating system; third, the addition of a software code to a non-Microsoft server operating system in order to allow it to communicate with a Windows client PC or server operating system using communication protocols specific to Windows operating systems; fourth, the use of a server operating system as a bridge between two different sets of communication protocols; and, fifth, the addition of a block of software code to all the client PC and server operating systems in a given network to achieve interoperability by means of communications between the different blocks of software code.347Microsoft further submits that the evidence which the Commission assembled during the administrative procedure shows that those methods work in practice for Linux and for the other work group server operating systems. Distributors of Linux products have constantly increased market share on the work group server operating systems market without having access to the specifications of Microsoft's communication protocols. Microsoft refers to sections D and E of a report by Evans, Nichols and Padilla (annex C.11 to the reply) and further submits that Linux products will continue to gain ground on Windows server operating systems. It is generally acknowledged that Linux is a serious competitor to Microsoft and that the 10 largest suppliers of servers costing under USD 25000 offer work group servers running Linux.348CompTIA and ACT put forward arguments which are essentially the same as Microsoft's.349CompTIA criticises, in particular, the fact that the Commission considers that non-Windows work group server operating systems must achieve a level of interoperability with the Windows client PC operating systems that is as good as that achieved by Microsoft itself'.350ACT refers to Microsoft's arguments on this point in its written pleadings and submits that there are several methods of ensuring sufficient interoperability between the operating systems of different suppliers. It also has concerns that the Commission's interpretation of the indispensability criterion will have negative effects on innovation.351The Commission claims that Microsoft's disclosure of the interoperability information is indispensable if its competitors are to continue to compete on the work group server operating systems market.352It contends, in the first place, that Microsoft's allegation of an error of law rests on a misrepresentation of the Commission's position and on confusion between different questions analysed in the contested decision. The indispensability criterion entails an examination of the degree of interoperability necessary to remain as a viable competitor on the market and of whether the withheld information is the only economically viable source for achieving that degree of interoperability.353The Commission emphasises that the information that Microsoft refuses to disclose is functionally related to the client PC' and explains that the indispensability of that information derives from the importance for work group server operating systems of interoperability with client PCs (recitals 383 to 386 to the contested decision) and from Microsoft's quasi-monopoly on the client PC operating systems market.354The Commission analysed the indispensability criterion, as defined in the case-law, at recitals 666 to 686 to the contested decision and examined whether there were alternative solutions to disclosure of the relevant information that would enable undertakings to compete viably with Microsoft on the work group server operating systems market.355The Commission observes that in Microsoft's view the mere existence of inefficient interoperability solutions that allow competitors to achieve only de minimis market penetration shows that the indispensability criterion is not satisfied. Such an argument cannot be accepted, as that criterion must be assessed against the aim of preserving an effective competitive structure that benefits consumers. The question is whether the information that Microsoft refuses to disclose is indispensable to any competitor seeking to carry on business on the relevant market as a viable competitive constraint and not as a de minimis player who has effectively left the market for a niche position.356In the rejoinder, the Commission makes clear that its position is that a dominant undertaking is not entitled to compromise effective competition on a secondary market by abusively refusing to allow its competitors access to an input necessary for their viability. If there is no alternative to the input to which access is refused that could allow competitors to exercise effective competitive pressure on the dominant undertaking on the secondary market, it is then clear that the input is indispensable to the maintenance of effective competition.357Also in the rejoinder, the Commission reiterates that there is a whole range of possible degrees of interoperability between Windows PCs and work group server operating systems. The Commission did not fix a priori a given level of interoperability that is indispensable for the maintenance of effective competition on the market, but based its findings on the manifestly unsatisfactory nature of the alternative methods which Microsoft's competitors had already used and which did not permit the level of interoperability required by customers in an economically viable manner. The Commission again denies having taken into account a degree of interoperability achieving the Virtual identity to which the applicant refers, and submits that what is indispensable is not that Microsoft's competitors be allowed to reproduce the interoperability solutions implemented by Microsoft but that they be able to achieve an equivalent degree of interoperability by their own innovative efforts'. Last, the Commission observes that at recitals 590 to 692 to the contested decision it examines the severe consequences' which the limited degree of interoperability with Windows client PC operating systems has for competitors and customers. In particular, Microsoft's conduct has the effect of progressively ousting all its competitors from the work group server operating systems market, even though some of them originally had a significant commercial or technical advantage over Microsoft on that market (recitals 587 and 668 to the contested decision).358In the second place, the Commission rejects the allegations of an error of fact.359First, it is not demonstrated that the solutions proposed by the computer scientists in the reports produced by Microsoft during the administrative procedure are commercially viable alternatives to disclosure of interoperability information.360Second, the argument which Microsoft derives from the responses to the Commissions requests for information is not relevant in so far as it means that interoperability with smaller players is enough, or that some interoperability already exists'. In reality, Microsoft overlooks the fact that its competitors entered the work group server operating systems market before Microsoft began to distribute products of that type. The fact that the information at issue is indispensable if Microsoft's competitors are to be able to continue to represent a competitive constraint for Microsoft's products means that those competitors will be gradually eliminated from the market. That fact that their elimination is not yet complete does not show that the indispensability criterion is not fulfilled, since the essential thing is whether the information is indispensable in order to remain as a viable competitor on the market.361Third, by its reference to the five alternative methods of achieving interoperability between the operating systems supplied by different distributors Microsoft does not contest the findings made on that point in the contested decision but merely asserts that those methods are feasible and that they allow its own products and its competitors' products to work well together.362The Commission recalls that it has already examined those methods in the contested decision and, in particular, the question whether reverse engineering might constitute an alternative to disclosure of the interoperability information (recitals 683 to 687 to the contested decision), and it demonstrated that they do not constitute Viable substitutes' to disclosure of the interoperability information at issue.363Fourth, the Commission rejects Microsoft's allegation that the analysis in the contested decision is contradicted by the entry and alleged growth of Linux on the work group server operating systems market.364First of all, the figures for Linux [do] not represent the penetration of the market by a single operator but rather the best efforts of a number of competing vendors who build upon Linux (Red Hat, Novell/SuSE, IBM, Sun, etc.). The respective market shares of those competing distributors are therefore miniscule.365The Commission proceeds to criticise the findings in section D of the Evans, Nichols and Padilla report in annex C.11 to the reply; it asserts that:

as stated, in particular, at recitals 487 to 490 to the contested decision, the data from International Data Corporation (IDC) used by those experts in drafting that report are approximate and are therefore not on their own appropriate for assessing market development;

that applies a fortiori as regards quite marginal annual changes relative to the overall size of the market;

there is no proof that Linux's market share of 6.75% of units sold, which Microsoft calculates using an extrapolation factor concerning all servers, applies to the work group server operating systems market;

the two examples of responses to the 2003 market enquiry to which the experts refer in order to demonstrate that it is possible to use, in relation to Linux, interoperability solutions based on reverse engineering are not representative in that the entities concerned are two of only three entities, out of a total of more than 100 which participated in that market enquiry, that made a non-insignificant use of Linux/Samba;

the experts provide no information on how the four other methods which Microsoft claims can ensure interoperability between operating systems supplied by different distributors could have allowed the alleged expansion of Linux on the market during the period covered by the abuse consisting in the refusal to supply.

366Likewise, the Commission criticises the findings in section E of that report It claims that:

it has already rejected, at recitals 605 to 610 to the contested decision, the arguments which Microsoft bases on IDC's projections and the results of the third Mercer survey;

IDC tends to overestimate its projections of Linux's market share of the networking and file/print subcategories;

the migration from the Windows NT operating systems to the Linux operating system mentioned in the Meryll Lynch report of 8 March 2004 (annex 7 to annex C.11 to the reply) is likely to be a one-off phenomenon, as Windows NT is an outdated product that is no longer supported by Microsoft;

the Yankee Group report of 25 May 2004 (annex 9 to annex Cll to the reply) relates to server operating systems in general and not to work group server operating systems, and is therefore largely irrelevant in the present case;

the Forrester Research report of 27 May 2004 (annex 10 to annex Cll to the reply) is not primarily concerned with work group server operating systems and contains findings which contradict Microsoft's argument, notably the finding that 92% of those questioned will use Active Directory in 2006.

367SIIA submits essentially the same arguments as the Commission. It maintains that it is essential for competition on the merits in the software industry that work group server operating systems suppliers are able to achieve interoperability with Microsoft's quasi-monopolistic products on a level playing field. In order to be able to compete effectively on the market, those suppliers must have access to the interoperability information at issue.368SFE rejects the argument which Microsoft bases on the five alternative methods of ensuring interoperability. It claims that, [t]echnically, all these ways describe realistic scenarios, but that they have a fundamental omission: [a]uthentication. Microsoft has tightly coupled its Windows client PC operating systems with its own [a]uthentication servers, so that it is simply impossible to separate the authentication task from the other tasks carried out by Windows work group servers.369As already pointed out at paragraph 207 above, the Commission adopted a two-stage approach in determining whether the information at issue was indispensable, in that, first of all, it considered what degree of interoperability with the Windows domain architecture non-Microsoft work group server operating systems must achieve in order for its competitors to be able to remain viably on the market and, second, it appraised whether the interoperability that Microsoft refused to disclose was indispensable to the attainment of that degree of interoperability.370Microsoft claims that that reasoning is incorrect in law and in fact.371Microsoft's arguments concerning the Commission's supposed error of law relate to the first stage of its reasoning.372Microsoft takes issue first of all with the degree of interoperability required by the Commission in the present case: it contends, in substance, that the Commission's position effectively requires that its competitors' work group server operating systems be able to communicate with Windows client PC and server operating systems in exactly the same way as Windows server operating systems do. The applicant reiterates that that degree of interoperability implies virtual identity between its systems and its competitors' systems.373Those assertions must be rejected.374The Court has already defined, at paragraphs 207 to 245 above, the degree of interoperability which the Commission required in the contested decision. The Court observed, in particular, that the Commission had concluded that, in order to be able to compete viably with Windows work group server operating systems, competitors' operating systems must be able to interoperate with the Windows domain architecture on an equal footing with those Windows systems (see paragraph 230 above). The Court has held that interoperability, as thus envisaged by the Commission, had two indissociable components, client/server interoperability and server/server interoperability and that it implied in particular that a server running a non-Microsoft work group server operating system could act as domain controller within a Windows domain using Active Directory and, consequently, would be able to participate in the multimaster replication mechanism with the other domain controllers (see paragraphs 231 and 233 above).375The Court has also already found that, contrary to Microsoft's contention, by requiring such a degree of interoperability the Commission did not intend that non-Microsoft work group server operating systems should function in every respect as a Windows work group server operating system and, accordingly, that the applicant's competitors could develop work group server operating systems that were identical, or even Virtually identical', to the applicant's (see paragraphs 234 to 242 above).376Next, Microsoft criticises the fact that the Commission appraised the requisite degree of interoperability according to what in its view was necessary to allow designers of non-Microsoft work group server operating systems to remain viably on the market.377It is sufficient to observe, in that regard, that the Court has already confirmed, at paragraph 229 above, the correctness of the approach thus adopted by the Commission.378Finally, Microsoft claims that it is not necessary for its competitors' work group server operating systems to attain the degree of interoperability required by the Commission in order for them to be able to remain viably on the market.379It must be emphasised that the Commission's analysis of that question in the contested decision is based on complex economic assessments and that, accordingly, it is subject to only limited review by the Court (see paragraph 87 above).380It follows from the considerations set out below that Microsoft has not demonstrated that the Commission's analysis is manifestly incorrect.381In that regard, it must be observed, in the first place, that Microsoft has not established that the Commission's finding that interoperability with the client PC operating system is of significant competitive importance in the market for work group server operating systems (recital 586 to the contested decision) is manifestly incorrect.382On the contrary, a number of factors confirm the correctness of that finding.383Thus, as may be seen from the technical explanations of the relevant products at recitals 21 to 59 to the contested decision and also from the explanations given by the parties' experts at the hearing, it is necessary to bear in mind that, by nature, computer programs do not function in isolation, but are designed to communicate and function with other computer programs and hardware, especially in network environments (see also, at paragraph 157 above, the 10th recital in the preamble to Directive 91/250).384Furthermore, within the computer networks installed in organisations, the need to be able to function together is particularly pressing in the case of client PC operating systems and work group server operating systems. As the Commission emphasises at recital 383 to the contested decision, and as the Court has already observed at paragraph 161 above, file and print services and group and user administration services are intimately connected to the use of client PCs and are provided to users of client PCs as a set of interconnected tasks. As the parties' expert witnesses explained at the hearing, in computer networks the relationship between work group servers and client PCs is stimulated' or provoked' by actions or requests originated by client PC users, such as, in particular, the entry of a name and password, the creation of a file or a request to print a document. The Commission was likewise correct to find, at recital 532 to the contested decision, that [c]lient PCs and work group servers represent nodes in a computer network and are therefore physically linked with each other. Last, it must be borne in mind that one of the essential functions of work group server operating systems is specifically the administration of client PCs.385Furthermore, as stated at recitals 383 to 386 to the contested decision, certain results of the Mercer surveys confirm the importance of the interoperability of work group server operating systems with client PC operating systems. Apart from the results of the second and third Mercer surveys, which are more specifically concerned with Windows client PCs and which will be examined at paragraphs 401 to 412 below, the first Mercer survey shows that the ease with which a product can be integrated in an existing or planned future computer environment is one of the main factors which IT executives take into account when deciding what products to purchase. It follows from a comparison of certain results of that survey with certain results of the third Mercer survey, moreover, that the importance of interoperability with client PC operating systems is more clear-cut for work group server operating systems than for other types of server products (recital 386 to the contested decision).386In the second place, the Court considers that the interoperability of work group server operating systems with client PC operating systems is even more important in the case of Windows client PC operating systems.387Microsoft's dominant position on the client PC operating systems market exhibits, as the Commission states at recitals 429 and 472 to the contested decision, extraordinary features, since, notably, its market shares on that market are more than 90% (recitals 430 to 435 to the contested decision) and since Windows represents the quasi-standard for those operating systems.388As the Windows operating system is thus present on virtually all client PCs installed within organisations, non-Windows work group server operating systems cannot continue to be marketed if they are incapable of achieving a high degree of interoperability with Windows.389In the third place, the Court observes that, according to the contested decision, it is important that non-Windows work group server operating systems can interoperate not only with Windows client PC operating systems but also, more generally, with the Windows domain architecture.390More specifically, the Commission considers that, in order to be able to be viably marketed, non-Windows work group server operating systems must be capable of participating in the Windows domain architecture — which consists of an architecture' of both client/server and server/server interconnections and interactions, closely interlinked (see paragraphs 179 to 189 above) — on an equal footing with Windows work group server operating systems. That means, in particular, that a server running a non-Microsoft work group server operating system is able to act as domain controller within a Windows domain using Active Directory and, consequently, is capable of participating in the multimaster replication mechanism with the other domain controllers.391The Court therefore finds that Microsoft has not established that that assessment is manifestly incorrect.392In that regard, the Court finds first, that, in light of the very narrow technological and privileged links that Microsoft has established between its Windows client PC and work group server operating systems, and of the fact that Windows is present on virtually all client PCs installed within organisations, the Commission was correct to find, at recital 697 to the contested decision, that Microsoft was able to impose the Windows domain architecture as the de facto standard for work group computing (see, to the same effect, recital 779 to the contested decision, where the Commission states, inter alia, that the quasi-monopoly that Microsoft has held on the client PC operating systems market for many years enables it to determine to a large extent and independently of its competitors the set of coherent communications rules that will govern the de facto standard for interoperability in work group networks).393Second, as the Commission states at recital 637 to the contested decision, various sources of evidence, such as Microsoft's own marketing documents, reports by industry analysts, evidence obtained during the 2003 market enquiry and the Mercer surveys, show that interoperability with the Windows environment is a factor that plays a key role in the uptake of Windows work group server operating systems.394Thus, at recitals 638 to 641 to the contested decision, the Commission describes various facts which demonstrate that, for marketing purposes, Microsoft systematically uses interoperability with the Windows environment as a key marketing argument for its work group server operating systems. Those facts are not disputed by Microsoft.395Likewise, at recitals 642 to 646 to the contested decision, the Commission refers to certain results of the 2003 market enquiry in order to demonstrate that interoperability with the Windows environment plays a key role in the decisions taken by the organisations questioned on the purchase of work group server operating systems.396In the application, Microsoft merely asserts that organisations do not choose server operating systems for reasons linked with their interoperability with Windows operating systems and makes a global reference to certain documents annexed to the application (annex A.12.1 to the application (Matthews, The Commissions Case on Microsoft's Interoperability: An Examination of the Survey Evidence), and annex A.22 to the application (Evans, Nichols and Padilla, The Commission Has Failed to Address Major Flaws in the Design, Conduct, and Analyses of Its Article 11 Inquiries)). For the reasons set out at paragraphs 94 to 99 above, the Court cannot take those annexes into account.397In any event, the Court finds that the abovementioned results of the 2003 market enquiry confirm the correctness of the Commission's case.398Thus, during that enquiry, the Commission requested the entities questioned to indicate whether they had already implemented (or decided to implement) Active Directory in the majority of the Windows domains in their computer network (question 15). It also requested the entities who answered that question in the affirmative, that is to say, 61 entities out of 102, to indicate from a list of factors those which had been important in their decision to implement Active Directory (question 16). Of those 61 entities, 52 (approximately 85.2%) mentioned as being such a factor the fact that Active Directory offers a better integration with Windows workstations — including applications running on the client PC or integrated into the client PC (e.g. Outlook, Office) than competing directory services' or the fact that Active Directory is required by applications used in [their] organisation (question 16). On the other hand, only 17 entities (approximately 27.9%) mentioned one of the following factors as having been important in their decision to implement Active Directory: Active Directory offers a better integration with Web services than competing directory services; Active Directory is a more mature product than competing directory services; and Active Directory offers a better compliance and quality of implementation of directory standards than competing directory services'.399Likewise, the entities taking part in the 2003 market enquiry were also asked whether they relied primarily on Windows servers to provide file and print services (question 13). If so, they were to state whether certain interoperability factors set out in that question had been important in their decision to make use of such servers. Of the 77 entities who answered that question, 58 (approximately 75.3%) mentioned at least one of the factors in question.400In footnote 101 to the application and also in footnote 68 to the reply, Microsoft suggests, while merely making a general reference to the arguments in certain annexes (annex A.22 to the application and section A of annex C.13 to the reply (Evans, Nichols and Padilla, Response to the Commission's Annex B.6 Regarding Its Article 11 Inquiries)), that a number of the questions put by the Commission in connection with the 2003 market enquiry were flawed or biased. The Court considers that that argument cannot be accepted. Apart from the fact that such a global reference to annexes cannot be accepted, for the reasons stated at paragraphs 94 to 99 above, the Court finds that Microsoft's argument is intrinsically contradictory in that, in the parts of its pleadings to which the footnotes concerned relate, the applicant specifically relies, in support of its own case, on certain results of the 2003 market enquiry.401Contrary to Microsoft's contention, moreover, the results of the second and third Mercer surveys lead to the same conclusions as the 2003 market enquiry as regards the importance for consumers of interoperability with Windows operating systems.402Thus, in its second survey, Mercer, citing the same interoperability-related factors as those set out in question 13 of the 2003 market enquiry (see paragraph 399 above), asked a number of IT executives whose organisations mainly used Windows operating systems to supply file and print services to indicate whether one or more of those factors had played a key role in the decision to adopt those operating systems, giving those factors a mark on a scale of 1 (low importance) to 5 (high importance). Of the 134 IT executives concerned, 99 (or approximately 73.9%) stated that at least one of those factors had played such a role. Furthermore, it is significant that 91 IT executives (or approximately 67.9%) awarded a mark of 4 out of 5 to at least one of those factors.403In the same survey, the IT executives questioned had also been invited to evaluate the role played by 21 different factors in their purchasing decisions concerning operating systems for the execution of file and print services, giving those factors a mark on a scale of 0 (no importance) to 5 (high importance). The factor interoperability with (Windows) work stations' received an average mark of 3.78 and was placed in fourth position, behind the factors reliability/availability (average mark 4.01), available functions and availability of help (internal or external (average mark 3.93) and security (average mark 3.80).404The results of the second Mercer survey also show that when the IT executives concerned were asked to evaluate the role played by 18 factors in their decisions concerning the acquisition of directory services, they gave the factor interoperability with (Windows) work stations an average mark of 3.94 (first position).405In the third Mercer survey, the IT executives were asked to evaluate the role played by 13 different factors in their decisions concerning the acquisition of work group server operating systems by giving those factors a mark on a scale from 0 (no importance) to 5 (high importance). In response to that request, the factor interoperability with Windows work stations received an average mark of 4.25. While it is true that that factor was only placed in second position, between reliability/availability of the server operating system (average mark 4.47) and integrated security in the server operating system (average mark 4.04), the fact remains that the results which it obtained show that to a very large extent the decisions of purchasers of work group server operating systems are dictated by considerations to do with interoperability with Windows client PCs.406It is true that in the third Mercer survey the IT executives were also invited to evaluate the relative importance of each of the 13 factors referred to in the preceding paragraph and that, on that basis, the gap between reliability/availability of the server operating system (in first place, with 34%) and interoperability with Windows work stations (in second place, with 9%) is much wider. However, those results must be qualified, because, as the Commission explains at recitals 643 and 659 to the contested decision, interoperability is a factor which influences other factors that purchasers take into consideration when choosing a work group server operating system. Thus, purchasers may believe that a non-Microsoft work group server operating system has disadvantages in relation to security or processing speed, whereas, in reality, those disadvantages are attributable to a lack of interoperability with Windows operating systems (see the two examples given by the Commission in footnote 786 to the contested decision). Those purchasers thus have a tendency to underestimate the importance of interoperability with Windows.407The results of the third Mercer survey are also important in so far as they show that Microsoft's manifest and increasing lead over its competitors on the work group server operating systems market (see the examination of the circumstance relating to the elimination of competition at paragraphs 479 to 620 below) is to be explained not so much by the merits of its products as by its interoperability advantage.408Furthermore, the IT executives concerned were requested not only to evaluate the relative importance of 13 different factors in their decisions concerning the acquisition of work group server operating systems (see paragraph 406 above), but also to evaluate, for each of those factors, the respective performances of Linux, NetWare, UNIX and Windows operating systems.409In fact, for reliability/availability of the server operating system, which had been considered the most important factor (with 34%) by the IT executives questioned, Windows obtained the lowest average mark (3.63). UNIX systems came first by a significant margin (average mark 4.55), followed by Linux (average mark 4.10) and NetWare (average mark 4.01).410Likewise, Windows obtained the lowest average mark for its performance for integrated security in the server operating system (average mark 3.14), far behind UNIX (average mark 4.09), NetWare (average mark 3.82) and Linux (average mark 3.73), although that factor plays a very important role in the organisations' decisions concerning the acquisition of work group server operating systems (see paragraph 405 above). Those results are all the more revealing since, as stated at paragraph 406 above, purchasers have a tendency to believe that problems are security-related when, in reality, they are the consequence of a lack of interoperability with Windows systems.411On the other hand, it is striking to note that, as regards performances relating to interoperability with Windows work stations, Windows was awarded the highest average mark (average mark 4.87) of all the average marks given to the different server operating systems concerned for each of the 13 factors used by Mercer. It is in relation to that factor, moreover, that the gap between Microsoft and its competitors' operating systems is widest, since NetWare obtained an average mark of 3.78, Linux an average mark of 3.43 and UNIX an average mark of 3.29.412On the same subject, the Court notes that, as the Commission quite correctly states at recital 662 to the contested decision, if the average marks given to Linux, NetWare, UNIX and Windows for each of the 13 factors concerned with the percentage of relative influence attributed to those factors are weighted, and if the weighted marks are added up, it is UNIX that gets the highest result, followed, first, by Windows and then, with close results that are not significantly lower than Windows' results, by Linux and NetWare.413Third, the Court observes that, at recital 183 to the contested decision, the Commission asserts that [w]hen a [non-Windows] work group server is added to a Windows work group network, the degree of interoperability with the Windows domain architecture that such a work group server is able to achieve will have an impact on the efficiency with which that work group server delivers its services to the users of the network.414The Court considers that the correctness of this assertion is confirmed by the contested decision in a number of respects. The decision refers to a series of problems which Microsoft's competitors' work group server operating systems encounter because they cannot interoperate with the Windows domain architecture to the same degree as can Windows work group server operating systems.415A first example given by the Commission is the fact that, if a work group server does not interoperate sufficiently with the security architecture' of the Windows work group network, the user might be required to log on twice if he wishes to have access to both Windows-based resources and resources offered by ... work group servers [using competing operating systems] (recital 183 to the contested decision). In its pleadings, Microsoft does not deny that that problem exists, but merely attempts to minimise it (see paragraph 340 above). Indeed, the Court takes note of the fact that at the hearing, one of Microsoft's expert witnesses himself underlined the risks that multiple user names and passwords created for network security and the disadvantages, in terms of efficiency and productivity, due to the fact that users had to enter several user names and passwords.416Another example is set out at recital 196 to the contested decision, where the Commission reproduces a statement made by Microsoft in its response of 16 November 2001 to the second statement of objections, namely that more policy-based [user group] management is possible if a Windows 2000 Professional client is attached to a Windows 2000 server running Active Directory than if it is running in standalone mode or is part of a non-Windows 2000 domain or realm.417At recital 240 to the contested decision, the Commission states that, more than a year after the launch of Windows 2000, Microsoft had still not fully disclosed the updated CIFS/SMB specification to its competitors. In footnote 319, the Commission correctly states that even if Microsoft had disclosed the updated specification, that would not have been sufficient to ensure proper administration of the file service.418It is also appropriate to cite the factors which the Commission quite correctly identifies concerning the ADSI interface developed by Microsoft to enable software writers to access the LDAP protocol which supports Active Directory (recitals 243 to 250 to the contested decision). In particular, the Court notes the limitations of the ADSI provider developed by Novell (recital 250 to the contested decision).419At recitals 251 to 266 to the contested decision, the Commission explains that Microsoft introduced a proprietary extension to the Kerberos standard protocol and that the work group server operating systems which run the unextended version of that security protocol encounter authorisation problems when they work in a Windows environment (see also footnote 786 to the contested decision). It should be borne in mind that the Kerberos protocol, as modified by Microsoft, offers advantages as regards, in particular, faster connection and efficiency (see recital 152 to the contested decision and paragraph 170 above).420At recitals 283 to 287 to the contested decision, the Commission correctly explains that the directory synchronisation tools to which Microsoft refers allow the directory services in its competitors systems to achieve only limited synchronisation with Active Directory. It emphasises, in particular, that those tools only synchronise a limited part of the information contained in a directory and that they do not suppress the need to manage the users, permissions, group memberships and security policies separately for the Windows work group servers and the non-Microsoft work group servers(recital 285 to the contested decision).421It follows from all of the foregoing considerations that Microsoft has not established that the Commission made a manifest error when it considered that non-Microsoft work group server operating systems must be capable of interoperating with the Windows domain architecture on an equal footing with Windows work group server operating systems if they were to be marketed viably on the market.422The Court also concludes from those considerations that the absence of such interoperability with the Windows domain architecture has the effect of reinforcing Microsoft's competitive position on the work group server operating systems market, particularly because it induces consumers to use its work group server operating system in preference to its competitors', although its competitors' operating systems offer features to which consumers attach great importance.423The arguments which Microsoft derives from the Commission's alleged error of fact are of two types.424In the first place, Microsoft claims that the Commission's case is contradicted, first, by the fact that several work group server operating systems are present on the market and by the heterogeneous nature of computer networks within undertakings in Europe and, second, by the fact that, even though they do not have access to the interoperability information at issue, distributors of Linux products have recently entered the market and have consistently gained market share.425The Court considers that the first of those arguments is not sufficient to call in question the validity of the Commission's argument.426First of all, contrary to Microsoft's contention, interoperability considerations play a key role in decisions concerning the acquisition of work group server operating systems (see paragraphs 381 to 412 above).427Also, the third Mercer survey shows that interoperability with Windows work posts is the factor in respect of which the gap between Microsoft's work group server operating system and its competitors' systems is the widest (see paragraph 411 above).428Next, as will be explained in greater detail at paragraphs 569 to 582 below, Microsoft's competitors, with the exception of distributors of Linux products, had been present on the work group server operating systems market for several years before Microsoft began to develop and market such systems. While it is true that on the date of adoption of the contested decision those competitors were still present on the market, the fact remains that their market share fell significantly as Microsoft's share increased rapidly, notwithstanding the fact that some of them, particularly Novell, had a considerable technological advantage over Microsoft. The fact that competition is eliminated gradually and not immediately does not contradict the Commission's argument that the information at issue is indispensable.429In fact, as the Commission stated in answer to one of the written questions put by the Court, the fact that Microsoft's competitors were able to continue to sell work group server operating systems during the years immediately preceding the adoption of the contested decision is explained in part by the fact that at that time there was still, within organisations, a not insignificant basis of client PCs using a Windows operating system belonging to a range of products predating the Windows 2000 range (see recitals 441 to 444 to the contested decision). For example, the table at recital 446 to the contested decision shows that in 2001 the Windows 98, Windows Millennium Edition (Windows Me) and Windows NT client PC operating systems were still being licensed in significant numbers. It is precisely with the Windows 2000 operating systems that interoperability problems arose in a particularly acute manner for Microsoft's competitors (see paragraphs 571 to 573 below). At the same time, there was also a non-negligible installed base of work group servers using Windows NT operating systems, which caused fewer interoperability problems than the systems which succeeded them. It must be borne in mind, in that regard, that organisations modify their work group server networks only once in a period of several years, and do so only incrementally (see recital 590 to the contested decision).430The second argument referred to at paragraph 424 above, based on the entry and growth of Linux products on the work group server operating systems market, must also be rejected.431First of all, as the Commission explains at recitals 487 and 488 to the contested decision, and as the Court will explain at paragraphs 502 and 553 below, the IDC data on which Microsoft relies to describe the evolution of the position of Linux products on the market present certain flaws. Those data come from a database which IDC established by identifying eight main categories of tasks (or workloads') carried out within organisations and distinguishing a number of sub-categories' within those main categories. The two tasks most closely related to the work group tasks referred to by the contested decision, namely file and print sharing and user and user group administration, are those known, respectively, as file/print sharing and networking (recital 486 to the contested decision). However, the tasks within those two sub-categories are not a perfect match for the services which constitute the work group server operating systems market. What is more, a number of those tasks can be performed with a much lower level of interoperability between client PCs and servers than the work group tasks identified by the Commission and are therefore more likely than the latter tasks to be carried out by non-Microsoft operating systems.432Next, account must be taken of the fact that the growth of Linux products on the work group server operating systems market was only modest during the years immediately preceding the adoption of the contested decision. When those Linux products were used in conjunction with Samba software (developed with the use of reverse engineering) they could attain a certain degree of interoperability with Windows operating systems. However, that degree of interoperability was significantly reduced following the launch of the Windows 2000 generation. Thus, in October 2003 — that is to say, several months after Microsoft had already begun to market the Windows 2003 server operating system, which had succeeded the Windows 2000 server system — the degree of interoperability that Linux products had managed to achieve enabled them to act only as member servers within a domain using Active Directory (see recitals 296 and 297 to the contested decision).433Finally, as will be explained in greater detail at paragraphs 595 to 605 below, the projected growth of Linux products on the work group server operating systems market is lower than Microsoft claims and will come about to the detriment not of Microsoft's systems but, in particular, of Novell's systems and the systems of distributors of UNIX products.434In the second place, Microsoft claims that the Commission failed to take account of the fact that several methods other than the disclosure of the information at issue ensure sufficient interoperability between different suppliers' operating systems.435On that point, it is sufficient to observe that Microsoft itself has recognised, both in its written pleadings and in answer to a question put to it at the hearing, that none of its recommended methods or solutions made it possible to achieve the high degree of interoperability which the Commission correctly required in the present case.436It follows from all of the foregoing considerations that Microsoft has not demonstrated that the circumstance that the interoperability information was indispensable was not present in this case.437Microsoft submits that the refusal at issue is not such as to exclude all competition on a secondary market, namely, in this case, the work group server operating systems market.438In support of that assertion, Microsoft claims, in the first place, that the Commission applied a test that was wrong in law.439Microsoft observes that, at recital 589 to the contested decision, the Commission refers to a mere risk of elimination of competition on the market. In cases dealing with compulsory licensing of intellectual property rights, on the other hand, the Court has always ascertained whether the refusal in question was likely to eliminate all competition and required, in that regard, something close to certainty. The Commission therefore ought to have applied a stricter test, namely the test of a high probability of eliminating effective competition. Contrary to the Commission's contention, the words risk, possibility and likelihood do not mean the same thing.440Microsoft further submits that the reference in the contested decision to Commercial Solvents v Commission and CBEM, cited in paragraph 320 above, is irrelevant. Those cases did not involve a refusal to license intellectual property rights. In each of those cases, moreover, the prospect of eliminating competition was immediate and real, as there were no alternative sources of supply.441In the second place, Microsoft claims that the Commission's argument that competition on the server operating systems market could be eliminated owing to its refusal to disclose its communication protocols to its competitors is contradicted by market conditions. The applicant reiterates, first, that it is commonplace for undertakings in Europe to have heterogeneous computer environments composed of Windows client PC and server operating systems and non-Microsoft server operating systems and, second, that the Mercer reports show that enterprise customers base their decisions relating to the purchase of operating systems on a range of criteria such as reliability, scalability and applications compatibility and do not consider the criterion of interoperability with Windows client PC operating systems to be a determinative criterion.442Microsoft also observes that, six years after the alleged refusal to supply, there were still numerous competitors on the work group server operating systems market, including IBM, Novell, Red Hat and Sun, and a number of suppliers of Linux products. The applicant reiterates that Linux is a recent entrant to the market and has grown rapidly and that it is an incontrovertible fact that Linux products, either on their own or together with Samba products or with Novell's Nterprise server software, compete directly with Windows server operating systems in performing a wide range of tasks, including the provision of work group services to Windows client PC operating systems. Furthermore, IDC, which describes itself as the premier global market intelligence and advisory group in the information technology and telecommunications industries, estimated that there was no risk of competition being eliminated. IDC's projections indicate that over the period 2003 to 2008 Microsoft's share of the market for work group server operating systems used on servers costing under USD 25000 will remain virtually stable, whereas Linux's share will double.443In the third place, Microsoft criticises the Commission's artificially narrow' definition of the second product market.444Microsoft contends that [competition with Windows server operating systems is even more vigorous if the definition also covers tasks other than the provision of file and print services and user and group administration services that Windows server operating systems can perform.445Microsoft observes that the Commission does not deny that the basic version of its Windows Server 2003 operating system enables a wide range of tasks to be performed, many of which are outside the second product market as defined in the contested decision. According to the Commission's approach, the same Windows server operating system is inside the relevant market when it provides file and print services to Windows client PC operating systems and is outside the market when it provides proxy services or firewall services to those same operating systems.446Microsoft maintains that the Commission is not entitled to rely on the fact that its Windows Server 2003 operating system is marketed in different versions at different prices to support its assertion that the basic version of that system is in a different market from the other versions of the same system. The more expensive versions of that system provide the same work group services as the basic version.447In the reply, Microsoft expands somewhat on its complaint relating to the incorrect definition of the second product market. It states, first of all, that on the market for server operating systems in general it has a market share of around 30%. Next, it asserts that [n]o one in the industry uses the term work group server in the way the Commission has used it to define [that product market] and that when industry observers occasionally do refer to work group servers' they generally include servers that perform a wide range of tasks, including Web, database and application serving. Last, it claims that none of the major server vendors on the market sells work group servers that are limited to performing the tasks identified by the Commission.448Microsoft also rejects the explanations which the Commission sets out in the defence to justify its definition of the market. First of all, Microsoft states that [v]endors do not charge different people different prices for the same server operating system edition depending on how they will use it. Next, it denies that the server operating systems considered by the Commission to be work group server operating systems are optimised to provide work group services: the IDC data on which the Commission relied when calculating market share show that, with the sole exception of Novell's NetWare, [those] operating systems spend far more time devoted to non-work group tasks than to work group [tasks]. Last, the applicant asserts that [t]he cost of modification in many cases would be zero [and] in the other cases ... would be negligible.449Furthermore, Microsoft refers generally to two reports by Evans, Nichols and Padilla, in annex A.23 to the application and annex C.12 to the reply.450In the fourth place, Microsoft, in the reply, criticises the methodology used by the Commission to calculate the market share of operators on the second product market, which consists in taking into account only the time which server operating systems spend in performing work group tasks and only sales of server operating systems costing under USD 25000. That leads to the absurd consequence that a copy of an operating system is counted as [being] both inside and outside the market, depending on the tasks it is performing at any given time' and provides no relevant information about dominance.451CompTIA claims, first of all, that the Commission applied the wrong legal standard when ascertaining whether Microsoft's refusal involved a mere risk of elimination of all effective competition when it ought to have examined whether that refusal gave rise to the likelihood that all competition would be eliminated from the secondary market. Next, CompTIA asserts that the evidence in the file does not demonstrate that that refusal was likely to have such a consequence. It emphasises, in particular, the growing success of Linux.452ACT emphasises the very close link between the indispensability criterion and the elimination of competition criterion. It claims, in particular, that the contested decision is contradictory in so far as, on the one hand, it recognises that up to 40% of the work group server operating systems market is held by competitors who are able to provide substitute products without having had access to the interoperability information and, on the other, it states that competition on that market is impossible without such access because the information is indispensable.453ACT also disputes the Commissions argument that there is no need to take into account competition by de minimis players. It also criticises the fact that the Commission relies on a mere risk of elimination of competition, and emphasises that Linux's position on the market continues to grow.454The Commission asserts that the applicants refusal creates a risk that all effective competition on the secondary market for work group server operating systems will be eliminated.455In the first place, the evidence analysed at recitals 585 to 692 to the contested decision clearly shows that there is a high likelihood that that risk will be realised in the near future. The Commission refers to recital 700 to the contested decision and submits that if Microsoft's conduct remains unfettered, there is a serious risk that its competitors' products will be confined to a niche existence or will not be profitable at all.456The Commission contends that the Commercial Solvents v Commission and CBEM cases, cited in paragraph 320 above, provide valuable guidance for the purpose of assessing Microsoft's conduct in the light of Article 82 EC, even though those cases did not involve a refusal to license intellectual property rights. In that context, the expressions risk, possibility and likelihood used by the Court of Justice in its case-law on abusive refusals to supply have the same meaning.457The Commission submits that most of Microsoft's arguments are based on the incorrect premiss that the Commission must establish that competition has already been eliminated or, at least, that its elimination is imminent. The Commission demonstrated in the contested decision that the degree of interoperability that can be achieved on the basis of Microsoft's disclosures is insufficient to enable competitors to stay viably on the market (footnote 712 to the contested decision). Microsoft has not adduced evidence that that conclusion is vitiated by a manifest error of assessment458In the second place, the Commission deals with the arguments which Microsoft bases on the facts observed on the market.459It states, first of all, that the risk of elimination of all competition was already present in 1998, as it is present today: the only difference is that now [that] elimination of competition is more imminent than it was in 1998.460Next, the Commission disputes the conclusions that Microsoft draws from the Mercer reports. In the Commission's view these reports demonstrate that customers choose Windows as a work group server operating system because of Microsoft's unfair interoperability advantage, in spite of the fact that Windows is lagging behind other products on a number of features that customers consider important.461The argument which Microsoft bases on the growth of Linux products is refuted as wholly unsupported; the Commission refers to recitals 506 and 632 to the contested decision, in which it is clearly shown that the past growth of Linux has been de minimis. The last two Mercer surveys demonstrate that Linux has only a very low market share, in the order of 5%, on the work group server operating systems market.462The

Commission contends that the IDC projections are exaggerated and based on imperfect data (see paragraphs 365 and 366 above). In reality, the IDC data suggest that Microsoft rapidly acquired a dominant position on the relevant market, that it is continuing to increase its market share and that it is facing an increasingly fragmented fringe of niche players.463In the third place, the Commission rejects Microsoft's criticism of its definition of the second product market.464In reaching that definition, the Commission first of all identified a list of core work group services, which closely correspond to a specific customer need'. Those core services are the key services that customers take into account when purchasing a work group server operating system. The Commission based its analysis on a variety of evidence, including the information gathered in the 2003 market enquiry (recitals 349 to 352 to the contested decision), statistical correlation' between the use of a given operating system for one of the core work group services and its use for the other core services (recital 353 to the contested decision) and Microsoft's description and pricing of its products (recitals 359 to 382 to the contested decision).465The Commission contends that work group server operating systems are optimised to provide work group services and that the way in which they provide those services plays a decisive role in the decision to purchase such systems. The fact that work group servers are sometimes used to run an application does not have the effect of temporarily excluding them from the market or of temporarily including in the market enterprise servers which are optimised to run enterprise applications.466In response to Microsoft's argument that its Windows work group server operating systems may be used to provide proxy services or firewall services, the Commission refers to recital 58 to the contested decision and states that those tasks are implemented by specialised edge servers. Those servers cannot therefore exercise a competitive constraint on Microsoft on the work group server operating systems market.467In the rejoinder, the Commission claims, first of all, that the terminology which it uses to designate the product market is irrelevant to whether it correctly defined that market. Furthermore, the expression work group server operating system is indeed used in the industry to designate the type of products at stake in the [contested] decision.468Next, the Commission rejects Microsoft's criticisms of the explanations set out in the defence (see paragraph 448 above).469First, contrary to Microsoft's contention, both it and its competitors do ... charge customers different prices for the same server operating system depending on how they will use it. Prices vary according to the number of client PCs which have access to the server concerned. Furthermore, server operating systems vendors offer a number of different editions — at different prices — of systems forming part of the same family. More generally, the Commission observes that Windows server operating systems are licensed by Microsoft to customers and [that] there is in principle no reason why Microsoft should not be able to discriminate depending on use.470Second, the Commission submits that Microsoft's assertion that work group server operating systems spend far more time devoted to non-work group tasks than to work group [tasks] is based on IDC data processed according to an inappropriate method.471Third, in response to Microsoft's assertion that the cost of modification in many cases would be zero, the Commission refers to recitals 334 to 341 and 388 to 400 to the contested decision, which show that there is no supply side substitutability for either client PC operating systems or work group server operating systems.472Still in the rejoinder, moreover, the Commission emphasises that Microsoft does not deny that interoperability with client PCs — and, more especially, with Windows client PCs — is particularly important for the performance of work group tasks by a server operating system. Microsoft's refusal to disclose interoperability information significantly harms its competitors' capacity to meet consumer expectations concerning the performance of those tasks and thus alters the conditions of competition for servers sold for those tasks by comparison with those sold for different tasks. In the Commission's submission, [that] remains true even assuming ... that, for each of both Microsoft and its rivals, the various editions of its server operating systems currently on the market are all equally suited ... for the performance of both work group server tasks and certain other low-end tasks (non-mission critical applications such as e-mail, etc.).473The Commission further submits that, [a]s for the supply side, it is obvious that, if one accepts for present purposes (i) the demand-side requirements of customers as regards work group services (undisputed by Microsoft) and (ii) Microsoft's own hypothesis that the various editions of each vendors respective server operating systems have identical capacities as regards work group tasks, then the very same distorted market forces which force the exit of Microsoft's competitors from the sale of server operating systems for work group tasks will prevent supply-side substitution through (re)entry on the basis of the high-end editions of the same operating system families.474Last, the Commission refers to annex B.11 to the defence and annex D.12 to the rejoinder, in which it comments on the observations set out in annex A.23 to the application and annex C.12 to the reply.475In the fourth place, the Commission rejects Microsoft's criticisms of the method which it used to calculate market share. First of all, for the purpose of its assessment, there is no need for Microsoft to have already acquired a dominant position on the relevant secondary market by means of its abusive conduct: what matters is that there is a risk of elimination of competition on that market. Next, the Commission's method gives a sufficiently reliable picture of the imbalance of forces on the market for work group server operating systems. The Commission did not consider only the time allocated to different tasks by a given server, but examined, in respect of the undertakings which participated in the 2003 market enquiry and responded to the second and third Mercer surveys, what proportion of the work group tasks was performed by servers from different suppliers. Neither that market enquiry nor those surveys indicate that Microsoft held a market share of less than 60% for any one of those work group tasks.476The Commission further contends that applying the filters identified by Microsoft makes it possible to use [the IDC] data as a rough proxy for the sale of the editions of various vendors identified as being work group server operating systems'. It maintains that, to the extent that Microsoft's own exclusionary behaviour has the effect of partitioning sales of server operating systems purchased primarily for work group tasks from those primarily purchased for other tasks, a workload filter permits one to form an impression of Microsoft's relative strength in sales primarily for the former tasks. In any event, even if only the [USD] 25000 filter were applied, without any distinction based on workload, Windows' share would be 65% by volume and 61% by relevant turnover (recital 491 of the contested decision).477SIIA claims that, owing to the indispensability of the interoperability information, the refusal at issue is by nature such as to eliminate competition on the work group server operating systems market. In particular, Microsoft's market share on that market rose significantly and rapidly at the time when it placed its Windows 2000 Server operating system on the market. SUA also contends that the arguments which Microsoft bases on the alleged growth in Linux products on the market are unfounded.478FSFE asserts that Linux products do not exert a competitive threat on the work group server operating systems market.479The Court will examine in the following order the four categories of arguments which Microsoft puts forward in support of its contention that the circumstance relating to the elimination of competition is not present in this case: first, the definition of the relevant product market; second, the method used to calculate market shares; third, the applicable criterion; and, fourth, the assessment of the market data and the competitive situation.480Microsoft's arguments in respect of the definition of the relevant product market concern the second of the three markets identified by the Commission in the contested decision (see paragraphs 23 and 25 to 27 above), namely, the work group server operating systems market The Commission describes those systems as being designed and marketed to deliver collectively file and print sharing services and group and user services to a relatively small number of client PCs linked together in a small or medium-sized network (recitals 53 and 345 to the contested decision).481Microsoft contends, in effect, that the Commission defined that second market too restrictively by including only server operating systems used to supply the services mentioned in the preceding paragraph, namely what are known as work group services. Microsoft's objective in challenging the Commission's definition of the market is essentially to establish that the evolution of the market is different from that described at recitals 590 to 636 to the contested decision and does not represent the elimination of all competition.482The Court notes at the outset that in so far as the definition of the product market involves complex economic assessments on the part of the Commission, it is subject to only limited review by the Community judicature (see, to that effect, Case T-342/99 Airtours v Commission [2002] ECR II-2585, paragraph 26). However, this does not prevent the Community judicature from examining the Commission's assessment of economic data. It is required to decide whether the Commission based its assessment on accurate, reliable and coherent evidence which contains all the relevant data that must be taken into consideration in appraising a complex situation and whether it is capable of substantiating the conclusions drawn from it (see, to that effect, Commission v Tetra Laval, cited in paragraph 89 above, paragraph 39).483The Court notes, moreover, that Microsoft on the one hand repeats arguments which it already submitted during the administrative procedure and which the Commission expressly rejected in the contested decision, but fails to indicate in what way the Commissions findings are incorrect, and, on the other, makes a general reference to two reports in annex A.23 to the application and annex C.12 to the reply. For the reasons set out at paragraphs 94 to 99 above, those reports will be taken into account by the Court only to the extent to which they support or complement pleas or arguments expressly set out by Microsoft in the body of its pleadings.484In arriving at the contested definition of the product market, the Commission took into account the demand-side substitutability and the supply-side substitutability of the products. It must be borne in mind that, as stated in the Commission Notice on the definition of the relevant market for the purposes of Community competition law (OJ 1997 C 372, p. 5), point 7, [a] relevant product market comprises all those products and/or services which are regarded as interchangeable or substitutable by the consumer, by reason of the products characteristics, their prices and their intended use'. As indicated at point 20 of that notice, moreover, supply-side substitutability may also be taken into account when defining markets in those situations in which its effects are equivalent to those of demand substitution in terms of effectiveness and immediacy. That means that suppliers are able to switch production to the relevant products and market them in the short term without incurring significant additional costs or risks in response to small and permanent changes in relative prices.485The Court would point out straight away that the definition of the second market is not based on the idea that there is a separate category of server operating systems exclusively implementing file and print services and user and group administration services. Quite to the contrary, at a number of points in the contested decision the Commission expressly acknowledges that work group server operating systems may also be used to carry out other tasks, and, in particular, may run non-mission critical applications (see, in particular, recitals 59, 355, 356 and 379 to the contested decision). At recital 59 to the contested decision, the Commission states that non-mission critical' applications are those whose failure would impact the activity of some users [but] would not impact the overall activity of the organisation. In that regard, the Commission refers, more specifically, to the running of internal email services. As will be explained in greater detail below, the Commission's definition is based in fact on the finding that the capacity of work group server operating systems to supply collectively file and print services and also user and group administration services constitutes, without prejudice to the other tasks which they are capable of performing, an essential feature of those systems, and that those systems are primarily designed, marketed, purchased and used to provide those services.486As regards, in the first place, demand-side substitutability, the Commission concludes at recital 387 to the contested decision that there are no products that ... exercise sufficient competitive pressure on work group server operating systems such that they should be included in the same relevant product market.487In arriving at that conclusion, the Commission established, first, that it followed from the information gathered in the 2003 market enquiry that work group servers performed a distinct set of linked tasks which were demanded by consumers (recitals 348 to 358 to the contested decision).488The Court considers that that finding is confirmed by the evidence in the file and that Microsoft has raised no argument which disproves it.489In its request for information of 4 June 2003, the Commission asked the organisations concerned whether within those organisations a particular type of server was used to supply file and print services and group and user administrative services (first part of question 1). Of the 85 organisations which answered that question, 70 (approximately 82.3%) said that that was so.490The Commission also asked the organisations whether they considered that those services constituted a set of server tasks that go together (second part of question 1). Of the 83 organisations which answered that question, 51 (61.4%) endorsed that proposition.491Those results are explained, in particular, by the fact that those services constitute the basic services which client PC users use in their daily activities. Entity I 06, for example, explains its positive answer to both parts of question 1 by describing servers that supply work group services as infrastructure servers and those services as standard desktop services'. It states that [e]ach user shall be identified/authenticated; he/she will create/modify files, print them, exchange/share them. Likewise, other organisations refer to the servers as being infrastructure server providers (see response of entities I 13 and I 30).492It is also significant that, as the Commission observes at recital 352 to the contested decision, several organisations explained their positive response to both parts of question 1 by the need to have a single sign-on identification' for users accessing the resources of the network or a single point of administration of the network (see, inter alia, the responses of entities I 30, I 46-16, I 46-37 and Inditex). Other organisations mention cost considerations, stating, in particular, that the use of the same operating system to supply work group services allows a reduction in administration costs (see, inter alia, the responses of entity I 49-19 and Inditex).493It is true that in the description of work group tasks' in its request for information of 4 June 2003 the Commission also included support for internal email and collaboration services and other non-mission critical applications' and that a number of the organisations questioned approved the inclusion of those services in that description. It is also true that, in answer to question 2 in the same request for information, 62 organisations out of 85 (approximately 72.9%) stated that they appreciated the flexibility offered by a work group server operating system which, in addition to file and print services and user and group administration services, was able to supply non-mission critical services.494However, it cannot be inferred from those findings alone that the Commission defined the second product market too narrowly.495First, those findings must be qualified. Thus, in their response to question 1 of the request for information of 4 June 2003, a number of the organisations questioned stated that in their operations internal email or collaboration services were performed on specialist servers and they distinguished those services from the other work group services mentioned by the Commission (see, in particular, the responses of entities I 09-1, I 11,1 22, I 37, I 53, I 46-13, I 46-15, I 59 and I 72, and also those of Danish Crown, Spardat and Stork Food & Dairy Systems). For example, while entity I 37 considered that the work group tasks defined by the Commission constituted a set of linked server tasks, it stated that file/print [services] [went] together, whereas internal email [services] [belonged to] a different set of servers. Likewise, entity I 46-15 stated that it had a server that provided file and print services and workstation management only.496Second, as the Commission observes at recitals 353 and 354 to the contested decision, and as it reiterates in its answer to one of the written questions put by the Court, the 2003 market enquiry also shows that when organisations use a given operating system to supply file or print services, they generally use the same operating system to supply user and group administration services. The Court notes that Microsoft does not dispute the findings in footnotes 436 and 438 to the contested decision relating to the correlation coefficients' calculated by the Commission on the basis of the responses to question 5 of its request for information of 16 April 2003. The Commission explains in those footnotes that the correlation coefficient' between the workload share of a NetWare system (or a

Windows system) for one of the work group services (namely file sharing, printing and user and group administration) and the workload share of the same system for another of the same services is particularly high. On the other hand, the correlation coefficient' is much lower between the workload share of a NetWare system (or a Windows system) for one of the work group services and the workload share of the same system for a different type of service, in particular internal email services or other applications which are non-mission critical. The Commission adds that the same conclusions may be deduced from results of the second and third Mercer surveys. In other words, it is apparent from that evidence, which Microsoft does not dispute, that it is much more usual to combine, on the same server, the work group services identified by the Commission than one of those services and a service of another type.497Consequently, while it is true that users attach a certain importance to the possibility of using work group server operating systems to perform certain non-mission critical tasks in addition to work group services, that does not at all affect the conclusion that there is a separate demand for server operating systems that supply work group services. Since it is settled that it is the three categories of services thus considered that determine the choice of demand, it is immaterial that the server operating systems belonging to the relevant market are capable of performing certain additional tasks.498Furthermore, as indicated at recitals 357, 358 and 628 to the contested decision, the customer statements produced by Microsoft during the administrative procedure confirm the correctness of the Commission's analysis.499Those statements show that while, admittedly, as Microsoft emphasises at a number of points in its pleadings, organisations often have heterogeneous computer networks (that is to say, networks in which server and client PC operating systems from different suppliers are used), they nevertheless use different types of servers to perform different types of tasks. More particularly, it is clear from those statements that work group services as defined by the Commission are generally supplied by other types of servers than those performing mission critical services. Thus, it appears from those organisations' descriptions of their computer environment that work group services are normally supplied by entry-level servers running a Windows or NetWare system, while mission critical applications run on more expensive and larger UNIX servers or on mainframes.500For example, a large chemical and pharmaceutical group states that the business-critical applications which it uses to pay its staff salaries and for internal banking transactions run on mainframes, while other business-critical applications used, inter alia, for the administrative and technical management of certain of its divisions are supplied by UNIX servers. On the other hand, within that group non-business-critical tasks, in particular file and print services and user and group administration services, are performed by separate servers which mainly run Windows operating systems. Likewise, a large airline explains that the applications which it uses especially for flight planning and reservation services are supplied by UNIX servers, whereas non-mission critical applications are supplied by Windows servers. A further relevant example is provided by a banking group, which states that it uses UNIX servers for essential financial applications, Solaris servers for other financial applications and applications which it develops in-house, and Windows NT servers to support infrastructure functionality such as domain services (especially login and permissioning) and file and print services.501The Court notes that, as indicated particularly at recitals 58 and 346 to the contested decision, low-end servers are not all used to supply work group services. Some of those servers are installed at the edge of networks and are intended to perform specialist tasks, such as Web serving, Web caching and firewall tasks.502Last, Microsoft's argument to the effect that the IDC data show that, with the single exception of Novell's NetWare system, the operating systems which the Commission describes as work group server operating systems' spend much less time performing work group tasks than performing other tasks cannot be upheld. That argument is based on IDC data which establish that only 24% of sales of servers, across all price ranges, running a Windows operating system correspond to file, print and network administration tasks (see footnote 93 to the reply). However, as may be seen from recitals 487 and 488 to the contested decision, and as the Court will explain in greater detail at paragraph 553 below, the method which IDC uses to calculate market shares has a number of flaws. In any event, even if the tasks mentioned above were to be considered to correspond to the work group services referred to in the contested decision, the percentage calculated on the basis of IDC's data would represent only Microsoft's share of sales of server operating systems, in all versions, which relate to the work group server operating systems market. Contrary to Microsoft's assertion, the percentage in question is not limited to work group server operating systems.503Second, the Commission found, relying in particular on Microsoft's own description of its products, that the server operating systems were optimised for the tasks which they were to perform (recitals 359 to 368 to the contested decision).504The Court considers that the evidence in the file confirms the correctness of that finding.505Thus, information published by Microsoft on its Internet site shows that the server operating systems in the Windows 2000 range are marketed in three different versions, namely, Windows 2000 Server, Windows 2000 Advanced Server and Windows 2000 Datacenter Server, and that each of those versions is intended to meet a specific task-based user demand.506Microsoft describes Windows 2000 Server as the entry-level version of its Windows 2000 server operating systems and as the right solution for work group file, print and communication servers (recital 361 to the contested decision). Windows 2000 Server scales from 1 to 4 processors and up to 4 gigabytes' (recital 364 to the contested decision).507Windows 2000 Advanced Server is presented by Microsoft as the right operating system for essential business and e-commerce applications that handle heavier workloads and high-priority processes (recital 362 to the contested decision). Windows Advanced Server not only contains all the functionalities offered by Windows 2000 Server but also offers additional scalability and reliability features, such as clustering, designed to keep ... business-critical applications up and running in the most demanding scenarios (recital 362 to the contested decision). Microsoft also states that Windows 2000 Advanced Server scales from 1 to 8 processors and up to 64 gigabytes (recital 364 to the contested decision).508Last, Microsoft presents Windows 2000 Datacenter Server as offering maximum reliability and availability and as constituting the right operating system for running mission-critical databases [and] enterprise resource planning software (recital 363 to the contested decision). Windows 2000 Datacenter Server is designed for enterprises that need very reliable high-end drivers and software and scales from 1 to 32 processors and up to 64 gigabytes (recitals 363 and 364 to the contested decision).509Microsoft gives a similar presentation of the different versions of the range of server operating systems that replaced the Windows 2000 range, namely Windows Server 2003 Standard Edition, Windows Server 2003 Enterprise Edition, Windows Server 2003 Datacenter Edition and Windows Server 2003 Web Edition.510Thus, it describes Windows Server 2003 Standard Edition as the ideal multipurpose network operating system for the everyday needs of organisations of all sizes, but especially small businesses and work groups and as permitting intelligent file and printer sharing, secure Internet connectivity, centralised desktop policy management and Web solutions that connect employees, partners, and customers (recital 365 to the contested decision).511Windows Server 2003 Enterprise Edition, according to Microsoft's description, offers, in addition to the functionalities present in Windows Server 2003 Standard Edition, reliability features needed for business-critical applications (recital 366 to the contested decision).512Windows Server 2003 Datacenter Edition, according to Microsoft, is built for mission critical applications that demand the highest levels of scalability, availability, and reliability (recital 366 to the contested decision).513Last, Windows Server 2003 Web Edition is described by Microsoft as being designed for building and hosting Web applications, pages, and services and as being designed specifically for dedicated Web serving needs (recital 367 to the contested decision). Microsoft emphasises that that system can be used solely to deploy Web pages, Web sites, Web applications, and Web services (recital 367 to the contested decision).514That publicity material shows that Microsoft itself presents the different versions of its server operating systems as being designed to meet distinct task-based user demands. It is also apparent from that publicity material that the different versions are not designed to run on the same hardware.515The Court also notes that the products of other operating system suppliers are also optimised for work group services. That is so particularly for the products of Red Hat, whose Red Hat Enterprise Linux ES and Red Hat Enterprise Linux AS operating systems are clearly designed to meet distinct user demands. Thus, as the Commission states at footnote 463 to the contested decision, on Red Hat's website its Red Hat Enterprise Linux ES system is described as being ideally suited for network, file, print, mail, Web, and custom or packaged business applications. On the other hand, its Red Hat Enterprise Linux AS system is presented as being targeted at high-end and mission-critical systems and as the ultimate solution for large departmental and datacenter servers. That is consistent with the finding that operating systems running on high-end servers are designed to perform mission critical tasks and must therefore be more reliable and have more functionalities than work group server operating systems (recitals 57 and 346 to the contested decision).516Third, the Commission relied on Microsoft's pricing strategy and, in particular, on the fact that it charged different prices for different versions of its server operating systems (recitals 369 to 382 to the contested decision).517First of all, it is clear from the information set out at recitals 370 to 373 to the contested decision, and not disputed by Microsoft, that there are significant price differentials between the different versions of its server operating systems, both in the Windows 2000 Server range and in the Windows 2003 Server range.518Thus, based on 25 Client Access Licences (CALs), the selling price of Windows 2000 Advanced Server is 2.22 times the price of Windows 2000 Server, while Windows 2000 Datacenter Server costs 5.55 times the price of Windows 2000 Server (based on 25 CALs).519Likewise, based on 25 CALs, the selling price of Windows Server 2003 Enterprise Edition is 2.22 times the price of Windows Server 2003 Standard Edition. The selling price of Windows Server 2003 Datacenter Edition is 5.55 times the price of Windows Server 2003 Standard Edition (based on 25 CALs). Windows Server 2003 Web Edition, which can be used only to perform certain specific tasks (see paragraph 513 above), is sold at a much lower price than Windows Server 2003 Standard Edition.520Next, contrary to what Microsoft appears to suggest (see paragraph 446 above), the Commission does not infer from the sole fact that Microsoft charges different prices for the different versions of its server operating systems that those versions belong to separate product markets. From the aspect of demand-side substitutability, the Commission takes into account not only those price differentials but also, and primarily, the fact that each of the different versions is designed to meet a specific user demand.521Nor is Microsoft entitled to rely on the fact that the more expensive versions of its

Windows Server 2003 range, namely Windows Server 2003 Enterprise Edition and Windows Server 2003 Datacenter Edition, allow the same work group tasks to be performed as Windows Server 2003 Standard Edition. Even though that may be true, the fact remains that the first two systems are intended to meet demands which are different from the third system and that it is unlikely that a user interested only in work group services will purchase a much more costly system than Windows Server 2003 Standard Edition for that purpose.522As the Commission correctly observes at recital 376 to the contested decision, Microsoft itself shares that opinion when, in its own marketing material, it states, with reference to the systems in the Windows 2000 Server range:

[T]he three offerings in the family — Windows 2000 Server, [Windows 2000] Advanced Server, and [Windows 2000] Datacenter Server — allow you to tailor your investment to provide the level of system availability that's appropriate for your various business operations, without overbuying for operations that don't require maximum uptime.

523In the same context, Microsoft cannot rely on the fact that the Windows Server 2003 Standard Edition operating system also allows tasks other than work group tasks to be performed. That argument ignores the fact that Microsoft charges different prices for that operating system depending on whether it is intended to be used to supply work group services or other types of services. As explained at recitals 84 and 380 to the contested decision, the prices charged by Microsoft for the Windows Server 2003 Standard Edition operating system include a fee for each server on which it is installed and a fee (CAL) for each client PC to which that server supplies work group services. By contrast, the user does not need to purchase a CAL if he wishes to use that operating system to perform unauthenticated tasks, such as firewall, proxy or cache serving. Those findings show, moreover, that Microsoft's assertion that [v]endors do not charge different people different prices for the same server operating system edition depending on how they will use it' is incorrect524Fourth, and last, the Commission observed that server operating systems other than work group server operating systems did not need to interoperate as fully with the client PCs in an organisation as work group server operating systems (recitals 384 and 383 to 386 to the contested decision).525In that regard, it is sufficient to point out that it has already been found at paragraph 385 above that the Commission was correct to make such an appraisal. In any event, its appraisal is not disputed by Microsoft.526It follows from the foregoing considerations that Microsoft has not established that the Commissions finding that there are no products that, from the demand-side perspective, exercise sufficient competitive pressure on work group server operating systems to justify their inclusion in the same relevant product market (recital 387 to the contested decision) was manifestly incorrect.527In the second place, the question of supply-side substitutability is analysed by the Commission at recitals 388 to 400 to the contested decision.528The Commission considers that other operating system vendors, including in particular vendors of server operating systems, would not be able to switch their production and distribution assets to work group server operating systems without incurring significant additional costs and risks and within a time framework sufficiently short so as to consider that supply-side considerations are relevant in this case' (recital 399 to the contested decision). More specifically, the Commission rejects the argument developed by Microsoft in its response of 16 November 2001 to the second statement of objections, that there is a Virtually instantaneous supply-side substitution, in that it is sufficient to disable the more complex functionalities in higher-end server operating systems in order to obtain a product comparable to a work group server operating system.529It is clear to the Court that, in the body of its pleadings, Microsoft puts forward no specific argument capable of calling in question the analysis carried out by the Commission in the recitals to the contested decision referred to above. In the reply, it merely makes the general assertion that [t]he cost of modification in many cases would be zero and in the other cases ... would be negligible, without even indicating whether it thereby intends to contest the Commission's finding that there was no supply-side substitutability.530In those circumstances, the Court finds that Microsoft has not established that the Commission manifestly erred when it concluded that there was no supply-side substitutability in this case.531The Court concludes from the foregoing that the Commission was correct to define the second product market as the work group server operating systems market.532That conclusion is not called in question by Microsoft's assertion that [n]o one in the industry uses the term work group server in the way the Commission has used it to define [the relevant product market]. First, as the Commission quite correctly states, the terminology which it uses to designate the market makes no difference whatsoever to whether it defined the market correctly. Second, Microsoft's assertion in any event has no basis in fact, since the file shows that the expressions work group server' and work group server operating system' are used in the industry to designate the type of products covered by the contested decision. Thus, in its complaint of 10 December 1998, Sun expressly states that the complaint relates to Microsoft's conduct in the work group server operating systems sector. Likewise, it must be borne in mind that in its marketing material Microsoft itself presents its Windows 2000 Server as the right solution for work group file, print and communication servers (see paragraph 506 above).533Microsoft takes issue with the Commission for having used an inappropriate method to calculate the market shares of the various operators on the second product market. It maintains, in particular, that that method provides no relevant information about dominance.534The Court finds that, for the reasons given below, Microsoft has not demonstrated that the method used by the Commission is vitiated by any manifest error of assessment.535At recitals 473 to 490 to the contested decision, the Commission explains its method in detail536The Commission states, first of all, that it uses two categories of proxies' to assess the position of the various operators on the market, namely, first, estimates of new sales by IDC based on price-band proxies and workload shares for various tasks and, second, estimates of market shares based on the results of the 2003 market enquiry and the second and third Mercer surveys (recital 473 to the contested decision).537It must be pointed out at the outset that the statement in the preceding paragraph shows that Microsoft's assertion that the Commission, when calculating market shares, took into account only the time spent by the server operating systems in performing work group tasks and sales of server operating systems costing under USD 25000 is clearly incorrect. Microsoft fails to mention that the Commission also took into consideration data from sources other than IDC. As will be shown at paragraph 556 below, the market shares established on the basis of the latter data correspond globally to those determined on the basis of the IDC data.538Next, the Commission states that market shares must be estimated on the number of units of the product shipped and the turnover generated by sales of software and hardware together (recitals 474 to 477 to the contested decision).539Last, the Commission contends that the IDC data must be adjusted by means of two filters (recitals 478 to 489 to the contested decision). First, it takes account only of servers costing less than USD 25000 (or EUR 25000, since, as stated in footnote 6 to the contested decision, at the material time EUR 1 corresponded roughly to USD 1). Second, it took into consideration only certain of the categories of tasks defined by IDC.540Microsoft's complaint is directed against the use of those two filters.541As regards the first filter, in the body of the reply Microsoft merely contests, quite generally, its relevance. In annex C.12 to the reply, it expands somewhat on its argument, first, by claiming that the 2003 market enquiry — some of the results of which were used by the Commission to justify the application of that filter — concerns the behaviour of a particular group of customers and, second, by criticising the fact that the Commission takes account of the selling price of servers and not the selling price of operating systems. On that last point, the applicant submits that the same work group server operating system can run on servers of very different prices, and in particular on servers costing more than USD 25000.542Those arguments cannot be accepted.543First of all, the entities questioned by the Commission in connection with the 2003 market enquiry do not represent a particular group of customers. As stated at recital 8 to the contested decision, those entities are companies selected at random by the Commission, established in different Member States, of different sizes and from different activity sectors.544Next, as the Commission stated in answer to one of the written questions put by the Court, the price limit of USD 25000 (or EUR 25000) applies to the total cost of the system (that is to say, hardware and software). The Court finds that the Commission was correct to take account of the selling price of hardware and software to evaluate the market shares of the operators on the work group server operating systems market. As stated at recitals 69 and 474 to the contested decision, some vendors (including Sun and most UNIX vendors) develop and sell server operating systems bundled with the hardware. The Court takes account, moreover, of the fact that during the administrative procedure Microsoft itself recommended the approach thus adopted by the Commission (see recital 476 to the contested decision).545Last, the Court finds that the Commission was quite correct to apply a maximum price of USD 25000 (or EUR 25000), which corresponds to the maximum selling price of servers in the first of the three categories of servers according to which IDC divides the market for the purposes of its analyses (recital 480 to the contested decision). In effect, the results of the 2003 market enquiry show that work group server operating systems generally run on relatively cheap servers, unlike mission critical applications, which are run on high-level servers.546Thus, in connection with that enquiry, the Commission asked the organisations concerned to state what price they were prepared to pay for a work group server (question 3 of the request for information of 4 June 2003). Of the 85 organisations which answered that question, 83 (approximately 97.6%) stated that they would not pay more than EUR 25000.547Likewise, in its request for information of 16 April 2003, the Commission asked the organisations a number of questions concerning their past and planned purchases of servers intended to supply file and print services (questions 8 and 9). It appears from the answers to those questions that, of the 8236 servers purchased for that purpose by those organisations, 8001 (approximately 97.1%) cost less than EUR 25000 and that, of the 2695 planned purchases of such servers, 2683 (approximately 99.6%) cost less than EUR 25000 (recital 479 to the contested decision).548As regards the second filter, Microsoft merely observes in the body of its reply that the application of that filter leads to the absurd consequence that a copy of an operating system is counted as [being] both inside and outside the market, depending on the tasks it is performing at any given time. In annex C.12 to the reply the applicant adds that a large part of the (artificially) excluded sales almost certainly represent sales of [server operating systems] editions that are within the Commission's candidate market [namely, the work group server operating systems market].549Those arguments cannot be upheld either.550The Court finds not only that the Commission was quite correct to use that second filter, but also that Microsoft greatly exaggerates the consequences of its being used.551It is important to bear in mind why the Commission considered it necessary to use that filter. As stated at recital 482 to the contested decision, the Commissions reason for doing so was that not all the operating systems running on servers costing under USD 25000 (or EUR 25000) supply work group services. In particular, some of those systems are devoted exclusively to specific tasks outside, or at the edge of, work group networks, such as Web services or firewall services. That is the case, for example, of Windows Server 2003 Web Edition, which according to its licence conditions cannot be used to supply work group services and which normally runs on servers costing below USD 25000 (or EUR 25000).552The Commission therefore correctly concluded that it was necessary to qualify the IDC data on sales of computers costing below USD 25000 (or EUR 25000) by also taking into account the various types of tasks performed by those servers (recital 483 to the contested decision). To that end, the Commission used the IDC data in a database called IDC Server Workloads 2003 Model'. Those data were obtained from consumers whom IDC requested to specify the tasks (or workloads') carried out by the servers which they used in their organisation. As already stated at paragraph 431 above, IDC identified eight main categories of tasks and distinguished a number of sub-categories within those categories. The Commission used the sub-categories file/print sharing and networking, which were the ones that most closely corresponded to the file and print and group and user administration services referred to in the contested decision (recital 486 to the contested decision).553Admittedly, the tasks in those two sub-categories do not correspond exactly with the services constituting the work group server operating systems market. The Commission was however fully aware of that as may be seen from the examples which it gives at recitals 487 and 488 to the contested decision and which show, in particular, that certain tasks performed on high-end servers may be placed in one or other of those sub-categories although they clearly do not represent work group tasks.554However, it was precisely the combination of the two filters of which Microsoft complains that allowed that problem of consistency between the tasks defined by IDC and those identified by the Commission to be reduced.555In any event, it is clear that the market shares obtained if only the first filter is applied are not significantly different from those obtained when both filters are used together. Thus, Microsoft's market share for 2002, when calculated on the basis of all servers sold for below USD 25000, is 64.9% by units shipped and 61% by turnover (recital 491 to the contested decision). When, for the same servers, only the subcategories file/print sharing and networking are taken into consideration, Microsoft's market shares are as follows: 66.4% by units shipped (65.7% by turnover) for the first sub-category and 66.7% by units shipped (65.2% by turnover) for the second (recital 493 to the contested decision).556More generally, as noted at recital 473 to the contested decision, the percentages obtained using the IDC data, when both filters are applied together, correspond globally with those obtained on the basis of the 2003 market enquiry and the second and third Mercer surveys (see, for example, recitals 495, 497 and 498 to the contested decision). It must be emphasised in that context that each time the Commission erred on the side of caution. Thus, in Microsoft's case, it took the lowest market share, at least 60%' (recital 499 to the contested decision).557The Court concludes that Microsoft has not demonstrated that the method which the Commission used when calculating market shares is vitiated by a manifest error of assessment or, consequently, that the estimates of market shares given at recitals 491 to 513 to the contested decision must be considered manifestly incorrect.558Nor did the Commission base its finding that Microsoft held a dominant position on the work group server operating systems market solely on its market shares on that market. It also took into account the fact that there were barriers to entry to that market (recitals 515 to 525 to the contested decision), owing in particular to the presence of network effects and obstacles to interoperability, and also the close commercial and technological links between that market and the client PC operating systems market (recitals 526 to 540 to the contested decision).559Last, as regards the abusive refusal to supply, it must be borne in mind that in the contested decision the Commission takes issue with Microsoft for having used, by leveraging, its quasi-monopoly on the client PC operating systems market to influence the work group server operating systems market (recitals 533, 538, 539, 764 to 778, 1063, 1065 and 1069). In other words, Microsoft's abusive conduct has its origin in its dominant position on the first product market (recitals 567 and 787 to the contested decision). Even if the Commission were wrongly to have considered that Microsoft was in a dominant position on the second market (see, in particular, recitals 491 to 541, 781 and 788 to the contested decision) that could not therefore of itself suffice to support a finding that the Commission was wrong to conclude that there had been an abuse of a dominant position by Microsoft.560In the contested decision, the Commission considered whether the refusal at issue gave rise to a risk of the elimination of competition on the work group server operating systems market (recitals 585, 589, 610, 622, 626, 631, 636, 653, 691, 692, 712, 725, 781, 992 and 1070 to the contested decision). Microsoft contends that that criterion is not sufficiently strict, since according to the case-law on the exercise of an intellectual property right the

Commission must demonstrate that the refusal to license an intellectual property right to a third party is likely to eliminate all competition, or, in other words, that there is a high probability that the conduct in question will have such a result.561The Court finds that Microsoft's complaint is purely one of terminology and is wholly irrelevant. The expressions risk of elimination of competition and likely to eliminate competition' are used without distinction by the Community judicature to reflect the same idea, namely that Article 82 EC does not apply only from the time when there is no more, or practically no more, competition on the market. If the Commission were required to wait until competitors were eliminated from the market, or until their elimination was sufficiently imminent, before being able to take action under Article 82 EC, that would clearly run counter to the objective of that provision, which is to maintain undistorted competition in the common market and, in particular, to safeguard the competition that still exists on the relevant market.562In this case, the Commission had all the more reason to apply Article 82 EC before the elimination of competition on the work group server operating systems market had become a reality because that market is characterised by significant network effects and because the elimination of competition would therefore be difficult to reverse (see recitals 515 to 522 and 533 to the contested decision).563Nor is it necessary to demonstrate that all competition on the market would be eliminated. What matters, for the purpose of establishing an infringement of Article 82 EC, is that the refusal at issue is liable to, or is likely to, eliminate all effective competition on the market. It must be made clear that the fact that the competitors of the dominant undertaking retain a marginal presence in certain niches on the market cannot suffice to substantiate the existence of such competition.564Last, it must be borne in mind that it is for the Commission to establish that the refusal to supply gives rise to a risk of the elimination of all effective competition. As already stated at paragraph 482 above, the Commission must base its assessment on accurate, reliable and coherent evidence which comprises all the relevant data that must be taken into consideration in order to assess a complex situation and which are capable of substantiating the conclusions drawn from them.565In the contested decision, the Commission analyses together the circumstance that interoperability is indispensable and the fact that the refusal is likely to eliminate competition (recitals 585 to 692 to the contested decision). Its analysis has four parts. In the first place, the Commission examines the evolution of the work group server operating systems market (recitals 590 to 636 to the contested decision). In the second place, it establishes that interoperability is a factor which plays a determining role in the use of Windows work group server operating systems (recitals 637 to 665 to the contested decision). In the third place, it states that there are no substitutes for disclosure by Microsoft of the interoperability information (recitals 666 to 687 to the contested decision). In the fourth place, it makes a number of observations about the CPLC (recitals 688 to 691 to the contested decision).566The arguments which Microsoft puts forward in support of the present complaint relate essentially to the first part of the Commission's analysis. Microsoft claims, in effect, that the market data contradict the Commission's argument that competition on the work group server operating systems market is at risk of being eliminated as a consequence of the refusal at issue.567In the first part of its analysis, the Commission began by examining the evolution of the market shares of Microsoft and its competitors on the second product market. It established, essentially, that Microsoft's market share had experienced rapid and significant growth and that it continued to increase to the detriment of Novell in particular. The Commission then noted that the market share of UNIX vendors was weak. Last, it considered that Linux products had only a very small presence on the market, that they had made no headway on the market during the years immediately preceding the adoption of the contested decision and that certain forecasts concerning their future growth were not capable of calling in question its finding that effective competition would be eliminated on the market.568The Court considers that those different findings are confirmed by the evidence in the file and that they are not called in question by Microsoft's arguments.569First, the file shows that initially Microsoft supplied only client PC operating systems and that it was a relatively late entrant to the server operating systems market (see, in particular, paragraph 47 of the response of 17 November 2000 to the first statement of objections). It was only in the early 1990s that Microsoft began to develop a server operating system — it marketed its first system, Windows NT 3.5 Server, in July 1992 — and it was only with Windows NT 4.0, released in July 1996, that it first encountered real commercial success (see, in particular, paragraph 50 of the response of 17 November 2000 to the first statement of objections and paragraphs 50 and 56 of the application).570It is apparent from the IDC data, as reproduced at recital 591 to the contested decision, that Microsoft's market share, by units shipped, on the market for operating systems for servers costing under USD 25000 grew from 25.4% (24.5% by turnover) in 1996 to 64.9% (61% by turnover) in 2002, a leap of almost 40% in just six years.571It also follows from the IDC data mentioned at recital 592 to the contested decision that Microsoft's market share increased continuously following the launch of the Windows 2000 generation of operating systems. As the Commission rightly observes at a number of places in the contested decision (see, for example, recitals 578 to 584, 588 and 613 to the contested decision), it was specifically with the Windows 2000 range of operating systems that the problems of interoperability arose in a particularly acute fashion for Microsoft's competitors.572Thus, for example, the NDS for NT software, which had been developed by Novell by reverse engineering, made interoperability possible between Microsoft's competitors' work group server operating systems and the Windows domain architecture (in this instance Windows NT). NDS for NT could be installed on a Windows NT domain controller and enabled clients to use Novell's NDS (Novell Directory Service) (later called eDirectory) to administer the different aspects of Windows NT domains. Because Microsoft failed to communicate certain information to Novell, however, NDS for NT does not work with the Windows 2000 Server operating system (see recital 301 to the contested decision).573Another example is AS/U, which AT&T had been able to develop in the 1990s by using certain Windows source code which Microsoft had agreed to disclose to it under a licence. AS/U enabled a server running UNIX to work as main domain controller in a Windows NT domain (see recital 211 to the contested decision). Likewise, Sun, on the basis of the AS/U source code licensed to it by AT&T, had developed a product comparable to AS/U, PC NetLink, which, when installed on a Solaris server, enabled that server to provide transparent Windows NT file, print, directory, and security services to Windows 3.X/95/98/NT clients (and to do so natively, that is to say, without users having to install additional software on their client PCs) and to act as a primary domain controller (or backup domain controller) in a Windows NT domain (see recital 213 to the contested decision). In 2001 Microsoft and AT&T decided not to extend their licence agreement to certain new server operating system technologies. Thus, Microsoft did not supply AT&T with the source code relating to the systems which replaced Windows NT 4.0. Consequently, PC NetLink was no longer capable of working except with Windows NT client PCs — in particular, it did not work with Windows 2000 — and gradually lost its attraction.574In the same context, it is appropriate to mention the various changes which followed the migration from Windows NT technology to Windows 2000 technology and Active Directory (see paragraphs 167 to 171 above).575Second, it is apparent from the file that, alongside the evolution of Microsoft's position as described above, Novell experienced a continuous decline on the work group server operating systems market and in just a few years became a secondary player. At the time when Microsoft entered the server operating systems market, the leading product for the supply of work group services was Novell's NetWare (see paragraph 56 of the application), which had been present on that market since the mid-1980s.576Thus, the IDC data mentioned at recital 593 to the contested decision show that, when the file/print sharing sub-category and servers costing under USD 25000 are taken into account, NetWare's market share fell from 33.3% in 2000 to 23.6% in 2002 by units shipped and from 31.5% in 2000 to 22.4% in 2002 by turnover.577Novells decline is confirmed both by the statements of market analysts and by Microsoft itself (see recital 596 to the contested decision).578Similarly, in the report containing the analysis of the results of its third survey, Mercer expressly states that numerous organisations have reduced their use of NetWare. Mercer observes, in particular, that when asked about their usage of each of the server operating systems for work group server functions over the last five years, organisations that have reduced their usage of NetWare outnumber those that have increased their usage of NetWare by a nearly 7:1 ratio' (page 25 and table 16 of the report).579Furthermore, as the Commission correctly observes at recitals 594 and 595 to the contested decision, certain results of the 2003 market enquiry and certain customer statements produced by Microsoft during the administrative procedure clearly show a tendency within organisations to replace NetWare by Windows 2000 Server. On the other hand, there are only very few examples of migration from Windows to NetWare (see recitals 594 and 632 to the contested decision).580Third, the evidence in the file shows that Microsoft's other competitors were able to maintain only a very marginal position on the work group server operating systems market.581Thus, first of all, the IDC data mentioned at recital 508 to the contested decision show that the market share of UNIX vendors (including Sun) represented, when the file/print sharing subcategory and servers costing under USD 25000 were taken into account, only 4.6% by units shipped and 7.4% by turnover. For the network administration sub-category, the corresponding figures were 6.4% by units sold and 10.8% by turnover.582The results of the 2003 market enquiry and the customer statements produced by Microsoft show that UNIX systems are effectively used not to perform work group tasks but to run mission-critical Web supply and firewall applications and also, to a lesser extent, to run internal email services (see recitals 509 to 511 to the contested decision).583Next, the IDC data, the results of the 2003 market enquiry and Microsoft's customer statements show that, contrary to Microsoft's assertions, Linux products also had only a marginal presence on the work group server operating systems market at the time of adoption of the contested decision.584Thus, the IDC data reproduced at recital 599 to the contested decision show that the combined market share of vendors of Linux products, by units shipped, fell, for the file/print sharing subcategory and servers costing under USD 25000, from 5.1% in 2000 to 4.8% in 2002. When measured by turnover, that combined market share remained at 3.9% over that period.585Admittedly, for the network administration sub-category and servers costing under USD 25000, the combined share of vendors of Linux products, by units shipped, rose, according to the IDC data mentioned in footnote 728 to the contested decision (see also recital 505 to the contested decision), from 10.1% in 2000 to 13.4% in 2002 (and from 8% to 10.8% over the same period, by turnover). However, that increase has to be qualified in light of the fact that, as the Commission observes at recital 488 to the contested decision and in the above footnote to the contested decision, that sub-category includes services which are not work group services within the meaning of the contested decision. IDC describes that sub-category as includ[ing] the following networking applications: directory, security/authentication, network data/file transfer, communication, and system data/file transfer (recital 488 to the contested decision). Such a description is likely to lead the users questioned by IDC to include in that sub-category certain tasks which do not belong there (and do not belong in the relevant product market) and which are generally performed by Linux or UNIX systems. For example, that description might be interpreted as covering network edge tasks, such as firewall (which might be considered to relate to security') and routing (which might be considered to relate to system data/file transfer'). As stated, in particular, at recitals 58, 346, 482, 600 and 601 to the contested decision, however, tasks of that type are generally performed by Linux on high-end servers. Accordingly, the IDC data relating to the network administration sub-category overestimate Linux sales on the work group server operating systems market.586It is true that, at recital 487 to the contested decision, the Commission observes that the IDC data on the file/print sharing sub-category are also less than perfect, notably in that, because high-end servers which perform mission critical applications may be used to print certain documents (for example invoices), the users questioned may form the view that those servers perform tasks belonging to that sub-category when it is clear that they are not work group servers. However, the application of the EUR 25000 (or USD 25000) filter allows such inaccuracy to be reduced (see recital 489 to the contested decision, where the Commission observes that mainframes that print invoices will generally cost more than that amount). The IDC data are therefore more flawed with respect to the network administration sub-category than with respect to the file/print sharing sub-category.587The results of the 2003 market enquiry contain no flaws of the type referred to in the preceding paragraph. Those results confirm that Linux had only a marginal presence on the work group server operating systems market Thus, in its request for information of 16 April 2003, the Commission requested the organisations concerned whether they used Linux servers in conjunction with Samba software to perform work group tasks (question 25). Of the 102 organisations which participated in that enquiry, only 19 used Linux servers for work group tasks, and in most cases did so to a very limited extent (recital 506 to the contested decision). Thus, out of a total of more than 1200000 client PCs covered by the 2003 market enquiry, fewer than 70000 (less than 5.8%) were served by Linux/Samba servers for file and print tasks (recitals 506 and 599 to the contested decision).588Likewise, as the Commission submits in the defence (paragraph 140), the second Mercer survey reveals, for Linux products, a combined market share of 4.8%

for file and print tasks and 5.2% for group and user administration tasks (the third Mercer survey reveals, for the same products, a market share of 5.4% for file and print services and 4.5% for group and user administration tasks).589In reality, the results of the 2003 market enquiry show that, like UNIX, Linux products are generally used to perform tasks other than work group tasks, namely, to provide Web and firewall services and to run mission-critical applications (see recitals 600 and 601 to the contested decision, where the Commission comments on the responses to questions 5 and 6 of the request for information of 16 April 2003).590That finding is confirmed, moreover, by the customer statements submitted by Microsoft during the administrative procedure, as the Commission correctly observes at recital 602 to the contested decision.591Furthermore, the presence of vendors of Linux products on the work group operating systems market, apart from the fact it is by no means comparable to the market presence which Microsoft managed to acquire in just a few years, was achieved not at Microsoft's expense but at the expense of Novell and UNIX vendors. As the Commission stated in the rejoinder (paragraph 104), among the entities questioned by Mercer whose use of Linux for work group server tasks had increased over the previous five years, 67% had decreased their use of NetWare or UNIX, while only 14% had decreased their use of Windows. As the Commission correctly states at recital 632 to the contested decision, moreover, the 2003 market enquiry revealed only two instances of migration from Windows to Linux for work group server tasks.592Microsoft's assertions to the contrary in annex C.11 to the reply are scarcely credible, having regard particularly to the consistent increase in its market share on the relevant product market throughout the period covered by the abusive refusal in question.593The above factors confirm that Microsoft's refusal has the consequence that its competitors' products are confined to marginal positions or even made unprofitable. The fact that there may be marginal competition between operators on the market cannot therefore invalidate the Commission's argument that all effective competition was at risk of being eliminated on that market.594In light of the factors referred to at paragraphs 583 to 593 above, the Court considers that the Commission was correct to find, at recital 603 to the contested decision, that Linux vendors did not represent a significant threat to Microsoft on the work group server operating systems market595Microsoft also claims that the presence of Linux products on the work group server operating systems market will continue to increase in the future. It expands on that argument in annex A.19 to the application and in annex C.11 to the reply. The Commission provides a detailed response to that argument in annex B.10 to the defence and in annex D.11 to the rejoinder.596In support of that argument, Microsoft refers, first of all, to certain results of the third Mercer survey.597In that survey, Mercer asked the IT executives whose organisations already used Linux operating systems for work group tasks whether they planned to increase that use within the next five years. Table 19 in the Mercer report, in which the results of that survey are analysed, shows that of the 70 IT executives concerned by that question, 53 responded in the affirmative.598The Court finds that the Commission was correct to conclude, at recital 605 to the contested decision, that that factor was not conclusive. On the one hand, those 53 IT executives represented only approximately 17.9% of the 296 IT executives who participated in the third Mercer survey (226 of those executives stated that their organisation did not use Linux systems to supply work group services). On the other hand, the 53 IT executives in question did not quantify their intended increase in use of Linux systems to perform work group tasks, nor did they specify whether that increase would be at the expense of Windows.599Furthermore, table 18 in the same Mercer report shows that 58 IT executives considered that Linux would not even become Viable' for the performance of work group tasks within the next five years.600It is true that the same table shows that 60% of the IT executives questioned stated that their organisation planned to adopt Linux systems within the next five years to supply work group services. However, as the Commission correctly observes at recital 606 to the contested decision, those executives were not invited to quantify their takeup of Linux nor to say whether it would be at the expense of Windows.601Next, Microsoft relies on certain projections by IDC which establish that Linux's market share will double between 2003 and 2008.602The Court observes that the IDC data contain a number of flaws, as its subcategories include tasks which do not belong to the work group server operating systems market covered by the contested decision. IDC's growth projections must therefore be qualified.603Furthermore, as the Commission correctly observes at recital 609 to the contested decision, the limited growth that Linux is forecast to achieve on the market, according to those projections, would be at the expense, not of Windows, but of competing systems and, more particularly, of NetWare. The Court observes, in that context, that in April 2003 Novell announced that from 2005 its NetWare 7.0 operating system would be sold in two different versions, one based on the traditional NetWare platform and the other on the Linux operating system (see recital 95 to the contested decision).604Last, in annex A.19 to the application and annex C.11 to the reply, Microsoft refers to the opinion expressed by certain industry observers. It refers, more expressly, to certain passages in a report of 8 March 2004 by Merrill Lynch (annex 7 to annex C.11 to the reply) which contains the results of a survey carried out by Merril Lynch among 50 IT executives. The applicant observes that half of those executives proposed to increase their use of Linux systems in their organisation and that, of that half, 34% envisaged doing so in order to replace Windows NT for file and print tasks.605That argument is not convincing. All that it means is that 17% of the IT executives questioned intended to replace Windows NT by Linux systems for the tasks referred to in the preceding paragraph, whereas it says nothing about the extent to which Windows would be thus replaced. In reality, in light of the fact that at the time of the Merril Lynch survey Windows NT technology was already outdated (see recital 583 to the contested decision), it is highly probable that the installed base of Windows NT servers was relatively small and, accordingly, that the migration referred to above would be on only a small scale. It should also be borne in mind that non-Microsoft server operating systems could achieve a higher degree of interoperability with the Windows NT generation of systems than with subsequent generations of Windows produced by Microsoft. As the Commission emphasises in its assessment of the circumstance relating to the indispensability of the information at issue (see paragraph 366 above), the migration referred to in the Merril Lynch report is likely to be a one-off phenomenon and cannot therefore affect the Commission's findings in respect of the risk of the elimination of competition.606Continuing with the first part of its analysis (the part relating to the evolution of the work group server operating systems market), the Commission then established that Windows 2000, and in particular Active Directory, were quickly gaining traction in the market' (recitals 613 to 618 and 781 to the contested decision). The Commission further observed that, [owing] to Microsoft's disruption of interoperability-related disclosures, interoperability with ... Windows 2000 features is significantly more difficult for non-Microsoft work group servers than used to be the case with the analogous technologies in Windows NT, before concluding that the uptake [of the new features of the Windows domain specific to Windows 2000] contributes to the lock-in of the customers that embrace them in a homogeneous Windows solution for work group networks (recital 613 to the contested decision).607The Court finds that a number of documents in the file substantiate the correctness of those findings.608Thus, in a bulletin published in November 2001, IDC stated that [f]or the vast majority of users, the question is not if, but when, they will implement directory services to support Windows 2000 Server and future Windows server operating systems and that for Windows 2000 users, the directory of choice is overwhelmingly going to be Active Directory (recital 614 to the contested decision).609Likewise, as the Commission notes at recital 616 to the contested decision, an Evans Data Corporation survey conducted in 2002 shows that, when asked about the directory services for which their applications were designed, 50.3% of the in-house developers concerned mentioned Active Directory.610Certain results of the 2003 market enquiry also confirm the impressive interest caused by Active Directory. Thus, in its request for information of 16 April 2003, the Commission asked the entities concerned whether they had already implemented (or decided to implement) Active Directory in the majority of the Windows domains in their computer network (question 15). Of the 102 entities covered by the survey, 61 answered that question in the affirmative.611The interest in Active Directory is also apparent from certain results of the second Mercer survey, as the Commission notes at recital 618 to the contested decision.612It was stated at paragraphs 571 to 574 above, moreover, that the interoperability that work group server operating systems can achieve with products of the Windows 2000 generation is much lower than they were able to achieve with systems of the previous generation.613Last, the Commission concluded the first part of its analysis by rejecting three categories of arguments that Microsoft had put forward during the administrative procedure to dispute the risk of elimination of competition identified by the Commission. Microsoft had referred to certain statements made by its competitors, relied on the fact that the computer networks within undertakings were heterogeneous and claimed that replacement solutions for Windows existed.614In its pleadings, Microsoft referred to the customer statements which it had produced during the administrative procedure and reiterated its argument that networks within undertakings are heterogeneous.615On that point, it is sufficient to observe that it has already been found at paragraphs 498 to 500 above that those statements confirmed that, so far as work group servers were concerned, those customers' computer networks consisted primarily of Windows systems.616In its pleadings, Microsoft also relies on the fact that professional customers adopt their purchasing decisions in respect of server operating systems according to a set of criteria and that the question of interoperability with Windows client PC operating systems is not a determining factor in that regard. As already demonstrated at paragraph 426 above, that assertion is incorrect.617Furthermore, Microsoft's argument that, six years after the alleged refusal to supply, there were still numerous competitors on the work group server operating systems market (see paragraph 442 above) must be rejected for the reasons set out at paragraph 429 above.618It follows from all of the foregoing that the Commission did not make a manifest error of assessment when it concluded that the evolution of the market revealed a risk that competition would be eliminated on the work group server operating systems market.619The Commission had even more reason to conclude that there was a risk that competition would be eliminated on that market because the market has certain features which are likely to discourage organisations which have already taken up Windows for their work group servers from migrating to competing operating systems in the future. Thus, as the Commission correctly states at recital 523 to the contested decision, it follows from certain results of the third Mercer survey that the fact of having an established record as proven technology is seen as a significant factor by the large majority of IT executives questioned. At the time of the adoption of the contested decision, Microsoft, at a conservative estimate, held a market share of at least 60% on the work group server operating systems market (recital 499 to the contested decision). Likewise, certain results of that survey also establish that the factor available skill-sets and cost/availability of support (in-house or external)' is important for the majority of the IT executives questioned. As the Commission quite correctly states at recital 520 to the contested decision, [that] means that the easier it is to find technicians skilled in using a given work group server operating system, the more customers are inclined to purchase that work group server operating system and, [i]n turn, however, the more popular a work group server operating system is among customers, the easier it is for technicians (and the more willing are technicians) to acquire skills related to that product. Microsoft's very high market share on the work group server operating system market has the consequence that a very large number of technicians possess skills which are specific to Windows operating systems.620The Court therefore concludes that the circumstance that the refusal at issue entailed the risk of elimination of competition is present in this case.621Microsoft cites paragraphs 48 and 49 of IMS Health, cited in paragraph 107 above, and maintains that it has not been established that its refusal prevented the appearance of a new product for which there is unsatisfied consumer demand.622The applicant already markets server operating systems which implement the communication protocols in question and its competitors market their own server operating systems, which use communication protocols which they have selected to provide work group services.623Microsoft refers to recital 669 to the contested decision and claims that the contested decision seeks to allow its competitors to make their products behave in exactly the same way as Windows server operating systems and that it is the Commissions intention that the applicants communication protocols should be used by its competitors to create server operating systems that compete directly with the applicants products by mimicking their functionality.624Microsoft also claims that the contested decision fails to identify any new product that its competitors would develop using the applicants communication protocols and to demonstrate that there is any demand for such a product. The Commission merely claims that Microsoft's competitors could use the disclosures to [develop] the advanced features of their own products' (recital 695 to the contested decision).625Microsoft observes that neither the letter of 15 September 1998 nor Sun's complaint of 10 December 1998 gives the slightest indication that Sun intended to use Microsoft's technology to create anything other than a work group server operating system.626Microsoft disputes the Commission's assertion that in order to be described as new, it is sufficient for a product to contain substantial elements contributed by the licensee's own efforts. It maintains that the [a]ddition of a feature taken from a competitor's products can hardly be viewed as the creation of a new product.627Microsoft also challenges the Commission's claim that the applicant's refusal is a refusal to allow follow-on innovation (see paragraph 632 below). It disputes the accuracy of the statements set out at recital 696 to the contested decision and submits that Novell never used AS/U and that sales of work group server operating systems supplied by Sun and several other vendors' who had been licensed to use AS/U were always modest. In reality, the compulsory licensing ordered in the contested decision is likely to reduce innovation, because the applicant will have less incentive to develop a specific technology if it is required to make that technology available to its competitors.628Last, Microsoft denies that the refusal at issue harms consumers. The Mercer report on which the Commission relies (see paragraph 635 below) relates to products currently on the market and is therefore irrelevant to the question whether the refusal to supply prevented the emergence of new products for which there is unmet consumer demand. Much more significantly, none of the Mercer reports shows that Microsoft lags behind' its competitors. More specifically, the Commission fails to mention that Windows server operating systems scored higher than NetWare and Linux systems in 10 out of 13 categories and higher than UNIX systems in 9 out of 13 categories; and throughout the administrative procedure no customer claimed that it had been forced to use Windows server operating systems as a result of the applicants alleged refusal to disclose interoperability information to its competitors.629CompTIA submits that the Commission has not shown in the contested decision that Microsoft's refusal had prevented the appearance of a new product.630The Commission rejects Microsoft's assertion that its refusal did not prevent the appearance of a new product for which there is unmet consumer demand.631The Commission submits that, in the first place, it follows from paragraph 49 of IMS Health, cited in paragraph 107 above, that a new product is a product which does not limit itself essentially to duplicating the products already offered on the market by the owner of the copyright. It is sufficient, therefore, that the product concerned contains substantial elements that result from the licensee's own efforts. As Microsoft is required to disclose only the specifications and not the implementation of its interfaces, its competitors will not limit themselves to duplicating its products and, indeed, will not be able to do so. Competitors will use the interoperability information to constantly market improved products and offer ... added value over their own and Microsoft's previous offerings, instead of being eliminated from the market as a consequence of Microsoft's refusal to disclose that information (recital 695 to the contested decision). Nor will any feature of Microsoft's products, and in particular any portion of its software code, be integrated in other work group server operating systems.632In the second place, the Commission did not confine itself in the contested decision to a mere analysis of the new product criterion as defined in IMS Health, cited in paragraph 107 above. It examined that criterion by reference to the prohibition laid down in Article 82(b) EC of abuses of a dominant position that limit technical development to the prejudice of consumers. The Commission thus took particular care to ascertain that Microsoft's refusal was a refusal to allow follow-on innovation, that is to say, the development of new products, and not a mere refusal to allow copying.633In support of those assertions, the Commission claims, first, that it examined the conduct which Microsoft's competitors had adopted in the past when Microsoft supplied interoperability information to them or inadvertently allowed them to employ workarounds' (recital 696 to the contested decision). In response to Microsoft's criticisms of that point, the Commission explains that, as Novell was not a UNIX vendor, it was not interested in UNIX-based implementations such as AS/U. However, Sun and other UNIX vendors offered innovative products which could have met demand from those consumers if Microsoft had not refused to supply interoperability information.634Second, the Commission observes that, at recital 698 to the contested decision, it noted that numerous different implementations of the same specification were possible.635Third, the Commission cites recital 699 to the contested decision and asserts that it follows from the results of the third Mercer survey that, in spite of the fact that Microsoft lags behind its competitors on several features considered important by server operating systems consumers, those consumers content themselves with Microsoft's products because of the interoperability barrier to adopting alternatives. Microsoft scores higher than its competitors only because interoperability with Windows is a factor taken into account and because less important factors are given the same weight as important factors. In response to Microsoft's argument that no customer has complained about having to adopt a Windows operating system because of its refusal to supply, the Commission refers to recitals 702 to 708 to the contested decision.636Fourth, the Commission observes that Microsoft's competitors undertake research and development, but that they need access to Microsoft's protocols to enable organisations using Windows work group servers and PCs to take advantage of their innovation without being penalised by the lack of interoperability. It states that [a]s such, the refusal does not directly impair competitors ability to innovate, but rather the consumer's ability to benefit from such innovation, as well as the competitors' ability to earn a return on their innovation — and hence in the longer term their incentives to innovate.637Last, the Commission asserts that Microsoft's arguments concerning its own incentives to innovate are not relevant to the assessment of the consequences which the abusive practice has for its competitors' incentives to innovate.638In the third place, the Commission claims that Microsoft's argument that the new product criterion is not satisfied in this case is based on a misinterpretation of the case-law.639First, that criterion does not require a concrete demonstration that the licensee's product will attract customers who do not buy the products offered by the existing dominant supplier. In IMS Health, cited in paragraph 107 above, the Court of Justice focused on product differentiation which could affect consumer choices or, in other words, whether there was potential demand for the new product. The new product criterion emphatically does not apply solely to restrictions on production. In the rejoinder, the Commission asserts that the proposed new products will clearly respond to potential demand and that they will build upon operating systems currently marketed by Microsoft's competitors, which have features that consumers value, often more highly than the corresponding features of Microsoft's work group server operating systems.640Second, Microsoft cannot rely on the fact that the contested decision focuses on its competitors' ability to adapt their own existing products. The relevant question is whether those competitors will essentially confine themselves to reproducing the existing products developed by the holder of the intellectual property right. Microsoft's competitors' products will implement the same set of protocols as Windows work group server operating systems do but will differ widely in terms of performance, security and functionality.641Third, the Commission asserts that the case-law does not preclude the possibility that the licensee's future products will compete with the products of the owner of the intellectual property right, as may be seen from the facts of Magill and IMS Health, cited in paragraph 107 above.642SIIA claims that the refusal at issue prevents the emergence of new and innovative non-Microsoft work group server operating systems meeting the interoperability needs of customers. If they have the interoperability information, Microsoft's competitors will be able to offer not only enhanced functional capabilities but also, and most importantly, interoperable products. SIIA also observes that there would be no competitive advantage for Microsoft's competitors in merely duplicating Microsoft's products and that, moreover, they would be unable to do so if they had access to the information covered by the contested decision.643It must be emphasised that the fact that the applicant's conduct prevents the appearance of a new product on the market falls to be considered under Article 82(b) EC, which prohibits abusive practices which consist in limiting production, markets or technical developments to the ... prejudice of consumers'.644Thus, at paragraph 54 of Magill, cited in paragraph 107 above, the Court of Justice held that the refusal by the broadcasting companies concerned had to be characterised as abusive within the meaning of that provision because it prevented the appearance of a new product which the broadcasting companies did not offer and for which there was a potential consumer demand.645It is apparent from the decision at issue in that case that the Commission had, more specifically, considered that by their refusal, the broadcasting companies limited production or markets to the prejudice of consumers (see the first paragraph of recital 23 to Commission Decision 89/205/EEC of 21 December 1988 relating to a proceedings under Article [82 EC] (IV/31.851, Magill TV Guide/ITP, BBC and RTE) (OJ 1989 L 78, p. 43). The Commission had found that that refusal prevented publishers from producing and publishing a weekly television guide for consumers in Ireland and Northern Ireland, a type of guide not then available on that geographic market. Although each of the broadcasting companies concerned published a weekly television guide, each guide was devoted to that particular broadcasters own programmes. In finding an abuse of a dominant position by those broadcasting companies, the Commission had emphasised the harm which the absence of a general weekly television guide on the market in Ireland and in Northern Ireland caused to consumers, who, if they wished to know what programmes were being offered in the coming week, had no alternative to buying the weekly guides of each channel and themselves extracting the relevant information in order to make comparisons.646In IMS Health, cited in paragraph 107 above, the Court of Justice, when assessing the circumstance relating to the appearance of a new product, also placed that circumstance in the context of the damage to the interests of consumers. Thus, at paragraph 48 of that judgment, the Court emphasised, with reference to the Opinion of Advocate General Tizzano in that case ([2004] ECR I-5042), that that circumstance related to the consideration that, in the balancing of the interest in protection of the intellectual property right and the economic freedom of its owner against the interest in protection of free competition, the latter can prevail only where refusal to grant a licence prevents the development of the secondary market, to the detriment of consumers.647The circumstance relating to the appearance of a new product, as envisaged in Magill and IMS Health, cited in paragraph 107 above, cannot be the only parameter which determines whether a refusal to license an intellectual property right is capable of causing prejudice to consumers within the meaning of Article 82(b) EC. As that provision states, such prejudice may arise where there is a limitation not only of production or markets, but also of technical development.648It was on that last hypothesis that the Commission based its finding in the contested decision. Thus, the Commission considered that Microsoft's refusal to supply the relevant information limited technical development to the prejudice of consumers within the meaning of Article 82(b) EC (recitals 693 to 701 and 782 to the contested decision) and it rejected Microsoft's assertion that it had not been demonstrated that its refusal caused prejudice to consumers (recitals 702 to 708 to the contested decision).649The Court finds that the Commission's findings at the recitals referred to in the preceding paragraph are not manifestly incorrect.650Thus, in the first place, the Commission was correct to observe, at recital 694 to the contested decision, that [owing] to the lack of interoperability that competing work group server operating system products can achieve with the Windows domain architecture, an increasing number of consumers are locked into a homogeneous Windows solution at the level of work group server operating systems.651It must be borne in mind that it has already been stated at paragraphs 371 to 422 above that Microsoft's refusal prevented its competitors from developing work group server operating systems capable of attaining a sufficient degree of interoperability with the Windows domain architecture, with the consequence that consumers' purchasing decisions in respect of work group server operating systems were channelled towards Microsoft's products. The Court has also already observed, at paragraphs 606 to 611 above, that it was apparent from a number of documents in the file that the technologies of the Windows 2000 range, in particular Active Directory, were increasingly being taken up by organisations. As interoperability problems arise more acutely with work group server operating systems in that range of products than with those of the preceding generation (see paragraphs 571 to 574 above and recitals 578 to 584, 588 and 613 to the contested decision), the increasing uptake of those systems merely reinforces the lock-in' effect referred to in the preceding paragraph.652The limitation thus placed on consumer choice is all the more damaging to consumers because, as already observed at paragraphs 407 to 412 above, they consider that non-Microsoft work group server operating systems are better than Windows work group server operating systems with respect to a series of features to which they attach great importance, such as reliability/availability of the ... system and security included with the server operating system'.653In the second place, the Commission was correct to consider that the artificial advantage in terms of interoperability that Microsoft retained by its refusal discouraged its competitors from developing and marketing work group server operating systems with innovative features, to the prejudice, notably, of consumers (see, to that effect, recital 694 to the contested decision). That refusal has the consequence that those competitors are placed at a disadvantage by comparison with Microsoft so far as the merits of their products are concerned, particularly with regard to parameters such as security, reliability, ease of use or operating performance speed (recital 699 to the contested decision).654The Commission's finding that [i]f Microsoft's competitors had access to the interoperability information that Microsoft refuses to supply, they could use the disclosures to make the advanced features of their own products available in the framework of the web of interoperability relationships that underpin the Windows domain architecture (recital 695 to the contested decision) is corroborated by the conduct which those competitors had adopted in the past, when they had access to certain information concerning Microsoft's products. The two examples which the Commission gives at recital 696 to the contested decision, PC NetLink and NDS for NT, speak volumes in that regard. PC NetLink is software developed by Sun on the basis of AS/U, which had been developed by AT&T using source code which Microsoft had licensed to it in the 1990s (recitals 211 to 213 to the contested decision). A document submitted by Microsoft during the administrative procedure shows that the innovative features and added value that PC NetLink brought to Windows work group networks was used as a selling point for that product (footnote 840 to the contested decision). Likewise, in its marketing material, Novell highlighted the new features which NDS for NT — software which it had developed using reverse engineering — brought to the Windows domain architecture (in this instance Windows NT) (footnote 841 to the contested decision).655The Commission was careful to emphasise, in that context, that there was ample scope for differentiation and innovation beyond the design of interface specifications' (recital 698 to the contested decision). In other words, the same specification can be implemented in numerous different and innovative ways by software designers.656Thus, the contested decision rests on the concept that, once the obstacle represented for Microsoft's competitors by the insufficient degree of interoperability with the Windows domain architecture has been removed, those competitors will be able to offer work group server operating systems which, far from merely reproducing the Windows systems already on the market, will be distinguished from those systems with respect to parameters which consumers consider important (see, to that effect, recital 699 to the contested decision).657It must be borne in mind, in that regard, that Microsoft's competitors would not be able to clone or reproduce its products solely by having access to the interoperability information covered by the contested decision. Apart from the fact that Microsoft itself acknowledges in its pleadings that the remedy prescribed by Article 5 of the contested decision would not allow such a result to be achieved (see paragraph 241 above), it is appropriate to repeat that the information at issue does not extend to implementation details or to other features of Microsoft's source code (see paragraphs 194 to 206 above). The Court also notes that the protocols whose specifications Microsoft is required to disclose in application of the contested decision represent only a minimum part of the entire set of protocols implemented in Windows work group server operating systems.658Nor would Microsoft's competitors have any interest in merely reproducing Windows work group server operating systems. Once they are able to use the information communicated to them to develop systems that are sufficiently interoperable with the Windows domain architecture, they will have no other choice, if they wish to take advantage of a competitive advantage over Microsoft and maintain a profitable presence on the market, than to differentiate their products from Microsoft's products with respect to certain parameters and certain features. It must be borne in mind that, as the Commission explains at recitals 719 to 721 to the contested decision, the implementation of specifications is a difficult task which requires significant investment in money and time.659Last, Microsoft's argument that it will have less incentive to develop a given technology if it is required to make that technology available to its competitors (see paragraph 627 above) is of no relevance to the examination of the circumstance relating to the new product, where the issue to be decided is the impact of the refusal to supply on the incentive for Microsoft's competitors to innovate and not on Microsoft's incentives to innovate. That is an issue which will be decided when the Court examines the circumstance relating to the absence of objective justification.660In the third place, the Commission is also correct to reject as unfounded Microsoft's assertion during the administrative procedure that it was not demonstrated that its refusal caused prejudice to consumers (recitals 702 to 708 to the contested decision).661First of all, as has already been observed at paragraphs 407 to 412 above, the results of the third Mercer survey show that, contrary to Microsoft's contention, consumers consider non-Microsoft work group server operating systems to be better than Windows work group server operating systems on a number of features to which they attach great importance.662Next, Microsoft cannot rely on the fact that consumers never claimed at any time during the administrative procedure that they had been forced to adopt a Windows work group server operating system as a consequence of its refusal to disclose interoperability information to its competitors. In that connection, it is sufficient to point out that Microsoft does not dispute the Commission's findings at recitals 705 and 706 to the contested decision. Thus, at recital 705 to the contested decision, the Commission observes that it is developers of complementary software required to interoperate with Microsoft's systems who depend on the interface information and that [c]ustomers will not always exactly know what is disclosed by Microsoft to other work group operating system vendors and what is not. At recital 706 to the contested decision, the Commission states [w]hen confronted with a choice between putting up with interoperability problems that render their business processes cumbersome, inefficient and costly, and embracing a homogeneous Windows solution for their work group network, customers will tend to opt for the latter proposition and that [o]nce they have standardised on Windows, they are unlikely to report interoperability problems between their client PCs and the work group servers.663Furthermore, Microsoft's own statements concerning the disclosures made under the United States settlement show that those disclosures had the consequence of offering greater choice to consumers (see recital 703 to the contested decision).664Last, it must be borne in mind that it is settled case-law that Article 82 EC covers not only practices which may prejudice consumers directly but also those which indirectly prejudice them by impairing an effective competitive structure (Case 85/76 Hoffmann-La Roche v Commission [1979] ECR 461, paragraph 125, and Irish Sugar v Commission, cited in paragraph 229 above, paragraph 232). In this case, Microsoft impaired the effective competitive structure on the work group server operating systems market by acquiring a significant market share on that market.665The Court concludes from all of the foregoing considerations that the Commissions finding to the effect that Microsoft's refusal limits technical development to the prejudice of consumers within the meaning of Article 82(b) EC is not manifestly incorrect. The Court therefore finds that the circumstance relating to the appearance of a new product is present in this case.666In the first place, Microsoft claims that the refusal to supply the information was objectively justified by the intellectual property rights which it holds over the technology concerned. It has made significant investment in designing its communication protocols and the commercial success which its products have achieved represents the just reward. It is generally accepted, moreover, that an undertakings refusal to communicate a specific technology to its competitors may be justified by the fact that it does not wish them to use that technology to compete with it.667In the reply, Microsoft relies on the fact that the technology which it is required to disclose to its competitors is secret, that it is of great value for licensees and that it contains significant innovation.668In its answer to one of the written questions put by the Court, the applicant adds that it had an objective justification for not licensing the technology given the prejudice to incentives to innovate that would have resulted if Sun (or others) had used that technology to build a functional equivalent that would compete against Microsoft's products on the same market.669In the second place, Microsoft claims that the Commission rejected its arguments on the basis of a new test, which is legally defective and marks a radical departure from the tests defined in the case-law. At recital 783 to the contested decision, the Commission considered that a refusal to communicate information protected by intellectual property rights constituted an infringement of Article 82 EC if, all things considered, the positive impact on the level of innovation in the whole industry outweighed the negative impact of the dominant undertaking's incentives to innovate.670Microsoft contends that the application of such a balancing test will have the consequence that dominant undertakings will have less incentive to invest in research and development, because they will have to share the fruits of their efforts with their competitors. Intellectual property rights give the holder an incentive to continue to innovate and they also encourage competing undertakings to undertake their own innovative activities in order to avoid being left behind'. Nor does the Commission make any attempt to quantify the negative impact that the compulsory licensing required by the contested decision will have on the applicants competitors, who will wait to see what technology they can obtain under a licence rather than take the trouble to create their own technology.671Microsoft also criticises the vagueness and the unforeseeable consequences of that test; it observes, in particular, that the Commission provides no guidance which would enable undertakings in a dominant position to assess whether preserving [their] incentives to innovate can justify a decision to retain [their] intellectual property for [their] own use. More generally, the contested decision gives no indication of the way in which that test was applied in the present case or of how it should be applied in the future.672In the third place, Microsoft disputes the relevance of the Commissions references to the United States settlement and the settlement with Sun (see paragraph 687 below).673Under the United States settlement, the applicant is required to license communication protocols implemented in Windows client PC operating systems for the sole purpose of being implemented in server software. Under the contested decision, on the other hand, it is required to license its server/server communication protocols so that they can be implemented in directly competing server operating systems. The applicants obligations under the United States settlement are limited to a five-year period, moreover, and an undertaking has a greater incentive to continue to develop technology when, after a fixed period, it will again have exclusive use of the improvements to that technology.674The settlement with Sun provides for a reciprocal commitment to share technology and intellectual property rights on negotiated terms, for a period of six years only. Under the contested decision, on the other hand, the applicant cannot choose its licensees and will be granted no licence in return; royalties and other licensing terms will be subjected to regulation by the Commission; and the applicant's licensing obligations extend indefinitely into the future.675CompTIA emphasises, first of all, the importance of innovation for competition in the IT and communications industry and the need to have a robust system of [intellectual property rights] protection. It submits, in particular, that those intellectual property rights encourage companies to improve existing products and to bring new products to the market.676Next, CompTIA, with reference to recital 783 to the contested decision, claims that the Commission applied a new balancing test in this case and submits that that test is inconsistent with the case-law.677The Commission, in the first place, asserts that it properly took into consideration the justification put forward by Microsoft.678First of all, Microsoft acknowledged in the application that it had relied on a single justification, namely the fact that it held intellectual property rights in the technology concerned. Such justification cannot be accepted, particularly since in Magill, cited in paragraph 107 above, where there was no doubt whatsoever that the effect of the contested decision for the companies concerned was the compulsory licensing of copyright, the Court of Justice held that the refusal was not objectively justified. The Commission is supported on that point by SIIA.679Next, the Commission explains that it took Microsoft's argument to mean that the facts of the case, and in particular the likely impact [which] an order to supply [would have] on [its] incentives to innovate, were so exceptional that the Commission could not apply the existing precedents.680It was for Microsoft to prove that its abusive conduct was objectively justified. More particularly, the applicant was at the very least required to show that the obligation imposed on it to disclose the interoperability information would have a negative impact on its incentives to innovate and also that there was a risk that that negative impact would outweigh the set of factors identified by the Commission which would otherwise make the behaviour abusive. However, the only arguments which Microsoft put forward were purely theoretical and wholly unsubstantiated.681The Commission also contends that Microsoft cannot justify its refusal by the fact that the technology concerned is secret and valuable and that it contains significant innovations. Furthermore, that justification was not presented in the application.682In the second place, the Commission denies having applied a new evaluation test in this case.683First, the Commission rejects Microsoft's assertion that an undertaking is justified in refusing to supply a given technology to its competitors where it wishes to prevent them from using that technology to compete with it. That argument might be interpreted as meaning that even if the first three criteria established by the Court of Justice in Magill and IMS Health, cited in paragraph 107 above, are satisfied, a refusal to license is lawful if competitors intend to use the licence to compete with the dominant undertaking. That argument is manifestly incorrect. Again, that assertion might be interpreted as meaning that the principles laid down in Magill, cited in paragraph 107 above, do not apply where the intellectual property right concerned covers technology. Apart from the fact that Microsoft fails to explain what it means by technology in this context, it would be extremely difficult to draw a distinction between technological intellectual property rights and non-technological intellectual property rights. Nor is it certain that the interoperability information at issue constitutes such technology, in particular if it represents what is a purely arbitrary convention without any innovative character.684Second, the Commission disputes Microsoft's assertion that because of the contested decision its competitors will no longer have any incentive to create their own technology. Microsoft fails to address the finding at recital 697 to the contested decision that, in view of Microsoft's quasi-monopoly on the client PC operating systems market, its competitors are not in a position to develop viable alternatives to its communication protocols.685Third, the Commission observes that Microsoft merely refers to its incentives to innovate in protocol design and ignores other aspects of its products. The Commission refers to recital 724 to the contested decision and submits that such an approach is incorrect.686Fourth, the Commission contends that Microsoft glosses over the fact that the information at issue is information necessary for interoperability within the meaning of Directive 91/250. It is clear from Article 6 of that directive that the Community legislature considers that the disclosure of interoperability information is beneficial for innovation.687In the third place, the Commission refers to certain statements made by Microsoft during the administrative procedure and after the adoption of the contested decision. Thus, at the administrative hearing, Microsoft stated, in response to a question from the Commission s services, that it had not noticed that the United States settlement had had any negative impact on its incentives to innovate. Likewise, at a joint press conference with Sun following the settlement concluded with that undertaking, Microsoft stated that both companies would continue to compete and innovate and that the impact of the settlement [would] not be less innovation, but more innovation. The Commission contends that the argument which Microsoft bases on the fact that the United States settlement provides for reciprocal commitments is irrelevant and notes that when Sun concluded that settlement it already had a policy of disclosing the relevant protocols to the entire industry.688The Court notes, as a preliminary point, that although the burden of proof of the existence of the circumstances that constitute an infringement of Article 82 EC is borne by the Commission, it is for the dominant undertaking concerned, and not for the Commission, before the end of the administrative procedure, to raise any plea of objective justification and to support it with arguments and evidence. It then falls to the Commission, where it proposes to make a finding of an abuse of a dominant position, to show that the arguments and evidence relied on by the undertaking cannot prevail and, accordingly, that the justification put forward cannot be accepted.689In the present case, as the Commission found at recital 709 to the contested decision and as Microsoft expressly confirmed in the application, Microsoft relied as justification for its conduct solely on the fact that the technology concerned was covered by intellectual property rights. It made clear that if it were required to grant third parties access to that technology, that would ... eliminate future incentives to invest in the creation of more intellectual property' (recital 709 to the contested decision). In the reply, the applicant also relied on that fact that the technology was secret and valuable and that it contained important innovations.690The Court considers that, even on the assumption that it is correct, the fact that the communication protocols covered by the contested decision, or the specifications for those protocols, are covered by intellectual property rights cannot constitute objective justification within the meaning of Magill and IMS Health, cited in paragraph 107 above. Microsoft's argument is inconsistent with the raison d'être of the exception which that case-law thus recognises in favour of free competition, since if the mere fact of holding intellectual property rights could in itself constitute objective justification for the refusal to grant a licence, the exception established by the case-law could never apply. In other words, a refusal to license an intellectual property right could never be considered to constitute an infringement of Article 82 EC even though in Magill and IMS Health, cited in paragraph 107 above, the Court of Justice specifically stated the contrary.691It must be borne in mind that, as stated at paragraphs 321, 323, 327 and 330 above, the Community judicature considers that the fact that the holder of an intellectual property right can exploit that right solely for his own benefit constitutes the very substance of his exclusive right. Accordingly, a simple refusal, even on the part of an undertaking in a dominant position, to grant a licence to a third party cannot in itself constitute an abuse of a dominant position within the meaning of Article 82 EC. It is only when it is accompanied by exceptional circumstances such as those hitherto envisaged in the case-law that such a refusal can be characterised as abusive and that, accordingly, it is permissible, in the public interest in maintaining effective competition on the market, to encroach upon the exclusive right of the holder of the intellectual property right by requiring him to grant licences to third parties seeking to enter or remain on that market It must be borne in mind that it has been established above that such exceptional circumstances were present in this case.692The argument which Microsoft puts forward in the reply, namely that the technology concerned is secret and of great value to the licensees and contains important innovations, cannot succeed either.693First, the fact that the technology concerned is secret is the consequence of a unilateral business decision on Microsoft's part. Furthermore, Microsoft cannot rely on the argument that the interoperability information is secret as a ground for not being required to disclose it unless the exceptional circumstances identified by the Court of Justice in Magill and IMS Health, cited in paragraph 107 above, are present, and at the same time justify its refusal by what it alleges to be the secret nature of the information. Last, there is no reason why secret technology should enjoy a higher level of protection than, for example, technology which has necessarily been disclosed to the public by its inventor in a patent-application procedure.694Second, from the moment at which it is established that — as in this case — the interoperability information is indispensable, that information is necessarily of great value to the competitors who wish to have access to it.695Third, it is inherent in the fact that the undertaking concerned holds an intellectual property right that the subject-matter of that right is innovative or original. There can be no patent without an invention and no copyright without an original work.696The Court further observes that in the contested decision the Commission did not simply reject Microsoft's assertion that the fact that the technology concerned was covered by intellectual property rights justified its refusal to disclose the relevant information. The Commission also examined the applicants argument that if it were required to give third parties access to that technology there would be a negative impact on its incentives to innovate (recitals 709 and 712 to the contested decision).697The Court finds that, as the Commission correctly submits, Microsoft, which bore the initial burden of proof (see paragraph 688 above), did not sufficiently establish that if it were required to disclose the interoperability information that would have a significant negative impact on its incentives to innovate.698Microsoft merely put forward vague, general and theoretical arguments on that point. Thus, as the Commission observes at recital 709 to the contested decision, in its response of 17 October 2003 to the third statement of objections Microsoft merely stated that [d]isclosure would ... eliminate future incentives to invest in the creation of more intellectual property, without specifying the technologies or products to which it thus referred.699In certain passages in the response referred to in the preceding paragraph, Microsoft envisages a negative impact on its incentives to innovate by reference to its operating systems in general, namely both those for client PCs and those for servers.700In that regard, it is sufficient to note that, at recitals 713 to 729 to the contested decision, the Commission quite correctly refuted Microsoft's arguments relating to the fear that its products would be cloned. It must be borne in mind, in particular, that the remedy prescribed in Article 5 of the contested decision does not, and is not designed to, allows Microsoft's competitors to copy its products (see paragraphs 198 to 206, 240 to 242 and 656 to 658 above).701It follows that it has not been demonstrated that the disclosure of the information to which that remedy relates will significantly reduce — still less eliminate — Microsoft's incentives to innovate.702In that context, the Court observes that, as the Commission correctly finds at recitals 730 to 734 to the contested decision, it is normal practice for operators in the industry to disclose to third parties the information which will facilitate interoperability with their products and Microsoft itself had followed that practice until it was sufficiently established on the work group server operating systems market. Such disclosure allows the operators concerned to make their own products more attractive and therefore more valuable. In fact, none of the parties has claimed in the present case that such disclosure had had any negative impact on those operators' incentives to innovate.703The Court further considers that if the disclosures made under the United States settlement and the MCPP as regards server-to-client protocols had no negative impact on Microsoft's incentives to innovate (recital 728 to the contested decision), there is no obvious reason to believe that the consequences should be any different in the case of disclosure relating to server/server protocols.704Last, the Court finds that Microsoft's assertion that in the contested decision the Commission applied a new evaluation test when rejecting the objective justification which Microsoft had submitted is based on a misreading of that decision.705That assertion is based on a single sentence in recital 783 to the contested decision, which is in a part of that decision containing the findings of the Commissions analysis, at recitals 560 to 778, of the refusal at issue.706That sentence reads as follows:

[A] detailed examination of the scope of the disclosure at stake leads to the conclusion that, on balance, the possible negative impact of an order to supply on Microsoft's incentives to innovate is outweighed by its positive impact on the level of innovation of the whole industry (including Microsoft)

707However, that sentence must be read in conjunction with the one coming immediately afterwards in the same recital, which states that ... the need to protect Microsoft's incentives to innovate cannot constitute an objective justification that would offset the exceptional circumstances identified.708It must also be compared with recital 712 to the contested decision, where the Commission sets out the following considerations:

It has been established above ... that Microsoft's refusal to supply [creates a risk of elimination of] competition in the relevant market for work group server operating systems, that this is due to the fact that the refused input is indispensable to carry on business in that market and that Microsoft's refusal has a negative impact on technical development to the prejudice of consumers. In view of these exceptional circumstances, Microsoft's refusal cannot be objectively justified merely by the fact that it constitutes a refusal to license intellectual property. It is therefore necessary to assess whether Microsoft's arguments regarding its incentives to innovate outweigh these exceptional circumstances

709In other words, in accordance with the principles laid down in the case-law (see paragraphs 331 to 333 above), the Commission, after establishing that the exceptional circumstances identified by the Court of Justice in Magill and IMS Health, cited in paragraph 107 above, were present in this case, then proceeded to consider whether the justification put forward by

Microsoft, on the basis of the alleged impact on its incentives to innovate, might prevail over those exceptional circumstances, including the circumstance that the refusal at issue limited technical development to the prejudice of consumers within the meaning of Article 82(b) EC.710The Commission came to a negative conclusion but not by balancing the negative impact which the imposition of a requirement to supply the information at issue might have on Microsoft's incentives to innovate against the positive impact of that obligation on innovation in the industry as a whole, but after refuting Microsoft's arguments relating to the fear that its products might be cloned (recitals 713 to 729 to the contested decision), establishing that the disclosure of interoperability was widespread in the industry concerned (recitals 730 to 735 to the contested decision) and showing that IBM's commitment to the Commission in 1984 was not substantially different from what Microsoft was ordered to do in the contested decision (recitals 736 to 742 to the contested decision) and that its approach was consistent with Directive 91/250 (recitals 743 to 763 to the contested decision).711It follows from all of the foregoing considerations that Microsoft has not demonstrated the existence of any objective justification for its refusal to disclose the interoperability at issue.712As the exceptional circumstances identified by the Court of Justice in Magill and IMS Health, cited in paragraph 107 above, were also present in this case, the first part of the plea must be rejected as wholly unfounded.713In the first place, Microsoft claims that Sun did not request access to interoperability information within the meaning of the contested decision.714The applicant refers to a passage in Sun's complaint and maintains that the request contained in the letter of 15 September 1998 did not relate to the full and complete specifications for its communication protocols but to detailed information about the internal features of its Windows server operating systems.715Accordingly, even on the assumption that the letter of 6 October 1998 might be interpreted as containing a refusal, quod non, it cannot be claimed that Microsoft refused to supply Sun with the technology which, according to the contested decision, it did not disclose.716In addition, the breadth of Suns request could not have put Microsoft on notice that Sun was seeking a licence [in respect of its] communication protocols.717The applicant further observes that Suns complaint contains no reference to communication protocols.718Last, in the letter of 15 September 1998, Sun expressed the belief that Microsoft should include a reference implementation and such other information as is necessary to insure, without reverse engineering, that COM objects and the compete set of Active Directory technologies will run in fully compatible fashion on Solaris. Microsoft claims that access to such technology would have enabled Sun to mimic virtually all the functionalities of Windows server operating systems; and, furthermore, Sun's request related to technology still under development, as Windows 2000 Server and Active Directory were not marketed until December 1999.719In the second place, Microsoft contends that Sun's request did not meet with a flat refusal in the letter of 6 October 1998: the applicant invited Sun to discuss ways in which the two firms might improve interoperability between their respective products for the benefit of mutual customers. That letter also mentioned various ways in which Sun might achieve interoperability. The applicant cites recital 565 to the contested decision and asserts that the Commission cannot maintain that the technologies concerned were so complex that Sun could not be expected to know what technology it needed: Sun is a highly specialised distributor of server operating systems and in any event it was Sun's responsibility to clarify its request.720Microsoft claims, moreover, that Sun did not take up its invitation and observes, in particular, that Sun failed to attend a meeting which had been arranged in order to discuss the interoperability of their products.721Last, Microsoft contends that there is no contradiction between its position that it is unclear whether it would have refused to disclose the specifications of its communication protocols if Sun or anyone else' had asked it to do so and the fact that it seeks annulment of the contested decision. There is a significant difference between a negotiated cross-licensing agreement with another leading operating system vendor and a duty to supply the entire world with proprietary technology under mandate from the public authority.722In the third place, Microsoft maintains that Sun did not request it to license its intellectual property rights so that Sun could develop work group server operating systems in the EEA. Microsoft was therefore under no obligation, when it replied to the letter of 15 September 1998, to have regard to its special responsibility under Article 82 EC not to hinder effective and undistorted competition.723In that context, Microsoft points out that Sun is a United States company and that the letter of 15 September 1998 was sent from Sun's headquarters in the United States to the United States headquarters of Microsoft, which is also a United States company. In the absence of any connection with the EEA, and as the letter did not mention that the technology concerned was necessary for the development and distribution of work group server operating systems on the territory of the EEA, Microsoft had no reason to consider that Sun wished to obtain a licence for the EEA.724The Commission rejects Microsoft's arguments in their entirety.725In the first place, the Commission contends that Suns request in the letter of 15 September 1998, although broader in certain respects than the scope of the [contested] decision', was sufficiently clear for Microsoft to understand (i) that Sun sought access to interoperability information and (ii) that some of that information pertained to certain features of Windows work group networks (the Active Directory domain') which were indispensable if Sun were to be able to exert viable competition on the work group server operating systems market.726The Commission contends that Microsoft misrepresents Sun's request when it claims that the request related to source code and not interface information. In its request, Sun sought a means of enabling its products to seamlessly communicate' with the Windows environment and in the letter of 6 October 1998 Mr Maritz clearly stated that he understood that request as relating to interoperability information. Furthermore, Sun made clear in its complaint that it wished to have access to interface information.727The Commission refers to recitals 713 to 722 to the contested decision and further submits that access to interoperability information will not allow Microsoft's competitors to clone or mimic the functionalities of Windows work group server operating systems.728The fact that Sun did not use the expression communication protocol' is irrelevant, since a request for access to the information necessary to interconnect and interact with Windows and a request for access to protocol specifications are one and the same thing.729The Commission also observes that in the letter of 6 October 1998 Microsoft did not mention the fact that Sun's request related to technology still under development. In any event, such an argument cannot be accepted, because when Sun sent the letter of 15 September 1998 to Microsoft it was already one year since the first beta version of Windows 2000 Server had been released.730In the second place, the Commission contends that Microsoft cannot deny having refused Sun's request.731First, Microsoft's position is inconsistent with its claim that Article 5 of the contested decision should be annulled.732Second, the Commission refers to recitals 194 to 198 to the contested decision and claims that Microsoft explicitly confirmed to the Commission that it refused to give access to certain interoperability information. As stated at recitals 573 to 577 to the contested decision, that refusal forms part of a general pattern of conduct. Likewise, during the interlocutory proceedings, Microsoft stated that the refusal was part of its business model.733Third, the Commission is not convinced that Microsoft would have supplied the requested information to Sun if Sun had responded more positively to Microsoft's alleged offer to discuss interoperability. The Commission refers to certain statements by Microsoft managers set out at recitals 576 and 778 to the contested decision. The Commission finds it unlikely that Mr Goldberg, the Microsoft employee referred to in the letter of 6 October 1998, was authorised to take decisions concerning such matters. Mr Terranova, of Sun, met Mr Goldberg on 25 November 1998 and Microsoft does not explain how the fact that Mr Terranova had to cancel a further meeting due to take place on 8 March 1999 prevented discussions on interoperability. Last, the Commission observes that the agenda of that last meeting, as suggested by Mr Goldberg, did not contain the slightest reference to the relevant technologies, such as Active Directory.734In the third place, the Commission considers it irrelevant that Sun did not specifically refer to the EEA in the letter of 15 September 1998. First, as the relevant geographic market was worldwide, the EEA was necessarily covered by the request in that letter and, second, Sun lodged a complaint with the Commission on 10 December 1998.735By its argument in support of the second part of its single plea, Microsoft seeks to establish that the Commission had no valid ground on which to find, in the contested decision, that Microsoft had abused its dominant position by refusing to disclose the interoperability information, since it cannot in fact be accused of any real refusal. In support of that argument, Microsoft relies, in substance, on the exchange of letters between it and Sun in the latter part of 1998. Its argument comes under three main heads. In the first place, Microsoft claims that Sun's request in the letter of 15 September 1998 did not relate to interoperability information as referred to in the contested decision. In the second place, it denies in any event having refused that request in the letter of 6 October 1998. In the third place, Microsoft maintains that in the letter of 15 September 1998 Sun did not seek a licence covering intellectual property rights which Microsoft held in the EEA.736Each of those heads must be examined separately.737First of all, it is appropriate to recall the precise content of the letter of 15 September 1998 and the Commissions analysis of that letter in the contested decision.738In that letter, Sun identifies the information which it seeks from Microsoft, as follows:

first, the complete information required to allow it to provide native support for COM objects on Solaris;

second, the complete information required to allow Sun to provide native support for the complete set of Active Directory technologies on Solaris.

739In the letter, Sun specified the extent of the information requested and also the objective of its request, indicating that:

applications written to execute on Solaris should be able to seamlessly communicate via COM and/or Active Directory with the Windows operating systems and/or with Windows-based software;

Microsoft should include a reference implementation and such other information as was necessary to ensure, without reverse engineering, that COM objects and the complete set of Active Directory technologies would run in fully compatible fashion on Solaris;

the information should be provided for the full range of COM objects as well as for the full set of Active Directory technologies currently on the market;

the information should be provided in a timely manner and on a continuing basis for COM objects and Active Directory technologies which would be released on the market in the future.

740At recital 186 to the contested decision, the Commission interprets the second part of Suns request in the letter of 15 September 1998 (see the second indent of paragraph 738 above) as meaning the ability for Solaris to act as fully compatible domain controller in Windows 2000 work group networks or as a member server (in particular as a file and print server) fully compatible with the Active Directory domain infrastructure (security, directory service). Furthermore, the fact that Sun s request covers both client/server interoperability and server/server interoperability is consistent with the fact that the Windows domain architecture closely connects both types of interoperability. In other words, Sun's request encompassed the specifications for the protocols used by Windows work group servers in order to provide file, print and group and user administration services to Windows work group networks, which include both direct interconnection and interaction between a Windows work group server and a Windows client PC, as well as interconnection and interaction between a Windows work group server and a Windows client PC that is indirect and passes through another Windows work group server (recital 187 to the contested decision).741At recital 188 to the contested decision, the Commission examines the first part of Sun's request (see the first indent of paragraph 738 above). The Commission observes that COM/DCOM is a technology which is relevant to the delivery of file, print and group and user administration in Windows and considers that there is an overlap between that part of Sun's request and the second part of its request, concerning Active Directory. At the following recital, the Commission states, however, that the only part of Sun's request for information concerning the COM technology that is relevant to the refusal to supply considered in [the contested decision] is what is encompassed in Sun's request for compatibility with Active Directory. That observation must be compared with the Commission's statement at recital 566 to the contested decision that, first, the only refusal at stake in [the contested decision] is a refusal to provide a full specification of the protocols underlying the Windows domain architecture, which organises the way through which Windows work group servers deliver work group server services to Windows client PCs and, second, [t] he fact that Microsoft has also turned down Sun's request for information that would facilitate cross-platform portability of COM does not form part of the conduct treated in [the contested decision] as a refusal to supply.742The Commission further observes, at recital 190 to the contested decision, that it is implicit in Suns request that Sun is seeking access to specification in order to be able to implement them in its products.743At recitals 199 to 207 to the contested decision, the Commission sets out a series of considerations in order to demonstrate that the information to which Sun requests access in the letter of 15 September 1998 is connected with interoperability. First, it rejects Microsoft's assertion in its response of 17 October 2003 to the third statement of objections that Sun wished Microsoft to create a version of Active Directory that could be used on Solaris. Second, the Commission rejects Microsoft's argument, also put forward during the administrative procedure, that Sun's request concerned the internal make-up of Windows server operating systems' and therefore went beyond interoperability information. On that last point, the Commission observes that in the letter of 15 September 1998 Sun expressly states that it is its intention to achieve seamless communication between the Solaris environment and the Windows environment (recital 207 to the contested decision). The Commission also observes that the letter of 6 October 1998 shows that Microsoft had fully understood that Sun wished to have access to information on interoperability with certain features of Windows' (recital 207 to the contested decision).744Next, in the light of those various factors, the Court finds, first, that while, as the Commission itself recognises in the defence, the scope of the request in the letter of 15 September 1998 was wider in certain regards than that of the contested decision, the fact remains that in that letter Sun qualified the scope of its request by stating that all that it wanted was that its products should be able to seamlessly communicate' with the Windows environment. Likewise, Sun also stated in its letter that the information requested should insure, without reverse engineering, that COM objects and the complete set of Active Directory technologies will run in fully compatible fashion on Solaris. In other words, it is clear from the wording of the letter of 15 September 1998 that Sun was seeking access to information and that the information should allow it to achieve interoperability between its products and the Windows environment.745It is also apparent from the wording of the letter of 15 September 1998 that Sun wished to be able to achieve a high level of interoperability between its products and the Windows domain architecture. In the letter of 6 October 1998, when Mr Maritz indicates that Microsoft has no plans to port the Active Directory to Solaris' and that there are Varying levels of functionality [designed to allow other operating systems] to interoperate with the Active Directory', he clearly draws a distinction between the high level of interoperability that can be achieved when the elements of one operating system are ported' to another operating system and the lower or Varying' levels that can be achieved by using the other methods suggested in that letter.746Second, Microsoft cannot reasonably rely on the fact that Sun did not use the expression communication protocols' in its complaint. As stated at recital 49 to the contested decision, and as the Commission correctly observes in its pleadings, a protocol represents a set of rules of interconnection and interaction between various pieces of software in a network (see also paragraphs 196 and 197 above). As stated at paragraph 740 above, it was precisely about such rules that Sun wished to obtain information. Microsoft's argument is all the less acceptable because it is purely formalistic. In the letter of 6 October 1998, Mr Maritz makes a number of references to interoperability between Microsoft's products and those of Sun or other software vendors. Microsoft had thus fully understood the scope of Sun's request, in spite of the fact that there is no formal reference to communication protocols' in the letter of 15 September 1998.747Third, Microsoft's assertion that access to the technology would have enabled Sun to mimic virtually all the functionalities of the Windows server operating systems cannot be upheld. It is clear from the preceding considerations that Sun sought access to the information necessary to be able to achieve interoperability between its products and the Windows domain architecture. As stated at recitals 34, 570 and 571 to the contested decision, and as already stated at paragraphs 199 to 206 above, such a result may be achieved by communicating only the specifications of certain protocols, that is to say, without disclosing implementation details. In so far as Microsoft's assertion is based on the fact that Sun indicates in the letter of 15 September 1998 that Microsoft should communicate a reference implementation, the Court finds that even if Sun had thereby intended to request communication of details of Microsoft's source code, Sun's qualification of the scope of its request (see paragraph 744 above) meant that Microsoft could not conclude that Sun's request did not also relate to the protocol specifications referred to by the contested decision, while the conduct penalised by that decision is limited, as stated at recital 569 to the contested decision, to Microsoft's refusal to communicate those specifications.748Fourth, Microsoft cannot effectively claim that the request in Sun's letter of 15 September 1998 concerned technology still under development. That assertion is wholly irrelevant to the question whether that request concerned interoperability information as referred to in the contested decision. Nor does it take account of the fact that, as stated at recitals 398 and 790 to the contested decision, Microsoft had already released the first beta version of Windows 2000 server on 23 September 1997, almost one year before the date of Sun's letter.749The Court concludes from all of the foregoing considerations that, contrary to Microsoft's assertion, Sun's request in the letter of 15 September 1998 clearly concerned the interoperability information referred to in the contested decision and forming the subject-matter of the remedy prescribed in Article 5 of that decision.750The second head of Microsoft's argument in support of the second part of the plea, namely the head relating to the letter of 6 October 1998, cannot be accepted either.751When the wording of that letter, examined in the light of the context in which it was written, the identity of its author, the extent of his knowledge of the technologies concerned and the approach adopted by Microsoft up to the time of the adoption of the contested decision, is taken into account, it must be concluded that the Commission was correct, in the contested decision, to interpret that letter as containing a refusal to disclose to Sun the information which it had requested.752It must be borne in mind, first of all, that, as stated in the first part of the plea, Microsoft's arguments concerning the refusal to supply and authorise the use of the interoperability information rely largely on the degree of interoperability that must be achieved between its own and its competitors' products. Throughout the administrative procedure and in these proceedings, Microsoft contended that it was sufficient that the various operating systems should be capable of exchanging information or of reciprocally supplying services, or, in other words, that they could work properly' together. Microsoft maintains that the information and methods already available on the market allow such a result to be achieved, so that it cannot be required to disclose additional information, in particular the information relating to the communications that come within the blue bubble. The applicant claims, in particular, that the Commission requires a degree of interoperability that goes far beyond what is envisaged by Directive 91/250 and which does not correspond to the way in which undertakings organise their computer networks in practice. It maintains that it is the Commission's intention that operating systems that compete with Microsoft's systems should function in all respects like a Windows server operating system, which would require Microsoft to communicate to its competitors much more than information on the interfaces of its products and would interfere with its intellectual property rights and reduce its incentives to innovate.753As the Court has already found at paragraphs 207 to 245 above, the way in which Microsoft interprets the degree of interoperability required by the Commission and, accordingly, the scope of the information referred to by the contested decision is incorrect.754It is necessary to take those factors into account when assessing the way in which the Commission interpreted the letter of 6 October 1998 and the arguments which Microsoft has put forward on that point.755As demonstrated at paragraph 746 above, Microsoft had fully grasped the scope of Suns request in the letter of 15 September 1998 and, in particular, had understood that Sun sought to obtain the information necessary for its products to be able to seamlessly communicate' with the Windows environment or, in other words, to establish a high level of interoperability between its products and that environment.756Furthermore, the purpose of the letter of 15 September 1998 was clearly to obtain access to information belonging to Microsoft that was not already in the public domain or available by means of the licences offered on the market.757The response in the letter of 6 October 1998 contains the following six points:

first, Mr Maritz thanks Mr Green for the letter of 15 September 1998 and informs him that Microsoft has always been willing to help its competitors to build the best possible products and interoperability for [its] platform;

second, he draws Mr Greens attention to the fact that information about the services and interfaces of the Windows platform is already available through the MSDN product;

third, he invites Sun to attend a conference organised by Microsoft to be held in Denver on II-15 October 1998;

fourth, he refers to a reference implementation of COM on Solaris that already exists and informs Mr Green that source code for COM can be licensed, notably from Software AG;

fifth, he states that Microsoft has no plans to port' the Active Directory to Solaris, but mentions the existence of a number of methods, with varying levels of interoperability, of interoperating with Active Directory, including use of the standard LDAP protocol;

sixth, he invites Sun, should it need additional support, to contact the account managers' of the Developer Relations Group, who are there to help developers who need additional support for Microsoft's platforms, naming Mr Goldberg as the person to contact for that purpose.

758The Court notes, in the first place, that in the letter of 6 October 1998 Mr Maritz wholly fails to answer the specific requests made by Sun in the letter of 15 September 1998 and merely refers Sun to sources of information and methods which were already in the public domain or available under licence. As Mr Maritz was clearly aware of the significance of the specific requests stated by Mr Green, such a reference cannot be interpreted as anything other than a refusal to communicate the information requested.759The fact that Mr Maritz states in the letter of 6 October 1998 that Microsoft has no plans to port' Active Directory to Solaris confirms the correctness of that interpretation, since it shows that Mr Maritz was fully aware that Microsoft's competitors, including Sun, aspired to achieve a higher level of interoperability than they could achieve by using the methods mentioned in that letter (see paragraph 745 above).760That point is established all the more clearly because, in the case, first of all, of MSDN, Microsoft does not dispute in the present part of the plea the Commission's analysis in the contested decision that that mechanism does not allow Microsoft's competitors to achieve a sufficient degree of interoperability with Windows client PC operating systems (recital 563 to the contested decision, which refers to Section 4.1.3 and, in particular, to recitals 209 and 210 to the contested decision).761As regards, next, the possibility that Sun could use a freely-available COM reference implementation, which Microsoft also mentions in the letter of 6 October 1998, Microsoft has also not maintained in the present part of the plea that the Commission had erred in considering, in the contested decision, that that product did not constitute a sufficient solution (recital 563 to the contested decision, which refers to Section 4.1.3 and, in particular, to recitals 218 to 230 to the contested decision; see also recitals 288 to 291 to the contested decision).762As regards, last, the possibility for Sun to use the LDAP protocol, which is also expressly mentioned in the letter of 6 October 1998, Microsoft has not maintained in the present part of the plea, and did not demonstrate in the preceding part of the plea, that the Commission had erred in concluding, particularly at recitals 194 and 195 and 243 to 250 to the contested decision, that that protocol was not sufficient to achieve a suitable level of interoperability with Active Directory.763In the second place, Microsoft cannot rely on Mr Maritz's offer of additional support from Mr Goldberg to substantiate its claim that that letter does not contain a refusal. The additional support mentioned in the final paragraph of that letter relates only to the information and methods mentioned in the second and third paragraphs of the letter. In essence, Microsoft thereby proposes to assist Sun only in the same way as the account managers' of the Developer Relations Group assist any developer requiring support in connection with Microsoft's platforms.764Nor can Microsoft usefully rely on the minute it prepared summarising the exchanges between itself and Sun in order to maintain that Sun had no intention of acting on Mr Goldberg's proposals. At no point in that minute, as the Commission correctly observed at recital 193 to the contested decision, is there any mention of a formal proposal by Microsoft to supply the information which Sun requested, that is to say, information going beyond that which was publicly available.765It should be added, in the third place, that in the contested decision the Commission had all the more reason to interpret the letter of 6 October 1998 as containing a refusal to give access to the interoperability information requested by Sun because, during the administrative procedure, Microsoft expressly recognised that it had not disclosed some of the information requested and that it continued to refuse to do so (see recitals 194 to 198 to the contested decision). Although at the hearing Microsoft questioned the exhaustive nature of one of the citations set out at recital 195 to the contested decision, it did not deny having stated during the administrative procedure that the replication among different copies of Active Directory was proprietary.766Microsoft's argument that the letter of 6 October 1998 does not constitute a refusal must therefore be rejected as unfounded.767It is appropriate, moreover, to analyse the letter of 6 October 1998 in the more general context described in the contested decision. In the decision, the Commission did not rely on that letter alone, but, as may be seen from recitals 194 to 198 and 573 to 577 to the contested decision in particular, it considered that the conduct which it evidenced formed part of a general pattern of conduct on Microsoft's part.768At recital 573 to the contested decision, which refers specifically to recital 194 to the contested decision, the Commission stated, in particular, that a number of Microsoft's competitors had confirmed that they did not obtain sufficient interoperability information and that some of them had also claimed that Microsoft had refused to provide information that they had requested, or had failed to answer their requests.769At recital 576 to the contested decision, moreover, the Commission reproduced excerpts from testimony given to the United States courts by a manager of the Windows Source Licensing Program, which, according to the Commission, indicates that Microsoft places restrictions on licence agreements concerning technologies necessary for interoperability with the Windows domain architecture.770Microsoft did not specifically deny those matters before the Court771Furthermore, the Court observes that, at recital 778 to the contested decision, the Commission, in refuting Microsoft's denials of the existence of a refusal, given Microsoft's claim that it never had any reason to exclude competitors by leveraging, cited an extract from a speech given by Mr Gates, President of Microsoft, in February 1997 to members of Microsoft's sales force. That extract confirms the existence of a pattern of general conduct designed to restrict the communication of interoperability information, containing as it does, the following declaration:

What we are trying to do is use our server control to do new protocols and lock out Sun and Oracle specifically ... Now, I don't know if we'll get to that or not, but that's what we are trying to do.

772The third head of the argument which Microsoft develops in support of the second part of its single plea is based on the fact that in the letter of 15 September 1998 Sun did not expressly request a licence over Microsoft's intellectual property rights in the EEA in order to develop work group server operating systems in the EEA. Microsoft concludes that when it responded to Sun it was under no obligation to have regard to its particular responsibility not to hinder effective and undistorted competition.773Those arguments are purely formal and must be rejected.774In the letter of 15 September 1998, Sun did not, admittedly, expressly request Microsoft to grant it a licence over intellectual property rights held in the EEA. However, there was no need for Sun to assess in its request whether the information to which it sought access was protected by intellectual property rights and whether the use of that information needed to be licensed by Microsoft. It is clear, moreover, that Sun wished Microsoft to supply the information at issue so that it would be able to implement that information in its own work group server operating systems. Furthermore, as the relevant geographic market for those systems is worldwide (see recital 427 to the contested decision), the territory of the EEA was necessarily covered by Suns request, which was drafted in general terms. Last, as the Commission observes in its pleadings, as Sun had lodged a complaint pursuant to Article 3 of Regulation No 17 a few weeks later, Microsoft could in any event no longer fail to be aware that the EEA was also concerned.775It follows that the Commission was correct to find at recital 787 to the contested decision that when Microsoft had responded to the letter of 15 September 1998 it had not taken sufficiently into account its special responsibility not to hinder effective and undistorted competition in the common market. The Commission was also correct to state, at the same recital, that that particular responsibility derived from Microsoft's quasi-monopoly on the client PC operating systems market. As is apparent from the considerations set out at paragraph 740 above, the refusal at issue concerned interface specifications that organise a network of Windows work group servers and client PCs and that, as such, are not attributable to one of the two [types of product] at stake (client PCs or work group servers), but rather represent a rule of compatibility between those two products (recital 787 to the contested decision).776It follows from all of the foregoing considerations that the second part of the single plea put forward by Microsoft in connection with the refusal to supply and authorise the use of the interoperability information must be rejected as unfounded.777Microsoft claims that, by requiring it to license to its competitors the communication protocol specifications which it owns, the contested decision infringes Article 13 of the TRIPS Agreement. It submits that the cumulative conditions laid down in that agreement are not met in the present case.778In the first place, the requirement in question goes further than is necessary to achieve interoperability and, consequently, violates the condition that limitations' or exceptions can be applied to intellectual property rights only in special cases'. By imposing that requirement, the Commission seeks to enable other server operating systems suppliers to create products that mimic the functionality of Windows server operating systems. Microsoft also criticises the requirement that it make its communication protocols available to its competitors, irrespective of whether or not they are affected by its allegedly anti-competitive conduct.779In the second place, Microsoft claims that the licensing requirement conflicts directly with the normal exploitation of its intellectual property rights. Rather than license their innovative technologies to third parties, commercial software writers like the applicant normally exploit their intellectual property rights by developing and marketing products that implement those technologies. The requirement will also have negative effects on its sales, since its competitors will be able to use its communication protocols to create server operating systems that are interchangeable with its own products.780In the third place, Microsoft claims that the requirement unreasonably prejudice [s] [its] legitimate interests', because it is disproportionate to the Commission's stated objective of eliminating the effects of anti-competitive conduct. The Commission's new balancing test appears to legitimise compulsory licensing whenever a dominant undertaking's competitors would benefit from access to the applicant's intellectual property, regardless of whether such a measure is necessary to remedy anticompetitive conduct.781Last, Microsoft acknowledges that the TRIPS Agreement may not be directly applicable in Community law, but observes that the Court of Justice has established the principle that Community law, including Article 82 EC, must be interpreted in the light of the international agreements concluded by the Community, such as the TRIPS Agreement (Case C-61/94 Commission v Germany [1996] ECR I-3989, paragraph 52).782ACT maintains that the principle of interpretation referred to in the preceding paragraph must apply not only to secondary Community legislation but also to norms of primary Community law.783Next, ACT claims that the Commission's interpretation of Article 82 EC in the contested decision is inconsistent with the Community's international obligations under the TRIPS Agreement, in three respects.784In the first place, the remedy prescribed in Article 5 of the contested decision is incompatible with Article 13 of that agreement.785In the second place, in so far as the remedy entails the compulsory licensing of Microsoft's patents, it violates Article 31 of the TRIPS Agreement.786More particularly, ACT observes that that article provides, in particular, the following:

Where the law of a Member allows for other use of the subject-matter of a patent with the authorisation of the right holder, including use by the Government or third parties authorised by the Government, the following provisions shall be respected:
(a)authorisation of such use shall be considered on its individual merits.

787ACT maintains that that provision means that licences must be granted only on a case-by-case basis. However, Article 5 of the contested decision provides for compulsory licensing that sweeps within it patents that have been granted, those that are the subject of current applications, and all of those that may be applied for and granted in future'. That decision means the compulsory licensing of categories of inventions'.788In the third place, by reference to Article 39 of the TRIPS Agreement (the only article in Section 7 of that agreement), in so far as Article 5 of the contested decision requires Microsoft to disclose business secrets to its competitors, it not only means the loss of the right to control the use of those business secrets, but also results in the complete destruction of those secrets.789The Commission observes, first of all, that it is settled case-law that, having regard to their nature and structure, the WTO agreements are not in principle among the rules in the light of which the Court is to review the legality of measures adopted by the Community institutions (Case C-149/96 Portugal v Council [1999] ECR I-8395, paragraph 47). In Joined Cases 0300/98 and C-392/98 Dior and Others [2000] ECR I-11307, paragraph 44, moreover, the Court of Justice held that the provisions of [the TRIPS Agreement], an annex to the WTO Agreement, are not such as to create rights upon which individuals may rely directly before the Courts by virtue of Community law. Commission v Germany, cited in paragraph 781 above, is not relevant to the present case, since it refers to the interpretation not of a provision of the EC Treaty but of a measure of secondary Community law. In any event, Microsoft's essential argument is that the contested decision is unlawful because it violates the TRIPS Agreement.790Next, the Commission contends that Microsoft's argument is based on the mistaken premiss that the contested decision requires it to license to its competitors the copyright specifications for its proprietary communication protocols. The question of copyright is, at most, purely incidental' in the present case, and as the right of disclosure on which Microsoft relies is a moral right, it cannot be covered by the

TRIPS Agreement.791Last, the Commission submits that Microsoft's assertion that the conditions laid down by Article 13 of the TRIPS Agreement are not met in the present case is based on erroneous assumptions. What is claimed to be the compulsory licensing imposed by the decision does not go beyond what is necessary to attain interoperability and the Commission did not apply any new balancing test in this case.792The Commission contends that ACT's arguments must be rejected as inadmissible in so far as they are based on Articles 31 and 39 of the TRIPS Agreement, since they were not submitted by Microsoft. In any event, its arguments are wholly unfounded.793SIIA supports the Commissions arguments.794In the third part of this single plea, Microsoft criticises the Commission for having interpreted Article 82 EC in a way that is inconsistent with Article 13 of the TRIPS Agreement. The applicant contends that if the Commission had properly taken that provision into account, it would not have been able to conclude, in Article 2(a) of the contested decision, that the refusal at issue constituted an abuse of a dominant position, or have been able to impose the remedy provided for in Articles 4, 5 and 6 of that decision, in so far as that measure concerned interoperability information.795Microsoft bases its argument on paragraph 52 of Commission v Germany, cited in paragraph 781 above, in which the Court stated that Community law, including Article 82 EC, must be interpreted in the light of binding international agreements, such as the TRIPS Agreement. At the hearing, Microsoft emphasised that it did not claim that the provisions of the TRIPS Agreement had direct effect.796The Court considers that Microsoft cannot properly rely on Commission v Germany, cited in paragraph 781 above.797Paragraph 52 of that judgment states, in particular:

[T]he primacy of international agreements concluded by the Community over provisions of secondary Community legislation means that such provisions must, so far as is possible, be interpreted in a manner that is consistent with those agreements

798The Court holds that the principle of consistent interpretation thus invoked by the Court of Justice applies only where the international agreement at issue prevails over the provision of Community law concerned. Since an international agreement, such as the TRIPS Agreement, does not prevail over primary Community law, that principle does not apply where, as here, the provision which falls to be interpreted is Article 82 EC.799In the present case, moreover, unlike the situation referred to by paragraph 52 of Commission v Germany, cited in paragraph 781 above, the Commission was not, strictly speaking, required to make a choice between several possible constructions of a text of Community law. The present case concerns a situation in which the Commission was required to apply Article 82 EC to the factual and legal circumstances of the particular case and in which it must be presumed, in the absence of proof to the contrary, that the conclusions which it reached in that regard are the only ones that it could validly adopt.800Furthermore, the Court considers that, under the guise of the principle of consistent interpretation, Microsoft is in reality simply challenging the legality of the contested decision on the ground that it is contrary to Article 13 of the TRIPS Agreement.801It is settled case-law that, given their nature and structure, WTO agreements are not in principle among the rules in the light of which the Community judicature is to review the legality of measures adopted by the Community institutions (Portugal v Council, cited in paragraph 789 above, paragraph 47; Joined Cases C-27/00 and C-122/00 Omega Air and Others [2002] ECR I-2569, paragraph 93; Case C-76/00 P Petrotub and Republica v Council [2003] ECR I-79, paragraph 53; and Case C-93/02 P Biret International v Council [2003] ECR I-10497, paragraph 52).802It is only where the Community has intended to implement a particular obligation assumed under the WTO or where the Community measure refers expressly to specific provisions of the WTO agreements that the Community judicature must review the legality of the Community measure in question in the light of the WTO rules (Portugal v Council, cited in paragraph 789 above, paragraph 49, and Biret International v Council, cited in paragraph 801 above, paragraph 53).803As the circumstances of the present case clearly do not correspond with either of the two situations described in the preceding paragraph, Microsoft cannot rely on Article 13 of the TRIPS Agreement in support of its claim for annulment of Articles 2, 4, 5 and 6 of the contested decision. Accordingly, there is no need to examine the arguments which Microsoft, supported by ACT, puts forward to substantiate its assertion that the conditions envisaged by Article 13 of the TRIPS Agreement are not satisfied in this case.804ACT's argument that Article 5 of the contested decision is incompatible with Articles 31 and 39 of the TRIPS Agreement (see paragraphs 785 to 788 above) must be rejected, for the same reasons as those set out at paragraphs 796 to 803 above.805Furthermore, ACT's argument that Article 5 of the contested decision fails to have regard to Article 31(a) of the TRIPS Agreement rests on the wholly erroneous idea that the remedy provides for the compulsory licensing of categories of inventions' and does not allow for any individual assessment. Even assuming that, in order to comply with Article 5 of the contested decision, Microsoft were obliged to grant licences authorising certain of its competitors to exploit one or more of its patents, there is nothing in the contested decision to prevent it from negotiating the terms of that licence on a case-by-case basis.806It follows from the contested decision that the remedy referred to in Article 5 must be implemented according to a three-stage procedure and which complies with the conditions set out at recitals 1005 to 1009 to the contested decision.807Thus, Microsoft is first of all required to draw up the interoperability information within the meaning of Article 1(1) of the contested decision and to implement the evaluation mechanism referred to in Article 5(c) of that decision.808At the second stage, Microsoft is required to give access to the interoperability information to the undertakings wishing to develop and distribute work group server operating systems in order to allow them to evaluate the business value to them of implementing that information in their products (recital 1008(i) to the contested decision). The conditions on which Microsoft authorises that evaluation must be reasonable and non-discriminatory.809At the third stage, Microsoft is required to give access to the information concerned to any undertaking interested in all or part of the interoperability and to authorise that undertaking to implement that information in work group server operating systems (recital 1003 to the contested decision). In that context too, the conditions which it intends to impose must be reasonable and non-discriminatory (recitals 1005 to 1008 to the contested decision).810It is clear from those various provisions of the contested decision that there is nothing to prevent Microsoft, where the interoperability information sought by a given undertaking relates to a technology covered by a patent (or by another form of intellectual property right), from giving access to and authorising the use of that information by granting a licence, subject to the application of reasonable and nondiscriminatory conditions.811The mere fact that the contested decision requires that the conditions to which any licences are subject be reasonable and non-discriminatory does not mean that Microsoft must impose the same conditions on every undertaking seeking such licences. It is not precluded that the conditions may be adapted to the specific situation of each of those undertakings and vary, for example, according to the extent of the information to which they seek access or the type of products in which they intend to implement the information.812It follows from all of the foregoing considerations that the third part of the single plea must be rejected as unfounded.813It follows that the single plea put forward in connection with the first issue must be rejected as unfounded in its entirety.814In this second issue, Microsoft relies on two pleas: first, infringement of Article 82 EC and, second, breach of the principle of proportionality. The first plea concerns the Commissions finding that Microsoft's conduct in making the availability of the Windows client PC operating system conditional on the simultaneous acquisition of Windows Media Player constitutes an abusive tied sale (Article 2(b) of the contested decision). The second plea relates to the remedy prescribed in Article 6 of the contested decision.815Before examining those pleas, the Court will summarise a number of factual and technical findings in the contested decision forming the background to the conduct in question which the Court notes are not in effect disputed by Microsoft.816At recitals 60 to 66 to the contested decision, the Commission describes digital media.817First of all, the Commission defines media players as software products that are able to play back audio and video content, that is to say, to decode the corresponding data and translate them into instructions for the hardware, such as loudspeakers or a display (recital 60 to the contested decision).818Next, at recital 61 to the contested decision, the Commission explains that the audio and video content is arranged in digital media files according to certain specific formats and that compression and decompression algorithms have been developed in order to reduce the storage space required by that content without any loss of audio or video quality. Those algorithms are implemented in media players and in encoding software which make it possible to generate compressed files. The piece of code in a media player that implements a compression/decompression algorithm is called a codec' and, in order to be able to act correctly with a compressed media content in a specific format using a specific compression/decompression algorithm, a media player needs to understand that format and that compression/decompression algorithm, that is to say, it needs to implement the corresponding codec.819At recital 62 to the contested decision, the Commission explains that the end user is able to access audio and video content via the Internet by downloading the relevant file to his client PC, that is to say, by copying the file and transferring it to his client PC. Once it has been downloaded, the file may be played back by a media player compatible with the files format.820At recital 63 to the contested decision, the Commission states that the end user may also receive audio and video content streamed over the Internet. Where that method is used, there is no longer any need to wait for an entire file to be downloaded, as the file is sent to the client PC in the form of a sequence of small pieces, that is to say, as a stream' of data which the media player plays as it goes along. Streaming requires the presence of a streaming media player on the client PC.821The Commission points out that the streaming of audio and video content to an end user often entails specific streaming protocols which govern communications between the media player and the software server which distributes the content over the Internet. In order to access sound and video content streamed using a given protocol, the user must have a media player that understands that protocol (recital 64 to the contested decision).822Last, at recital 66 to the contested decision, the Commission explains that by using encoding software streaming servers and media players which are compatible in terms of codec, format and streaming protocol support, it is possible to build a software infrastructure for delivery and consumption of streamed digital audio or video content over IT networks. Such an infrastructure will also be able to provide a platform for the development of other applications, which will use the services provided by it. In particular, media players may exhibit APIs which other applications will call in order, for example, to trigger the playback of a file by the player.823At recitals 107 to 120 to the contested decision, the Commission briefly describes the economic factors that characterise supply, competition and consumption patterns in the digital media industry.824In the first place, at the beginning of the digital media content chain are the content owners, who generally have copyright in the content and can therefore control its reproduction and distribution (recital 108 to the contested decision).825In the second place, the content is then aggregated by content providers, who distribute the content to consumers, in particular by storing it on servers connected to the Internet which consumers are able to access from their client PCs (recitals 109 to 111 to the contested decision).826In the third place, the software infrastructure that enables the creation, transmission and playback of digital content is provided by software developers, including Microsoft, RealNetworks and Apple (recital 112 to the contested decision). Those three companies have the specific feature that, as well as supporting certain industry standard formats, they offer a comprehensive solution, from encoding software to player, based essentially on their own digital media technologies and on their own proprietary file formats (recital 113 to the contested decision). Thus, Microsoft owns the following formats: Windows Media Audio (WMA), Windows Media Video (WMV) and Advanced Streaming Format (ASF). RealNetworks' formats are called RealAudio and RealVideo, while Apple's QuickTime formats have the file extensions .qt, .mov and .moov. Other software developers do not offer an end-to-end solution for delivery of media content, but generally license the technology from one of the three companies mentioned above or use open industry standards (recital 117 to the contested decision).827In the fourth place, there are various channels through which media players may be distributed to end users (recitals 119 and 120 to the contested decision).828First, media players may be installed on client PCs by OEMs under agreements between the OEMs and the software developers. End users thus find a media player and possibly other software pre-installed on their client PCs in addition to an operating system. According to recital 68 to the contested decision, OEMs are companies which assemble computers using a variety of components supplied by different manufacturers. That assembly generally includes the installation of an operating system supplied by a software developer or developed by the OEM itself, together with the bundling of several applications required by the end users. The devices thus assembled are then purchased by resellers, who resell them with additional software.829Second, end users may download media players on to their client PCs over the Internet.830Third, media players may be sold in retail outlets or distributed with other software products.831At recitals 121 to 143 to the contested decision, the Commission describes Microsoft's products and those of its competitors.832Microsoft's media player is called Windows Media Player and at the time of the contested decision the most recent version of that player was called Windows Media Player 9 Series (WMP 9). WMP 9, which allows the playback of downloaded or streamed audio and video content, has been available since 7 January 2003 and since November 2003 has also worked with the Mac OS and UNIX operating systems. WMP 9 does not support the Real and QuickTime formats.833As regards Microsoft's competitors, the Commission describes, in particular, the products of RealNetworks (recitals 125 to 134 to the contested decision) and Apple (recitals 135 to 140 to the contested decision).834In 1995, RealNetworks — which was then called Progressive Networks Inc. — was the first large company to market products allowing the streaming of digital audio content, including RealAudioPlayer. In February 1997 RealNetworks released RealPlayer 4.0, which played live and on-demand audio and video.835Apple developed, in the early 1990s, a media player called QuickTime Player, which initially ran only on Macintosh computers. In November 1994 Apple released QuickTime 2.0 for Windows and, in April 1999, QuickTime 4.0, which supported media streaming.836The Commission also mentions MusicMatch's MusicMatch Jukebox and Nullsoft's Winamp Media Player, which rely not on their own codecs or file formats but on technologies owned by Microsoft, Apple or RealNetworks or on open formats (recitals 141 to 143 to the contested decision).837Recitals 302 to 314 to the contested decision contain a chronology of Microsoft's activities in the media software industry, which may be summarised as follows:

in August 1991, Microsoft released a version of its Windows 3.0 operating system, which contained Multimedia Extensions that allowed users to view still photographs and to listen to sounds, but did not enable media streaming;

in 1993, Microsoft released Video for Windows, which included Media Player 2.0 and allowed users to play downloaded video files on their client PCs;

in August 1995, Microsoft released the Windows 95 operating system, in which it subsequently integrated its Internet Explorer browser, which included RealNetworks' RealAudio Player;

in September 1996, Microsoft released NetShow 1.0, which was developed to work with Windows 95 and which allowed audio and video distributed over intranets to be played;

on 21 July 1997, Microsoft and RealNetworks announced an agreement to collaborate on streaming media, under which Microsoft licensed from RealNetworks, first, RealAudio and RealVideo 4.0 codecs for inclusion in its NetShow software and, second, RealPlayer 4.0 for inclusion in Internet Explorer;

in October 1997, Microsoft announced that RealPlayer 4.0 was included in Internet Explorer 4.0;

on 4 May 1998, Microsoft released the beta version of Microsoft Media Player, which was capable of streaming media across the Internet and of supporting, in particular, MPEG, QuickTime, RealAudio and RealVideo formats, and also the beta version of its Netshow 3.0 Server software;

on 25 June 1998, Microsoft released its Windows 98 operating system, the installation CD of which included the NetShow 2.0 player, which played streamed content but did not feature in the default configurations which Windows 98 offered to users;

on 7 July 1998, Microsoft released Windows Media Player 6 (WMP 6), which played content streamed over the Internet and worked with Windows 95, Windows 98 and Windows NT 4.0 and which supported RealAudio 4.0, RealVideo 4.0, ASF, AVI, WAV, MPEG and QuickTime;

on 5 May 1999, Microsoft released Windows 98 Second Edition for client PCs, which included the media player WMP 6; that media player could not be removed by OEMs or by users and was also included in subsequent versions of Windows, namely Windows Me, Windows 2000 Professional and Windows XP;

in August 1999, Microsoft released the Windows Media Technologies 4 architecture, which included Windows Media Player, Windows Media Services, Windows Media Tools and Microsoft's own digital rights management technology;

that software no longer provided native support for RealNetworks' or QuickTime's formats;

in September 2002, Microsoft announced the release of the beta version of its Windows Media 9 Series technology, which included, inter alia, the WMP 9 player.

838It should be noted that Microsoft complied with its obligation under the United States settlement to allow OEMs and consumers to enable or remove access to its middleware software, by releasing Windows 2000 Professional Service Pack 3 on 1 August 2002 and Windows XP Service Pack 1 on 9 September 2002 (recital 315 to the contested decision).839The first plea raised by Microsoft in relation to the Windows Media Player issue may be broken down into four parts. In the first part, Microsoft claims that the Commission applied a new, speculative, argument with no basis in law, in order to establish the existence of a foreclosure effect. In the second part, it claims that the Commission failed to take sufficient account of the advantages flowing from the architectural concept' of its operating system. In the third part, it submits that the Commission failed to establish the existence of an infringement of Article 82 EC, and in particular of Article 82(d) EC. Last, in the fourth part, Microsoft maintains that the Commission failed to take account of the obligations imposed by the TRIPS Agreement.840Furthermore, by way of introduction to the arguments which it develops in connection with the Windows Media Player issue, Microsoft makes a number of assertions concerning the conditions necessary to establish the existence of abusive bundling.841The Court will first examine the assertions referred to in the preceding paragraph. Next, in the light of the conclusions which it reaches (see paragraph 869 below), it will analyse the arguments which Microsoft puts forward in the first three parts of the first plea. It will consider finally the fourth part of the plea.842Microsoft refers to recital 794 to the contested decision and asserts that the Commission based its finding that there was abusive tying in the present case on the following factors:

first, the tying and tied products are two separate products;

second, the undertaking concerned is dominant in the market for the tying product;

third, the undertaking concerned does not give customers a choice to obtain the tying product without the tied product; and

fourth, the practice in question forecloses competition.

843The applicant refers to recital 961 to the contested decision and observes that the Commission also took into account the fact that the tying was not objectively justified.844Microsoft asserts that those various factors depart from the conditions laid down in Article 82(d) EC, in two respects.845First, the applicant claims that the Commission replaced the condition that the conclusion of contracts [must be made] subject to acceptance by the other parties of supplementary obligations which, by their nature or according to commercial usage, have no connection with the subject of such contracts by the condition that the dominant undertaking does not give customers a choice to obtain the tying product without the tied product.846Second, the Commission is alleged to have added a foreclosure requirement, not expressly provided for in Article 82(d) EC and which is not normally taken into account when assessing the existence of abusive tying. More specifically, the Commission, after acknowledging at recital 841 to the contested decision that the present case was not a classical tying case, based its conclusion that there was a foreclosure effect on a new and highly speculative theory that the widespread distribution of media functionality in Windows would compel content providers to encode their content in Windows Media format, which would have the effect of excluding all competing media players from the market and would then, indirectly, compel consumers to use only that media functionality.847Microsoft further submits that the contested decision is contradictory in that the Commission asserts at recital 792 to the contested decision that the conditions of Article 82(d) EC are satisfied in the present case, while at the same time taking into account conditions which derogate from that provision.848ACT claims that the Commission took three different categories of conditions into account in order to find that there had been abusive tying in the present case, namely, first, those laid down in Article 82(d) EC, second, those laid down in Article 82 EC in general and, third, the four conditions set out at recital 794 to the contested decision. ACT contends that, whatever category of conditions is applied, the Commission s appraisal is flawed.849The Commission, referring to recital 831 to the contested decision, claims that the tying at issue infringes Article 82 EC generally and Article 82(d) in particular'. It explains that it referred to those two provisions jointly in view of Microsoft's arguments during the administrative procedure and for the avoidance of doubt and also to avoid semantic debate on the interpretation [of Article 82(d) EC]. The conditions which the Commission applied in the present case in finding that there was abusive tying are consistent with those recognised in the case-law.850The Court finds that Microsoft's arguments are purely semantic and cannot be accepted.851It is appropriate to recall the way in which the Commission structures its argument relating to bundling in the contested decision.852At recital 794 to the contested decision, the Commission states that tying prohibited under Article 82 EC requires the presence of the four factors set out at paragraph 842 above.853Next, it examines Microsofts conduct in the light of those four factors (recitals 799 to 954 to the contested decision).854So, the Commission first observes that Microsoft has a dominant position on the client PC operating systems market (recital 799 to the contested decision). The Court notes that Microsoft does not dispute that fact.855Second, the Commission says that streaming media players and client PC operating systems are two separate products (recitals 800 to 825 to the contested decision).856Third, the Commission states that Microsoft does not give customers the choice of obtaining Windows without Windows Media Player (recitals 826 to 834 to the contested decision).857Fourth, the Commission claims that the tying of Windows Media Player forecloses competition in the media players market (recitals 835 to 954 to the contested decision). It observes, in particular, that in classical tying cases both it and the Community Courts considered the foreclosure effect for competing vendors to be demonstrated by the bundling of a separate product with the dominant product' (recital 841 to the contested decision). The Commission states, however, that in the present case there are good reasons not to assume without further analysis that tying Windows Media Player constitutes conduct which by its very nature is liable to foreclose competition (ibid.). The Commission considers, in essence, that tying [Windows Media Player] with the dominant Windows makes [Windows Media Player] the platform of choice for complementary content and applications which in turn [creates a risk of] foreclosing competition in the market for media players (recital 842 to the contested decision). Furthermore, [t]his has spillover effects on competition in related products such as media encoding and management software (often server-side), but also in client PC operating systems for which media players compatible with quality content are an important application (ibid.).858Last, the Commission examines the basis on which Microsoft relies in its attempt to demonstrate that the abusive conduct imputed to it is objectively justified (recitals 955 to 970 to the contested decision).859The Court considers that the Commissions analysis of the constituent elements of bundling is correct and that it is consistent both with Article 82 EC and with the case-law. The Commission was correct to rely on the factors set out at recital 794 to the contested decision and on the fact that the tying was without objective justification in deciding whether Microsoft's conduct constituted abusive tying. Those factors can be deduced both from the very concept of bundling and from the case-law (see, in particular, Case T-30/89 Hilti v Commission [1991] ECR II-1439, upheld in Case C-53/92 P Hilti v Commission [1994] ECR I-667 (both cases being referred to below as Hilti) and judgments of the Court of First Instance and the Court of Justice in Tetra Pak II, cited in paragraph 293 above).860It must be borne in mind that the list of abusive practices set out in the second paragraph of Article 82 EC is not exhaustive and that the practices mentioned there are merely examples of abuse of a dominant position (see, to that effect, Case C-333/94 P Tetra Pak II, cited in paragraph 293 above, paragraph 37). It is settled case-law that the list of practices contained in that provision is not an exhaustive enumeration of the abuses of a dominant position prohibited by the EC Treaty (Case 6/72 Europemballage and Continental Can v Commission [1973] ECR 215, paragraph 26, and Compagnie maritime beige transports and Others v Commission, cited in paragraph 229 above, paragraph 112).861It follows that bundling by an undertaking in a dominant position may also infringe Article 82 EC where it does not correspond to the example given in Article 82(d) EC. Accordingly, in order to establish the existence of abusive bundling, the Commission was correct to rely in the contested decision on Article 82 EC in its entirety and not exclusively on Article 82(d) EC.862In any event, the Court holds that the constituent elements of abusive tying identified by the Commission at recital 794 to the contested decision coincide effectively with the conditions laid down in Article 82(d) EC.863The Court thus rejects Microsoft's argument that in the present case the Commission applied conditions which differ, from two perspectives, from those laid down in Article 82(d) EC.864In the first place, when the Commission states that it is necessary to examine whether the dominant undertaking does not give customers a choice to obtain the tying product without the tied product, it is merely expressing in different words the concept that bundling assumes that consumers are compelled, directly or indirectly, to accept supplementary obligations', such as those referred to in Article 82(d) EC.865In the present case, as the Court will explain in greater detail at paragraphs 962 and 965 below, that coercion is mainly applied first of all to OEMs, who then pass it on to the end user. The end user is directly exposed to that coercion in the less frequent situation in which, rather than deal through an OEM, he acquires a Windows client PC operating system directly from a retailer.866In the second place, it cannot be claimed that the Commission introduced a new condition relating to the foreclosure of competitors from the market in order to establish the existence of abusive bundling within the meaning of Article 82(d) EC.867In that regard, the Court observes that, while it is true that neither that provision nor, more generally, Article 82 EC as a whole contains any reference to the anticompetitive effect of bundling, the fact remains that, in principle, conduct will be regarded as abusive only if it is capable of restricting competition (see, to that effect, Case T-203/01 Michelin v Commission [2003] ECR II-4071 (Michelin II), paragraph 237).868Furthermore, as will be made explicit at paragraphs 1031 to 1058 below, the applicant cannot claim that the Commission relied on a new and highly speculative theory to reach the conclusion that a foreclosure effect exists in the present case. As indicated at recital 841 to the contested decision, the Commission considered that, in light of the specific circumstances of the present case, it could not merely assume, as it normally does in cases of abusive tying, that the tying of a specific product and a dominant product has by its nature a foreclosure effect. The Commission therefore examined more closely the actual effects which the bundling had already had on the streaming media player market and also the way in which that market was likely to evolve.869In light of the foregoing, the Court considers that the question of the bundling must be assessed by reference to the four conditions set out at recital 794 to the contested decision (see paragraph 842 above) and to the condition relating to the absence of objective justification.870The second condition set out at recital 794 to the contested decision must be considered to be met, because it is common ground that Microsoft has a dominant position on the market for what is alleged to be the tying product, namely client PC operating systems. The arguments which Microsoft puts forward in relation to the first three parts of the first plea (see paragraph 839 above) will be examined in conjunction with the four other conditions which must be satisfied to substantiate the finding of abusive tying. In carrying out that examination, the Court will proceed as follows. First, it will examine the condition relating to the existence of two separate products in the light of the arguments advanced by Microsoft on the second and third parts of the plea. Second, it will examine the condition to the effect that the conclusion of contracts is made subject to supplementary obligations, in the light of the arguments which Microsoft puts forward in support of the third part of the plea. Third, the Court will analyse the condition relating to the restriction of competition on the market in the light of the submissions made by Microsoft in connection with the first part of the plea. Fourth, it will examine the objective justifications on which the applicant relies, taking into account the arguments which it puts forward in connection with the second part of the plea.871The fourth part, relating to the alleged failure to take into account the obligations imposed on the Communities by the TRIPS Agreement, will then be examined.872The Commission deals with this first condition at recitals 800 to 825 to the contested decision. Its analysis comes under three heads. In the first place, it takes particular care to demonstrate that streaming media players and client PC operating systems are separate products (recitals 800 to 813 to the contested decision). In the second place, it rejects Microsoft's argument that it began to bundle its media player technology with its Windows operating system before 1999 (recitals 814 to 820 to the contested decision). In the third place, it rejects Microsoft's argument that bundling a streaming media player with an operating system is normal commercial practice (recitals 821 to 824 to the contested decision).873Under the first head of its analysis, the Commission explains, first, that, according to the case-law, the fact that there are independent manufacturers who specialise in the manufacture of the tied product indicates the existence of separate consumer demand and therefore of a distinct market for the tied product (recital 802 to the contested decision). The Commission therefore considers that the distinctness of products for the purposes of an analysis under Article 82 EC must be assessed in the light of consumer demand, in the sense that if there is no separate demand for what is alleged to be a tied product the products at issue are not distinct (recital 803 to the contested decision).874Second, the Commission observes that the market provides media players separately and that there are vendors who develop and supply media players on a standalone basis, separately from operating systems (recital 804 to the contested decision).875Third, the Commission refers to Microsoft's practice of developing and distributing versions of Windows Media Player for Apple's Mac and Sun's Solaris operating systems (recital 805 to the contested decision). It also notes that Microsoft releases upgrades of its media player, distinct from Windows operating system releases or upgrades (recital 804 to the contested decision).876Fourth, the Commission states that a not insignificant number of consumers choose to obtain media players separately from their operating system, including RealPlayer from RealNetworks, which does not develop or sell operating systems (ibid.).877Fifth, the Commission points out that some operating system users will not need or want a media player (recital 807 to the contested decision).878Sixth, the Commission rejects Microsoft's argument that there is no material demand for operating systems without media player technologies (recital 809 to the contested decision).879Seventh, the Commission observes that Microsoft engages in specific promotions of Windows Media Player, independent of the operating system (recital 810 to the contested decision).880Eighth, the Commission explains that client PC operating systems and streaming media players are also different in terms of their functionalities (recital 811 to the contested decision).881Ninth, the Commission states that the two products involve different industry structures, as may be seen from the fact that Microsoft still has some competitors on the media players market, whereas its competitors on the client PC operating systems market are insignificant (recital 812 to the contested decision). The price points of the two products are also different (ibid.).882Tenth, the

Commission explains that Microsoft applies software developer's kit licences (SDK licences) which differ according to whether the software developer's kit (SDK) relates to the Windows operating systems or the Windows Media technologies (recital 813 to the contested decision).883Under the second head of its analysis, the Commission asserts that Microsoft's argument that its media player technology has been bundled with Windows since 1992 cannot affect the Commission's conclusion that there are two separate products. It states, in particular, that it takes issue with Microsoft's conduct at a juncture where tying became more harmful than it had previously been, and observes, in that regard, that in 1999 Microsoft tied a product (WMP 6) which matched other vendors products in the essential functionality that many customers came to expect from a media player (media streaming over the Internet) and with which Microsoft had entered the market for streaming media players in 1998 (recital 816 to the contested decision). The Commission also observes that the first streaming media player which Microsoft distributed together with Windows, in 1995, was RealNetworks' RealAudio Player, as at the time Microsoft did not yet have a Viable' streaming media player (recital 817 to the contested decision). The Commission states that the RealAudio Player software code could be fully uninstalled (ibid.).884Under the third head of its analysis, the Commission refutes Microsoft's argument that bundling a streaming media player with a client PC operating system is normal commercial practice. First, that argument does not take account of the fact that there are independent suppliers of the tied product; second, Sun and the Linux vendors do not bundle their own media players but third-party media players; and, third, none of those operating system vendors links the media player with the operating system in such a way that it cannot be uninstalled (recitals 821 to 823 to the contested decision).885In the first place, Microsoft, supported by CompTIA, DMDsecure and Others, ACT, TeamSystem, Mamut and Exor, claims that the contested decision does not establish that Windows and its media functionality belong to two separate product markets.886The media functionality in question is a long-standing feature of the Windows operating system'. In Windows, the software code that permits users to play audio and video content is no different from the code that permits them to access other types of information, such as text or graphics. Furthermore, other parts of Windows and of third-party applications running on top of the Windows operating system call on the same software code.887Microsoft takes issue with the fact that in the contested decision the Commission considers only the question whether what it alleges to be the tied product, namely media functionality, is available separately from what it alleges to be the tying product, namely the client PC operating system. In reality, the appropriate question is whether the tying product is regularly offered without the tied product. In fact, there is no real consumer demand for a client PC operating system without media functionality and no operator therefore markets such a system.888Microsoft submits that the Commission punishes dominant undertakings which improve their products by integrating new features in them, when it requires that such features be made removable whenever a third party markets a standalone product that provides the same or similar functionalities.889Furthermore, the position adopted by the Commission is even less acceptable, because the alleged abuse is not the result of the integration of media functionality in Windows — which goes back to 1992 and has been the subject of continuous improvement — but of the improvement which Microsoft made to that functionality in 1999, when it added its own streaming capability. In other words, the Commission challenges the presence of media functionality in Windows only in so far as it permits audio and video content found on the Internet to be played before it is completely downloaded.890Microsoft also claims that all the other major client PC operating systems, namely Mac OS, Linux, OS/2 and Solaris, contain media functionality capable of playing content streamed over the Internet. Its competitors all consider that the integration of such functionality in client PC operating systems is normal commercial practice that responds to consumer demand. That shows that streaming capability is a natural feature in client PC operating systems and not a separate product. In that regard, Microsoft emphasises that a product should be defined primarily in terms of customer expectations and demands'. As stated at recital 824 to the contested decision, however, the Commission appears to accept that customers do in fact want operating systems to have media functionality.891Microsoft further submits that the Commission expressly recognises, at recital 1013 to the contested decision, that it would not have committed an abuse if it had in 1999 offered two versions of Windows at the same price, namely one with Windows Media Player and the other without it. However, there is no evidence that there would have been any demand for a version of Windows that, at the same price, contained fewer features. That lack of demand also shows that Windows with media functionality is a single product.892Furthermore, Microsoft, supported on this point by DMDsecure and Others and ACT, asserts that the Commission cannot rely on Tetra Pak II, cited in paragraph 293 above, and Hilti, cited in paragraph 859 above, to substantiate its argument that Windows and its media functionality belong to two separate product markets. First of all, those cases concerned consumable products which were used with durable equipment over the lifetime of that durable equipment and which were physically separate. In those two cases, unlike in the present case, there was evidence of demand for the tying product without the tied product. In the present case, moreover, the Commission has never identified a customer wishing to obtain what is alleged to be the tying product without what is alleged to be the tied product.893Last, Microsoft takes issue with certain arguments put forward by the Commission in the defence to demonstrate that Windows is a separate product from Windows Media Player. First, it submits that the United States courts never found that Windows Media Player belonged to a separate market from the market to which the Windows operating system belonged. Second, it contends that the fact that it releases versions of Windows Media Player separately from Windows does not demonstrate the existence of demand for Windows without Windows Media Player. In addition, those versions of Windows Media Player are in fact merely updates of the media functionality present in Windows. Third, the Commission's assertion that the files that constitute Windows Media Player are readily identifiable is irrelevant. In any event, that assertion is incorrect.894Microsoft also asserts that the Commission has not demonstrated that the media functionality is not linked, by its nature or according to commercial usage, to the client PC operating systems.895The applicant claims that the integration of media functionality is a natural step in the evolution of those operating systems, as may be seen from the fact that all vendors of operating systems include such functionality in their products. Microsoft is constantly seeking to improve Windows in response to technological advances and to changes in consumer demand, and Windows and other client PC operating systems have evolved over time to support an increasingly wider range of file types. For software developers and consumers, there is no fundamental difference between files that contain text or graphics and files that contain audio or video. In reality, a modern operating system is expected to support both types of files.896Operating systems and media functionalities have also become strongly connected' by commercial usage. The applicant integrated media functionality in Windows in 1992 and has steadily improved that functionality since then. The streaming capability which it added in 1999 was just one of the many capabilities [which it] added to keep pace with rapid changes in technology.897Last, Microsoft contends that the Commission cannot rely on the Court of Justice's statement, at paragraph 37 its judgment in Tetra Pak II, cited in paragraph 293 above, that even where tied sales of two products are in accordance with commercial usage, such sales may still constitute abuse within the meaning of Article 82 EC unless they are objectively justified. Unlike the situation in Tetra Pak II, suppliers of third-party media players are not excluded from the market by the presence of media functionality in Windows.898In the reply, Microsoft further contends that the Commission's argument that an undertaking in a dominant position may be deprived of the right to adopt a course of conduct which would be unobjectionable if it were adopted by an non-dominant undertaking, and that it is not permissible to refer to industry practice in certain circumstances, is irrelevant to the issue whether the Commission has demonstrated that the conditions laid down in Article 82(d) EC were satisfied.899The Commission, supported by SUA, disputes Microsoft's assertion that the contested decision does not establish that Windows and its media functionality belong to two separate markets.900The Commission makes the preliminary observation that Microsoft's argument rests on a diffuse notion of media functionality. What Microsoft calls media functionality is not one general, indivisible block of code. In practice, Microsoft itself draws a distinction between the underlying media infrastructure of the operating system, which acts as a platform for media applications and provides basic system services to the rest of the operating system, and the media player application which runs on top of the operating system and which decodes, decompresses and plays digital audio and video files downloaded or streamed over the Internet: the Commission gives the example of Microsoft's product Windows XP Embedded. The Commission emphasises that the contested decision is concerned with Microsoft's tying of the streaming media application Windows Media Player and not with the underlying media infrastructure.901The Commission refers to recital 802 to the contested decision and submits that the Community Courts have held that the existence of independent manufacturers which specialise in the manufacture of the tied product indicated a separate consumer demand and therefore a distinct market for the tied product. The distinction that Microsoft draws between the present case and Tetra Pak II and Hilti, on the basis that the latter cases concerned consumables that were physically separate from the equipment with which they were used, lacks conviction. The judgments delivered in those cases, paragraphs 293 and 859 above, cannot be interpreted as meaning that the application of Article 82 EC must be limited to the tying of consumables.902The Commission disputes Microsoft's assertion that it ought, rather, to have considered whether there was a demand for the tying product without the tied product, which in the Commissions submission amounts to an incorrect claim that complementary products cannot constitute two separate products for the purposes of Article 82 EC. The United States courts have rejected similar arguments which Microsoft had raised before them and have consistently held that there was a separate market for Intel-compatible client PC operating systems and excluded middleware products (which include Windows Media Player) from that market.903The Commission also maintains that Microsoft's commercial practice of developing and distributing versions of Windows Media Player for Apple's Mac and Sun's Solaris operating systems, and even for non-PC platforms — notably television decoders — provides further indication that client PC operating systems and media players are not just parts of the same product (recital 805 to the contested decision). Likewise, Microsoft releases upgrades of Windows Media Player distinct from Windows operating systems releases or upgrades, engages in promotion specifically dedicated to Windows Media

Player and applies different SDK licence agreements depending on whether the SDK concerns Windows or Windows Media technologies (recitals 805 and 813 to the contested decision).904Furthermore, particular importance should be attached to the role of OEMs, which, in their relationships with software vendors, act as intermediaries on behalf of end users and provide them with an out-of-the-box product, by combining hardware, client PC operating system and applications for which there is demand (recitals 68 and 119 to the contested decision). The great majority (75%) of Microsoft's sales of client PC operating systems are made through OEMs and the fact that consumers want to find a media player pre-installed on their computers is no reason for Microsoft to tie its own media player with its PC operating system. OEMs could meet such consumer demand by adding a media player to the client PCs which they sell, just as they offer the possibility of other software applications being included. Microsoft's argument that there is no demand for a Windows operating system without a media player ignores the role thus played by OEMs.905The evidence in the Commission's possession shows that users of operating systems do not necessarily want those systems to have a streaming media player (recital 807 to the contested decision) and that, to the extent that they do, their demand for streaming media players is distinct from the demand [for] operating systems.906The Commission refers to recitals 814 to 820 to the contested decision and submits that Microsoft's assertion that the alleged abuse is the result of the improvement which it made to its media functionality in 1999 is misleading.907In response to Microsoft's arguments that other operating system vendors are doing exactly the same as it does, the Commission observes that tying practices have a different impact depending on whether or not they are engaged in by a dominant undertaking. Furthermore, some operating system vendors, such as Sun and Linux distributors, do not bundle their own media player with their operating system but bundle a different media player offered by independent suppliers, and they do not link the media player concerned with their operating system in such a way that it is impossible to remove it (recitals 822 and 823 to the contested decision).908The Commission denies having acknowledged, at recital 1013 to the contested decision or anywhere else in that decision, that Microsoft would not have committed an abuse if in 1999 it had offered, at the same price, two versions of Windows, one with and the other without Windows Media Player. Should Microsoft now decide to sell the unbundled version of Windows at the same price as the bundled version, the Commission would examine that price by reference to the present market situation and in the light of Microsoft's obligation to refrain from any measure having an equivalent effect to tying and, if necessary, adopt a new decision pursuant to Article 82 EC.909Last, the Commission disputes Microsoft's assertion that it has not been shown that media functionality is not linked, by its nature or according to commercial usage, to client PC operating systems.910The Commission refers to recital 961 to the contested decision and observes that a dominant undertaking may be deprived of the right to adopt a course of conduct which would be unobjectionable if it were adopted by a non-dominant undertaking. The Court of Justice held in Tetra Pak II, cited in paragraph 293 above, that even if tied sales of two products are in accordance with commercial usage, they may none the less constitute abuse within the meaning of Article 82 EC unless they are objectively justified. In the Commission's submission, it is tautological to refer to commercial usage or practice in an industry that is 95% controlled by Microsoft; and it is established case-law that reference to industry practice in a market where competition is already restricted by the very presence of a dominant undertaking is not admissible.911Last, the Commission disputes Microsoft's argument that the integration of media functionality in Windows client PC operating systems forms part of a natural evolution. Microsoft was unable to develop a streaming media player using its own technology and it was only after it acquired VXtreme in 1997 that it was able to create a media player capable of competing with RealNetworks' player. The Commission also refers to an email sent to Mr Gates in January 1997 by Mr Bay, a Microsoft executive, in which the latter proposed to reposition [the] streaming media battle from NetShow vs. Real to Windows vs. Real and to follow the [Internet Explorer] strategy wherever appropriate.912Microsoft contends, in substance, that media functionality is not a separate product from the Windows client PC operating system but forms an integral part of that system. As a result, what is at issue is a single product, namely the Windows client PC operating system, which is constantly evolving. In Microsoft's submission, customers expect that any client PC operating system will have the functionalities which they perceive as essential, including audio and video functionalities, and that those functionalities will be constantly updated.913The Court notes, by way of preliminary observation, that the IT and communications industry is an industry in constant and rapid evolution, so that what initially appear to be separate products may subsequently be regarded as forming a single product, both from the technological aspect and from the aspect of the competition rules.914It is by reference to the factual and technical situation that existed at the time when, according to the Commission, the impugned conduct became harmful, and therefore the period after May 1999, that the Court must assess whether the Commission was correct to find that streaming media players and client PC operating systems constituted two separate products.915The Court must thus ascertain whether the Commission was correct to conclude in the contested decision that when, from May 1999, Microsoft released the version of Windows incorporating Windows Media Player, that conduct involved the bundling of two separate products for the purposes of Article 82 EC.916The Court notes, by way of further preliminary observation, that, as the Commission correctly explains, the argument which Microsoft puts forward in connection with the bundling of Windows and Windows Media Player relies to a large extent on the vague concept of media functionality. In that regard, it must be emphasised that it is clear from the contested decision that, so far as that issue is concerned, the impugned conduct concerns only the application software that is Windows Media Player, to the exclusion of any other media technology included in the Windows client PC operating system (see, in particular, recitals 1019 and 1020 to the contested decision). As the Commission and the parties intervening in its support observed in their pleadings and at the hearing, Microsoft itself differentiates, in its technical documentation, the files which constitute Windows Media Player from the other media files, in particular those relating to the basic media infrastructure of the operating system. It is also appropriate to mention the example of the Microsoft product called Windows XP Embedded, referred to at recitals 1028 to 1031 to the contested decision and discussed at the hearing. From the technical aspect, that product is a genuine client PC operating system, but Microsoft's licensing conditions limit its use to certain specialised machines, such as bank automatic teller machines and decoders. The particular feature of that product is that it enables IT engineers to select the components of the operating system. In order to do so, they use a tool called Target Designer' to access a menu of the components which they can include in, or exclude from, their operating systems. Those components specifically include Windows Media Player. Furthermore, the menu contains separate entries for the media infrastructure and for the media applications, and Windows Media Player is expressly included among the latter applications.917First of all, it must be observed that, as the Commission correctly states at recital 803 to the contested decision, the distinctness of products for the purpose of an analysis under Article 82 EC has to be assessed by reference to customer demand. Furthermore, Microsoft clearly shares that opinion (see paragraph 890 above).918The Commission was also correct to state, at the same recital, that in the absence of independent demand for the allegedly tied product, there can be no question of separate products and no abusive tying.919Microsoft's argument that the Commission thus applied the wrong test and that it ought in reality to have ascertained whether what was alleged to be the tying product was regularly offered without the tied product or whether customers want [ed] Windows without media functionality' cannot be accepted.920In the first place, the Commission's argument finds support in the case-law (see, to that effect, Case C-333/94 P Tetra Pak II, cited in paragraph 293 above, paragraph 36; Case T-30/89 Hilti, cited in paragraph 859 above, paragraph 67; and Case T-83/91 Tetra Pak II, cited in paragraph 293 above, paragraph 82).921In the second place, as the Commission correctly observes in its pleadings, Microsoft's argument, based on the concept that there is no demand for a Windows client PC operating system without a streaming media player, amounts to contending that complementary products cannot constitute separate products for the purposes of Article 82 EC, which is contrary to the Community case-law on bundling. To take Hilti, for example, it may be assumed that there was no demand for a nail gun magazine without nails, since a magazine without nails is useless. However, that did not prevent the Community Courts from concluding that those two products belonged to separate markets.922In the case of complementary products, such as client PC operating systems and application software, it is quite possible that customers will wish to obtain the products together, but from different sources. For example, the fact that most client PC users want their client PC operating system to come with word-processing software does not transform those separate products into a single product for the purposes of Article 82 EC.923Microsoft's argument ignores the particular intermediary role played by OEMs, who combine hardware and software from different sources in order to offer a ready-to-use PC to the end user. As the Commission very correctly observes at recital 809 to the contested decision, if OEMs and consumers were able to obtain Windows without Windows Media Player, that would not mean that they would choose to obtain Windows without a streaming media player. OEMs follow consumer demand for a pre-installed media player on the operating system and offer a software package including a streaming media player that works with Windows, the difference being that that player would not necessarily be Windows Media Player.924In the third place, and in any event, Microsoft's argument cannot succeed because, as the Commission observes at recital 807 to the contested decision, there exists a demand for client PC operating systems without streaming media players, for example by companies afraid that their staff might use them for non-work-related purposes. That fact is not disputed by Microsoft.925Next, the Court finds that a series of factors based on the nature and technical features of the products concerned, the facts observed on the market, the history of the development of the products concerned and also Microsoft's commercial practice demonstrate the existence of separate consumer demand for streaming media players.926In the first place, it must be borne in mind that the Windows client PC operating system is system software while Windows Media Player is application software. As the Commission explains at recital 37 to the contested decision, [s]ystem software controls the hardware of the computer, to which it sends instructions on behalf of applications fulfilling a specific user need, such as word processing, and [o]perating systems are system software products that control the basic functions of a computer and enable the user to make use of such a computer and run application software on it. More generally, it is clear from the description of those products at recitals 324 to 342 and 402 to 425 to the contested decision that client PC operating systems and streaming media players clearly differ in terms of functionalities.927In the second place, there are distributors who develop and supply streaming media players on an autonomous basis, independently of client PC operating systems. Thus, Apple supplies its QuickTime player separately from its client PC operating systems. A further particularly convincing example is that of RealNetworks, Microsoft's main competitor on the streaming media players market, which neither develops nor sells client PC operating systems. It must be pointed out, in that regard, that according to the case-law the fact that there are on the market independent companies specialising in the manufacture and sale of the tied product constitutes serious evidence of the existence of a separate market for that product (see, to that effect, Case C-333/94 P Tetra Pak II, cited in paragraph 293 above, paragraph 36; Case T-30/89 Hilti, cited in paragraph 859 above, paragraph 67; and Case T-83/91 Tetra Pak II, cited in paragraph 293 above, paragraph 82).928Likewise, in the third place, Microsoft, as it confirmed in answer to a written question put by the Court, develops and markets versions of Windows Media Player which are designed to work with its competitors' client PC operating systems, namely Apples Mac OS X and Suns Solaris. Similarly, RealNetworks' RealPlayer works with, inter alia, the Windows, Mac OS X, Solaris and some UNIX operating systems.929In the fourth place, Windows Media Player can be downloaded, independently of the Windows client PC operating system, from Microsoft's Internet site. Likewise, Microsoft releases upgrades of Windows Media Player, independently of releases or upgrades of its Windows client PC operating system.930In the fifth place, Microsoft engages in promotions specifically dedicated to Windows Media Player (see recital 810 to the contested decision).931In the sixth place, as the Commission pertinently observes at recital 813 to the contested decision, Microsoft offers SDK licences which differ according to whether they relate to the Windows client PC operating system or to Windows Media technologies. There is thus a specific SDK licence for Windows Media Player.932Last, and in the seventh place, in spite of the bundling applied by Microsoft, a not insignificant number of customers continue to acquire media players from Microsoft's competitors, separately from their client PC operating system, which shows that they regard the two products as separate.933The foregoing facts demonstrate to the requisite legal standard that the Commission was correct to conclude that client PC operating systems and streaming media players constituted two separate products for the purposes of Article 82 EC.934That conclusion is not undermined by Microsoft's other arguments.935In the first place, as regards Microsoft's argument that the integration of Windows Media Player in the Windows operating system from May 1999 constitutes a normal and necessary step in the evolution of that system and is in keeping with the constant improvement of its media functionality, it is sufficient to observe that the fact that tying takes the form of the technical integration of one product in another does not have the consequence that, for the purpose of assessing its impact on the market, that integration cannot be qualified as the bundling of two separate products.936As Microsoft itself acknowledged in answer to a question put to it by the Court at the hearing, its decision to supply WMP 6 as a functionality integrated in the Windows operating system from May 1999 was not the consequence of a technical constraint. At that time there was nothing to prevent Microsoft from distributing WMP 6 in the same way as it had distributed its previous player, NetShow, which since June 1998 had been included on the Windows 98 installation CD: and none of the four Windows 98 default installations provided for the installation of NetShow, which had to be installed by users if they wished to use it.937Furthermore, Microsoft's argument that the integration of Windows Media Player in the Windows operating system was dictated by technical reasons is scarcely credible in the light of the content of certain of its own internal communications. Thus, it follows from Mr Bays email of 3 January 1999 to Mr Gates (see paragraph 911 above) that the integration of Windows Media Player in Windows was primarily designed to make Windows Media Player more competitive with RealPlayer by presenting it as a constituent part of Windows and not as application software that might be compared with RealPlayer.938In the second place, Microsoft cannot claim that the Commission fails to show that media functionality is not linked, by nature or according to commercial usage, to client PC operating systems.939First, it follows from the considerations set out at paragraphs 925 to 932 above that client PC operating systems and streaming media players do not, by their nature, constitute indissociable products. While it is true that there is a link between a client PC operating system such as Windows and application software such as Windows Media Player, in the sense that both products are on the same computer from the user's perspective and that a media player will only work when an operating system is present, that does not mean that the two products are not dissociable in economic and commercial terms for the purpose of competition rules.940Second, as the Commission rightly observes, it is difficult to speak of commercial usage in an industry that is 95% controlled by Microsoft.941Third, Microsoft cannot rely on the fact that vendors of competing client PC operating systems also bundle those systems with a streaming media player. On the one hand, Microsoft has not adduced any evidence that such bundling was already carried out by its competitors at the time when the abusive bundling commenced. On the other hand, moreover, it is clear that the commercial conduct of those competitors, far from invalidating the

Commissions argument, corroborates it. As may be seen from recitals 822 and 823 to the contested decision and as the Commission observes in its pleadings, some vendors of non-Microsoft operating systems who supply their operating systems with a media player make the installation of the media player optional, or allow it to be uninstalled, or offer a selection of different media players.942Fourth, and in any event, it is settled case-law that even when the tying of two products is consistent with commercial usage or when there is a natural link between the two products in question, it may none the less constitute abuse within the meaning of Article 82 EC, unless it is objectively justified (Case C-333/94 P Tetra Pak II, cited in paragraph 293 above, paragraph 37).943Finally, in the third place, the argument which Microsoft put forward at the hearing, that the unbundled version of Windows which it placed on the market pursuant to the remedy had met with no success, must also be rejected. As already stated at paragraph 260 above, the lawfulness of a Community measure must be assessed on the basis of the matters of fact and of law existing at the time when the measure was adopted. Furthermore, any doubts as to the effectiveness of the remedy ordered by the Commission do not in themselves prove that its finding as to the existence of two separate products is wrong.944The Court concludes from all of the foregoing considerations that the Commission was correct to find that client PC operating systems and streaming media players constituted separate products.945At recitals 826 to 834 to the contested decision, the Commission seeks to demonstrate that the third condition necessary for a finding of abusing bundling, namely the condition relating to coercion, is satisfied in the present case, in that Microsoft does not give consumers the option of obtaining the Windows client PC operating system without Windows Media Player.946In the first place, the Commission states that the OEMs who license the Windows operating system from Microsoft for pre-installation on a client PC are direct addressees of that coercion and pass it on to end-users (recital 827 to the contested decision). It explains that under Microsoft's licensing system, OEMs must license the Windows operating system with Windows Media Player pre-installed. In effect, Microsoft does not license Windows without Windows Media Player. OEMs who wish to install a different media player on Windows can do so only by adding it to Windows Media Player. At recital 829 to the contested decision, the Commission adds that there are no technical means of uninstalling Windows Media Player.947In the second place, the Commission asserts that the United States settlement does not alter that situation, since [r]emoval of end-user access does not restore the choice of Microsoft's customers as to whether to acquire Windows without [Windows Media Player] (recital 828 to the contested decision).948In the third place, the Commission considers that Microsoft cannot rely on the fact that consumers are not required to pay extra for Window

Media Player, since Article 82(d) EC makes no mention of paying' where it refers to supplementary] obligations' (recital 831 to the contested decision). Furthermore, the price of Windows Media Player is probably hidden in the overall price for the bundle of Windows and Windows Media Player (footnote 971 to the contested decision).949In the fourth place, the Commission observes that there is no suggestion in the language of Article 82 EC that consumers must be compelled to use the tied product. It submits that, in so far as the tied sale gives rise to a risk that competition will be restricted, it is immaterial whether consumers are forced to buy or use Windows Media Player (recitals 832 and 833 to the contested decision).950Microsoft, supported by CompTIA, DMDsecure and Others, ACT, TeamSystem, Mamut and Exor, claims that the question of supplementary obligations' within the meaning of Article 82(d) EC does not arise in the present case.951In support of that assertion, Microsoft submits, first of all, that consumers are not required to pay anything extra for the media functionality of Windows. Media functionality is a feature of Windows and is included in the overall price of the operating system. Unlike the situation in Hoffmann-La Roche v Commission, cited in paragraph 664 above, and Hilti, Microsoft does not impose any financial disadvantage that might discourage consumers from using its competitors' products.952Nor are consumers required to use the media functionality in Windows. They can even use the Set Program Access & Defaults function in Windows, which Microsoft created pursuant to the United States settlement, confirmed by decision of the District Court of 1 November 2002, to remove all end-user access to that functionality and set a competing media player as the default handler of various media file types.953Last, Microsoft contends that, unlike in Tetra Pak II and Hilti, consumers are not prevented from installing and using third-party media players instead of, or in addition to, the media functionality in Windows. At recital 860 to the contested decision, moreover, the Commission notes that consumers use on average 1.7 media players each month and states that that figure is increasing.954In the reply, Microsoft further submits that the Commission's argument has the consequence of depriving Article 82 EC of its useful effect. If the Commission's argument were to be accepted, it would have the consequence of eliminating the requirement of coercion' as an element of abusive tying, which would be contrary to sound economic principles.955The Commission submits that the arguments which Microsoft puts forward in support of its proposition that the question of supplementary payments' within the meaning of Article 82(d) EC does not arise in the present case have already been rejected at recitals 826 to 834, 960 and 961 to the contested decision. Those arguments find no support in the case-law and would deprive Article 82 EC of its useful effect Coercion exists when a dominant undertaking deprives its customers of the realistic choice of buying the tying product without the tied product956Article 82(d) EC makes no mention of payment. By its arguments, Microsoft suggests that there can be no question of harm to competition where a dominant undertaking charges a uniform price, rather than two separate prices, for two products or imposes a product on consumers without charging a supplement. Microsoft is thus confusing the question of coercion and the question of harm to competition.957Nor, in the Commission's submission, does it follow from the wording of Article 82 EC that customers must be forced to use the tied product or prevented from using competitors' substitutes for the tied product. The question whether or not consumers or suppliers of complementary software and content are likely to use the bundled product at the expense of competing non-bundled products is clearly relevant to the examination of the condition relating to foreclosure of competition.958In response to Microsoft's assertion that an average of 1.7 media players are used each month by consumers, the Commission contends that consumers cannot replace Windows Media Player by another media player on their PCs, but can only add a second media player. That average figure of 1.7 must not obscure the fact that Windows Media Player is always pre-installed on Windows PCs.959Last, in answer to a written question put by the Court, the Commission stated that the United States settlement did not require Microsoft to suppress end-user access to Windows Media Player but only to hide that access, so that Windows Media Player remained pre-installed and fully active on the PC. OEMs and end users are therefore still compelled to acquire Windows Media Player and Windows simultaneously. Referring to recital 852 to the contested decision, the Commission also maintained, in its answer, that Microsoft had conceived the hiding mechanism in such a way that Windows Media Player could override the default parameters and reappear when the user accessed media files streamed over the Internet via Internet Explorer.960Microsoft contends, in essence, that the fact that it integrated Windows Media Player in the Windows client PC operating system does not entail any coercion or supplementary obligation within the meaning of Article 82(d) EC. In support of its argument, it emphasises, in the first place, that customers pay nothing extra for the media functionality of Windows; in the second place, that they are not obliged to use that functionality; and, in the third place, that they are not prevented from installing and using competitors' media players.961The Court observes that it cannot be disputed that, in consequence of the impugned conduct, consumers are unable to acquire the Windows client PC operating system without simultaneously acquiring Windows Media Player, which means (see paragraph 864 above) that the condition that the conclusion of contracts is made subject to acceptance of supplementary obligations must be considered to be satisfied.962As the Commission correctly states at recital 827 to the contested decision, in most cases that coercion is applied primarily to OEMs, and is then passed on to consumers. OEMs, who assemble client PCs, install on those PCs a client PC operating system provided by a software producer or developed by themselves. OEMs who wish to install a Windows operating system on the client PCs which they assemble must obtain a licence from Microsoft in order to do so. Under Microsoft's licensing system, it is not possible to obtain a licence on the Windows operating system without Windows Media Player. The Court notes, in that regard, that it is common ground that the vast majority of sales of Windows client PC operating systems are made through OEMs, that is to say, by means of licences purchased when a client PC is purchased, while only 10% of sales of those systems are generated by the sale of individual Windows licences.963The coercion thus applied to OEMs is not just contractual in nature, but also technical. In effect, it is common ground that it was not technically possible to uninstall Windows Media Player.964As OEMs act in their relationships with software producers as intermediaries on behalf of end users, and as they supply end users with an out-of-the-box PC, the impossibility of acquiring the Windows client PC operating system without simultaneously acquiring Windows Media Player applies ultimately to those users.965In the less common case where the end user acquires a Windows client PC operating system directly from a retailer, the abovementioned contractual and technical coercion is applied directly to that end user.966The Court considers that the arguments which Microsoft puts forward must be rejected.967Thus, in the first place, Microsoft cannot rely on the fact that customers are not required to pay anything extra for Windows Media Player.968First, while it is true that Microsoft does not charge a separate price for Windows Media Player, it cannot be inferred that the media player is provided free of charge. As is evident from paragraph 232 of Microsoft's application, the price of Windows Media Player is included in the total price of the Windows client PC operating system.969Second, and in any event, it does not follow from either Article 82(d) EC or the case-law on bundling that consumers must necessarily pay a certain price for the tied product in order for it to be concluded that they are subject to supplementary obligations within the meaning of that provision.970Nor, in the second place, is it relevant for the purposes of the examination of the present condition that, as Microsoft claims, consumers are not obliged to use the Windows Media Player which they find pre-installed on their client PC and that they can install and use other undertakings' media players on their PCs. Again, neither Article 82(d) EC nor the case-law on bundling requires that consumers must be forced to use the tied product or prevented from using the same product supplied by a competitor of the dominant undertaking in order for the condition that the conclusion of contracts is made subject to acceptance of supplementary obligations to be capable of being regarded as satisfied. For example, as the Commission correctly observes at recital 832 to the contested decision, in Hilti users were not forced to use the Hilti branded nails which they obtained with the Hilti branded nail gun.971The Court observes that, as will be explained in greater detail when it examines the condition relating to the restriction of competition on the market due to the bundling in question, first, OEMs are deterred from pre-installing a second streaming media player on client PCs and, second, consumers have an incentive to use Windows Media Player at the expense of competing media players, notwithstanding that the latter players are of better quality.972The argument which Microsoft bases on certain measures which it adopted pursuant to the United States settlement (see paragraph 952 above) must also be rejected.973First, it was only in November 2001 that that settlement was concluded and only in August and September 2002 that Microsoft adopted the measures required by that settlement concerning middleware (including Windows Media Player); however, the abusive bundling began in May 1999. Furthermore, the United States settlement was concluded for a limited period, until 2007.974Second, as the Commission correctly observes at recital 828 to the contested decision, the measures which Microsoft adopted under the United States settlement did not have the consequence of allowing consumers to acquire the Windows client PC operating system without having to acquire Windows Media Player at the same time. Under that settlement, Microsoft was only required to remove the Windows Media Player icon which appeared on the screen and the similar points of access and also to disable the automatic implementation of that player. As Windows Media Player thus remained pre-installed and fully active, OEMs and customers continued to be compelled to acquire both products together. Furthermore, as stated at recital 852 to the contested decision, Microsoft devised the mechanism in such a way that Windows Media Player could override the default setting and reappear when the user used Internet Explorer to access media files streamed over the Internet.975It follows from all of the foregoing considerations that the Commission was correct to find that the condition relating to the imposition of supplementary obligations was satisfied in the present case.976At recitals 835 to 954 to the contested decision, the Commission analyses the fourth condition necessary for a finding of abusive bundling, namely the condition relating to the foreclosure of competition.977The Commissions analysis takes as its starting point recital 841 to the contested decision, which is worded as follows:

There are ... circumstances relating to the tying of [Windows Media Player] which warrant a closer examination of the effects that tying has on competition in this case. While in classical tying cases, the Commission and the Courts considered the foreclosure effect for competing vendors to be demonstrated by the bundling of a separate product with the dominant product, in the case at issue, users can and do to a certain extent obtain third party media players through the Internet, sometimes [free of charge]. There are therefore indeed good reasons not to assume without further analysis that tying [Windows Media Player] constitutes conduct which by its very nature is liable to foreclose competition

978Next, the Commissions reasoning in the contested decision follows three stages.979In the first stage, it establishes that the tied sale ensures that Windows Media Player is ubiquitous on client PCs worldwide (recitals 843 to 878 to the contested decision).980In that context, first, the Commission observes that the Windows client PC operating system is pre-installed on more than 90% of client PCs shipped worldwide, so that, by bundling Windows Media Player with Windows, Microsoft ensures that its media player is as ubiquitous as Windows on client PCs. Users who find Windows Media Player pre-installed on their client PCs are generally less inclined to use another media player (recitals 843 to 848 to the contested decision).981Second, the Commission considers that the option of entering into distribution agreements with OEMs constitutes a less efficient means of obtaining media player distribution than Microsoft's bundling (recitals 849 to 857 to the contested decision).982Third, the Commission asserts that neither the downloading of media players from the Internet nor other distribution channels, including the tied sale of a media player with other software or Internet access services and retail sale of media players, can offset Windows Media Players ubiquity (recitals 858 to 876 to the contested decision).983In the second stage, the Commission examines the effects of that bundling on content providers and software developers, and on certain adjacent markets (recitals 879 to 899 to the contested decision). The Commission considers, in substance, that in view of the indirect network effects that obtain in the media player market, the ubiquitous presence of the [Windows Media Player] code provides [that media player] with a significant competitive advantage, which is liable to have a harmful effect on the structure of competition in that market (recital 878 to the contested decision).984In that context, the Commission emphasises, first of all, that it is on the basis of the percentages of installation and use of media players that content providers and software developers choose the technology for which they will develop their complementary software. Those operators tend to develop their solutions on the basis of Windows Media Player, since that enables them to reach all users of Windows, that is, more than 90% of client PC users. Furthermore, once complementary software is encoded in the proprietary Windows media formats, it will work with competitors' media players only if Microsoft licenses the relevant technology.985At recitals 883 to 891 to the contested decision, the Commission examines, more particularly, the situation of content providers. More particularly, since supporting many different technologies generates additional development, infrastructure and administration costs, content providers tend to give priority to a single set of technologies. Furthermore, the fact that a given media player incorporating a number of media technologies is widely installed is an important factor likely to convince content providers to create media content for the technologies used by that player. By supporting the most widely-disseminated media player, content providers maximise the potential reach of their own products. The Commission concludes that the ubiquity of Windows Media Player on Windows client PCs therefore gives Microsoft a competitive advantage unrelated to the intrinsic qualities of its product.986At recitals 892 to 896 to the contested decision, the Commission examines the situation of software developers. In substance, software developers have an incentive to create applications designed to run on Windows Media Player alone, rather than on several different platforms, as they can thereby reach virtually all potential users of their products, recover their costs and make the most efficient use of their limited development resources. The Commission emphasises that some results of the 2003 market enquiry show that designing applications which support several media technologies gives rise to additional costs.987At recitals 897 to 899 to the contested decision, the Commission states that the ubiquity of Windows Media Player on client PCs has effects on certain adjacent markets, such as the markets for media players on wireless information devices, set-top boxes, DRM (Digital Rights Management) solutions and on-line music delivery.988Last, in the third stage, the Commission examines market development in the light of market surveys carried out by Media Metrix, Synovate and Nielsen/NetRatings (recitals 900 to 944 to the contested decision). In substance, the data obtained in those surveys consistently point to a trend in favour of usage of [Windows Media Player] and Windows Media formats to the detriment of the main competing media players (and media player technologies) (recital 944 to the contested decision).989First of all, Microsoft claims that the Commission added a further condition, namely foreclosure, which is not normally taken into account for the purpose of assessing the existence of abusive tying. At recital 841 to the contested decision, the Commission acknowledged that the present case was not a classical tying case' and that there were good reasons not to assume without further analysis that tying [Windows Media Player] constitute [d] conduct which by its very nature [was] liable to foreclose competition. The Commission then concluded that there was a foreclosure effect, and in reaching that conclusion it relied on a new and highly speculative theory (see paragraph 846 above).990Microsoft refers to recital 842 to the contested decision and submits that the Commission s new theory is based on the existence of indirect network effects and on the notion that competition may be foreclosed at some unidentified point in the future if, as a result of the widespread distribution of media functionality in Windows, software developers and content providers have an incentive to design their products solely for Windows Media Player. That theory thus bases a presumption that anti-competitive effects exist on a single prediction about the future conduct of third parties over which Microsoft has no control.991Next, Microsoft claims that it took all necessary measures to ensure that the integration of media functionality in Windows did not have the effect of excluding competing media players from the market. Furthermore, a number of those measures were codified' in the decision of the District Court of 1 November 2002.992In support of that argument, Microsoft relies, in the first place, on a series of considerations about the way in which it designs Windows.993First, it ensures that the inclusion of media functionality does not interfere with the functioning of third-party media players. It is thus technically possible — and indeed common practice — for a Windows-based client PC to run one or more third-party media players in addition to the media functionality in Windows. Second, third-party media players are easily accessible from the Windows user interface. Third, Microsoft designs Windows in such a way that third-party media players can automatically supply certain aspects of the media functionality that Windows itself is capable of supplying. Fourth, OEMs and consumers can use a dedicated tool created by Microsoft to remove end-user access to Windows Media Player. Fifth, Microsoft facilitates the development of applications that compete with the media functionality in Windows by exposing that functionality through published APIs.994In the second place, Microsoft claims that in its agreements with Windows distributors — that is, essentially, OEMs — it ensures that vendors of competing media players retain the possibility of distributing their own products. Thus, it expressly provides that OEMs are free to install whatever software products they please on client PCs running Windows, including media players that compete with Windows Media Player. It also authorises them to offer Internet access by placing icons on the Start menu and on the Windows desktop, by showing those offers on screen when Windows is started for the first time. In fact, Internet access providers frequently distribute and promote third-party media players.995In the third place, Microsoft states that in its contracts with software developers, content providers or anyone else, it never requires them to distribute or otherwise promote Windows Media Player either exclusively or as a fixed percentage of their total distribution of media software.996In the fourth place, Microsoft contends that the integration of media functionality into Windows does not prevent the use of third-party media players on Windows or their widespread distribution'. Media players can be distributed by various methods, including pre-installation by OEMs on new client PCs, downloading from the Internet or corporate intranets, inclusion in other developers' software and distribution to users of products and services by content providers or Internet service providers.997In the same context, Microsoft states, with reference to an analysis in annex A.24.1 to the application, that a recent survey shows that most OEMs, both in the United States and in Western Europe, install media players that compete with Windows Media Player, such as RealPlayer and QuickTime, on their client PCs. The Commission's assertion that OEMs will not install third-party media players on a client PC unless they can remove Windows Media Player is therefore untrue. Furthermore, even the market data set out in the contested decision show that the use of third-party media players continues to increase, sometimes as much as or more than growth in the use of the media functionality in Windows.998Last, Microsoft, supported on this point by ACT, claims that the Commission's foreclosure theory fails to take account of certain relevant factors and that it is based on predictions which are contradicted by the facts. The applicant emphasises that the burden of proof borne by the Commission is particularly heavy when it carries out such a prospective analysis.999In the first place, Microsoft submits that the Commission ignored the factors that lead content providers to write to formats other than Windows Media format. There is no basis for the belief that it is the extent of distribution of media software associated with a particular format that determines a content provider s choice of the format in which it will encode its products. Microsoft criticises the Commission for not having asked content providers, in the 2003 market enquiry, whether other factors influenced their encoding decisions.1000Microsoft criticises the Commissions assertion that content providers bear additional costs when they make their products available in more than one format. The Commission ought to have proved that the costs involved in providing content in an additional format outweigh the benefits of doing so. In reality, the Commission collected, but ignored, evidence that the costs of making content available in a given media format represented an insignificant portion of overall costs. Microsoft refers to recital 894 to the contested decision and further submits that encoding in a second media technology costs only 50% as much as to support the first. Supported on this point by CompTIA and ACT, the applicant concludes that offering several media formats brings economies of scale and that a second format will be offered even if it is much less popular with users.1001Microsoft also submits that even some content providers who rely on only one format did not choose Windows Media, even after the alleged abuse began. Thus, Apple does not use Windows media technology either for its iPod or for its iTunes music store.

Furthermore, software developers informed the Commission that they used on average two or three major sets of APIs (Windows, Real or QuickTime).1002In the reply, Microsoft, supported on this point by DMDsecure and Others, claims, with reference to a report drawn up by one of its experts (annex C.16 to the reply), that media players would be susceptible to tipping only if (i) users or content providers faced significant costs if they used multiple media players and (ii) media players were perceived as homogeneous with respect to their intrinsic characteristics and the content accessible by such media players. Neither of those two conditions is met in the present case.1003In the second place, Microsoft claims that the prediction made at recital 984 to the contested decision that tipping in favour of Windows Media format will occur in the foreseeable future is contradicted by the facts and by the evidence in the file, which show that content providers continue to make content available in different formats; that, far from having disappeared from the market, third-party media players are flourishing; and that consumers are not forced to use Windows Media Player.1004In that regard, Microsoft observes, first, that the 2003 market enquiry shows that 10 of the 12 content providers who encoded their content in Windows Media format also encoded it in other formats. Thus, numerous content providers continue to use formats developed by Apple, RealNetworks or other producers. A survey of the 1000 Web sites most visited in the United States between 2001 and 2004 shows that the number of sites with any media content' rose by 47%, whereas the number of sites using RealNetworks' formats rose by 59% and the number of sites using QuickTime formats rose by 79%.1005Second, Microsoft asserts that OEMs continue to offer several media players on the PCs which they sell. Thus, in May 2004, the average number of third-party media players installed on home or small office computers sold by the main OEMs was 4.3 on United States models and 2.4 on European models.1006Third, Microsoft claims that the average number of media players per person used each month rose from 1.5 at the end of 1999 to 2.1 in 2004. The Commissions contention that the number of users of Windows Media Player is increasing is irrelevant; what matters is whether the number of users of other formats is sufficient for content providers to find it worthwhile to encode their products in those formats. Microsoft also disputes the relevance of the analogy which the Commission draws with Netscape Navigator.1007Microsoft further submits that the Commissions foreclosure theory clearly lacks objectivity. It is apparent from the contested decision that that theory applies only where the media functionality bundled with Windows is developed by Microsoft. In particular, the Commission did not apply that theory between 1995 and 1998, when RealNetworks' streaming media player was integrated into Windows.1008DMDsecure and Others, ACT, TeamSystem, Mamut and Exor put forward essentially the same arguments as Microsoft.1009The Commission first of all recalls the findings made at recital 841 to the contested decision and claims that it follows from earlier well-known cases that the mere fact that an undertaking in a dominant position bundles a separate product with a dominant product in itself permits the conclusion that there is a foreclosure effect on the market. In the present case, however, the particular features of the market led the Commission to consider that there [were] therefore ... good reasons not to assume without further analysis that tying [Windows Media Player] [constituted] conduct which by its very nature [was] liable to foreclose competition. The Commission did not conclude that the impugned conduct was not abusive in itself but considered that it must be analysed in its specific market context. The Commission finds it surprising that Microsoft should criticise it for having taken the trouble to examine the real foreclosure effect created by the tying at issue and contends that the fact that it demonstrated such a foreclosure effect in a case where it is normally presumed does not mean that it applied a new legal theory.1010The Commission claims that it found, at the close of its analysis, that Microsoft thus [interfered] with the normal competitive process (recital 980 to the contested decision) and that there [was] therefore a reasonable likelihood that tying [Windows Media Player] with Windows [would] lead to a lessening of competition so that the maintenance of an effective competition structure [would] not be ensured in the foreseeable future (recital 984 to the contested decision). Contrary to Microsoft's contention, the Commission did not assert at recital 984 to the contested decision, or at any other point in that decision, that the abusive conduct at issue would lead to the elimination of all third-party media players in the foreseeable future. It demonstrated that Microsoft distort [ed] the choices and incentives of market participants through its tying and maintains that such a distortion of the competitive process amounts to a restriction of competition within the meaning of the case-law, as it is liable to foreclose competition'. The Commission also analysed the actual foreclosure effects of Microsoft's abusive conduct on the basis of data on the development of the market and submits, with reference to recital 944 to the contested decision, that those data point to a consistent trend in favour of Windows Media Player and the Windows Media formats and confirm that there was already a degree of foreclosure on the market.1011Next, the Commission disputes Microsoft's assertion that it took all necessary steps to ensure that the tying at issue did not foreclose third-party media players from the market. That abusive conduct began in May 1999 and was still continuing on the date on which the defence was lodged. The United States settlement was not concluded until November 2001 and the measures adopted pursuant to that agreement were not taken until August and September 2002. Furthermore, those measures are clearly insufficient to remedy the tying abuse found in the contested decision. As for the various methods of distributing third-party media players described by Microsoft, the Commission states, with reference to recitals 849 to 877 to the contested decision, that they do not allow those players to achieve the ubiquity that Microsoft can ensure for Windows Media Player by bundling it with Windows.1012The Commission also reviews the findings of foreclosure of competition which it made in the contested decision, in particular at recitals 844 to 846 and 879 to 882 to the contested decision.1013Supported on this point by SUA, the Commission contends that its finding that the tying at issue created a risk of foreclosure of competition on the market is not speculative but is based on a factual assessment of the specific characteristics of the market and also of the incentives of content providers and software developers. It follows from Case T-65/98 Van den Bergh Foods v Commission [2003] ECR II-4653 that it is acceptable to take into account the likely reactions of third parties, and in particular competitors or customers, to the unilateral action of a dominant undertaking when assessing whether that action is likely to lead to foreclosure. In the present case, it is beyond dispute that Microsoft does not give customers the choice to acquire Windows without Windows Media Player. Furthermore, the tying at issue has a direct influence on third parties and therefore interferes with their free choice (recitals 845, 851, 870, 883, 884 and 895 to the contested decision).1014The Commission refers to recitals 879 to 896 to the contested decision and observes, in that context, that it undertook a detailed analysis of the impact of the impugned conduct, including by sending extensive questionnaires to a large number of content providers, software developers and content owners.1015On the basis of the responses to those questionnaires, the Commission made the following findings:

all the content providers that responded to the questionnaires stated that the creation of specific content for more than one technology generated additional costs (recital 884 to the contested decision);

those content providers considered that the number of users of a given technology and the presence of media software on PCs were significant factors in deciding which technology to support (recital 886 to the contested decision);

some of those providers even stated that the number of users of a given technology was the single most important factor (recital 889 to the contested decision);

so long as third-party media players' usage is still significant, the trade-off of supporting additional formats may be positive for content providers (recital 890 to the contested decision);

software developers responded along the same lines as content providers (recitals 893 to 896 to the contested decision);

thus, 12 software developers out of 13 answered in the affirmative the question whether the additional costs of multiple format support were in the future likely to influence their decisions on whether to develop applications for technologies other than Windows Media (recital 890 to the contested decision);

by tying Windows Media Player to Windows, Microsoft assures content providers and software developers that end users will be able to play back their content, in other words that they will reach a wide audience; the ubiquity of Windows Media Player on Windows client PCs therefore secures Microsoft a competitive advantage unrelated to the merits of that product (recital 891 to the contested decision).

1016Last, the Commission rejects Microsoft's assertion that the theory applied in the present case does not take account of certain relevant factors and is based on predictions that are contradicted by the facts.1017In the first place, the Commission denies having ignor[ed] factors that lead content providers to write to non-Windows Media formats. In the requests for information which it sent to those content providers, it did not refer solely to the question of the reach of a media reader; and in the contested decision it did not state that reach was the only relevant factor, but merely highlighted the importance of that factor. In any event, Microsoft recognises that content providers take that factor into consideration when choosing the encoding format of their products and therefore implicitly accepts that the unmatched ubiquity achieved through [its] tie distorts that [choice].1018It follows from the questions put to content providers and software developers, moreover, that those third parties do balance and give more weight to the costs of multi-technology support than to its benefits. The Commission observes that Microsoft itself has stated that to encode streaming content for delivery to multiple formats [was] expensive and time-consuming for content providers (recital 883 to the contested decision) and refers to certain evidence gathered in the 2003 market enquiry (recital

884 to the contested decision). Even if the cost of supporting several technologies is not the only factor that determines content providers' choice of whether or not to encode in several formats, it is clearly one significant factor that they do take into consideration. The Commission also denies having gathered, in the 2003 market enquiry, evidence showing that the cost of making content available in a specific media format represented only a trivial portion of overall costs. On the contrary, the feedback which the Commission received on the estimation of content preparation costs rather indicates that those costs are significant.1019The Commission also disputes the merits of the findings in the report in annex C.16 to the reply (see paragraph 1002 above). First of all, the contested decision demonstrates that downloading cannot offset the ubiquity that Windows Media Player acquires through the tying at issue and that its ubiquity distorts the incentives of content providers. Next, the Commission's conclusion that there is an abuse of a dominant position does not rely on a finding of complete elimination of competition or tipping of the market. Last, the author of that report (i) does not substantiate his claim, (ii) ignores various material aspects of the present case, such as the distortions caused to network effects by monopoly leveraging and (iii) does not demonstrate that the conditions which he claims are necessary for tipping have not been fulfilled.1020In the second place, the Commission, supported on this point by SUA, disputes Microsoft's assertion that the analysis of foreclosure in the contested decision is contradicted by the facts.1021The Commission reiterates, first of all, that Microsoft has misrepresented recital 984 to the contested decision, which does not refer to the tipping of the market but states only that Microsoft's tying is likely to affect the structure of competition on the media player market.1022Next, the Commission submits that the industry data which it used in the contested decision invariably reveal a tendency in favour of the use of Windows Media Player and Windows Media formats to the detriment of the main competing media players (recitals 906 to 942 to the contested decision). Those data show that until the second quarter of 1999 RealPlayer was the market leader, with almost twice as many users as Windows Media Player and QuickTime (recital 906 to the contested decision). From the second quarter of 1999 to the second quarter of 2002, on the other hand, the total number of users of Windows Media Player increased by approximately 39 million, which was roughly equal to the combined increase in users of RealNetworks' and Apple's media players (recital 907 to the contested decision). More recent data from Nielsen/NetRatings show that Windows Media Player attained a distinct lead over RealPlayer (more than 50% more unique users) and QuickTime (three times as many users) and that its lead increased further between October 2002 and January 2004 (recital 922 to the contested decision). That trend is similar to the situation on the web browser market, which was the

subject of the proceedings for violation of United States antitrust law.1023The Commission maintains that Microsoft does not contest those various data, but presents new data, some of which postdate the adoption of the contested decision and for that reason clearly could not be taken into consideration.1024Last, the Commission claims that in any event the foreclosure effect established in the contested decision is confirmed by more recent data.1025Thus, first, the Commission states that the data relating to content providers presented by Microsoft (see paragraph 1004 above) are not substantiated and that Microsoft's presentation of them is misleading. The Commission maintains that it is clear that during the period 2001-04 the number of Internet sites with any media content increased, so that it is not surprising that there are more Internet sites which offer non-Windows Media formats. Microsoft also fails to mention that during the same period the number of Internet sites supporting Windows Media formats rose by 141%, or to give any real indication of the actual quantity of content in non-Windows Media format offered by the Internet sites in question or of the actual usage of the content in those media formats.1026Second, the Commission asserts that the data relating to the average number of media players pre-installed on client PCs by OEMs are not conclusive (see paragraph 1005 above). In any event, Microsoft's evidence shows that more than 70% of PCs shipped in Europe and more than 80% of those shipped worldwide typically have just one media player and that, because of the tie, that player is always Windows Media Player. Furthermore, in so far as OEMs pre-install competing media players on PCs, that pre-installation is overshadowed by the fact that Windows Media Player is automatically present on 95% of PCs shipped worldwide. Last, Microsoft's data are not reliable, since they relate in particular to competing media players which were pre-installed following legacy deals' which were not renewed and to software which does not satisfy the streaming media player' criteria.1027Third, the Commission claims that there is a clear trend in favour of Windows Media Player and Windows Media format usage. The Nielsen/NetRatings data on United States media player usage show that in March 2005 Windows Media Player's usage share had risen to over 80%, RealPlayer's usage share had fallen to below 40% and QuickTime's usage share had fallen to just over 10%. Recent Nielsen/NetRatings data also show that Windows Media Player s share of exclusive users has steadily increased, with 53 to 55% of users currently using Windows Media Player exclusively, against 10 to 13% for RealPlayer and 3 or 4% for QuickTime Player.1028In response to Microsoft's assertion that the foreclosure theory lacks objectivity, in that it did not apply when RealNetworks' media player was integrated in Windows (see paragraph 1007 above), the Commission refers to recital 818 to the contested decision and observes that it cannot be precluded from pursuing a given infringement of

Community competition law on the ground that it did not pursue another possible infringement.1029SIIA makes essentially the same arguments as the Commission.1030Audiobanner claims that the bundling in question has a negative impact on third-party investment in non-Microsoft technologies, on innovation in the digital streaming media industry and on consumers. On that last point, Audiobanner emphasises that bundling precludes competition on the merits.1031Microsoft claims, in substance, that the Commission has failed to prove that the integration of Windows Media Player in the Windows client PC operating system involved foreclosure of competition, so that the fourth constituent element of abusive tying, as set out at recital 794 to the contested decision, is not fulfilled in this case.1032In particular, Microsoft contends that the Commission, recognising that it was not dealing with a classical tying case, had to apply a new and highly speculative theory, relying on a prospective analysis of the possible reactions of third parties, in order to reach the conclusion that the tying at issue was likely to foreclose competition.1033The Court considers that Microsoft's arguments are unfounded and that they are based on a selective and inaccurate reading of the contested decision. Those arguments essentially focus on the second of the three stages of the Commissions reasoning set out at recitals 835 to 954 to the contested decision.1034In fact, it is clear that in the contested decision, the Commission clearly demonstrated, inter alia, that the fact that from May 1999 Microsoft offered OEMs, for pre-installation on client PCs, only the version of Windows bundled with Windows Media Player had the inevitable consequence of affecting relations on the market between Microsoft, OEMs and suppliers of third-party media players by appreciably altering the balance of competition in favour of Microsoft and to the detriment of the other operators.1035As already observed at paragraph 868 above, the fact that the Commission examined the actual effects which the bundling had already had on the market and the way in which that market was likely to evolve, rather than merely considering — as it normally does in cases of abusive tying — that the tying has by its nature a foreclosure effect, does not mean that it adopted a new legal theory.1036The Commissions analysis of the foreclosure condition begins at recital 841 to the contested decision, where the Commission states that in the present case there are good reasons not to assume without further analysis that the bundling of Windows and Windows Media Player constitutes conduct which by its very nature is liable to foreclose competition (sere paragraph 977 above). In substance, the conclusion which the Commission reached is based on the finding that the bundling of Windows Media Player with the Windows client PC operating system — the operating system pre-installed on the great majority of client PCs sold throughout the world — without the possibility of removing that media player from the operating system, allows

Windows Media Player to benefit from the ubiquity of that operating system on client PCs, which cannot be counterbalanced by the other methods of distributing media players.1037The Court considers that that finding, which is the subject-matter of the first stage of the Commissions reasoning (see recitals 843 to 878 to the contested decision, as summarised at paragraphs 979 to 982 above), is entirely well founded.1038Thus, in the first place, it is clear that owing to the bundling, Windows Media Player enjoyed an unparalleled presence on client PCs throughout the world, because it thereby automatically achieved a level of market penetration corresponding to that of the Windows client PC operating system and did so without having to compete on the merits with competing products. It must be borne in mind that it is common ground that Microsoft's market share on the client PC operating systems market is more than 90% and that the great majority of sales of Windows client PC operating systems (approximately 75%) are made through OEMs, who pre-install Windows on the client PCs which they assemble and distribute. Thus, the figures cited at recital 843 to the contested decision show that in 2002 Microsoft had a market share of 93.8% by units shipped on the client PC operating systems market (see also recital 431 to the contested decision) and that Windows — and, as a result, Windows Media Player — was pre-installed on 196 million of the 207 million client PCs shipped in the world between October 2001 and March 2003.1039As will be explained in greater detail below, no third-party media player could achieve such a level of market penetration without having the advantage in terms of distribution that Windows Media Player enjoys as a result of Microsoft's use of its Windows client PC operating system.1040It should be added that Microsoft's combined offer of the Windows operating system and the NetShow 2.0 player from June 1998 did not guarantee NetShow 2.0 the same degree of presence on client PCs. As already explained at paragraphs 837 and 936 above, NetShow 2.0 was included on the Windows 98 installation CD but was not installed by any of the four default installations of that system. In other words, users had to make the effort to install NetShow 2.0 separately and could therefore decide not to install it. Similarly, that combined offer did not prevent developers of third-party media players from competing with Microsoft on the intrinsic merits of their products or prevent OEMs from taking advantage of that competition.1041In the second place, it is clear that, as the Commission correctly states at recital 845 to the contested decision, [u] sers who find [Windows Media Player] pre-installed on their client PCs are indeed in general less likely to use alternative media players as they already have an application which delivers media streaming and playback functionality. The Court therefore considers that, in the absence of the bundling, consumers wishing to have a streaming media player would be induced to choose one from among those available on the market.1042In that regard, it is necessary to bear in mind the circumstance to which the Commission refers at recitals 119, 848, 869 and 956 to the contested decision, namely the importance that users attach to being able to buy out-of-the-box client PCs or systems, that is to say, those that can be installed and used with a minimum of effort. Thus, the supplier whose software is initially pre-installed on the client PC and is launched automatically as soon as the PC is started clearly has a competitive advantage over any other supplier of similar products.1043In the third place, the Court considers that the Commission was correct to state, at recital 857 to the contested decision, that the impugned conduct created disincentives for OEMs to ship third-party media players on their client PCs.1044On the one hand, as stated at recital 851 to the contested decision, OEMs are reluctant to add a second media player to the package which they offer consumers, as a second media player uses hard-disk capacity on the client PC while offering functionality similar, in essence, to that of Windows Media Player and when it is unlikely that consumers will be prepared to pay a higher price for such a bundle.1045On the other hand, the presence of several media players on the same client PC creates a risk of confusion on the part of users and an increase in customer support and testing costs (see recital 852 to the contested decision). The Court points out in that regard that during the administrative procedure Microsoft itself emphasised that OEMs generally operate on thin profit margins and that they would therefore prefer to avoid having to bear such costs (see footnote 1006 to the contested decision).1046Thus, the release of the bundled version of Windows and Windows Media Player as the only version of the Windows operating system capable of being pre-installed by OEMs on new client PCs had the direct and immediate consequence of depriving OEMs of the possibility previously open to them of assembling the products which they deemed most attractive for consumers and, more particularly, of preventing them from choosing one of Windows Media Player s competitors as the only media player. On this last point, it must be borne in mind that at the time RealPlayer had a significant commercial advantage as market leader. As Microsoft itself acknowledges, it was only in 1999 that it succeeded in developing a streaming media player that performed well enough, given that its previous player, NetShow, was unpopular with customers because it did not work very well' (recital 819 to the contested decision). It must also be borne in mind that between August 1995 and July 1998 it was RealNetworks' products — first RealAudio Player, then RealPlayer — that were distributed with Windows. There is therefore good reason to conclude that if Microsoft had not adopted the impugned conduct competition between RealPlayer and Windows Media Player would have been decided on the basis of the intrinsic merits of the two products.1047Furthermore, even if developers of media players competing with Microsoft succeeded in reaching an agreement with OEMs for the pre-installation of their product, they would still be in a disadvantageous competitive position by comparison with Microsoft. First, as Windows Media Player cannot be removed by OEMs or by users from the package consisting of Windows and Windows Media Player, the third-party media player could never be the only media player on the client PC. In particular, the bundling prevents developers of third-party media players from competing with Microsoft for that purpose on the intrinsic merits of the products. Second, as the number of media players that OEMs are prepared to pre-install on client PCs is limited, developers of third-party media players compete with each other in order to have their products pre-installed, while, owing to the bundling, Microsoft evades that competition and the significant additional costs which it entails. On this last point, it is pertinent to refer to recital 856 to the contested decision, where the Commission mentions the distribution agreement for RealPlayer concluded in 2001 between RealNetworks and Compaq and also the fact that Microsoft acknowledged during the administrative procedure that RealNetworks paid OEMs to pre-install its products.1048It follows from those findings that the Commission was correct to conclude that the option of entering into agreements with OEMs [was] a less efficient and effective means of obtaining media player distribution in the face of Microsoft's tying (recital 849 to the contested decision).1049In the fourth place, the Court finds that the Commission was also correct to find that methods of distributing media players other than pre-installation by OEMs could not offset Windows Media Player's ubiquity (recitals 858 to 876 to the contested decision).1050First, while it is true that downloading via the Internet enables suppliers to reach a large number of users, it is less effective than pre-installation by OEMs. First, downloading does not guarantee competing media players distribution equivalent to Windows Media Player's (recital 861 to the contested decision). Second, downloading, unlike using a pre-installed product, is seen as complicated by a significant number of users. Third, as the Commission observes at recital 866 to the contested decision, a significant number of download attempts — more than 50%, according to tests carried out by RealNetworks in 2003 — are not successfully concluded. While it is true that broadband makes downloading faster and less complex, it must be borne in mind that in 2002 only one in six households in Europe with Internet access had a broadband connection (recital 867 and footnote 1037 to the contested decision). Fourth, users will probably tend to consider that a media player integrated in the client PC which they have bought will work better than a product which they install themselves (recital 869 to the contested decision). Fifth and last, in most undertakings employees cannot download software from the Internet as that complicates the work of the network administrators (ibid.).1051Some data provided by Microsoft itself during the administrative procedure, and mentioned at recitals 909 to 911 to the contested decision, confirm that downloading via the Internet is less effective as a method of distribution than pre-installation by OEMs. Microsoft stated that 8.8 million copies of WMP 6 were downloaded during the 12 months following its release and also that it sold 7.9 million Windows 98 SE operating systems between July and September 1999. In other words, in three months WMP 6 obtained almost the same distribution by being bundled with the Windows operating system as it achieved in a year by downloading.1052As the Commission asserts at recital 870 to the contested decision, while downloading is in itself a technically inexpensive way of distributing media players, vendors must deploy major resources to overcome end-users' inertia and persuade them to ignore the pre-installation of [Windows Media Player].1053Second, Microsoft has put forward no argument capable of calling in question the Commissions finding that the other methods of distributing streaming media players mentioned in the contested decision, namely bundling the media player with other software or Internet access services, and retail sale, are only a second-best solution and [do] not rival the efficiency and effectiveness of distributing software pre-installed on [Windows] PCs' (recitals 872 to 876 to the contested decision).1054It follows from the foregoing that in the analysis set out at recitals 843 to 878 to the contested decision, which is the first stage of its reasoning, the Commission demonstrated to the requisite legal standard that the bundling of Windows and Windows Media Player from May 1999 inevitably had significant consequences for the structure of competition. That practice allowed Microsoft to obtain an unparalleled advantage with respect to the distribution of its product and to ensure the ubiquity of Windows Media Player on client PCs throughout the world, thus providing a disincentive for users to make use of third-party media players and for OEMs to pre-install such players on client PCs.1055Admittedly, as Microsoft contends, a number of OEMs continue to add third-party media players to the packages which they offer to their customers. It is also common ground that the number of media players and the extent of the use of multiple players are continually increasing. However, those factors do not invalidate the Commissions conclusion that the impugned conduct was likely to weaken competition within the meaning of the case-law. Since May 1999 vendors of third-party media players have no longer been able to compete through OEMs to have their own products placed instead of Windows Media Player as the only media player on the client PCs assembled and sold by OEMs.1056It should further be noted that the merits of the findings made above are borne out by data examined by the Commission in the third stage of its reasoning. More particularly, as will be explained at paragraphs 1080 to 1084 below, the data mentioned at recitals 905 to 926 to the contested decision show a clear tendency in favour of using Windows

Media Player to the detriment of competing media players.1057It follows from information communicated by Microsoft itself during the administrative procedure and referred to at recitals 948 to 951 to the contested decision that the significant growth in the use of Windows Media Player has not come about because that player is of better quality than competing players or because those media players, and particularly RealPlayer, have certain defects.1058In the light of all the foregoing considerations, the Court concludes that the Commission s findings in the first stage of its reasoning are in themselves sufficient to establish that the fourth constituent element of abusive bundling is present in this case. Those findings are not based on any new or speculative theory, but on the nature of the impugned conduct, on the conditions of the market and on the essential features of the relevant products. They are based on accurate, reliable and consistent evidence which Microsoft, by merely contending that it is pure conjecture, has not succeeded in showing to be incorrect.1059It follows from the foregoing that it is not necessary to examine the arguments which Microsoft puts forward against the findings made by the Commission in the other two stages of its reasoning. None the less, the Court considers that it should examine them briefly.1060In the second stage of its reasoning, the Commission seeks to establish that the ubiquity of Windows Media Player as a result of its bundling with Windows is capable of having an appreciable impact on content providers and software designers.1061The Commission's theory is based on the fact that the market for streaming media players is characterised by significant indirect network effects or, to use the expression employed by Mr Gates, on the existence of a positive feedback loop (recital 882 to the contested decision). That expression describes the phenomenon where, the greater the number of users of a given software platform, the more there will be invested in developing products compatible with that platform, which, in turn reinforces the popularity of that platform with users.1062The Court considers that the Commission was correct to find that such a phenomenon existed in the present case and to find that it was on the basis of the percentages of installation and use of media players that content providers and software developers chose the technology for which they would develop their own products (recital 879 to the contested decision). The Commission correctly stated, first, that those operators tended primarily to use Windows Media Player as that allowed them to reach the very large majority of client PC users in the world and, second, that the transmission of content and applications compatible with a given media player was in itself a significant competitive factor, since it increased the popularity of that media player, and, in turn, favoured the use of the underlying media technology, including codecs, formats (including DRM) and server software (recitals 880 and 881 to the contested decision).1063First, as to the effects of the bundling on content providers, the Court considers that the Commissions assessment of that issue at recitals 883 to 891 to the contested decision is well founded.1064More particularly, the Commission was quite correct to find that the provision of several different technologies gave rise to additional development, infrastructure and administrative costs for content providers, who were therefore inclined to use only one technology for their products if that allowed them to reach a wide audience.1065Thus, it follows from the evidence gathered by the Commission, and especially from the replies to the requests for information which it sent to content providers in connection with the 2003 market enquiry, that encoding streamed content in several formats is expensive and time-consuming. In its request for information of 16 April 2003, the Commission asked those content providers, inter alia, whether it cost more for them to make available the same content based on more than one technology (question 19). All the entities who responded did so in the affirmative, mentioning mainly additional person/hours for content preparation, additional hardware/infrastructure costs and additional licensing costs. When asked to estimate those costs, the entities concerned put them within a range of 20 to 100% by reference to the initial costs of providing content in only one format, or on average additional costs of approximately 50% (question 20). As the Commission observes at recital 884 to the contested decision, one of the entities questioned even stated that the relatively high costs of content preparation [might] reduce the economic incentive for record companies and/or online portals to support multiple formats with different reaches and that [i]ndividual record companies [would] balance these additional costs against the benefits of extended reach and supporting multiple [t]echnologies.1066The Court notes that, contrary to Microsoft's contention, the Commission examined whether the advantages resulting from encoding in several formats could outweigh the additional costs created by such encoding. The Commission had questioned content providers about that point in the 2003 market enquiry and the content providers expressed their views on the subject (see recitals 884, 887, 889 and 890 to the contested decision).1067It is also apparent from the evidence gathered by the Commission that the more widely distributed a media player is, the more content providers are inclined to create content for the technology implemented in that media player. As the Commission rightly states at recital 885 to the contested decision, by supporting the widely disseminated media player, developers maximise the potential reach of their own products.1068Thus, as stated at recital 886 to the contested decision, in its request for information of 16 April 2003 the Commission had asked content providers whether a particular technology's reach and the presence of media client software on client PCs were significant factors in deciding which technology to support (questions 33 and 34). All the companies which answered those questions did so in the affirmative.1069In view of the foregoing, and of the fact that Windows is present on almost all client PCs in the world, it must be held that the Commission was correct to conclude, at recital 891 to the contested decision, that [b]y tying [Windows Media Player], Microsoft [could] assure content providers that end-users [would] be able to play back their content, that is to say, that they [would] reach a wide audience, that [u]biquity of [Windows Media Player] on Windows PCs therefore [secured] Microsoft a competitive advantage unrelated to the merits of its product and that, [once] content based on a given format [was] widespread, the competitive standing of compatible media players [was] reinforced [and] entry for new contenders [was] difficult.1070It must be borne in mind, in that context, that Article 82 EC is intended to prohibit a dominant undertaking from strengthening its position by recourse to means other than those based on competition on the merits (Case T-229/94 Deutsche Bahn v Commission [1997] ECR II-1689, paragraph 78, and Van den Bergh Foods v Commission, cited in paragraph 1013 above, paragraph 157).1071In the second place, the Court considers that the Commission, at recitals 892 to 896 to the contested decision, correctly assessed the effects of the bundling on software developers.1072More particularly, the Commission was correct to observe, at recital 892 to the contested decision, that software developers were inclined to create applications for a single platform if that enabled them to reach virtually all potential users of their products, whereas porting, marketing and supporting other platforms gave rise to additional costs.1073Thus, it is apparent from the answers to a number of questions which the Commission asked software developers in connection with the 2003 market enquiry (see, in particular, questions 8 and 48 of the request for information of 16 April 2003) that the development of software for several media technologies entails additional costs in terms of person/hours, licensing and customer support. The software developers concerned placed those additional costs on a scale of 1 to 100% by reference to the costs of developing applications for a single technology, or an average additional cost of approximately 58% (see recital 894 to the contested decision).1074It is also apparent from the answers to the request for information of 16 April 2003 that the fact that the development of applications for additional technologies, other than Microsoft's, entails additional costs for software developers is likely to influence their decision on whether to develop applications for additional technologies (see recital 894 to the contested decision; see also the statement of Entity T30 at recital 893 to the contested decision).1075In view of those factors, and of the fact that, owing to the bundling, Windows Media Player is present on the great majority of client PCs in the world, it must be held that the Commission was correct to find, at recital 895 to the contested decision, that software developers who wrote applications that relied on a media player had incentives to write foremost to Windows Media Player. It should be noted, in that regard, that in the 2003 market enquiry the Commission had requested the software developers questioned to state the factors which determined their choice of the technology for which they wrote their applications (question 7 of the request for information of 16 April 2003). Of the 14 entities who answered that question, 10 identified the degree of presence of a media player on PCs as being the most important or the second most important factor (recital 896 to the contested decision). The Commission had also asked the software developers whether it was important to them that the interfaces of Windows Media Player were on almost all Windows PCs (question 14 of the request for information of 16 April 2003). Of the 13 entities who answered that question, 10 did so in the affirmative (recital 896 to the contested decision).1076In the third place, the Court recalls that, at recitals 897 to 899 to the contested decision, the Commission states that the ubiquity which Windows Media Player enjoys by virtue of the bundling also has effects on adjacent markets, such as media players on wireless information devices, set-top boxes, DRM solutions and on-line music delivery. On that point, it is sufficient to state that Microsoft has put forward no argument capable of vitiating that assessment.1077In light of the foregoing considerations, the Court concludes that the second stage of the Commissions reasoning is well founded.1078In the third stage of its reasoning, the Commission examines the evolution of the market in light of market surveys carried out by Media Metrix, Synovate and Nielsen/NetRatings and concludes that the data in those surveys consistently point to a trend in favour of usage of [Windows Media Player] and Windows Media formats to the detriment of the main competing media players (and media player technologies)' (recital 944 to the contested decision).1079The Court finds that the conclusion referred to in the preceding paragraph is correct.1080Thus, in first place, as regards media players usage, it is apparent from the data gathered by Media Metrix that until the second quarter of 1999, when the bundling began, Windows Media Player was a considerable way behind the market leader, RealPlayer, which had almost twice as many users (recitals 905 and 906 to the contested decision). Between the second quarter of 1999 and the second quarter of 2002, on the other hand, the total number of users of Windows Media Player increased by more than 39 million, which was comparable with the combined increase in the number of users of RealPlayer and QuickTime Player (tables 8 and 9 of recital 907 to the contested decision).1081The data gathered by Synovate on behalf of Microsoft and mentioned at recitals 918 to 920 to the contested decision also clearly show a tendency towards Windows Media Player and away from RealPlayer and QuickTime Player.1082In particular, it is apparent from the Synovate data set out at recital 920 to the contested decision that while a number of users did make use of more than one media player, in August 2003 45% of the multiple users questioned stated that the media player which they used most often was Windows Media Player, against 19% for RealPlayer and 11% for QuickTime Player. By comparison, in October 1999 the media player most used by multiple users was RealPlayer (50%), followed first by Windows Media Player (22%) and then QuickTime Player (15%).1083In that context, it is appropriate to add that Microsoft's assertion that consumers used an average of 1.7 media players in June 2002 — a figure which had increased to 2.1 in 2004 — must be put in context. As the Commission correctly observes at recital 860 to the contested decision, downloading over the Internet — even though it is less effective as a means of distribution than pre-installation by OEMs — at the most enables users to add a second media player to their client PC and not to replace Windows Media Player. Windows Media Player is always present on the client PC, while the additional player is RealPlayer in some cases and QuickTime Player in others, or a different third-party media player.1084Last, the data gathered by Nielsen/NetRatings (see recitals 921 and 922 to the contested decision) also show that between October 2002 and January 2004 Windows Media Player significantly increased its lead over both RealPlayer and QuickTime Player.1085In second place, as regards the use of formats, the Nielsen/NetRatings data mentioned at recitals 930 to 932 to the contested decision clearly show a tendency towards the Windows Media formats and away from the RealNetworks formats and Apples QuickTime formats.1086In third place, the Court considers that the Commission was correct to find, at recitals 934 to 942 to the contested decision, that the data on the media formats used on Internet sites gathered by Netcraft, a company providing Internet services, which Microsoft had submitted during the administrative procedure were not conclusive. In particular, the Commission demonstrated to the requisite legal standard that the faulty methodology affecting Netcraft's surveys, as identified at recitals 940 to 942 to the contested decision, undermined Microsoft's assertion that in November 2002, RealNetworks' formats continued to be much more common on the [Internet] (recital 937 to the contested decision).1087Last and in fourth place, the Court considers that the Commission was correct to reject, at recital 943 to the contested decision, the argument which Microsoft based on the fact that in 2001 RealPlayer was present on 92% of home PCs in the United States and therefore had an installed base comparable with Windows Media Player's for client PCs. In fact, as stated at the same recital, by 2003 RealPlayer was present on only 60 to 70% of home PCs in the United States. Furthermore, it must be borne in mind that the rate of installation of Windows Media Player is 100% on Windows client PCs and more than 90% on client PCs, whether for home or work use, worldwide.1088It follows from the foregoing considerations that the final conclusion which the Commission sets out at recitals 978 to 984 to the contested decision concerning the anti-competitive effects of the bundling is well founded. The Commission is correct to make the following findings:

Microsoft uses Windows as a distribution channel to ensure for itself a significant competitive advantage on the media players market (recital 979 to the contested decision);

because of the bundling, Microsoft's competitors are a priori at a disadvantage even if their products are inherently better than Windows Media Player (ibid.);

Microsoft interferes with the normal competitive process which would benefit users by ensuring quicker cycles of innovation as a consequence of unfettered competition on the merits (recital 980 to the contested decision);

the bundling increases the content and applications barriers to entry, which protect Windows, and facilitates the erection of such barriers for Windows Media Player (ibid.);

Microsoft shields itself from effective competition from vendors of potentially more efficient media players who could challenge its position, and thus reduces the talent and capital invested in innovation of media players (recital 981 to the contested decision);

by means of the bundling, Microsoft may expand its position in adjacent media-related software markets and weaken effective competition, to the detriment of consumers (recital 982 to the contested decision);

by means of the bundling, Microsoft sends signals which deter innovation in any technologies in which it might conceivably take an interest and which it might tie with Windows in the future (recital 983 to the contested decision).

1089The Commission therefore had ground to state, at recital 984 to the contested decision, that there was a reasonable likelihood that tying Windows and Windows Media Player would lead to a lessening of competition so that the maintenance of an effective competition structure would not be ensured in the foreseeable future. It must be made clear that the Commission did not state that the tying would lead to the elimination of all competition on the market for streaming media players. Microsoft's argument that, several years after the beginning of the abuse at issue, a number of third-party media players are still present on the market therefore does not invalidate the Commission's argument.1090It follows from all of the foregoing considerations that Microsoft has put forward no argument capable of vitiating the merits of the findings made by the Commission in the contested decision concerning the condition relating to the foreclosure of competition. The Court must therefore conclude that the Commission has demonstrated to the requisite legal standard that the condition was satisfied in the present case.1091At recitals 955 to 970 to the contested decision the Commission examines the argument whereby Microsoft seeks to show that the bundling produces efficiency gains that would outweigh the anti-competitive effects identified.1092In the first place, the Commission rejects Microsoft's argument that the bundling produces efficiencies related to distribution (recitals 955 to 961 to the contested decision).1093First of all, the Commission considers that Microsoft cannot claim that the fact that a set of options are defined by default on an out-of-the-box computer has advantages for consumers by saving time and reducing the risk of confusion. Microsoft is thus confusing the benefit to consumers of having a media player pre-installed along with the client PC operating system and Microsoft selecting the media player for consumers (recital 956 to the contested decision).1094Next, the Commission emphasises the role played by OEMs and, in particular, the fact that they customise client PCs with respect to both hardware and software in order to differentiate them from competing products and to meet specific consumer demand. It explains that [t]he market would therefore respond to the efficiencies associated with the purchase of a full package [consisting of] hardware, operating system and software applications such as media players and, in addition, the market would be free to offer the variety that consumers demand (recital 957 to the contested decision). Consumers could choose, from among the bundles of client PC operating systems and media players offered by OEMs, the one that suited them the best.1095The Commission further considers that Microsoft is also unable to rely on the fact that the economies made by the tied sale of two products can mean a saving in financial resources which would otherwise be spent on maintaining a distribution system for the second product and that those economies would be passed on to consumers, who could save costs related to a second purchasing act, including selection and installation of the product (recital 958 to the contested decision). It contrasts, in particular, the low distribution costs associated with software licensing with the importance of consumer choice and innovation regarding software such as media players.1096Last, the

Commission rejects Microsoft's assertion that by prohibiting the bundling it placed Microsoft at a competitive disadvantage by comparison with most of its competitors, who provide multimedia capabilities with their operating systems. First, the contested decision does not prevent Microsoft from entering into agreements with OEMs to pre-install the Windows operating system and a media player — possibly Windows Media Player — in order to meet consumer demand. It emphasises that [w]hat is abusive is that Microsoft invariably imposes its own media player through tying (recital 959 to the contested decision). In addition, Microsoft fails to take account of the fact that tying has different effects on the market, depending on whether it is done by an undertaking in a dominant position or by an undertaking not having such a position. Furthermore, an undertaking in a dominant position may be deprived of the right to adopt a course of conduct which would not be objectionable if it were adopted by non-dominant undertakings.1097In the second place, the Commission rejects Microsoft's argument that the tying at issue produces efficiencies related to Windows Media Player as a platform for content and applications (recitals 962 to 969 to the contested decision).1098The Commission asserts, in substance, that Microsoft has not adduced evidence that the integration of Windows Media Player in Windows enhances the technical performance of the product or, more generally, that the tying at issue is indispensable in order for the pro-competitive effects on which it relies to be achieved. In particular, Microsoft neither claims nor demonstrates that software developers would not have been able to develop applications if Windows Media Player had been distributed independently of the Windows client PC operating system (recital 965 to the contested decision).1099The Commission also states that the fact that media players of different makes are able to work with Windows has contributed significantly to the dissemination of multimedia streaming technology and to the consequent development of a host of multimedia-enabled applications (recital 966 to the contested decision).1100In the third place, the Commission concludes, at recital 970 to the contested decision, that Microsoft has not established to the requisite legal standard that the tying at issue was objectively justified by pro-competitive effects which would outweigh the barrier to competition caused by that practice. The benefits which Microsoft presents as being the result of the tying could be achieved without it. Furthermore, the other benefits on which Microsoft relies consist essentially in increased profitability for Microsoft and are disproportionate to the anti-competitive effects of the tying.1101At recitals 1026 to 1042 to the contested decision, the Commission examines the arguments which Microsoft bases on the alleged interdependencies between Windows and Windows Media Player and also on those between Windows and third-party applications.1102By way of introduction to the arguments which it develops in connection with the bundling of Windows and Windows Media Player, Microsoft makes a series of factual observations.1103Thus, first, it claims that the integration of new functionalities generally into successive releases of its Windows client PC operating system brings benefits for software developers, OEMs and consumers.1104Microsoft states, first of all, that for software developers the Windows client PC operating system provides a stable and well-defined platform for software development The integration of new functionality into Windows makes it easier and faster to develop software that works with Windows. The fact that software developers are able to use the functionality offered by Windows enables them to reduce the number of functionalities which they need to design, develop and test in their own products and also the overall size of those products. Last, Microsoft observes that the less software code an application contains, the less likely it is that the application will malfunction and require technical support.1105OEMs, according to Microsoft, depend on the addition of functionality to Windows to create PCs that will appeal to customers and that will support the creation of interesting new applications.1106Consumers expect that Windows will be continually improved. In addition, new users of PCs, particularly those with limited technical knowledge, want PCs to be easy to set up and use.1107Second, Microsoft describes the benefits that result from the integration, more particularly, of multimedia functionality in Windows. First, third-party applications can call upon that functionality, which makes it easier for software developers to include audio and video content in their products. The uniform presence of media functionality in Windows, which is exposed to software developers through published APIs, encouraged the creation of numerous applications that make use of such content. Next, media functionality in Windows offers a series of functions, such as the ability to play audio CDs and video DVDs and to download music over the Internet, which are popular with consumers and help to increase sales of client PCs. Last, the presence of media functionality in Windows makes PCs more attractive and easier to use for consumers.1108Microsoft submits that the main justification for its conduct is that the integration of new functionality into operating systems in response to technological advances and changes in consumer demand is a core element of competition in the operating system business and has served the industry well for more than 20 years. The integration of streaming capacity into Windows is one of the aspects of its successful business model' and has contributed to the increasing use of digital media. Supported on this point by DMDsecure and Others and Exor, Microsoft claims that the Commission made a manifest error of assessment by not sufficiently considering the real benefits flowing from the integration of new functionality into the Windows operating system.1109In support of the arguments set out in the preceding paragraph, Microsoft formulates three series of considerations.1110In the first place, Microsoft, supported by DMDsecure and Others, TeamSystem, Mamut and Exor, contends that the integration of media functionality in Windows is essential to allow software developers and Internet site creators to make efficient use of the stable and well-defined' Windows platform. By calling on that functionality, those software developers and Internet site creators can easily include audio and video content in their products and thus do not need to develop the complex software code required to play such content and are able to concentrate on improving the features of their products.1111Microsoft refutes the Commissions assertion at recital 1031 to the contested decision that it does not matter whether the media functionality bundled with Windows is provided by Microsoft or by a third party, because it is possible to redistribute the software code that supplies that functionality or to rely on functionality supplied by third-party media players. It claims that if software developers did not have a common platform that provides a reliable set of system services they would need to determine in each individual case what functionality is present on the version of Windows installed on a particular customer s PC and then to supplement that functionality as necessary. That would render applications larger and more complex and thus more expensive to develop, test and support.1112Microsoft, supported on this point by Exor, submits that adding components to Windows on a piecemeal basis is likely to create conflicts between the different versions of those components, which would cause Windows or the application being installed to malfunction.1113Microsoft also claims that, as regards applications that are already in broad use, there is no ready mechanism to distribute the components of Windows on which they rely in order to obtain media functionality. Those applications will no longer work correctly with a version of Windows without Windows Media Player. Furthermore, the media functionality in Windows is not fungible, so that an application designed to call on that functionality cannot call on similar functionality provided by a competing media player without being substantially revised.1114Microsoft further disputes the Commission's assertion that competing media players are capable of replacing Windows Media Player for much of its functionality. It claims, in particular, that the Commission does not demonstrate that any third party will decide to offer substitute functionality for all the media functionality integrated into Windows'.1115In Microsoft's submission, the absence of media functionality in some copies of Windows will also be damaging for Internet site creators, who rely on it to distribute audio and video content If they can no longer count on the uniform presence of media functionality in Windows, they will have to incorporate in their products mechanisms for detecting the presence of the requisite media functionality and, if it is missing, for downloading the necessary software code to the user's PC.1116Last, in the reply, Microsoft disputes the Commission's assertion that the benefits flowing from the integration of media functionality in Windows cannot constitute valid justification under Community law. When the Commission applies Article 82 EC it cannot ignore the benefits that flow from the conduct regarded as abusive; and, furthermore, it is not correct to claim that the standardisation that would come about in the present case would not be the result of a competitive process.1117In the second place, Microsoft contends that the integration of media functionality in Windows is indispensable to achieving other benefits.1118The applicant explains that Windows is composed of a large number of specialised blocks of software that perform specific functions. In order to avoid duplicating the same functionality in each of those blocks, particular blocks of software code — the components' — call upon one another to perform specific tasks. A single component may thus be used to perform several functions. For example, a component which plays audio content may be used both for the Help system in Windows and for the text-to-voice narration feature that makes Windows more accessible to the visually impaired. That method of software design, known as componentisation', relies on the interdependency of the components, so that if one of them were removed many others will malfunction. Thus, numerous features of Windows XP, including the Help system, will no longer work if media functionality is removed from the operating system. Furthermore, because of the interdependency of the components, Microsoft will be unable to develop other parts of Windows that are designed to rely on the media function if it cannot be sure that that functionality will be present in all Windows client PCs. Computer manufacturers must not therefore be free to remove the components of Windows, especially those that supply media functionality.1119In the reply, Microsoft denies that it has never argued that the integration of Windows Media Player in Windows produced efficiencies. It explained in detail the reasons why it was technically efficient to include media functionality in Windows that is available to be called upon by other parts of the operating system as well as by applications running on top of the operating system. In addition, the fact that many software developers freely choose to rely on the media functionality in Windows is itself evidence that uniform integration of such functionality generates technical efficiencies. Last, Microsoft claims to have shown during the administrative procedure that Windows operated faster when media functionality was integrated.1120In the third place, Microsoft claims that enforcement of the remedy prescribed in Article 6(a) of the contested decision will have harmful consequences.1121First, it submits that removing components from the integrated whole made up of Windows and Windows Media Player would degrade the operating system, especially when those components are used to provide basic services, such as the ability to play audio and video content.1122Second, Microsoft asserts that if the contested decision were to apply as precedent against future integration in its Windows operating system, it would quickly become impossible to design, develop and test that operating system. For each block of software code that had to be made removable, Microsoft would face an exponential increase in the amount of work required. Thus, for example, if the Commission decided to apply to a second block of software codes the same principles as those established in the contested decision, it would have to offer four different versions of Windows. Such fragmentation would have the effect that it would be impossible to know whether any given copy of the operating systems contained functionality on which software developers, manufacturers of peripherals or users wished to rely. There would therefore be one version, or indeed several versions, of Windows per computer manufacturer, each offering a different set of functionalities. In the long term, the ability to remove Windows functionalities would reduce consumer choice, since consumers would be tied to particular brands of client PCs running idiosyncratic versions of Windows, with no assurance that applications, such as graphics, would work on other versions of Windows. It would also become much more difficult to mix and match different brands of client PCs within the same computer network. In Microsoft's submission, the only way to avoid such fragmentation would be to freeze Windows in its current version.1123The Commission first of all rejects the factual observations formulated by Microsoft. It claims, in particular, that the applicant's general assertions concerning the benefits of the integration of new functionalities unrelated to Windows Media Player into client PC operating systems are irrelevant.1124Next, the Commission, supported by SIIA, submits that Microsoft has failed to show that the impugned conduct is objectively justified.1125In the first place, at recitals 955 to 970 to the contested decision, the Commission rejected Microsoft's argument that the tying at issue produced efficiencies capable of outweighing the anti-competitive effects identified. As regards, more particularly, the alleged distribution efficiencies, the Commission observes that Microsoft's arguments are based on confusion between the benefits to consumers of having a media player pre-installed along with the client PC operating system, and Microsoft selecting the media player for consumers. Referring to recital 962 to the contested decision, the Commission further submits that Microsoft has not put forward any technical efficiency for which integration of Windows Media Player into Windows would be a precondition. Microsoft's assertion, first submitted in the reply, that Windows operates faster when media functionality is integrated, is not supported by any evidence. Last, by the tying at issue, Microsoft shields itself from effective competition from vendors of potentially more efficient media player vendors which could challenge its position. Microsoft thus reduces the talent and capital invested in innovation in respect of media players and reduces its own incentive to innovate in that sphere.1126In the second place, the Commission examines the three series of considerations formulated by Microsoft.1127First, the Commission observes that media players exhibit both application and platform software characteristics. In other words, although they build on the client PC operating system, other applications may build on them. Media players offer their platform services irrespective of whether or not they are tied to a PC operating system.1128The Commission claims that the benefit that the bundling offers to software developers and content providers is that it allows them to avoid the efforts of competition, which cannot constitute valid justification under Community competition law. Because of the bundling of Windows Media Player with the ubiquity of the Windows monopoly, software developers and content providers who base their products on Windows Media Player do not need to convince users to install that player. By contrast, those who base their products on a third-party media player platform typically provide an incentive for users to install the necessary media player on their own computer, for example by including links for downloading the player through the Internet.1129The Commission further submits that the bundling has the effect of increasing the costs which vendors of competing media players and third-party software developers who rely on those media players necessarily incur in convincing users to install those media players, because competitors need to overcome the disincentives generated by the automatic presence of Windows Media Player to install a different media player product, but with essentially similar characteristics (learning, support, and storage costs are examples of such disincentives).1130The Commission also maintains that Microsoft's arguments relating to the uniform platform amount to asserting that it should be allowed to extend the Windows monopoly by tying other software products to Windows, for the simple reason that such other software products also offer platform capabilities to third-party developers. Microsoft essentially claims that the integration of Windows Media Player in Windows leads to de facto standardisation and that this provides benefits to third parties, since they know that Windows Media Player will always be present in Windows. However, standardisation cannot be imposed unilaterally by a dominant undertaking through tying (recital 969 to the contested decision).1131Furthermore, even if software code is not completely fungible (see paragraph 1113 above), the fact remains that competing media players can replace Windows Media Player for a large part of its functionality. As regards other functionality, third-party media player vendors may choose not to implement it at present because they know that it is available in Windows Media Player. However, that does not exclude the possibility that they will develop that functionality immediately after implementation of the remedy in order to take advantage of the unbundled version of Windows and to meet the demand of software developers.1132In the rejoinder, the Commission insists that it never asserted that third-party media players were complete substitutes' for the media functionality in Windows. It merely explained in the contested decision that third-party media players running on top of an unbundled version of Windows could to a large extent replace features of Windows Media Player. Streaming media players compete on the basis of a number of parameters, such as the quality of streaming, the method of organising content and the format in which the file is provided.1133Last, the Commission refutes Microsoft's assertion that some applications will no longer work properly when they are used with the version of Windows imposed by Article 6(a) of the contested decision. Referring to the example given at recital 1038 to the contested decision, moreover, the Commission observes that professional Internet sites normally incorporate mechanisms that automatically detect the absence of components needed to run an Internet page and allow them to be downloaded. In the rejoinder, it further submits that in any event developers who base their products on Windows Media Player have a variety of ways of dealing with the possibility that a PC user has not already installed Windows Media Player.1134Second, the Commission rejects the arguments which Microsoft bases on componentisation.1135It claims, first of all, that those arguments are wholly abstract, as Microsoft refers to media functionality in general It reiterates that the remedy prescribed in Article 6(a) to the contested decision does not affect the basic media functionality of Windows.1136Next, the Commission submits that the files constituting Windows Media Player which must be removed pursuant to the contested decision have been clearly identified by Microsoft. It refers to a letter of 13 September 2004 from Mr Heiner, a Microsoft employee, and contends that Microsoft cannot claim that it is not technically feasible to design an unbundled version of Windows.1137The Commission further observes that the contested decision requires Microsoft to develop and offer an unbundled version of Windows without Windows Media Player and to ensure that that version is full-functioning and of good quality, but does not prevent Microsoft from continuing to offer a version of Windows bundled with Windows Media Player in line with its current software design methodology.1138Last, the Commission observes that Microsoft gives only a single example of component cross-dependency, namely the Windows XP Help system. In so far as that Help system relies on audio and video, it relies on media infrastructure that will remain in the unbundled version of Windows without Windows Media Player. It will therefore work well irrespective of the presence of Windows Media Player, as has been demonstrated by a test report submitted by RealNetworks in the interim measures proceedings. Furthermore, Microsoft's assertion that numerous other features of Windows XP will no longer work if media functionality is removed from the system consisting of Windows and Windows Media Player is wholly unfounded.1139The Commission further submits that it examined in detail, at recitals 1026 to 1042 to the contested decision, the question of the alleged interdependencies between Windows and Windows Media Player. It noted that it was obvious that if Windows Media Player were removed from Windows certain functionalities which it normally delivered would not be available (recital 1033 to the contested decision). That does not mean, however, that the operating system will not work properly or that the product will be degraded. In addition, the example of Windows XP Embedded shows that it is technically possible for Windows to cope with the absence of multimedia capabilities caused by code removal without entailing the breakdown of operating system functionality (recitals 1028 to 1030 to the contested decision).1140Third, the Commission contends that the arguments which Microsoft puts forward concerning the future negative effects of the remedy prescribed in Article 6(a) of the contested decision are hypothetical, conjectural and wholly irrelevant.1141First of all, pursuant to the contested decision, Microsoft is to retain the right to offer the bundled version of Windows.1142Next, the Commission, supported on this point by SUA, observes that Microsoft already markets a number of different versions of its client PC operating system which are not all interchangeable, such as Windows 98, Windows 2000, Windows Millennium Edition, Windows NT and Windows XP. Those different versions of Windows do not support the same applications.1143Last, the Commission rejects Microsoft's assertion that it would have to freeze Windows in its current version. The remedy prescribed in Article 6(a) of the contested decision fully preserves Microsoft's incentives to innovate both in the media player market and in the client PC operating systems market and it allows consumers to exercise their choice on the basis of the merits of the products. Supported on this point by Audiobanner.com, the Commission claims that, in reality, it is the bundling that deters innovation, in particular on the media player market (recital 981 to the contested decision). Furthermore, that practice discourages investment in all the technologies in which Microsoft could conceivably take an interest in the future (recital 983 to the contested decision).1144It must be borne in mind, as a preliminary point, that although the burden of proof of the existence of the circumstances that constitute an infringement of Article 82 EC is borne by the Commission, it is for the dominant undertaking concerned, and not for the Commission, before the end of the administrative procedure, to raise any plea of objective justification and to support it with arguments and evidence. It then falls to the Commission, where it proposes to make a finding of an abuse of a dominant position, to show that the arguments and evidence relied on by the undertaking cannot prevail and, accordingly, that the justification put forward cannot be accepted.1145In its pleadings, Microsoft submits in substance two series of arguments to justify its conduct, which to a large extent cover those which it submitted to the same end during the administrative procedure and which were examined and correctly rejected by the Commission at recitals 955 to 970 and 1026 to 1042 to the contested decision, as appears from the following paragraphs.1146First, Microsoft takes issue with the Commission for having ignored the benefits flowing from its business model, which entails the ongoing integration of new functionality into Windows. In that context, it claims, more particularly, that the integration of media functionality in Windows is indispensable in order for software developers and Internet site creators to be able to continue to benefit from the significant advantages offered by the stable and well-defined' Windows platform.1147Second, Microsoft claims that the removal of media functionality from the system consisting of Windows and Windows Media Player would create a series of problems to the detriment of consumers, software developers and Internet site creators. It refers, in particular, to the fact that its Windows operating system relies on the method know as componentisation' (see paragraph 1118 above) and that the withdrawal of media functionality would result in the degrading and fragmentation of that system.1148As regards the first series of arguments invoked by Microsoft, it is appropriate, first of all, to recall the precise scope of the abuse found in Article 2(b) of the contested decision and of the remedy prescribed in Article 6(a) of that decision.1149The circumstance to which the Commission takes exception in the contested decision is not that Microsoft integrates Windows Media Player in Windows, but that it offers on the market only a version of Windows in which Windows Media Player is integrated, that is to say, that it does not allow OEMs or consumers to obtain Windows without Windows Media Player or, at least, to remove Windows Media Player from the system consisting of Windows and Windows Media Player. Thus, while Article 6(a) of the contested decision requires Microsoft to offer a full-functioning version of the Windows Client PC Operating System which does not incorporate Windows Media Player, it expressly states that Microsoft ... retains the right to offer a bundle of the Windows Client PC Operating System and Windows Media Player (see, to the same effect, recitals 1011 and 1023 to the contested decision).1150Thus, the Commission does not interfere with Microsoft's business model in so far as that model includes the integration of a streaming media player in its client PC operating system or the possibility for that operating system to allow software developers and Internet site creators to take advantage of the benefits offered by the stable and well-defined' Windows platform. The Commission takes issue with the fact that Microsoft does not market the version of Windows that corresponds to its business model and at the same time a version of that system without Windows Media Player, thus permitting OEMs or end users wishing to do so to install the product of their choice on their client PC as the first streaming media player.1151Next, the Court considers that Microsoft is not entitled to rely on the fact that the bundling ensures the uniform presence of media functionality in Windows, which enables software developers and Internet site creators to avoid the need to include in their products mechanisms which make it possible to ascertain what media player is present on a particular client PC and where necessary to install the necessary functionality (see paragraphs 1107, 1111 and 1115 above). The fact that that tying enables software developers and Internet site creators to be sure that Windows Media Player is present on virtually all client PCs in the world is precisely one of the main reasons why the Commission correctly took the view that the bundling led to the foreclosure of competing media players from the market. Although the uniform presence to which Microsoft refers may have advantages for those operators, that cannot suffice to offset the anti-competitive effects of the tying at issue.1152As the Commission correctly observes (see paragraph 1130 above), by such an argument Microsoft is in fact claiming that the integration of Windows Media Player in Windows and the marketing of Windows in that form alone lead to the de facto standardisation of the Windows Media Player platform, which has beneficial effects on the market. Although, generally, standardisation may effectively present certain advantages, it cannot be allowed to be imposed unilaterally by an undertaking in a dominant position by means of tying.1153The Court further notes that it cannot be ruled out that third parties will not want the de facto standardisation advocated by Microsoft but will prefer it if different platforms continue to compete, on the ground that that will stimulate innovation between the various platforms.1154Furthermore, as the Commission and SUA rightly submit, the other benefits on which Microsoft relies could just as easily be obtained in the absence of the impugned conduct.1155Thus, consumer demand for an out-of-the-box client PC incorporating a streaming media player can be fully satisfied by OEMs, who are in the business of assembling such PCs and combining, inter alia, a client PC operating system with the applications desired by consumers (recitals 68 and 119 to the contested decision). Nor does the contested decision prevent Microsoft from continuing to offer the bundled version of Windows and Windows Media Player to consumers who prefer that solution.1156Similarly, Microsoft cannot rely on the fact that OEMs depend on the addition of functionality to Windows to create PCs that will appeal to customers and that will support the creation of interesting new applications. OEMs are capable of offering client PCs with such features by pre-installing on them applications obtained from software developers. In the same way, the functionalities offered by Windows Media Player may be supplied by Microsoft on an independent basis, that is to say, without that media player being tied to the Windows operating system.1157Nor can Microsoft claim that the integration of media functionality in Windows is essential in order to enable software developers and Internet site creators to use the Windows platform effectively and that it enables those operators to avoid having to develop the requisite software code themselves.1158For the reasons set out at recitals 962 to 967 to the contested decision, that argument must be rejected as unfounded. It must be borne in mind, in that regard, that although streaming media players — and this applies both to Windows Media Player and to competing media players — constitute application software, they none the less expose APIs and may therefore also serve as platforms for third-party applications. It is wholly unnecessary for a streaming media player to be integrated in a client PC operating system in order to be able to provide such platform services. In particular, contrary to the impression that Microsoft would give, the absence of such integration does not have the consequence that software developers must write the requisite software code. Thus, as stated at recital 966 to the contested decision, a large number of software developers and Internet content providers develop their products using APIs exposed by RealPlayer even though that is not integrated in any client PC operating system. Similarly, the Court notes that software developers can — and do — write applications designed to work with WMP 9, although that player was not pre-installed on Windows (recital 965 to the contested decision).1159Last, the Court notes that, as the Commission observes both in the contested decision and in its pleadings, Microsoft does not show that the integration of Windows Media Player in Windows creates technical efficiencies or, in other words, that it lead[s] to superior technical product performance (recital 962 to the contested decision).1160In the reply, Microsoft asserts, for the first time, that Windows ... operate[s] faster when media functionality is integrated. In that regard, it is sufficient to state that that assertion is unsupported.1161Also in the reply, Microsoft asserts that the fact that numerous software developers freely choose to call on the media functionality in Windows shows that the uniform integration of such functionality creates technical efficiencies. That assertion must be rejected: the contested decision refers to Windows Media Player and not to media functionality in general, and the mere fact that software developers rely on Windows Media Player does not prove that the tying produces technical efficiencies.1162The second series of arguments on which Microsoft relies must also be rejected.1163First of all, as regards Microsoft's claim that applications that are already in broad use will no longer work correctly when they are implemented on the version of Windows without Windows Media Player, it is sufficient to state that this has not been demonstrated to the requisite legal standard.1164Next, the Court finds that Microsoft's assertion that the removal of media functionality from the system consisting of Windows and Windows Media Player will affect the functioning of parts of the Windows operating system itself is unfounded. The only examples that Microsoft provides on that point, namely the examples of the Help system and the text-to-voice system contained in Windows, are unconvincing. Those systems rely on the basic media infrastructure of the Windows operating system and not on Windows Media Player. As already stated at paragraph 916 above in connection with the bundling issue, the impugned conduct concerns only the application software that constitutes Windows Media Player, to the exclusion of any other multimedia technology in the Windows client PC operating system, and the basic multimedia infrastructure of that system remains in the version of Windows imposed by Article 6(a) of the contested decision. It was also stated at paragraph 916 above that Microsoft itself differentiates in its technical literature the files which constitute Windows Media Player from the other multimedia files, notably those relating to the basic multimedia infrastructure.1165The Court further considers that Microsoft cannot contend that the removal of Windows Media Player from the system consisting of Windows Media Player and Windows will entail a degrading of the operating system. Thus, Windows XP Embedded can be configured in such a way as not to include Windows Media Player without having any effect on the integrity of the other functionality of the operating system. Furthermore, throughout the period between June 1998 and May 1999, when Microsoft first integrated WMP 6 in its Windows client PC operating system without allowing OEMs or users to remove it from that system, Microsoft offered its streaming media player as separate application software, without any effect on the functioning of the Windows operating system. The Court further notes that, pursuant to the remedy prescribed in Article 6(a) of the contested decision, Microsoft placed on the market a version of Windows without Windows Media Player and that that version is fully functional.1166Last, the Court also rejects Microsoft's argument based on the risk of fragmentation of its Windows operating system (see paragraph 1122 above). As the Commission states in the defence, that argument is hypothetical and speculative. Furthermore, it is inconsistent with Microsoft's own business practice. Thus, over recent years, Microsoft has successively marketed a number of different versions of its Windows operating system which are not all interchangeable, namely Windows 98, Windows 2000, Windows Me, Windows NT and Windows XP. In addition, as regards, for example, Windows XP, that operating system can be broken down into seven distinct versions.1167It follows from all of the foregoing considerations that Microsoft has not demonstrated the existence of any objective justification for the abusive bundling of Windows Media Player with the Windows client PC operating system.1168At recitals 1049 to 1053 to the contested decision, the Commission examines Microsoft's argument that the remedy for the abusive refusal to supply fails to comply with the obligations imposed on the Community by the TRIPS Agreement and also the argument that the remedy for the abusive tying fails to comply with the Agreement on Technical Barriers to Trade (TBT) of 15 April 1994 (Annex 1A to the Agreement establishing the WTO (the WTO Agreement).1169The Commission maintains, in effect, that the contested decision is fully consistent with its obligations under the TRIPS Agreement and the WTO Agreement (recital 1052 to the contested decision).1170The Commission further asserts that, for the reasons set out at paragraphs 801 and 802 above, Microsoft cannot invoke those agreements in order to challenge the legality of the contested decision (recital 1053 to the contested decision).1171Microsoft claims that the contested decision forces it to develop a version of its Windows operating system from which nearly all the media functionality has been removed and to offer that degraded product, under the Microsoft and Windows trade marks, to consumers in Europe. The contested decision thereby infringes its trade mark rights and its copyright, two categories of rights which the Communities are legally bound to protect under the TRIPS Agreement.1172In the first place, Microsoft claims that the contested decision infringes its trade mark rights, contrary to Articles 17 to 20 of the TRIPS Agreement. Under Article 17 of the TRIPS Agreement, any exceptions to trade mark rights must be limited and must take account of the legitimate interests of the owner of the trade mark and of third parties, while Article 20 of the TRIPS Agreement provides that the use of a trade mark cannot be unjustifiably encumbered by special requirements, such as use in a special form or use in a manner detrimental to its capability to distinguish the goods or services of one undertaking from those of other undertakings.1173Microsoft maintains that by requiring it to offer to license a version of Windows without media functionality, the Commission requires it to place its most valuable trade mark on a product which it did not design and which it knows will not work in the desired way. In addition, there is a likelihood of confusion between the version of Windows without media functionality and the version with media functionality. The contested decision also infringes Microsoft's right to control the quality of the products to which the trade mark is affixed and, in that regard, the applicant reiterates that the version of Windows imposed by Article 6(a) of the contested decision will affect the functioning of a series of elements of the Windows operating system itself and also applications and Internet sites which call on that media functionality. The encumbrances thus created by the contested decision do not form part of the type of limited' exceptions envisaged by Article 17 of the TRIPS Agreement and the requirement that it place its Windows and Microsoft trade marks on inferior products over which it is unable to exercise design control runs directly counter to its own interests and also to those of consumers and third-party software developers.1174There is a breach of Article 20 of the TRIPS Agreement in so far as, in spite of the existence of equally effective alternatives, the Commission forces Microsoft to encumber the Windows trade mark in a manner that reduces its function as an indicator of source and quality, which causes confusion in the minds of consumers and harms the goodwill of the trade mark.1175In the second place, as regards its copyright, Microsoft claims that the contested decision infringes its exclusive rights — protected by the TRIPS Agreement — to authorise adaptations, arrangements and other alterations of its works, to authorise the reproduction of its works, in any manner or form, and to distribute copies of Windows to the public. The contested decision forces it to create an adaptation of Windows which is not of the applicant's own design and which represents a substantial alteration of its copyrighted work, and also to license the use of copies of that compelled adaptation of its copyrighted work'. The compulsory licensing of a copyrighted work is authorised by the TRIPS Agreement only on the conditions laid down in Article 13 of that agreement, which are not fulfilled in this case.1176The Commission claims, primarily, that the legality of the contested decision cannot be reviewed by reference to the TRIPS Agreement (see paragraph 789 above).1177In the alternative, the Commission contends that Microsoft's arguments are in any event wholly unfounded.1178In the first place, the Commission rejects Microsoft's arguments relating to its trade marks.1179First of all, it submits that those arguments are difficult to understand and that Microsoft fails to make clear whether the alleged breach of the TRIPS Agreement refers to the finding of the tying abuse made in the contested decision or to the remedy for that abuse.1180Next, the Commission submits that, under Article 16(1) of the TRIPS Agreement, the owner of a registered trade mark is to have the exclusive right to prevent third parties acting without its consent from using identical or similar signs. Microsoft fails to explain how that right would be affected by the contested decision or to what extent the use of its trade marks might, on account of the contested decision, be unjustifiably encumbered by special requirements within the meaning of Article 20 of the TRIPS Agreement. In the Commission's submission, the exclusive right referred to above is therefore preserved in the present case, as is the function of the trade mark as a guarantee of origin of the products.1181The Commission further submits that the remedy prescribed by Article 6(a) of the contested decision does not infringe Microsoft's right to control the quality of the products to which the trade mark is affixed, since Microsoft would retain total control of the quality of its own products. Furthermore, the argument that the version of Windows without Windows Media Player was a degraded product has already been refuted, and the risk of confusion on which Microsoft relies can be avoided with adequate information and labelling.1182Last, the

Commission asserts that, even on the assumption that the contested decision does infringe Microsoft's trade marks, the derogation provided for in Article 17 of the TRIPS Agreement, read together with Article 8(2) and Article 40(2) of that agreement, would allow the infringement of competition law identified in the contested decision to be brought to an end.1183In the second place, the Commission rejects the arguments which Microsoft bases on its copyright.1184First of all, the contested decision does not authorise any third party to adapt or reproduce Microsoft's copyright works and Microsoft cannot rely on an integrity right, which is a moral right and is therefore not covered by the TRIPS Agreement.1185Next, the Commission submits that the arguments which Microsoft bases on Article 13 of the TRIPS Agreement cannot be upheld. In particular, the contested decision deals with a special case within the meaning of that article, since it applies to instances of tying which would constitute an abuse of a dominant position.1186Last, the Commission contends that, even on the assumption that the contested decision does infringe Microsoft's copyright, the exception provided for in Article 13 of the TRIPS Agreement, read together with Article 8(2) and Article 40(2) of that agreement, would allow the infringement of competition law identified in the contested decision to be brought to an end.1187SUA essentially supports the Commissions arguments.1188The Court notes that Microsoft is challenging the legality of the contested decision on the ground that it is contrary to various provisions of the TRIPS Agreement, and in particular to Articles 13, 17 and 20 of that agreement.1189However, as the Court has already stated at paragraph 801 above, it is settled case-law that, given their nature and structure, WTO Agreements are not in principle among the rules by reference to which the Community judicature will review the legality of measures adopted by the Community institutions.1190As the Court has also already observed at paragraph 802 above, it is only where the Community has intended to implement a particular obligation assumed under the WTO or where the Community measure refers expressly to specific provisions of the WTO Agreements that the Community judicature must review the legality of the Community measure in question in the light of the WTO rules. As the circumstances of the present case clearly do not correspond to either of those two situations, Microsoft cannot rely on the TRIPS Agreement, in particular its Articles 13, 17 and 20, in support of its application for annulment of the contested decision in so far as it concerns the bundling of Windows and Windows Media Player.1191It follows that this part of the first plea must be rejected without there being any need to examine the arguments which Microsoft has raised in support of it.1192In any event, there is nothing in the provisions of the TRIPS Agreement to prevent the competition authorities of the members of the WTO from imposing remedies which limit or regulate the exploitation of intellectual property rights held by an undertaking in a dominant position where that undertaking exercises those rights in an anti-competitive manner. Thus, as the Commission correctly observes, it follows expressly from Article 40(2) of the TRIPS Agreement that the members of the WTO are entitled to regulate the abusive use of such rights in order to avoid effects which harm competition. Article 40(2) provides as follows:

Nothing in this Agreement shall prevent Members from specifying in their legislation licensing practices or conditions that may in particular cases constitute an abuse of intellectual property rights having an adverse effect on competition in the relevant market. As provided above, a Member may adopt, consistently with the other provisions of this Agreement, appropriate measures to prevent or control such practices, which may include for example exclusive grantback conditions, conditions preventing challenges to validity and coercive package licensing, in the light of the relevant laws and regulations of that Member.

1193It follows from all of the foregoing that the first plea must be rejected as unfounded in its entirety.1194By way of remedy for the abusive tying referred to in Article 2(b) of the contested decision, Article 6 of that decision orders Microsoft to offer, within 90 days of the date of notification of that decision, a full-functioning version of its Windows client PC operating system which does not incorporate Windows Media Player, although Microsoft is to retain the right to offer a bundle of its Windows client PC operating system and Windows Media Player. Article 6 also provides that Microsoft is to communicate to the Commission, within the same period, all the measures which it has taken to comply with that obligation.1195At recitals 1011 to 1042 to the contested decision, the Commission provides details of that remedy.1196In the first place, the Commission describes the scope of the remedy (recitals 1011 to 1014 to the contested decision).1197In particular, the obligation imposed on Microsoft to offer a version of Windows without Windows Media Player applies both where Windows is licensed directly to end users and where it is licensed to OEMs. Likewise, the option which Microsoft retains to offer a bundle of Windows and Windows Media Player applies with respect both to end users and to OEMs.1198The Commission also prohibits Microsoft from adopting any technological, commercial, contractual or other measure which would have an effect equivalent to tying Windows and Windows Media Player, and states in particular that the version of Windows without Windows Media Player must perform as well as the version of Windows with Windows Media Player. Recital 1013 to the contested decision contains a non-exhaustive list of practices which are prohibited on that ground.1199In the second place, the Commission fixes at 90 days the period within which Microsoft must implement the remedy in question (recitals 1015 to 1017 to the contested decision).1200In the third place, the Commission rejects Microsoft's assertion that the remedy prescribed in Article 6(a) of the contested decision is not sufficiently precise, since Microsoft knows exactly what software code it must remove from its product (recitals 1018 to 1021 to the contested decision). The Commission gives, inter alia, the example of Windows XP Embedded and makes clear that the contested decision does not require Microsoft to remove all media files from Windows, but only those which constitute Windows Media Player.1201In the fourth place, the Commission puts forward a series of considerations in order to demonstrate that the remedy in question is proportionate (recitals 1022 to 1042 to the contested decision).1202First, it maintains that the remedy is necessary to remove the restriction of competition resulting from Microsoft's conduct (recital 1022 to the contested decision).1203Second, the remedy prescribed in Article 6(a) of the contested decision does not prevent Microsoft from marketing its media player and places no restrictions on Microsoft apart from prohibiting the tying practice at issue or the adoption of any measures having an equivalent effect to that practice (recital 1023 to the contested decision). The Commission reiterates that Microsoft can continue to market a bundle of Windows and Windows Media Player (ibid.).1204Third, the Commission rejects Microsoft's argument that there is no significant consumer demand for client PC operating systems without multimedia functionality (recitals 1024 and 1025 to the contested decision). The Commission states, in substance, that OEMs can respond to consumer expectations by pre-installing the media player chosen by the consumer on the client PCs which they sell to them.1205Fourth, at recitals 1026 to 1034 to the contested decision, the Commission examines Microsoft's arguments concerning the interdependencies between Windows and Windows Media Player. Referring again to the example of Windows XP Embedded, the Commission rejects the assertion that the elimination of the Windows Media Player code would harm the integrity of the operating system. It also contends that Microsoft has not shown that the integration of Windows Media Player in Windows was a precondition for efficiency gains, and asserts, in particular, that [i] f developers devise their own solutions or integrate a third party's redistributable code in their application, they do not depend on the presence of the media player on the user's client PC (recital 1032 to the contested decision).1206Last, and fifth, at recitals 1035 to 1042 to the contested decision the Commission examines Microsoft's arguments relating to the alleged interdependencies between Windows and third-party applications. More specifically, it rejects the assertion that the elimination of the Windows Media Player code would have harmful consequences for content providers and software developers. The Commission submits that it is not uncommon for content providers to implement solutions which determine what media player is installed on a given client PC and that they foresee the measures to be taken where the presentation of their content requires a particular media player or a particular version of a given media player (recital 1037 to the contested decision), and it rejects Microsoft's argument that there is an advantage in preserving Windows as a consistent platform (recital 1041 to the contested decision). The Commission considers, in substance, that Microsoft cannot rely on the fact that its practice allows software developers whose products rely on media players to have a focal point for that purpose, since that practice distorts competition on the merits (recital 1042 to the contested decision).1207Microsoft claims that the remedy prescribed in Article 6(a) of the contested decision infringes the principle of proportionality from three perspectives.1208In the first place, the remedy ignores the legitimate interest of software developers and Internet site creators in preserving Windows as a stable and consistent platform.1209In the second place, the remedy infringes Microsoft's moral rights by requiring it to degrade its Windows operating system and to license that degraded version of its product to third parties. In particular, the remedy ignores Microsoft's right to object to changes in its work or to the deformation, mutilation or other impairment of it1210In the third place, Microsoft maintains that the remedy prescribed in Article 6(a) of the contested decision is internally inconsistent and impossible for Microsoft to comply with, because it is required to remove important functionality from Windows and at the same time ensure that the degraded version of Windows is not less performing than the version with Windows Media Player.1211The Commission contends that the remedy is proportionate, especially since Microsoft retains the right to offer a bundled version of Windows with Windows Media Player. Nor does the remedy prevent Microsoft from marketing its media player or from continuing to offer it separately for downloading.1212The Commission disputes Microsoft's assertion that it is impossible to identify the software code of Windows Media Player or to comply with the remedy prescribed in Article 6(a) of the contested decision, and points out that Microsoft itself acknowledges that it has already developed an unbundled version of Windows which is ready to be placed on the market. It refers, moreover, to recitals 1018 to 1021 to the contested decision.1213The Commission further contends that Microsoft has adduced no evidence capable of showing that third parties would suffer harm or that the operating system would be degraded as a result of the remedy.1214As regards the alleged infringement of Microsoft's moral rights, the Commission asserts that Microsoft is not normally considered [to be] the rightholder of moral rights in Europe. Nor does the remedy prevent the authors of the work from claiming paternity or involve any disclosure of the code.1215Last, the Commission, supported on this point by SIIA, contends that the measures provided for by the judgment of the District Court of 1 November 2002 are not sufficient to remedy the tying abuse identified in the contested decision. That judgment does not require Microsoft to remove the Windows Media Player code from the client PC operating system, but only to provide a means for OEMs and end users to hide the on-screen icon and menu entries used to access the Windows Media Player software. Furthermore, Microsoft designed the hiding mechanism in such a way that Windows Media Player can be reactivated and can override the default settings chosen by users. The remedies referred to in that judgment therefore do not affect the ubiquity of the Windows Media Player code on client PCs or, consequently, the incentives for software developers and content providers to focus on Windows Media Player as the platform technology for their complementary offerings.1216First of all, the Court notes that, in support of the present plea, Microsoft reiterates in essence the same arguments it submitted in the first plea on the condition relating to the absence of objective justification (see paragraphs 1102 to 1122 above).1217The grounds on which the Court held that those arguments were unfounded must apply also in the examination of the present plea.1218Thus, in the first place, as regards the argument that the Commission failed to take account of the interest of software developers and Internet site creators in having a stable and well-defined platform, it is sufficient to refer to paragraphs 1148 to 1153 above.1219In the second place, Microsoft's argument that the remedy prescribed in Article 6(a) of the contested decision requires it to degrade its Windows operating system and to license such a degraded version of its product to third parties has already been refuted at paragraph 1165 above.1220In that regard, it must be borne in mind that the contested decision does not require Microsoft to offer a version of Windows from which all multimedia files, including those relating to the basic multimedia infrastructure of the operating system, have been removed. The only files affected are the files constituting Windows Media Player, which Microsoft itself distinguishes from the other files in its technical documentation (see paragraphs 916 to 1164 above). It must also be borne in mind that the example of Windows XP Embedded shows that the absence of Windows Media Player from the operating system does not harm the integrity of the other functionalities of that system (see paragraph 1165 above).1221Furthermore, between June 1998 and May 1999 Microsoft offered its streaming media player as separate application software, without any effect on the Windows operating system. As already stated at paragraph 936 above, Microsoft acknowledged at the hearing that there was no technical reason in May 1999 to prevent it from continuing to supply its media player in that form, that is to say, without integrating it in the Windows 98 Second Edition operating system.1222In the third place, it follows from the considerations set out at paragraphs 1219 to 1221 above that Microsoft's assertion that the remedy prescribed in Article 6(a) of the contested decision is internally inconsistent and impossible to comply with is unfounded. That assertion rests on the incorrect premiss that the version of Windows imposed by Article 6(a) is a degraded version of Microsoft's operating system. As the Commission correctly submits in its pleadings, while it is clear that when Windows Media Player is removed from Windows the functionalities offered by that player are no longer available on such a version of the operating system, it cannot be inferred that that version is degraded or that it performs less well in other respects than a version of the operating system bundled with Windows Media Player. The requirement that Microsoft offer a full-functioning version of its Windows client PC operating system without Windows Media Player (Article 6(a) of the contested decision) must be seen in the light of, in particular, the requirement at recital 1012 to the contested decision that [t]he unbundled version of Windows must in particular not be less performing than the version of Windows which comes bundled with [Windows Media Player], regard being had to [Windows Media Player]s functionality which, by definition, will not be part of the unbundled version of Windows'.1223Next, the Court considers that, far from being disproportionate, the remedy prescribed in Article 6(a) of the contested decision is an appropriate means of putting an end to the abuse in question and of resolving the competition issues identified, while causing the least possible inconvenience to Microsoft and its business model.1224Thus, the implementation of that measure does not entail any change in Microsoft's current technical practice other than the development of the version of Windows imposed by Article 6(a) of the contested decision.1225In particular, Microsoft retains the right to continue to offer the bundle of Windows and Windows Media Player. It must be borne in mind that the Commission's sole intention is to make it possible for consumers to obtain Windows without Windows Media Player.1226Furthermore, as the Commission correctly observes, the remedy does not affect Microsoft's ability to market its media player and, in particular, to offer it for downloading over the Internet.1227Last, the Court finds that, for the reasons set out at paragraph 974 above, the Commission was correct to consider that the measures taken by Microsoft pursuant to the United States settlement were not sufficient to put an end to the abuse and to resolve the competition issues identified.1228It follows from all of the foregoing considerations that the second plea must be rejected as unfounded.1229It follows that the claims relating to the annulment of the contested decision must be rejected in so far as they concern the bundling of Windows and Windows Media Player.1230The first paragraph of Article 4 of the contested decision provides that Microsoft is to bring to an end the abusive conduct established in Article

2, in accordance with the procedures laid down in Articles 5 and 6 of that decision. Microsoft is also required to refrain from repeating any act or conduct having the same or equivalent object or effect as that abusive conduct (second paragraph of Article 4).1231By way of remedy for the abusive refusal to supply the interoperability information, Article 5 of the contested decision orders Microsoft to disclose, within 120 days of notification of that decision, that information to any undertaking having an interest in developing and distributing work group server operating systems and to allow, on reasonable and non-discriminatory terms, those undertakings to use the information in question to develop and distribute work group server operating systems. Microsoft is also required to ensure that the interoperability information disclosed is kept updated on an ongoing basis and in a timely manner. Last, Article 5 of the contested decision orders Microsoft, within 120 days of the date of notification of that decision, to set up an evaluation mechanism that will give interested undertakings a workable possibility of informing themselves about the scope and terms of use of the interoperability information.1232By way of remedy for the abusive bundling of the Windows client PC operating system and Windows Media Player, Article 6 of the contested decision orders Microsoft, inter alia, to offer, within 90 days of notification of the decision, a full-functioning version of its Windows client PC operating system which does not incorporate Windows Media Player, although Microsoft is to retain the right to offer a bundle of the Windows client PC operating system and Windows Media Player.1233Article 7 of the contested decision, moreover, provides for the establishment of a suitable mechanism to assist the Commission in monitoring Microsoft's compliance with the contested decision and including, in particular, the appointment of an independent monitoring trustee. Article 7 provides that that mechanism is to form the subject-matter of a proposal by Microsoft within 30 days of notification of the decision, while in the event that the Commission considers that the proposed mechanism is not suitable, it is to retain the right to impose such a mechanism by way of a decision.1234At recitals 1043 to 1048 to the contested decision, the Commission describes in greater detail the monitoring mechanism referred to in the preceding paragraph and, in particular, sets out the [g]uiding principles for Microsoft [when it draws up its proposal for the appointment of an independent monitoring trustee] (recital 1044 to the contested decision).1235Thus, at recital 1045 to the contested decision, the Commission states that the monitoring trustee's primary responsibility is to issue opinions, and to do so upon application by a third party or by the Commission, or on his own initiative, on whether Microsoft has, in a specific instance, failed to comply with [the contested decision], or on any issue that may be of interest with respect to the effective enforcement of [that decision].1236At recitals 1046 and 1047 to the contested decision, the Commission describes the task of the monitoring trustee with respect to each of the two abuses at issue (see paragraph 1261 below).1237At recital 1048 to the contested decision, the Commission establishes the principles which Microsoft must take into account in its proposal concerning the monitoring trustee. In the first place, the monitoring trustee is to be appointed by the Commission from a list of persons submitted by Microsoft and Microsoft is to devise a procedure which allows the Commission to appoint a monitoring trustee of its choosing if it does not deem any of the persons proposed by Microsoft adequate for the task. In the second place, the monitoring trustee must be independent of Microsoft and provisions [must] be established to ensure that [he] is not and will not become exposed to a conflict of interest. The monitoring trustee must possess the necessary qualifications to carry out his mandate and it should be possible for him to hire experts to carry out certain precisely-defined tasks on his behalf. In the third place, provisions must be established in order to guarantee that the monitoring trustee has access to Microsoft's assistance, information, documents, premises and employees to the extent that he may reasonably require such access in carrying out his mandate. In the fourth place, the monitoring trustee must have full access to the source code of the relevant Microsoft products. Last, in the fifth place, all costs of establishment of the monitoring trustee, including a fair remuneration for the monitoring trustee's activities, should be borne by Microsoft.1238Microsoft contends that the obligation imposed on it by Article 7 of the contested decision to appoint an independent monitoring trustee is unlawful, since the Commission lacks authority, first, to delegate to a private individual the enforcement powers conferred on it by Regulation No 17 and, second, to require Microsoft to bear the costs of monitoring its compliance with the contested decision, including remuneration of the monitoring trustee.1239As a preliminary point, Microsoft denies that its application for annulment of Article 7 of the contested decision is premature. In particular, the Commission cannot rely on the fact that it could have imposed a monitoring mechanism by adopting a separate decision if it had not been satisfied with Microsoft's proposal and that Microsoft could then have sought annulment of that decision.1240Next, in the first place, Microsoft asserts that it is clear from recitals 1043 to 1048 to the contested decision that the powers delegated to the monitoring trustee in the present case are powers of investigation and enforcement that normally belong to the Commission. Although the monitoring trustees primary task is to issue opinions on compliance with the contested decision, he also has the power to investigate the measures taken by Microsoft to comply with that decision. Microsoft points out that footnote 1317 to the contested decision states that [t]he monitoring trustee should not only be reactive, but should play a proactive role in the monitoring of Microsoft's compliance. The contested decision is thus intended to establish an independent source of measures of investigation and enforcement.1241Under Articles 11 and 14 of Regulation No 17 and Articles 18 to 21 of Council Regulation (EC) No 1/2003 on the implementation of the competition rules laid down in Articles 81 [EC] and 82 [EC] (OJ 2003 L 1, p. 1), however, the powers of investigation and enforcement in connection with those rules belong exclusively to the Commission and the national competition authorities. Neither of those regulations authorises the Commission to delegate those powers to third parties or, a fortiori, to private individuals.1242Furthermore, by thus delegating its powers, the Commission deprives Microsoft of guarantees recognised to undertakings by the case-law to safeguard their rights of defence.1243In the reply, Microsoft makes clear that it has no objection to an independent monitoring trustee advising the Commission on technical questions. However, the Commission ought to have appointed its own expert for that purpose.1244In the second place, Microsoft observes that Article 7 of the contested decision, read with recital 1048(v) thereto, requires it to bear all costs of establishment of the monitoring trustee, including a fair remuneration for the monitoring trustee's activities'. In applying the competition rules, the Commission cannot impose on the undertaking concerned any pecuniary charges other than fines and periodic penalty payments.1245Microsoft submits that the Commission cannot invoke its power to order an undertaking to bring an infringement to an end as a ground for making that undertaking responsible for the costs associated with the monitoring trustee. The imposition of such a pecuniary charge has no legal basis in Regulation No 17, Regulation No 1/2003 or any other provision.1246The Commission contends, primarily, that Microsoft's arguments concerning the question of the monitoring trustee are inadmissible in that they are premature, conjectural and insufficient to warrant annulment of Article 7 of the contested decision. That article requires Microsoft to submit a proposal for the establishment of a monitoring mechanism, while reserving to the Commission the right to impose such a mechanism by adopting a decision should it consider that Microsoft's proposed mechanism is not suitable. Recitals 1044 to 1048 to the contested decision set out the guiding principles that Microsoft should take into account in drawing up that proposal, but most of those principles are not imposed on Microsoft by Article 7 of the contested decision. In particular, that article does not specify either the independent monitoring trustee's precise functions or the source of his remuneration. Microsoft is thus free to suggest a narrower scope of action than that envisaged in the contested decision and different arrangements for remuneration. The Commission would then be able to reject those proposals and impose a differently-worded mandate by decision. Such a decision would not merely be confirmatory of the contested decision and would be open to challenge.1247In the alternative, the Commission contends that Microsoft's arguments are unfounded.1248In the first place, the Commission submits that it does not follow from recitals 1044 to 1048 to the contested decision that it delegated to a private individual the powers of investigation and enforcement conferred on it by Articles 81 EC and 82 EC. From the perspective of information-gathering, the contested decision provides only for a consensual mechanism' which permits the swift resolution of many of the technical issues that are likely to arise concerning the implementation of the remedies. Admittedly, recital 1048 and footnote 1317 to the contested decision provide that the independent monitoring trustee can put questions to Microsoft and have access to documents and to the source code of the relevant products, but there is nothing to prevent Microsoft from specifying in its proposal for the mandate that it could refuse to answer such questions or to grant access to the requested information. In the event of such a refusal, the Commission would consider whether it would be appropriate to take action pursuant to Chapter V of Regulation No 1/2003 and would thus retain full discretion as concerns the use of its powers of investigation.1249In answer to a written question put by the Court, the Commission stated that Article 7 of the contested decision was based on Article 3 of Regulation No 17 and that it constituted an expression of the power conferred on it by that article to adopt decisions ordering undertakings to bring an infringement to an end.1250In the second place, the Commission claims that the obligation imposed on Microsoft to bear the costs associated with the remuneration of the monitoring trustee clearly does not form part of the sanctions provided for in Regulation No 17 and Regulation No 1/2003. If Article 7 of the contested decision must be understood as imposing an obligation as regards the remuneration of the monitoring trustee, that obligation must have its legal basis in Article 3 of Regulation No 17. A decision adopted on the basis of that article may include an order to do certain acts or provide certain advantages which have been wrongfully withheld as well as prohibiting the continuation of certain action, practices or situations which are contrary to the Treaty and will entail some costs for the addressee. The Commission refers to recital 1044 to the contested decision and observes that the implementation of the remedies requires effective monitoring of compliance with the obligations imposed on Microsoft by the contested decision.1251Microsoft seeks annulment of Article 7 of the contested decision on the ground that, by unlawfully delegating its powers of investigation and enforcement to a third party, the Commission exceeded its powers under Article 82 EC and Regulation No 17. Microsoft maintains that the imposition on an undertaking of a monitoring mechanism such as that referred to in Article 7 of the contested decision, and the charging to that undertaking of the remuneration of a third party appointed by the Commission to assist its task of monitoring compliance with the remedies ordered in an infringement decision, have no legal basis in Community law.1252The Commission contends that that application for annulment is premature and therefore inadmissible, in that Article 7 of the contested decision imposes no obligation on Microsoft but merely invites it to submit a proposal for the establishment of a monitoring mechanism; and in any event, that article entails no delegation of the Commissions powers. The Commission claims that that monitoring mechanism and the charging to Microsoft of the remuneration of the independent monitoring trustee have their basis in Article 3 of Regulation No 17, which allows it to order the undertakings concerned to bring to an end an infringement which the Commission has found.1253It must be borne in mind that the legality of Article 7 of the contested decision falls to be assessed by reference to the facts and the law as they existed at the time of adoption of the contested decision. At that time Regulation No 17 was still in force, whereas Regulation No 1/2003, which replaced it, became applicable on 1 May 2004.1254It must also be borne in mind that the powers of investigation and enforcement which the Commission enjoyed at the time of adoption of the contested decision, in so far as they are relevant to the application for annulment of Article 7 of that decision, were its power under Article 3(1) of Regulation No 17 to require the undertakings concerned to bring to an end an infringement, its powers under Article 11 of that regulation to request information, its powers of investigation under Article 14 of that regulation and the power under Article 16 of that regulation to impose periodic penalty payments on undertakings in order to compel them to put an end to the infringement found.1255First of all, the Court rejects the Commission's argument that the application for annulment of Article 7 is premature in that the article merely invites Microsoft to submit a proposal prior to the adoption by the Commission of a final decision on the establishment of a monitoring mechanism. The fact that Article 7 of the contested decision contains an invitation to submit a proposal cannot alter the binding nature of that article in so far as it constitutes the exercise by the Commission of its power to order that an infringement be brought to an end.1256When the Commission finds in a decision that an undertaking has infringed Article 82 EC, that undertaking is required to take, without delay, all the measures necessary to comply with that provision, even in the absence of specific measures prescribed by the Commission in that decision. Where remedies are provided for in the decision, the undertaking concerned is required to implement them — and to assume all the costs associated with their implementation —, failing which it exposes itself to liability for periodic penalty payments imposed pursuant to Article 16 of Regulation No 17 (see paragraph 1259 below).1257It follows from the wording of Article 7 of the contested decision, and in particular from the period of 30 days imposed on Microsoft, that it was precisely such a binding measure that was provided for by that provision. Although the first reaction envisaged in the event that Microsoft should fail to submit a suitable proposal is that referred to in the second paragraph of Article 7, namely the imposition of a monitoring mechanism by way of a decision, the fact remains that if Microsoft fails to comply with the obligation to submit a proposal it also incurs the risk of periodic penalty payments. The binding nature of the measure thus ordered cannot be affected by the mere fact that the Commission retains the right to impose such a mechanism itself in the event that it considers that Microsoft's proposal is not suitable. Failure to comply with such a specific measure ordered in a decision designed to put an end to an infringement of Article 82 EC constitutes a separate infringement of Community law, in this particular case Article 3 of Regulation No 17.1258That assessment is not invalidated by the Commissions argument that Microsoft could have submitted a different proposal better tailored to its own perception of what the Commission was entitled to require it to do. It is settled case-law that the operative part of an act is indissociably linked to the statement of reasons for it and when it has to be interpreted account must be taken of the reasons that led to its adoption (Case C-355/95 P TWD v Commission [1997] ECR I-2549, paragraph 21; Case C-91/01 Italy v Commission [2004] ECR I-4355, paragraph 49; and Case T-137/02 Pollmeier Malchow v Commission [2004] ECR II-3541, paragraph 60).1259The Court considers that in the light of the role which the Commission envisages for the monitoring trustee, as summarised at paragraph 1261 below, and of the powers conferred on the Commission by Articles 3 and 16 of Regulation No 17, Article 7 of the contested decision has the effect that if Microsoft failed, within the prescribed period of 30 days, to submit a proposal consistent with the principles set out, in particular, at recitals 1045 to 1048 to the decision, it would infringe the contested decision and incur the risk of being ordered to pay periodic penalty payments pursuant to Article 16 of Regulation No 17. It follows that Microsoft's legal situation was directly affected by Article 7 of the contested decision and that the application for annulment of that provision cannot be characterised as premature or as speculative, as the Commission contends.1260Next, the Court considers it appropriate to examine whether Article 7 of the contested decision has a legal basis in Regulation No 17 or whether, as Microsoft maintains, the Commission exceeded its powers of investigation and enforcement in so far as it ordered Microsoft to accept the establishment of an independent monitoring trustee endowed with the role and powers in question.1261It follows from recitals 1043 to 1048 to the contested decision that the monitoring trustee s task includes, in particular, the following functions:

his primary responsibility is to issue opinions on whether Microsoft has, in a specific instance, failed to comply with the contested decision (including compliance with the obligation to implement the remedies correctly);

those opinions will be given either upon application by a third party or by the Commission, or by the monitoring trustee acting on his own initiative;

on that point, the monitoring trustee must not only be reactive but must play a proactive role in the monitoring of Microsoft's compliance (footnote 1317 to the contested decision);

as regards the abusive refusal to disclose the interoperability information, the monitoring trustee is required to assess whether the information made available by Microsoft is complete and accurate, whether the terms under which Microsoft makes the specifications available and authorises their use are reasonable and non-discriminatory and whether the ongoing disclosures are made in a timely manner;

as regards the abusive tying, the monitoring trustee is required to advise the Commission whether substantiated complaints by third parties about Microsofts compliance with the contested decision are well founded from a technical point of view and, in particular, whether the version of Windows without Windows Media Player is less performing than any bundled version of Windows that Microsoft would continue to market. The monitoring trustee is also required to advise whether Microsoft hinders the performance of rival media players through selective, inadequate or untimely disclosures of Windows APIs.

1262At recital 1048 to the contested decision, the Commission sets out the principles which Microsoft must take into account in its proposal concerning the independent monitoring trustee pursuant to the decision. Those principles are, in particular, as follows:

(i) the monitoring trustee should be appointed by the Commission from a list of persons submitted by Microsoft;

(ii) the monitoring trustee is to be independent of Microsoft and provisions should be established to ensure that the monitoring trustee is not and will not become exposed to a conflict of interests; he should possess the necessary qualifications to carry out his mandate, and be entitled to hire experts to carry out certain precisely-defined tasks on his behalf;

(iii) provisions are to be established in order to guarantee that the monitoring trustee has access to Microsoft's assistance, information, documents, premises and employees to the extent that he may reasonably require such access in carrying out his mandate;

(iv) the monitoring trustee should have full access to the source code of the relevant Microsoft products (any controversy as to the accuracy and completeness of the specifications that will be disclosed can only be resolved if the technical information is checked against the actual source code of Microsoft's products);

(v) all costs of establishment of the monitoring trustee, including a fair remuneration for the monitoring trustees activities, are to be borne by Microsoft.

1263It is clear from that description that the Commission sees the monitoring trustee's role as being to evaluate and monitor the implementation of the remedies, by having access where necessary to the resources referred to in the preceding paragraph, at (iii) and (iv), while acting independently and, indeed, on his own initiative.1264The Commission expressly acknowledges in its pleadings that it is not entitled to delegate to a third party the powers of investigation and enforcement conferred on it by Regulation No 17. It does not accept, however, that the monitoring mechanism provided for in the contested decision entails such a delegation of powers.1265On the other hand, as Microsoft acknowledges, the Commission is entitled to monitor the implementation by the undertaking concerned of the remedies ordered in an infringement decision and to ensure that the other measures necessary to put an end to the anti-competitive effects of the infringement are fully implemented without delay. For those purposes, it is entitled to use the powers of investigation provided for in Article 14 of Regulation No 17 and, where necessary, to use an external expert in order, inter alia, to resolve technical issues.1266Nor can it be disputed that where the Commission decides to obtain the assistance of an external expert it may communicate to that expert any information and documents which it may have obtained in the exercise of its powers of investigation under

Article 14 of Regulation No 17.1267Under Article 11(4) and Article 14(3) of Regulation No 17, undertakings are required to provide the information requested by the Commission and to submit to the investigations which it orders. However, such requests and investigations are subject where necessary to the control of the Community Courts.1268The Court considers that by establishing a monitoring mechanism involving the appointment of an independent monitoring trustee as referred to in Article 7 of the contested decision, and charged with the functions set out, in particular, at recital 1048(iii) and (iv) to that decision, the Commission went far beyond the situation in which it retains its own external expert to provide advice when it investigates the implementation of the remedies prescribed in Articles 4, 5 and 6 of the contested decision.1269In effect, by Article 7 of the contested decision, the Commission requires the appointment of a trustee who, in the performance of his tasks, is independent not only of Microsoft but also of the Commission itself, in so far as he is required to act on his own initiative and upon application by third parties in the exercise of his powers. As the Commission observes at recital 1043 to the contested decision, that requirement goes beyond a mere obligation to report to the Commission on Microsoft's actions.1270Furthermore, the role envisaged for the monitoring trustee is not limited to putting questions to Microsoft and reporting the answers to the Commission, or to advice concerning the implementation of the remedies. As regards the obligation imposed on Microsoft to allow the monitoring trustee, independently of the Commission, access to information, documents, premises and employees and also to the source code of its relevant products, the Court notes that no limit in time is envisaged for the continuing intervention of the monitoring trustee in monitoring Microsoft's activities related to the remedies. Furthermore, it is clear from recital 1002 to the contested decision that the Commission considers that the obligation to disclose interoperability information must apply in a prospective manner to future generations of Microsoft's products.1271It follows that the Commission has no authority, in the exercise of its powers under Article 3 of Regulation No 17, to compel Microsoft to grant to an independent monitoring trustee powers which the Commission is not itself authorised to confer on a third party. The second subparagraph of Article 7 of the contested decision is therefore without legal basis, particularly in so far as it entails the delegation to the monitoring trustee of powers of investigation which the Commission alone can exercise pursuant to Regulation No 17.1272If, moreover, as the Commission maintains, its intention was to establish a purely consensual mechanism, there was no need to order such a mechanism in Article 7 of the contested decision.1273Last, the Commission exceeds its powers in so far as Article 7 of the contested decision, read with recital 1048(v) to that decision, makes Microsoft responsible for all the costs associated with the appointment of the monitoring trustee, including his remuneration and the expenditure incurred in carrying out his functions.1274There is no provision of Regulation No 17 that authorises the Commission to require an undertaking to bear the costs which the Commission incurs as a result of monitoring the implementation of remedies.1275It is for the Commission, in its capacity as authority responsible for applying the Community competition rules, to pursue the implementation of infringement decisions in an independent, objective and impartial manner. It would be incompatible with its responsibility in that regard for the effective implementation of Community law to depend on or be influenced by the willingness or the capacity of the addressee of the decision to bear such costs.1276The case-law shows, moreover, that the Commission does not have unlimited discretion when formulating remedies to be imposed on undertakings for the purpose of putting an end to an infringement. In the context of the application of Article 3 of Regulation No 17, the principle of proportionality requires that the burdens imposed on undertakings in order to bring an infringement to an end do not exceed what is appropriate and necessary to attain the objective sought, namely re-establishment of compliance with the rules infringed (Magill, cited in paragraph 107 above, paragraph 93).1277If the Commission is not competent to adopt a decision pursuant to Article 3 of Regulation No 17 imposing remedies on an undertaking which has infringed Article 82 EC, including the costs associated therewith, which exceed what is appropriate and necessary, then it is even less competent to make that undertaking responsible for the costs which are to be borne by the Commission in fulfilling its own investigation and enforcement responsibilities.1278It follows from all of the foregoing considerations that Article 7 of the contested decision has no legal basis in Regulation No 17 and therefore exceeds the Commission s powers of investigation and enforcement under Regulation No 17 in so far as it orders Microsoft to submit a proposal for the establishment of a mechanism which must include the appointment of an independent monitoring trustee empowered to access, independently of the Commission, Microsoft's assistance, information, documents, premises and employees and also the source code of its relevant products and also provides that Microsoft is to bear all the costs of the appointment of the monitoring trustee, including his remuneration. The Commission cannot therefore retain the right to impose such a mechanism by adopting a decision in the event that it considers that the mechanism proposed by Microsoft is not suitable.1279It follows that Article 7 of the contested decision must be annulled to the extent described in the preceding paragraph.1280For the two types of abuse identified in the contested decision, a single fine of EUR 497196304 is imposed (Article 3 of the contested decision).1281The question of the fine is examined by the Commission at recitals 1054 to 1080 to the contested decision.1282In the first place, the Commission states that it took into account the provisions of Article 15(2) of Regulation No 17 (recital 1054 to the contested decision) and observes that, in fixing the amount of the fine, it must have regard to the gravity and duration of the infringement and also to any aggravating or attenuating circumstances (recital 1055 to the contested decision).1283In the second place, the Commission rejects the arguments which Microsoft had put forward during the administrative procedure in support of its argument that no fine ought to be imposed on it in the present case (recitals 1056 to 1058 to the contested decision).1284First, the Commission states that the contested decision establishes to the requisite legal standard that Microsoft intentionally, or at least negligently, infringed Article 82 EC and Article 54 of the EEA Agreement (recital 1057 to the contested decision). Second, it denies having introduced a new rule of law and concludes that Microsoft ought to have been aware that it was infringing those provisions (ibid.). Third, it rejects Microsoft's argument that the abusive tying cannot have begun in 1999, since certain media functionality has been integrated in Windows since 1992 (ibid.).1285In the third place, the Commission explains the way in which it calculated the fine (recitals 1059 to 1079 to the contested decision).1286First, the Commission determined the basic amount of the fine according to the gravity and duration of the infringement (recitals 1059 to 1078 to the contested decision).1287The Commission observes that, in order to assess the gravity of the infringement, it must take into consideration the nature of the infringement, its impact on the market and the size of the relevant geographic market (recital 1060 to the contested decision).1288As regards the nature of the infringement, the Commission draws attention, at recitals 1061 to 1068 to the contested decision, to the following factors:

the Court of Justice has on several occasions declared that refusals to supply by undertakings in a dominant position and tied sales by such undertakings are unlawful;

Microsoft has a dominant position on the client PC operating systems market, with a market share of over 90%;

that market, and the other two markets identified in the contested decision, are characterised by the existence of significant direct and indirect network effects;

in those circumstances, Microsoft adopted a leveraging strategy which constitutes two separate abuses;

as regards the abusive refusal to supply, Microsoft adopted a general pattern of conduct aimed at the creation and exploitation to its advantage of a range of privileged connections between its client PC operating system and its work group server operating system and which entails a disruption of previous higher levels of supply;

that abusive practice enables Microsoft to extend its dominant position to the market for work group server operating systems, which is of significant value';

Microsoft's capture of that market is likely to have other harmful effects on competition;

as regards the abusive tying, it ensures that the ubiquity of Microsoft's client PC operating system is shared by Windows Media Player, which creates disincentives for OEMs to pre-install third-party media readers on client PCs and harms competition on the streaming media player market;

that abusive practice also has significant effects on competition for the delivery of content over the Internet and in the multimedia software industry;

last, domination of the streaming media player market may constitute a strategic gateway to a range of related markets, some of which are very profitable.

1289In the light of the factors mentioned in the preceding paragraph, the Commission concludes that the infringement must, by its nature, be characterised as Very serious' (recital 1068 to the contested decision).1290As regards the effects of the infringement on the market, the Commission finds that [t]he pattern of exclusionary leveraging behaviour engaged in by Microsoft has a significant impact on the markets for work group server operating systems and for streaming media players (recital 1069 to the contested decision).1291The Commission bases that finding on the following factors:

the abusive refusal to supply interoperability information already allowed Microsoft to acquire a dominant position on the work group server operating systems market and created a risk that competition would be eliminated on that market (recital 1070 to the contested decision);

the abusive tying already enabled Microsoft to achieve a leading position on the streaming media players market and the evidence examined in the contested decision shows that the market may already be tipping in favour of [Windows Media Player] (recital 1071 to the contested decision).

1292As regards the size of the relevant geographic market, the Commission states that the three markets identified in the contested decision cover the whole of the EEA (recital 1073 to the contested decision).1293At recital 1074 to the contested decision, the Commission concludes from the foregoing analysis that Microsoft committed a very serious infringement of Article 82 EC and Article 54 of the EEA Agreement, for which the likely fine is above EUR 20 million. At the following recital, it fixes an initial amount for gravity at EUR 165732101, the starting point of the basic amount of the fine (the starting amount).1294At recital 1076 to the contested decision, the Commission states that, in order to ensure a sufficient deterrent effect on Microsoft, and in the light of that undertaking's significant economic capacity, the starting amount should be doubled, which brings the amount of the fine at that stage to EUR 331464203.1295Furthermore, as regards duration, the Commission states that the abusive refusal to supply began in October 1998 and had not yet finished, while the abuse tying began in May 1999 and has not yet finished (recital 1077 to the contested decision). The Commission concludes that the total duration of the infringement committed by Microsoft is therefore five years and five months, which corresponds to an infringement of long duration (ibid.). The Commission therefore increases the amount stated in the preceding paragraph by 50% and thus fixes the basic amount of the fine at EUR 497196304 (recital 1078 to the contested decision).1296Second, the Commission considers that there is no aggravating or attenuating circumstance to be taken into account in the present case (recital 1079 to the contested decision). The final amount of the fine is therefore set at EUR 497196304 (recital 1080 to the contested decision).1297Microsoft submits, primarily, that the fine imposed by Article 3 of the contested decision is wholly unfounded in the absence of an infringement of Article 82 EC.1298In the alternative, Microsoft claims that the fine is excessive and disproportionate and that it should therefore be annulled or substantially reduced.1299In the first place, Microsoft contends that there is no justification for imposing a fine when the infringements result from novel theories of law. In support of that assertion, Microsoft refers to extracts from press releases issued by the Commission concerning competition cases (Press Releases IP/01/584 of 20 April 2001 and IP/04/705 of 2 June 2004) and to the Commissions practice of not imposing fines in cases which raise novel or complex issues. In some cases, moreover, the Commission has imposed only a symbolic fine on the undertakings concerned because they could not easily have concluded from its previous practice in taking decisions that their conduct infringed the competition rules.1300Microsoft contends that the principles applied by the Commission in the present case represent a significant departure from established case-law and are the product of substantial modification of the Commissions theories as the case progressed over the last five years'.1301Thus, as regards the abusive conduct consisting in its refusal to supply its competitors with interoperability information and to authorise its use, Microsoft asserts that the Commission has never precisely identified the information concerned. Microsoft reiterates that Sun did not ask it to license its intellectual property rights for use in the development of work group server operating systems in the EEA. Last, the Commission's position is unprecedented in that it imposes an obligation to license valuable intellectual property rights to facilitate the development of products that compete directly against Windows server operating systems. For those various reasons Microsoft had good reason to believe that the present case did not present the exceptional circumstances required by the Court of Justice.1302Furthermore, as regards the abusive conduct consisting in the fact that Microsoft made the supply of its Windows client PC operating system conditional upon the simultaneous acquisition of Windows Media Player, Microsoft observes, first of all, that the Commission's tying theory was not even mentioned in the first statement of objections. Next, this is the first time that the Commission has considered that improving a product through the integration of improved functionality, in this instance media functionality incorporating streaming capacity, without simultaneously offering a version of that product at the same price without that functionality, could constitute an infringement of Article 82 EC.1303In the second place, Microsoft claims that the amount of the fine is excessive. In support of that assertion, it puts forward three series of arguments.1304First, it submits that the starting amount of the fine is not justified. First of all, the way in which that amount is set at EUR 165732101 is arbitrary and lacks proper reasoning. Next, the applicant disputes the Commissions assertion that the infringement was Very serious'. It took the Commission more than five years to arrive at the conclusion that the conduct in question was objectionable, and even longer to determine what remedies were appropriate. Last, Microsoft was unable to predict that its conduct might be regarded as constituting an infringement of the competition rules, still less a Very serious' infringement.1305In the reply, Microsoft challenges the Commission's assertion that the abuses have a significant impact on the relevant markets.1306Also in the reply, Microsoft claims that the Commission did not merely take into account the products ... concerned by the infringements' when setting the starting amount, but took as its basis Microsoft's turnover on the market for server operating systems in general. In fact, less than one quarter of the applicant's revenues from those systems can be attributed to the work group server operating systems market as defined by the Commission.1307Second, Microsoft contends that the Commission was not correct to double the starting amount on account of its significant economic capacity' and the need to ensure a sufficient deterrent effect. The Commission does not claim that Microsoft was unwilling to comply with the law and, on the contrary, Mr Monti, the then Member of the Commission responsible for competition, commended Microsoft's efforts to arrive at an amicable settlement of the case and also the professionalism of the members of its team. Nor can the Commission invoke the need to deter other undertakings from committing similar infringements. Last, the starting amount is based on Microsoft's worldwide turnover and profits and the same figures are used to justify the multiplier for deterrence (footnote 1342 to the contested decision), which amounts to double counting. The other factors mentioned in footnote 1342 to the contested decision do not justify the doubling of the starting amount.1308Third, Microsoft claims that the increase of the fine by 50% of double the starting amount, to reflect the duration of the infringement, is excessive. First of all, the Commission has not taken account of the measures Microsoft took to address the issues raised by the Commission during their discussions and in the statements of objections or of the commitments which Microsoft made under the United States settlement. Next, the Commission failed to take account of the duration of the administrative procedure and Microsoft cannot be criticised for having attempted to reach a settlement with the Commission. And Microsoft could not have brought the alleged abuses to an end earlier, since the Commission's theories changed so much over six years.1309The Commission contends that Microsoft's main argument must be rejected, since it has not established that the Commission erred in finding that it had infringed Article 82 EC.1310The Commission also disputes Microsoft's alternative argument.1311In the first place, the Commission maintains that the fine is justified.1312First, it did not apply any new rule of law in the present case.1313Thus, as regards the abusive refusal, the Commission took account of the possibility that [intellectual property rights] are involved. Consequently, in reliance on judgments such as Magill, cited in paragraph 107 above, it devoted a large part of the contested decision to showing that in exceptional circumstances a refusal to license intellectual property rights could be an abuse of a dominant position. Furthermore, as the recitals to Directive 91/250 specifically indicate that withholding interoperability information may constitute an abuse of a dominant position, Microsoft cannot seriously maintain that it was not aware that it was infringing Article 82 EC.1314Furthermore, the Commission has already rebutted Microsoft's arguments relating to the scope of Sun's request and has already stated that the possibility that the products of the copyright owner and the future products of the licensee would compete was not precluded by the case-law. In the rejoinder, the Commission further submits that it had identified at the time of the first statement of objections a certain amount of information that was wrongfully withheld by Microsoft' and reiterates that Microsoft had been fully aware that it was refusing to give its competitors access to the interoperability information referred to in the contested decision.1315As regards the tying abuse, the Commission acknowledges that the present case may differ from previous tying cases in that in the contested decision it conducted an assessment of the actual effects of that conduct. However, it cannot be inferred that the Commission developed a new theory and its findings are based on well-known legal and economic principles.1316Second, the Commission submits that Microsoft's significant financial and legal resources were such that it was capable of predicting that its conduct in using its dominant position on one market to conquer another market would be characterised as abusive. Furthermore, the Community Courts have consistently rejected the argument that no fine should be imposed when the undertaking concerned could not be aware that it was infringing the competition rules. Last, Microsoft cannot rely on the fact that the Commission did not impose a fine on an undertaking in a different case.1317In the second place, the Commission contends that the fine is not excessive and points out that it represents only 1.62% of Microsoft's worldwide turnover in the business year ending 30 June 2003.1318First, the Commission has a margin of discretion when setting the amount of a fine and is not required to apply specific mathematical formulae. Its obligation to state reasons does not require it to set out in its decision the statements of figures relating to the calculation of the fines. In accordance with the Guidelines on the method of setting fines imposed pursuant to Article 15(2) of Regulation No 17 and Article 65(5) [CS] (OJ 1998 C 9, p. 3; the Guidelines), moreover, it assessed the gravity of the infringement in the light of its nature, its impact on the market and the size of the relevant geographic market.1319The Commission set the starting amount of the fine not on the basis of Microsoft's worldwide turnover but on the basis of its turnover in the EEA on the market for client PC and work group server operating systems. In footnote 217 to the defence, the Commission states that the starting point represents 7.5% of that turnover. The Commission concludes that

Microsoft's assertion that there is double counting is unfounded. In response to Microsoft's assertion that it took into account its turnover on the market for operating systems for servers in general, the Commission states that it relied on the figures provided by Microsoft in response to a request for information concerning work group server operating systems. The Commission refers, on that point, to a letter which Microsoft sent to it on 9 March 2004 (annex D.16 to the rejoinder).1320Second, the Commission claims that it was entitled to apply a weighting of 2 to the starting amount of the fine. That starting amount represented less than 1% of Microsoft's turnover during the last business year, which would not have made the fine sufficiently deterrent. When fixing that multiplier, it took account of the fact that large undertakings generally have resources which make them better able to be aware of the requirements and consequences of competition law than smaller undertakings are.1321The Commission also submits that it is clear from the case-law that the objective of deterrence which it is entitled to pursue when setting the amount of fines is intended to ensure that undertakings comply with the competition rules laid down in the Treaty when conducting their business within the Community or the EEA (Case T-224/00 Archer Daniels Midland and Archer Daniels Midland Ingredients v Commission [2003] ECR II-2597, paragraphs 110 and 111). It follows that the deterrent nature of a fine imposed for infringement of the Community competition rules cannot be assessed by reference solely to the particular situation of the undertaking sanctioned. It is necessary not only to deter that undertaking from repeating the same infringement or from committing infringements of the competition rules but also to deter other undertakings of similar size and resources from committing similar infringements.1322The Commission also emphasises that it did not claim that Microsoft had obstructed its investigation and that it did not find any aggravating circumstance on Microsoft's part1323Third, the Commission denies that the increase of 50% which it applied to the amount determined for gravity, in order to reflect the duration of the infringement, is excessive. It followed the normal practice of applying, for long duration, an increase of 10% for each year of participation in the infringement.1324The Commission submits that Microsoft cannot rely on the measures which it took to remedy the issues raised by the Commission or under the United States settlement, which have no relevance to the calculation of the duration of the infringement. The Commission refers to recitals 241, 242 and 270 to 279 to the contested decision and submits that those measures did not bring the infringement to an end.1325Last, the Commission disputes Microsoft's argument relating to the duration of the administrative procedure and observes, in particular, that that duration was objectively justified by the complexity of the case and the need to ensure Microsoft's rights of defence.1326The present submissions call upon the Court to examine the legality of Article 3 of the contested decision and, if appropriate, to exercise its unlimited jurisdiction and annul or reduce the fine imposed on Microsoft by that article.1327The Commission imposed a single fine on Microsoft for the two abuses found in Article 2 of the contested decision. It is apparent from recitals 1061 to 1068 to that decision that the Commission, while recognising the existence of two separate abuses, none the less considered that Microsoft committed a single infringement, namely the application of a strategy consisting in leveraging its dominant position on the client PC operating systems market (see, in particular, recital 1063 to the contested decision).1328It follows from recitals 1054 to 1080 to the contested decision that, even though the decision does not expressly say so, the Commission calculated the amount of the fines according to the method set out in the Guidelines.1329Microsoft claims, primarily, that Article 3 of the contested decision should be annulled in that, as there has been no infringement of Article 82 EC, the fine has no legal basis.1330That argument must be rejected. It follows from the assessment of the refusal to supply and authorise the use of the interoperability information, and also of the bundling of the Windows client PC operating system and Windows Media Player, that the Commission was correct to find that Microsoft had infringed Article 82 EC by adopting those two courses of conduct.1331In the alternative, Microsoft maintains that the fine is excessive and disproportionate and should therefore be annulled or substantially reduced. In particular, the two types of conduct referred to in Article 2 of the contested decision are wholly new forms of abuse of a dominant position and Microsoft could not have predicted that its conduct, consisting in exercising its intellectual property rights with respect to a valuable technology which it developed and in introducing new technology to an existing product, would be interpreted by the Commission as constituting an infringement of Article 82 EC.1332The Court finds that the arguments put forward by Microsoft in the alternative are unfounded and, in particular, that Microsoft has not shown that the Commission erred in assessing the gravity and duration of the infringement or in setting the amount of the fine.1333It must be borne in mind that in the examination of the issues arising in the first abuse, the Court confirmed the validity of the Commission's finding that Microsoft's refusal — and the Commission proceeded on the premiss that the refusal might represent a refusal to license Microsoft's intellectual property rights to a third party — was abusive since, first, it took place in exceptional circumstances such as those envisaged in the case-law, which, in the public interest in maintaining effective competition on the market, permitted an interference with the exclusive right of the owner of the intellectual property right and, second, it was not objectively justified.1334It must also be borne in mind that, in the examination of the issues of the second abuse, the Court found that the Commission had established to the requisite legal standard that the fact that Microsoft made the supply of the Windows client PC operating system conditional on the simultaneous acquisition of the Windows Media Player software satisfied the conditions for a finding of abusive tying within the meaning of Article 82 EC and was not objectively justified.1335In the first place, as regards Microsoft's argument that the two abuses found in Article 2 of the contested decision result from a new interpretation of the law (see paragraphs 1299 to 1302 above), it is sufficient to state that it has already been established by the Court, in its examination of the two sets of claims of annulment of the contested decision, that Microsoft's argument was unfounded. That examination shows that the Commission did not apply any new rule of law in the present case.1336Thus, as regards, first, the abuse found in Article 2(a) of the contested decision, it has already been explained that, at the time when the facts took place, the Court of Justice had already held, in Magill, paragraph 107 above, that while a refusal by the owner of an intellectual property right to grant a licence, even where it is the act of an undertaking in a dominant position, cannot in itself constitute an abuse of a dominant position, the exercise of the exclusive right by the owner might however, in exceptional circumstances, give rise to abusive conduct.1337Microsoft's assertion that it could not easily be aware that its conduct infringed the competition rules is also difficult to reconcile with the position which it adopted throughout the administrative procedure. In effect, Microsoft claimed that if the Commission were to find that the refusal at issue constituted abuse, that could upset the careful balance between copyright and competition policies' struck by Directive 91/250 (recital 743 to the contested decision). It should be added that the 26th recital to that directive states that the provisions of the directive are without prejudice to the application of the competition rules under Articles [81 EC and 82 EC] if a dominant supplier refuses to make information available which is necessary to interoperability as defined in [that] directive.1338It follows that the Commission was correct to conclude that Microsoft ought to have been aware that its refusal might infringe the competition rules.1339The same applies as regards, second, the abuse found in Article 2(b) of the contested decision, as the arguments alleging the application of a new theory have already been rejected during the examination of the bundling issue (see, in particular, paragraphs 859 and 863 to 868 above). The Court therefore finds that the Commission was correct to state, at recital 1057 to the contested decision, that its examination of the tying at issue and its conclusion that Microsoft's conduct was abusive were based on a practice that was well established, notably in Hilti and Tetra Pak II.1340The fact that the abusive tying was not mentioned in the first statement of objections is of no relevance to the question whether the Commission applied a new legal theory.1341Nor can the assertion that the contested decision is the first decision in which the Commission has characterised as abusive the improvement of a product consisting in the integration of an improved functionality in that product be upheld. As stated at paragraphs 936, 937 and 1221 above, the integration of that product was not dictated by technical grounds. Furthermore, for the reasons stated at paragraph 935 above, that assertion does not invalidate the Commission's finding that there were two separate products, which constitutes one of the criteria on which it is possible to identify abusive tying, according to the case-law cited at paragraph 859 above.1342It follows from the foregoing considerations that Microsoft cannot validly claim that the Commission ought not to have imposed a fine on it or that it ought to have imposed a symbolic fine.1343In the second place, Microsoft's argument that the amount of the fine is excessive must also be rejected. The Court finds that the Commission made a correct assessment of the gravity and duration of the infringement.1344First, as regards the gravity of the infringement, it must be borne in mind at the outset that the two abuses at issue form part of a leveraging infringement, consisting in Microsoft's use of its dominant position on the client PC operating systems market to extend that dominant position to two adjacent markets, namely the market for work group server operating systems and the market for streaming media players.1345First of all, as regards the abuse found in Article 2(a) of the contested decision, the Commission evaluated the gravity of that abuse by taking into consideration its nature (recitals 1064 and 1065 to the contested decision), its actual impact on the market (recitals 1069 and 1070 to the contested decision) and the size of the relevant geographic market (recital 1073 to the contested decision). The Commission characterised the infringement of which that abuse formed part as Very serious' and therefore likely to incur a fine of over EUR 20 million.1346The Court finds that the matters taken into consideration by the Commission in the recitals mentioned in the preceding paragraph justify the description of the infringement as Very serious'. That assessment is not called in question by Microsoft's arguments.1347The Court would observe that a number of internal Microsoft documents in the file confirm that Microsoft made use, by leveraging, of its dominant position on the client PC operating systems market to strengthen its position on the work group server operating systems market. Thus, at recital 774 to the contested decision, the Commission cites an extract from an email from Mr Bayer, a senior director of Microsoft, to Mr Madigan, another senior director of Microsoft, in which he states that [Microsoft] has a huge advantage in the enterprise computing market by leveraging the dominance of the Windows desktop.1348At the following recital to the contested decision, the Commission refers to a passage from another email between those two senior directors which shows that conquering the work group server operating systems market was regarded as a means of implementing the same leveraging strategy against the Internet. That passage reads as follows:

Dominance on the server infrastructure on the Internet is a tougher nut to crack [but] we just might be able to do it from the enterprise out if we could own the enterprise (which I think we can).

1349Furthermore, as the Commission correctly observes at recital 778 to the contested decision, it is clear from an extract from a speech given by Mr Gates in February 1997 that the most senior directors of Microsoft regarded interoperability as a tool in that leveraging strategy. That extract reads as follows:

What we are trying to do is use our server control to do new protocols and lock out Sun and Oracle specifically ... Now, I don't know if we'll get to that or not, but that's what we are trying to do.

1350The Court notes that Mr Gates' speech was given in February 1997, well before the date on which Microsoft rejected the request contained in the letter of 15 September 1998. The Commission was therefore correct to consider that Microsoft's refusal formed part of an overall strategy consisting in Microsoft's use of its dominant position on the client PC operating systems market to strengthen its dominant position on the adjacent market for work group server operating systems.1351Next, as regards the tying of Windows Media Player and Windows referred to in Article 2(b) of the contested decision, the Court finds that the Commission also made a correct assessment of the gravity of the infringement by characterising it as Very serious'.1352It should be noted first that it follows from the email sent to Mr Gates by Mr Bay in January 1999 (see paragraph 911 above) that the second abuse also formed part of a leveraging strategy.1353Second, the Commission was correct to find, at recital 1068 to the contested decision, that the abuse constituted by its nature a very serious infringement of Article 82 EC and Article 54 of the EEA Agreement.1354Tying practices had already clearly been declared unlawful by the Community Courts, notably in Hilti and Tetra Pak II, and the impugned conduct satisfied the conditions laid down in that case-law. It must be borne in mind, in particular, that, as stated at paragraphs 859 and 863 to 868 above, the Commission did not apply a new legal theory in this case, especially when it examined whether the foreclosure condition was satisfied.1355The Commission was quite correct, moreover, to observe, at recital 1066 to the contested decision, that the tying ensured the worldwide ubiquity of Windows Media Player, which created disincentives for OEMs to pre-install competing media players on their client PCs and harmed competition on the market for streaming media players (see paragraphs 1031 to 1058 above).1356Last, as the Commission properly emphasises at recital 1067 to the contested decision, the abusive tying has significant effects on competition for the delivery of content over the Internet and also on the multimedia software industry. As stated at paragraphs 1060 to 1075 above, the ubiquity that tying confers on Windows Media Player gives content providers an incentive to distribute their content in Windows Media formats and gives software developers an incentive to develop their products so that they rely on certain functionalities of Windows Media Player, in spite of the fact that competing media players are of similar or even better quality than Windows Media Player. It has also been shown at paragraphs 1076 above that the Commission was quite correct to find, at recitals 897 to 899 to the contested decision, that the abusive tying had also had effects on some adjacent markets.1357Third, the Commission was correct to observe, at recitals 1069 and 1071 to the contested decision, that the abusive tying has a significant effect on the market for streaming media players. The tying enabled Microsoft to become market leader with Windows Media Player.1358Fourth, it is common ground that the market for streaming media players covers the whole of the EEA (recital 1073 to the contested decision).1359It follows from the considerations set out at paragraphs 1344 to 1358 above that the Commission was correct to take as a starting point for the fine imposed for the infringement a minimum amount of EUR 20 million.1360In the present case, after taking into consideration the nature of the infringement, its effects on the relevant product markets and the geographical size of those markets, the Commission took a single starting point, which it set at EUR 165732101 (recital 1075 to the contested decision). The Commission does not explain in the contested decision what that amount represented or how it was apportioned between the two types of abuse. It is apparent, however, upon reading footnote 217 to the defence together with the content of Microsoft's letter of 9 March 2004 (see paragraph 1319 above), that that amount represents 7.5% of Microsoft's overall EEA turnover on the markets for client PC operating systems and work group server operating systems in the business year ending 30 June 2003. Contrary to Microsoft's contention, the starting amount cannot therefore be considered to have been fixed arbitrarily.1361As regards Microsoft's assertion that the Commission failed to state the reasons for fixing the starting amount of the fine at EUR 165732101, it is sufficient to observe that it is settled case-law that the obligation to state reasons does not require the Commission to indicate in its decision the figures relating to the method of calculating the fines (Case C-291/98 P Sarrió v Commission [2000] ECR I-9991, paragraphs 76 and 80, and Limburgse Vinyl Maatschappij and Others v Commission, cited in paragraph 95 above, paragraph 464).1362Nor can Microsoft's assertion that the Commission took account of its turnover on the market for server operating systems in general, that is to say, a wider market than the second market identified in the contested decision, be upheld. The Commission relied on the figures which had been given to it by Microsoft in its letter of 9 March 2004 (see paragraph 1319 above) in response to a request for information of 2 March 2004 (annex D.16 to the rejoinder) expressly referring to the Windows work group server operating systems which Microsoft was still supplying at the time.1363Furthermore, the Court finds that the Commission was correct to apply a weighting of 2 to that amount to ensure that the fine was sufficiently deterrent and to reflect Microsoft's significant economic capacity. Since Microsoft is very likely to maintain its dominant position on the client PC operating systems market, at least over the coming years, it cannot be precluded that it will have other opportunities to use leveraging vis-à-vis other adjacent markets. Furthermore, Microsoft had already faced proceedings in the United States for a practice similar to the abusive tying at issue, namely the tying of its Internet Explorer browser and its Windows client PC operating system, and the possibility cannot be precluded that it might commit the same type of infringement in future with other application software.1364Second, as regards the duration of the infringement, Microsoft's argument that the increase of 50% of the basic amount of the fine is excessive must be rejected. As the Court has already held when examining the second part of the refusal to supply interoperability information, the Commission was correct to consider that the letter of 6 October 1998 contained a refusal to communicate to Sun the information which it had requested. It follows that the Commission was correct to find that, from that date, Microsoft was guilty of an infringement of Article 82 EC. It has been established that that infringement continued until the date of adoption of the contested decision and that, from May 1999, a second type of abusive conduct was added to that infringement.1365Third, the Court finds that the Commission was correct to take the view that no aggravating or attenuating circumstances were to be taken into account in the present case.1366It follows from all of the foregoing considerations that Microsoft's argument that the fine is excessive and disproportionate must be rejected.1367The application must therefore be rejected as unfounded in so far as it seeks annulment or a reduction in the amount of the fine.1368Under Article 87(2) of the Rules of Procedure, the unsuccessful party is to be ordered to pay the costs if they have been applied for in the successful party's pleadings. Article 87(3) provides that where each party succeeds on some and fails on other heads, or where the circumstances are exceptional, the Court may order that the costs be shared or that each party bear its own costs.1369In the present case, Microsoft has been unsuccessful in its claim that the contested decision should be annulled in its entirety and in its claim that the fine should be annulled or reduced, and the Commission has been unsuccessful in its claim that the entirety of the application should be dismissed.1370In the main action, it is appropriate, in those circumstances, to order that the costs be shared. Microsoft shall bear 80% of its own costs and pay 80% of the Commissions costs, with the exception of the costs which the Commission has incurred in connection with the intervention of CompTIA, ACT, TeamSystem, Mamut, DMDsecure and Others and Exor. The Commission shall bear 20% of its own costs and pay 20% of Microsoft's costs, with the exception of the costs which Microsoft has incurred in connection with the intervention of SUA, FSFE, Audiobanner.com and ECIS.1371In the interim measures proceedings, Microsoft shall bear its own costs and pay the costs incurred by the Commission, with the exception of the costs which the Commission incurred in connection with the intervention of CompTIA, ACT, TeamSystem, Mamut, DMDsecure and Others and Exor.1372CompTIA, ACT, TeamSystem, Mamut, DMDsecure and Others and Exor shall bear their own costs, including those relating to the interim measures proceedings. As the Commission did not request that those interveners be ordered to pay the costs which it incurred in connection with their intervention, they shall bear only their own costs.1373The costs incurred by SIIA, FSFE, Audiobanner.com and ECIS, including those relating to the interim measures proceedings, shall be paid by Microsoft.

On those grounds,

THE COURT OF FIRST INSTANCE (Grand Chamber)

hereby:

1.Annuls Article 7 of Commission Decision 2007/53/EC of 24 March 2004 relating to a proceeding pursuant to Article 82 [EC] and Article 54 of the EEA Agreement against Microsoft Corp, (Case COMP/C-3/37.792 — Microsoft), in so far as:

it orders Microsoft to submit a proposal for the establishment of a mechanism which is to include a monitoring trustee with the power to have access, independently of the Commission, to Microsoft's assistance, information, documents, premises and employees and to the source code of the relevant Microsoft products;

it requires that the proposal for the establishment of that mechanism provide that all the costs associated with the appointment of the monitoring trustee, including his remuneration, be borne by Microsoft; and

it reserves to the Commission the right to impose by way of decision a mechanism such as that referred to in the first and second indents above;

2.Dismisses the remainder of the application;3.Orders Microsoft to bear 80% of its own costs and to pay 80% of the Commission's costs, with the exception of the costs incurred by the Commission in connection with the intervention of The Computing Technology Industry Association, Inc., Association for Competitive Technology, Inc., TeamSystem SpA, Mamut ASA, DMDsecurexom BV, MPS Broadband AB, Pace Micro Technology plc, Quantel Ltd, Tandberg Television Ltd and Exor AB;4.Orders Microsoft to bear its own costs and to pay the Commission's costs relating to the interim measures proceedings in Case T-201/04 R, with the exception of the costs incurred by the Commission in connection with the intervention of The Computing Technology Industry Association, Association for Competitive Technology, TeamSystem, Mamut, DMDsecurexom, MPS Broadband, Pace Micro Technology, Quantel, Tandberg Television and Exor;5.Orders Microsoft to pay the costs of Software & Information Industry Association, Free Software Foundation Europe, Audiobannerxom and European Committee for Interoperable Systems (ECIS), including those relating to the interim measures proceedings;6.Orders the Commission to bear 20% of its own costs and to pay 20% of Microsoft's costs, with the exception of the costs incurred by Microsoft in connection with the intervention of Software & Information Industry Association, Free Software Foundation Europe, Audiobannerxom and ECIS;7.Orders The Computing Technology Industry Association, Association for Competitive Technology, TeamSystem, Mamut, DMDsecurexom, MPS Broadband, Pace Micro Technology, Quantel, Tandberg Television and Exor to bear their own costs, including those relating to the interim measures proceedings,

United States of America, Appellee v. Microsoft Corporation, Appellant, 253 F.3d 34 (D.C. Cir. 2001)

Microsoft Corporation appeals from judgments of the District Court finding the company in violation of 1 and 2 of the Sherman Act and ordering various remedies.

The action against Microsoft arose pursuant to a complaint filed by the United States and separate complaints filed by individual States. The District Court determined that Microsoft had maintained a monopoly in the market for Intelcompatible PC operating systems in violation of 2; attempted to gain a monopoly in the market for internet browsers in violation of 2; and illegally tied two purportedly separate products, Windows and Internet Explorer ("IE"), in violation of 1. United States v. Microsoft Corp., 87 F. Supp. 2d 30 (D.D.C. 2000) ("Conclusions of Law"). The District Court then found that the same facts that established liability under 1 and 2 of the Sherman Act mandated findings of liability under analogous state law antitrust provisions. Id. To remedy the Sherman Act violations, the District Court issued a Final Judgment requiring Microsoft to submit a proposed plan of divestiture, with the company to be split into an operating systems business and an applications business. United States v.

Microsoft Corp., 97 F. Supp. 2d 59, 64-65 (D.D.C. 2000) ("Final Judgment"). The District Court's remedial order also contains a number of interim restrictions on Microsoft's conduct. Id. at 66-69.

Microsoft's appeal contests both the legal conclusions and the resulting remedial order. There are three principal aspects of this appeal. First, Microsoft challenges the District Court's legal conclusions as to all three alleged antitrust violations and also a number of the procedural and factual foundations on which they rest. Second, Microsoft argues that the remedial order must be set aside, because the District Court failed to afford the company an evidentiary hearing on disputed facts and, also, because the substantive provisions of the order are flawed. Finally, Microsoft asserts that the trial judge committed ethical violations by engaging in impermissible ex parte contacts and making inappropriate public comments on the merits of the case while it was pending. Microsoft argues that these ethical violations compromised the District Judge's appearance of impartiality, thereby necessitating his disqualification and vacatur of his Findings of Fact, Conclusions of Law, and Final Judgment.

After carefully considering the voluminous record on appeal--including the District Court's Findings of Fact and Conclusions of Law, the testimony and exhibits submitted at trial, the parties' briefs, and the oral arguments before this court--we find that some but not all of Microsoft's liability challenges have merit. Accordingly, we affirm in part and reverse in part the District Court's judgment that Microsoft violated 2 of the Sherman Act by employing anticompetitive means to maintain a monopoly in the operating system market; we reverse the District Court's determination that Microsoft violated 2 of the Sherman Act by illegally attempting to monopolize the internet browser market; and we remand the District Court's finding that Microsoft violated 1 of the Sherman Act by unlawfully tying its browser to its operating system. Our judgment extends to the District Court's findings with respect to the state law counterparts of the plaintiffs' Sherman Act claims.

We also find merit in Microsoft's challenge to the Final Judgment embracing the District Court's remedial order. There are several reasons supporting this conclusion. First, the District Court's Final Judgment rests on a number of liability determinations that do not survive appellate review; therefore, the remedial order as currently fashioned cannot stand. Furthermore, we would vacate and remand the remedial order even were we to uphold the

District Court's liability determinations in their entirety, because the District Court failed to hold an evidentiary hearing to address remedies-specific factual disputes.

Finally, we vacate the Final Judgment on remedies, because the trial judge engaged in impermissible ex parte contacts by holding secret interviews with members of the media and made numerous offensive comments about Microsoft officials in public statements outside of the courtroom, giving rise to an appearance of partiality. Although we find no evidence of actual bias, we hold that the actions of the trial judge seriously tainted the proceedings before the District Court and called into question the integrity of the judicial process. We are therefore constrained to vacate the Final Judgment on remedies, remand the case for reconsideration of the remedial order, and require that the case be assigned to a different trial judge on remand. We believe that this disposition will be adequate to cure the cited improprieties.

In sum, for reasons more fully explained below, we affirm in part, reverse in part, and remand in part the District Court's judgment assessing liability. We vacate in full the Final Judgment embodying the remedial order and remand the case to a different trial judge for further proceedings consistent with this opinion.

In July 1994, officials at the Department of Justice ("DOJ"), on behalf of the United States, filed suit against Microsoft, charging the company with, among other things, unlawfully maintaining a monopoly in the operating system market through anticompetitive terms in its licensing and software developer agreements. The parties subsequently entered into a consent decree, thus avoiding a trial on the merits. See United States v. Microsoft Corp., 56 F.3d 1448 (D.C. Cir. 1995) ("Microsoft I"). Three years later, the Justice Department filed a civil contempt action against Microsoft for allegedly violating one of the decree's provisions. On appeal from a grant of a preliminary injunction, this court held that Microsoft's technological bundling of IE 3.0 and 4.0 with Windows 95 did not violate the relevant provision of the consent decree. United States v. Microsoft Corp., 147 F.3d 935 (D.C. Cir. 1998) ("Microsoft II"). We expressly reserved the question whether such bundling might independently violate 1 or 2 of the Sherman Act. Id. at 950 n.14.

On May 18, 1998, shortly before issuance of the Microsoft II decision, the United States and a group of State plaintiffs filed separate (and soon thereafter consolidated) complaints, asserting antitrust violations by Microsoft and seeking preliminary and permanent injunctions against the company's allegedly unlawful conduct. The complaints also sought any "other preliminary and permanent relief as is necessary and appropriate to restore competitive conditions in the markets affected by Microsoft's unlawful conduct." Gov't's Compl. at 53, United States v. Microsoft Corp., No. 98-1232 (D.D.C. 1999). Relying almost exclusively on Microsoft's varied efforts to unseat Netscape Navigator as the preeminent internet browser, plaintiffs charged four distinct violations of the Sherman Act: (1) unlawful exclusive dealing arrangements in violation of 1; (2) unlawful tying of IE to Windows 95 and Windows 98 in violation of 1; (3) unlawful maintenance of a monopoly in the PC operating system market in violation of 2; and (4) unlawful attempted monopolization of the internet browser market in violation of 2. The States also brought pendent claims charging Microsoft with violations of various State antitrust laws.

The District Court scheduled the case on a "fast track." The hearing on the preliminary injunction and the trial on the merits were consolidated pursuant to Fed. R. Civ. P. 65(a) (2). The trial was then scheduled to commence on September 8, 1998, less than four months after the complaints had been filed. In a series of pretrial orders, the District Court limited each side to a maximum of 12 trial witnesses plus two rebuttal witnesses. It required that all trial witnesses' direct testimony be submitted to the court in the form of written declarations. The District Court also made allowances for the use of deposition testimony at trial to prove subordinate or predicate issues. Following the grant of three brief continuances, the trial started on October 19, 1998.

After a 76-day bench trial, the District Court issued its Findings of Fact. United States v. Microsoft Corp., 84 F. Supp. 2d 9 (D.D.C. 1999) ("Findings of Fact"). This triggered two independent courses of action. First, the District Court established a schedule for briefing on possible legal conclusions, inviting Professor Lawrence Lessig to participate as amicus curiae. Second, the District Court referred the case to mediation to afford the parties an opportunity to settle their differences. The Honorable Richard A. Posner, Chief Judge of the United States Court of Appeals for the Seventh Circuit, was appointed to serve as mediator. The parties concurred in the referral to mediation and in the choice of mediator.

Mediation failed after nearly four months of settlement talks between the parties. On April 3, 2000, with the parties' briefs having been submitted and considered, the District Court issued its conclusions of law. The District Court found Microsoft liable on the 1 tying and 2 monopoly maintenance and attempted monopolization claims, Conclusions of Law, at 35-51, while ruling that there was insufficient evidence to support a 1 exclusive dealing violation, id. at 5154. As to the pendent State actions, the District Court found the State antitrust laws conterminous with 1 and 2 of the Sherman Act, thereby obviating the need for further Statespecific analysis. Id. at 54-56. In those few cases where a State's law required an additional showing of intrastate impact on competition, the District Court found the requirement easily satisfied on the evidence at hand. Id. at 55.

Having found Microsoft liable on all but one count, the District Court then asked plaintiffs to submit a proposed remedy. Plaintiffs' proposal for a remedial order was subsequently filed within four weeks, along with six supplemental declarations and over 50 new exhibits. In their proposal, plaintiffs sought specific conduct remedies, plus structural relief that would split Microsoft into an applications company and an operating systems company. The District Court rejected Microsoft's request for further evidentiary proceedings and, following a single hearing on the merits of the remedy question, issued its Final Judgment on June 7, 2000. The District Court adopted plaintiffs' proposed remedy without substantive change.

Microsoft filed a notice of appeal within a week after the District Court issued its Final Judgment. This court then ordered that any proceedings before it be heard by the court sitting en banc. Before any substantive matters were addressed by this court, however, the District Court certified appeal of the case brought by the United States directly to the Supreme Court pursuant to 15 U.S.C. 29(b), while staying the final judgment order in the federal and state cases pending appeal. The States thereafter petitioned the Supreme Court for a writ of certiorari in their case. The Supreme Court declined to hear the appeal of the Government's case and remanded the matter to this court; the Court likewise denied the States' petition for writ of certiorari. Microsoft Corp. v. United States, 530 U.S. 1301 (2000). This consolidated appeal followed.

Before turning to the merits of Microsoft's various arguments, we pause to reflect briefly on two matters of note, one practical and one theoretical.

The practical matter relates to the temporal dimension of this case. The litigation timeline in this case is hardly problematic. Indeed, it is noteworthy that a case of this magnitude and complexity has proceeded from the filing of complaints through trial to appellate decision in a mere three years. See, e.g., Data Gen. Corp. v. Grumman Sys. Support Corp., 36 F.3d 1147, 1155 (1st Cir. 1994) (six years from filing of complaint to appellate decision); Transamerica Computer Co., Inc. v. IBM, 698 F.2d 1377, 1381 (9th Cir. 1983) (over four years from start of trial to appellate decision); United States v. United Shoe Mach. Corp., 110 F. Supp. 295, 298 (D. Mass. 1953) (over five years from filing of complaint to trial court decision).

What is somewhat problematic, however, is that just over six years have passed since Microsoft engaged in the first conduct plaintiffs allege to be anticompetitive. As the record in this case indicates, six years seems like an eternity in the computer industry. By the time a court can assess liability, firms, products, and the marketplace are likely to have changed dramatically. This, in turn, threatens enormous practical difficulties for courts considering the appropriate measure of relief in equitable enforcement actions, both in crafting injunctive remedies in the first instance and reviewing those remedies in the second. Conduct remedies may be unavailing in such cases, because innovation to a large degree has already rendered the anticompetitive conduct obsolete (although by no means harmless). And broader structural remedies present their own set of problems, including how a court goes about restoring competition to a dramatically changed, and constantly changing, marketplace. That is just one reason why we find the District Court's refusal in the present case to hold an evidentiary hearing on remedies--to update and flesh out the available information before seriously entertaining the possibility of dramatic structural relief--so problematic. See infra Section V.

We do not mean to say that enforcement actions will no longer play an important role in curbing infringements of the antitrust laws in technologically dynamic markets, nor do we assume this in assessing the merits of this case. Even in those cases where forward-looking remedies appear limited, the Government will continue to have an interest in defining the contours of the antitrust laws so that law-abiding firms will have a clear sense of what is permissible and what is not. And the threat of private damage actions will remain to deter those firms inclined to test the limits of the law.

The second matter of note is more theoretical in nature. We decide this case against a backdrop of significant debate amongst academics and practitioners over the extent to which "old economy" 2 monopolization doctrines should apply to firms competing in dynamic technological markets characterized by network effects. In markets characterized by network effects, one product or standard tends towards dominance, because "the utility that a user derives from consumption of the good increases with the number of other agents consuming the good." Michael L. Katz & Carl Shapiro, Network Externalities, Competition, and Compatibility, 75 Am. Econ. Rev. 424, 424 (1985). For example, " [a]n individual consumer's demand to use (and hence her benefit from) the telephone network ... increases with the number of other users on the network whom she can call or from whom she can receive calls." Howard A. Shelanski & J. Gregory Sidak, Antitrust Divestiture in Network Industries, 68 U. Chi. L. Rev. 1, 8 (2001). Once a product or standard achieves wide acceptance, it becomes more or less entrenched. Competition in such industries is "for the field" rather than "within the field." See Harold Demsetz, Why Regulate Utilities?, 11 J.L. & Econ. 55, 57 & n.7 (1968) (emphasis omitted).

In technologically dynamic markets, however, such entrenchment may be temporary, because innovation may alter the field altogether. See Joseph A. Schumpeter, Capitalism, Socialism and Democracy 81-90 (Harper Perennial 1976) (1942). Rapid technological change leads to markets in which "firms compete through innovation for temporary market dominance, from which they may be displaced by the next wave of product advancements." Shelanski & Sidak, at 11-12 (discussing Schumpeterian competition, which proceeds "sequentially over time rather than simultaneously across a market"). Microsoft argues that the operating system market is just such a market.

Whether or not Microsoft's characterization of the operating system market is correct does not appreciably alter our mission in assessing the alleged antitrust violations in the present case. As an initial matter, we note that there is no consensus among commentators on the question of whether, and to what extent, current monopolization doctrine should be amended to account for competition in technologically dynamic markets characterized by network effects. Compare Steven C. Salop & R. Craig Romaine, Preserving Monopoly: Economic Analysis, Legal Standards, and Microsoft, 7 Geo. Mason L. Rev. 617, 654-55, 663-64 (1999) (arguing that exclusionary conduct in high-tech networked industries deserves heightened antitrust scrutiny in part because it may threaten to deter innovation), with Ronald A. Cass & Keith N. Hylton, Preserving Competition: Economic Analysis, Legal Standards and Microsoft, 8 Geo. Mason L. Rev. 1, 36-39 (1999) (equivocating on the antitrust implications of network effects and noting that the presence of network externalities may actually encourage innovation by guaranteeing more durable monopolies to innovating winners). Indeed, there is some suggestion that the economic consequences of network effects and technological dynamism act to offset one another, thereby making it difficult to formulate categorical antitrust rules absent a particularized analysis of a given market. See Shelanski & Sidak, at 6-7 ("High profit margins might appear to be the benign and necessary recovery of legitimate investment returns in a Schumpeterian framework, but they might represent exploitation of customer lock-in and monopoly power when viewed through the lens of network economics.... The issue is particularly complex because, in network industries characterized by rapid innovation, both forces may be operating and can be difficult to isolate.").

Moreover, it should be clear that Microsoft makes no claim that anticompetitive conduct should be assessed differently in technologically dynamic markets. It claims only that the measure of monopoly power should be different. For reasons fully discussed below, we reject Microsoft's monopoly power argument. See infra Section II.A.

With this backdrop in mind, we turn to the specific challenges raised in Microsoft's appeal.

Section 2 of the Sherman Act makes it unlawful for a firm to "monopolize." 15 U.S.C. 2. The offense of monopolization has two elements: "(1) the possession of monopoly power in the relevant market and (2) the willful acquisition or maintenance of that power as distinguished from growth or development as a consequence of a superior product, business acumen, or historic accident." United States v. Grinnell Corp., 384 U.S. 563, 570-71 (1966). The District Court applied this test and found that Microsoft possesses monopoly power in the market for Intel-compatible PC operating systems. Focusing primarily on Microsoft's efforts to suppress Netscape Navigator's threat to its operating system monopoly, the court also found that Microsoft maintained its power not through competition on the merits, but through unlawful means. Microsoft challenges both conclusions. We defer to the District Court's findings of fact, setting them aside only if clearly erroneous. Fed R. Civ. P. 52(a). We review legal questions de novo. United States ex rel. Modern Elec., Inc. v. Ideal Elec. Sec. Co., 81 F.3d 240, 244 (D.C. Cir. 1996).

We begin by considering whether Microsoft possesses monopoly power, see infra Section II.A, and finding that it does, we turn to the question whether it maintained this power through anticompetitive means. Agreeing with the District Court that the company behaved anticompetitively, see infra Section II.B, and that these actions contributed to the maintenance of its monopoly power, see infra Section II.C, we affirm the court's finding of liability for monopolization.

While merely possessing monopoly power is not itself an antitrust violation, see Northeastern Tel. Co. v. AT & T, 651 F.2d 76, 84-85 (2d Cir. 1981), it is a necessary element of a monopolization charge, see Grinnell, 384 U.S. at 570. The Supreme Court defines monopoly power as "the power to control prices or exclude competition." United States v. E.I. du Pont de Nemours & Co., 351 U.S. 377, 391 (1956). More precisely, a firm is a monopolist if it can profitably raise prices substantially above the competitive level. 2A Phillip E. Areeda et al., Antitrust Law p 501, at 85 (1995); cf. Ball Mem'l Hosp., Inc. v. Mut. Hosp. Ins., Inc., 784 F.2d 1325, 1335 (7th Cir. 1986) (defining market power as "the ability to cut back the market's total output and so raise price"). Where evidence indicates that a firm has in fact profitably done so, the existence of monopoly power is clear. See Rebel Oil Co. v. Atl. Richfield Co., 51 F.3d 1421, 1434 (9th Cir. 1995); see also FTC v. Indiana Fed'n of Dentists, 476 U.S. 447, 460-61 (1986) (using direct proof to show market power in Sherman Act 1 unreasonable restraint of trade action). Because such direct proof is only rarely available, courts more typically examine market structure in search of circumstantial evidence of monopoly power. 2A Areeda et al., Antitrust Law p 531a, at 156; see also, e.g., Grinnell, 384 U.S. at 571. Under this structural approach, monopoly power may be inferred from a firm's possession of a dominant share of a relevant market that is protected by entry barriers. See Rebel Oil, 51 F.3d at 1434. "Entry barriers" are factors (such as certain regulatory requirements) that prevent new rivals from timely responding to an increase in price above the competitive level. See S. Pac. Communications Co. v. AT & T, 740 F.2d 980, 1001-02 (D.C. Cir. 1984).

The District Court considered these structural factors and concluded that Microsoft possesses monopoly power in a relevant market. Defining the market as Intel-compatible PC operating systems, the District Court found that Microsoft has a greater than 95% share. It also found the company's market position protected by a substantial entry barrier. Conclusions of Law, at 36.

Microsoft argues that the District Court incorrectly defined the relevant market. It also claims that there is no barrier to entry in that market. Alternatively, Microsoft argues that because the software industry is uniquely dynamic, direct proof, rather than circumstantial evidence, more appropriately indicates whether it possesses monopoly power. Rejecting each argument, we uphold the District Court's finding of monopoly power in its entirety.

a. Market definition

"Because the ability of consumers to turn to other suppliers restrains a firm from raising prices above the competitive level," Rothery Storage & Van Co. v. Atlas Van Lines, Inc., 792 F.2d 210, 218 (D.C. Cir. 1986), the relevant market must include all products "reasonably interchangeable by consumers for the same purposes." du Pont, 351 U.S. at 395. In this case, the District Court defined the market as "the licensing of all Intel-compatible PC operating systems worldwide," finding that there are "currently no products--and ... there are not likely to be any in the near future--that a significant percentage of computer users worldwide could substitute for [these operating systems] without incurring substantial costs." Conclusions of Law, at 36. Calling this market definition "far too narrow," Appellant's Opening Br. at 84, Microsoft argues that the District Court improperly excluded three types of products: non-Intel compatible operating systems (primarily Apple's Macintosh operating system, Mac OS), operating systems for non-PC devices (such as handheld computers and portal websites), and "middleware" products, which are not operating systems at all.

We begin with Mac OS. Microsoft's argument that Mac OS should have been included in the relevant market suffers from a flaw that infects many of the company's monopoly power claims: the company fails to challenge the District Court's factual findings, or to argue that these findings do not support the court's conclusions. The District Court found that consumers would not switch from Windows to Mac OS in response to a substantial price increase because of the costs of acquiring the new hardware needed to run Mac OS (an Apple computer and peripherals) and compatible software applications, as well as because of the effort involved in learning the new system and transferring files to its format. Findings of Fact p 20. The court also found the Apple system less appealing to consumers because it costs considerably more and supports fewer applications. Id. p 21. Microsoft responds only by saying: "the district court's market definition is so narrow that it excludes Apple's Mac OS, which has competed with Windows for years, simply because the Mac OS runs on a different microprocessor." Appellant's Opening Br. at 84. This general, conclusory statement falls far short of what is required to challenge findings as clearly erroneous. Pendleton v. Rumsfeld, 628 F.2d 102, 106 (D.C. Cir. 1980); see also Terry v. Reno, 101 F.3d 1412, 1415 (D.C. Cir. 1996) (holding that claims made but not argued in a brief are waived). Microsoft neither points to evidence contradicting the District Court's findings nor alleges that supporting record evidence is insufficient. And since Microsoft does not argue that even if we accept these findings, they do not support the District Court's conclusion, we have no basis for upsetting the court's decision to exclude Mac OS from the relevant market.

Microsoft's challenge to the District Court's exclusion of non-PC based competitors, such as information appliances (handheld devices, etc.) and portal websites that host serverbased software applications, suffers from the same defect: the company fails to challenge the District Court's key factual findings. In particular, the District Court found that because information appliances fall far short of performing all of the functions of a PC, most consumers will buy them only as a supplement to their PCs. Findings of Fact p 23. The District Court also found that portal websites do not presently host enough applications to induce consumers to switch, nor are they likely to do so in the near future. Id. p 27. Again, because Microsoft does not argue that the District Court's findings do not support its conclusion that information appliances and portal websites are outside the relevant market, we adhere to that conclusion.

This brings us to Microsoft's main challenge to the District Court's market definition: the exclusion of middleware. Because of the importance of middleware to this case, we pause to explain what it is and how it relates to the issue before us.

Operating systems perform many functions, including allocating computer memory and controlling peripherals such as printers and keyboards. See Direct Testimony of Frederick Warren-Boulton p 20, reprinted in 5 J.A. at 3172-73. Operating systems also function as platforms for software applications. They do this by "exposing"--i.e., making available to software developers--routines or protocols that perform certain widely-used functions. These are known as Application Programming Interfaces, or "APIs." See Direct Testimony of James Barksdale p 70, reprinted in 5 J.A. at 2895-96. For example, Windows contains an API that enables users to draw a box on the screen. See Direct Testimony of Michael T. Devlin p 12, reprinted in 5 J.A. at 3525. Software developers wishing to include that function in an application need not duplicate it in their own code. Instead, they can "call"--i.e., use--the Windows API. See Direct Testimony of James Barksdale p p 70-71, reprinted in 5 J.A. at 2895-97. Windows contains thousands of APIs, controlling everything from data storage to font display. See Direct Testimony of Michael Devlin p 12, reprinted in 5 J.A. at 3525.

Every operating system has different APIs. Accordingly, a developer who writes an application for one operating system and wishes to sell the application to users of another must modify, or "port," the application to the second operating system. Findings of Fact p 4. This process is both timeconsuming and expensive. Id. p 30.

"Middleware" refers to software products that expose their own APIs. Id. p 28; Direct Testimony of Paul Maritz p p 234-36, reprinted in 6 J.A. at 3727-29. Because of this, a middleware product written for Windows could take over some or all of Windows's valuable platform functions--that is, developers might begin to rely upon APIs exposed by the middleware for basic routines rather than relying upon the API set included in Windows. If middleware were written for multiple operating systems, its impact could be even greater. The more developers could rely upon APIs exposed by such middleware, the less expensive porting to different operating systems would be. Ultimately, if developers could write applications relying exclusively on APIs exposed by middleware, their applications would run on any operating system on which the middleware was also present. See Direct Testimony of Avadis Tevanian, Jr. p 45, reprinted in 5 J.A. at 3113. Netscape Navigator and Java--both at issue in this case--are middleware products written for multiple operating systems. Findings of Fact p 28.

Microsoft argues that, because middleware could usurp the operating system's platform function and might eventually take over other operating system functions (for instance, by controlling peripherals), the District Court erred in excluding Navigator and Java from the relevant market. The District Court found, however, that neither Navigator, Java, nor any other middleware product could now, or would soon, expose enough APIs to serve as a platform for popular applications, much less take over all operating system functions. Id. p p 28-29. Again, Microsoft fails to challenge these findings, instead simply asserting middleware's "potential" as a competitor. Appellant's Opening Br. at 86. The test of reasonable interchangeability, however, required the District Court to consider only substitutes that constrain pricing in the reasonably foreseeable future, and only products that can enter the market in a relatively short time can perform this function. See Rothery, 792 F.2d at 218 ("Because the ability of consumers to turn to other suppliers restrains a firm from raising prices above the competitive level, the definition of the 'relevant market' rests on a determination of available substitutes."); see also Findings of Fact p 29 (" [I]t would take several years for middleware ... to evolve" into a product that can constrain operating system pricing.). Whatever middleware's ultimate potential, the District Court found that consumers could not now abandon their operating systems and switch to middleware in response to a sustained price for Windows above the competative level. Findings of Fact p p 28, 29. Nor is middleware likely to overtake the operating system as the primary platform for software development any time in the near future. Id.

Alternatively, Microsoft argues that the District Court should not have excluded middleware from the relevant market because the primary focus of the plaintiffs' 2 charge is on Microsoft's attempts to suppress middleware's threat to its operating system monopoly. According to Microsoft, it is "contradict [ory]," 2/26/2001 Ct. Appeals Tr. at 20, to define the relevant market to exclude the "very competitive threats that gave rise" to the action. Appellant's Opening Br. at 84. The purported contradiction lies between plaintiffs' 2 theory, under which Microsoft preserved its monopoly against middleware technologies that threatened to become viable substitutes for Windows, and its theory of the relevant market, under which middleware is not presently a viable substitute for Windows. Because middleware's threat is only nascent, however, no contradiction exists. Nothing in 2 of the Sherman Act limits its prohibition to actions taken against threats that are already well-developed enough to serve as present substitutes. See infra Section II.C. Because market definition is meant to identify products "reasonably interchangeable by consumers," du Pont, 351 U.S. at 395, and because middleware is not now interchangeable with Windows, the District Court had good reason for excluding middleware from the relevant market.

b. Market power

Having thus properly defined the relevant market, the District Court found that Windows accounts for a greater than 95% share. Findings of Fact p 35. The court also found that even if Mac OS were included, Microsoft's share would exceed 80%. Id. Microsoft challenges neither finding, nor does it argue that such a market share is not predominant. Cf. Grinnell, 384 U.S. at 571 (87% is predominant); Eastman Kodak Co. v. Image Technical Servs., Inc., 504 U.S. 451, 481 (1992) (80%); du Pont, 351 U.S. at 379, 391 (75%).

Instead, Microsoft claims that even a predominant market share does not by itself indicate monopoly power. Although the "existence of [monopoly] power ordinarily may be inferred from the predominant share of the market," Grinnell, 384 U.S. at 571, we agree with Microsoft that because of the possibility of competition from new entrants, see Ball Mem'l Hosp., Inc., 784 F.2d at 1336, looking to current market share alone can be "misleading." Hunt-Wesson Foods, Inc. v. Ragu Foods, Inc., 627 F.2d 919, 924 (9th Cir. 1980); see also Ball Mem'l Hosp., Inc., 784 F.2d at 1336 ("Market share reflects current sales, but today's sales do not always indicate power over sales and price tomorrow.") In this case, however, the District Court was not misled. Considering the possibility of new rivals, the court focused not only on Microsoft's present market share, but also on the structural barrier that protects the company's future position. Conclusions of Law, at 36. That barrier--the "applications barrier to entry"--stems from two characteristics of the software market: (1) most consumers prefer operating systems for which a large number of applications have already been written; and (2) most developers prefer to write for operating systems that already have a substantial consumer base. See Findings of Fact p p 30, 36. This "chicken-and-egg" situation ensures that applications will continue to be written for the already dominant Windows, which in turn ensures that consumers will continue to prefer it over other operating systems. Id.

Challenging the existence of the applications barrier to entry, Microsoft observes that software developers do write applications for other operating systems, pointing out that at its peak IBM's OS/2 supported approximately 2,500 applications. Id. p 46. This misses the point. That some developers write applications for other operating systems is not at all inconsistent with the finding that the applications barrier to entry discourages many from writing for these less popular platforms. Indeed, the District Court found that IBM's difficulty in attracting a larger number of software developers to write for its platform seriously impeded OS/2's success. Id. p 46.

Microsoft does not dispute that Windows supports many more applications than any other operating system. It argues instead that " [i]t defies common sense" to suggest that an operating system must support as many applications as Windows does (more than 70,000, according to the District Court, id. p 40) to be competitive. Appellant's Opening Br. at 96. Consumers, Microsoft points out, can only use a very small percentage of these applications. Id. As the District Court explained, however, the applications barrier to entry gives consumers reason to prefer the dominant operating system even if they have no need to use all applications written for it:

The consumer wants an operating system that runs not only types of applications that he knows he will want to use, but also those types in which he might develop an interest later. Also, the consumer knows that if he chooses an operating system with enough demand to support multiple applications in each product category, he will be less likely to find himself straitened later by having to use an application whose features disappoint him. Finally, the average user knows that, generally speaking, applications improve through successive versions. He thus wants an operating system for which successive generations of his favorite applications will be released--promptly at that. The fact that a vastly larger number of applications are written for Windows than for other PC operating systems attracts consumers to Windows, because it reassures them that their interests will be met as long as they use Microsoft's product.

Findings of Fact p 37. Thus, despite the limited success of its rivals, Microsoft benefits from the applications barrier to entry.

Of course, were middleware to succeed, it would erode the applications barrier to entry. Because applications written for multiple operating systems could run on any operating system on which the middleware product was present with little, if any, porting, the operating system market would become competitive. Id. p p 29, 72. But as the District Court found, middleware will not expose a sufficient number of APIs to erode the applications barrier to entry in the foreseeable future. See id. p p 28-29.

Microsoft next argues that the applications barrier to entry is not an entry barrier at all, but a reflection of Windows' popularity. It is certainly true that Windows may have gained its initial dominance in the operating system market competitively--through superior foresight or quality. But this case is not about Microsoft's initial acquisition of monopoly power. It is about Microsoft's efforts to maintain this position through means other than competition on the merits. Because the applications barrier to entry protects a dominant operating system irrespective of quality, it gives Microsoft power to stave off even superior new rivals. The barrier is thus a characteristic of the operating system market, not of Microsoft's popularity, or, as asserted by a Microsoft witness, the company's efficiency. See Direct Testimony of Richard Schmalensee p 115, reprinted in 25 J.A. at 16153-14.

Finally, Microsoft argues that the District Court should not have considered the applications barrier to entry because it reflects not a cost borne disproportionately by new entrants, but one borne by all participants in the operating system market. According to Microsoft, it had to make major investments to convince software developers to write for its new operating system, and it continues to "evangelize" the Windows platform today. Whether costs borne by all market participants should be considered entry barriers is the subject of much debate. Compare 2A Areeda & Hovenkamp, Antitrust Law 420c, at 61 (arguing that these costs are entry barriers), and Joe S. Bain, Barriers to New Competition: Their Character and Consequences in Manufacturing Industries 6-7 (1956) (considering these costs entry barriers), with L.A. Land Co. v. Brunswick Corp., 6 F.3d 1422, 1428 (9th Cir. 1993) (evaluating cost based on " [t]he disadvantage of new entrants as compared to incumbents"), and George Stigler, The Organization of Industry 67 (1968) (excluding these costs). We need not resolve this issue, however, for even under the more narrow definition it is clear that there are barriers. When Microsoft entered the operating system market with MS-DOS and the first version of Windows, it did not confront a dominant rival operating system with as massive an installed base and as vast an existing array of applications as the Windows operating systems have since enjoyed. Findings of Fact p p 6, 7, 43. Moreover, when Microsoft introduced Windows 95 and 98, it was able to bypass the applications barrier to entry that protected the incumbent Windows by including APIs from the earlier version in the new operating systems. See id. p 44. This made porting existing Windows applications to the new version of Windows much less costly than porting them to the operating systems of other entrants who could not freely include APIs from the incumbent Windows with their own.

Having sustained the District Court's conclusion that circumstantial evidence proves that Microsoft possesses monopoly power, we turn to Microsoft's alternative argument that it does not behave like a monopolist. Claiming that software competition is uniquely "dynamic," Appellant's Opening Br. at 84 (quoting Findings of Fact p 59), the company suggests a new rule: that monopoly power in the software industry should be proven directly, that is, by examining a company's actual behavior to determine if it reveals the existence of monopoly power. According to Microsoft, not only does no such proof of its power exist, but record evidence demonstrates the absence of monopoly power. The company claims that it invests heavily in research and development, id. at 88-89 (citing Direct Testimony of Paul Maritz p 155, reprinted in 6 J.A. at 3698 (testifying that Microsoft invests approximately 17% of its revenue in R&D)), and charges a low price for Windows (a small percentage of the price of an Intelcompatible PC system and less than the price of its rivals, id. at 90 (citing Findings of Fact p p 19, 21, 46)).

Microsoft's argument fails because, even assuming that the software market is uniquely dynamic in the long term, the District Court correctly applied the structural approach to determine if the company faces competition in the short term. Structural market power analyses are meant to determine whether potential substitutes constrain a firm's ability to raise prices above the competitive level; only threats that are likely to materialize in the relatively near future perform this function to any significant degree. Rothery, 792 F.2d at 218 (quoting Lawrence Sullivan, Antitrust 12, at 41 (1977)) (only substitutes that can enter the market "promptly" should be considered). The District Court expressly considered and rejected Microsoft's claims that innovations such as handheld devices and portal websites would soon expand the relevant market beyond Intel-compatible PC operating systems. Because the company does not challenge these findings, we have no reason to believe that prompt substitutes are available. The structural approach, as applied by the District Court, is thus capable of fulfilling its purpose even in a changing market. Microsoft cites no case, nor are we aware of one, requiring direct evidence to show monopoly power in any market. We decline to adopt such a rule now.

Even if we were to require direct proof, moreover, Microsoft's behavior may well be sufficient to show the existence of monopoly power. Certainly, none of the conduct Microsoft points to-

-its investment in R&D and the relatively low price of Windows--is inconsistent with the possession of such power. Conclusions of Law, at 37. The R&D expenditures Microsoft points to are not simply for Windows, but for its entire company, which most likely does not possess a monopoly for all of its products. Moreover, because innovation can increase an already dominant market share and further delay the emergence of competition, even monopolists have reason to invest in R&D. Findings of Fact p 61. Microsoft's pricing behavior is similarly equivocal. The company claims only that it never charged the short-term profit-maximizing price for Windows. Faced with conflicting expert testimony, the District Court found that it could not accurately determine what this price would be. Id. p 65. In any event, the court found, a price lower than the short-term profit-maximizing price is not inconsistent with possession or improper use of monopoly power. Id. p p 65-66. Cf. Berkey Photo, Inc. v. Eastman Kodak Co., 603 F.2d 263, 274 (2d Cir. 1979) (" [I]f monopoly power has been acquired or maintained through improper means, the fact that the power has not been used to extract [a monopoly price] provides no succor to the monopolist."). Microsoft never claims that it did not charge the longterm monopoly price. Micosoft does argue that the price of Windows is a fraction of the price of an Intel-compatible PC system and lower than that of rival operating systems, but these facts are not inconsistent with the District Court's finding that Microsoft has monopoly power. See Findings of Fact p 36 ("Intel-compatible PC operating systems other than Windows [would not] attract [ ] significant demand ... even if Micosoft held its prices substantially above the competitive level.").

More telling, the District Court found that some aspects of Microsoft's behavior are difficult to explain unless Windows is a monopoly product. For instance, according to the District Court, the company set the price of Windows without considering rivals' prices, Findings of Fact p 62, something a firm without a monopoly would have been unable to do. The District Court also found that Microsoft's pattern of exclusionary conduct could only be rational "if the firm knew that it possessed monopoly power." Conclusions of Law, at 37. It is to that conduct that we now turn.

As discussed above, having a monopoly does not by itself violate 2. A firm violates 2 only when it acquires or maintains, or attempts to acquire or maintain, a monopoly by engaging in exclusionary conduct "as distinguished from growth or development as a consequence of a superior product, business acumen, or historic accident." Grinnell, 384 U.S. at 571; see also

United States v. Aluminum Co. of Am., 148 F.2d 416, 430 (2d Cir. 1945) (Hand, J.) ("The successful competitor, having been urged to compete, must not be turned upon when he wins.").

In this case, after concluding that Microsoft had monopoly power, the District Court held that Microsoft had violated 2 by engaging in a variety of exclusionary acts (not including predatory pricing), to maintain its monopoly by preventing the effective distribution and use of products that might threaten that monopoly. Specifically, the District Court held Microsoft liable for: (1) the way in which it integrated IE into Windows; (2) its various dealings with Original Equipment Manufacturers ("OEMs"), Internet Access Providers ("IAPs"), Internet Content Providers ("ICPs"), Independent Software Vendors ("ISVs"), and Apple Computer; (3) its efforts to contain and to subvert Java technologies; and (4) its course of conduct as a whole. Upon appeal, Microsoft argues that it did not engage in any exclusionary conduct.

Whether any particular act of a monopolist is exclusionary, rather than merely a form of vigorous competition, can be difficult to discern: the means of illicit exclusion, like the means of legitimate competition, are myriad. The challenge for an antitrust court lies in stating a general rule for distinguishing between exclusionary acts, which reduce social welfare, and competitive acts, which increase it.

From a century of case law on monopolization under 2, however, several principles do emerge. First, to be condemned as exclusionary, a monopolist's act must have an "anticompetitive effect." That is, it must harm the competitive process and thereby harm consumers. In contrast, harm to one or more competitors will not suffice. "The [Sherman Act] directs itself not against conduct which is competitive, even severely so, but against conduct which unfairly tends to destroy competition itself." Spectrum Sports, Inc. v. McQuillan, 506 U.S. 447, 458 (1993); see also Brooke Group Ltd. v. Brown & Williamson Tobacco Corp., 509 U.S. 209, 225 (1993) ("Even an act of pure malice by one business competitor against another does not, without more, state a claim under the federal antitrust laws....").

Second, the plaintiff, on whom the burden of proof of course rests, see, e.g., Monsanto Co. v. Spray-Rite Serv. Corp., 465 U.S. 752, 763 (1984); see also United States v. Arnold, Schwinn & Co., 388 U.S. 365, 374 n.5 (1967), overruled on other grounds, Cont'l T.V., Inc. v. GTE Sylvania Inc., 433 U.S. 36 (1977), must demonstrate that the monopolist's conduct indeed has the requisite anticompetitive effect. See generally Brooke Group, 509 U.S. at 225-26. In a case brought by a private plaintiff, the plaintiff must show that its injury is "of 'the type that the statute was intended to forestall,' " Brunswick Corp. v. Pueblo Bowl-O-Mat, Inc., 429 U.S. 477, 487-88 (1977) (quoting Wyandotte Transp. v. United States, 389 U.S. 191, 202 (1967)); no less in a case brought by the Government, it must demonstrate that the monopolist's conduct harmed competition, not just a competitor.

Third, if a plaintiff successfully establishes a prima facie case under 2 by demonstrating anticompetitive effect, then the monopolist may proffer a "procompetitive justification" for its conduct. See Eastman Kodak, 504 U.S. at 483. If the monopolist asserts a procompetitive justification--a nonpretextual claim that its conduct is indeed a form of competition on the merits because it involves, for example, greater efficiency or enhanced consumer appeal--then the burden shifts back to the plaintiff to rebut that claim. Cf. Capital Imaging Assocs., P.C. v. Mohawk Valley Med. Assocs., Inc., 996 F.2d 537, 543 (2d Cir. 1993).

Fourth, if the monopolist's procompetitive justification stands unrebutted, then the plaintiff must demonstrate that the anticompetitive harm of the conduct outweighs the procompetitive benefit. In cases arising under 1 of the Sherman Act, the courts routinely apply a similar balancing approach under the rubric of the "rule of reason." The source of the rule of reason is Standard Oil Co. v. United States, 221 U.S. 1 (1911), in which the Supreme Court used that term to describe the proper inquiry under both sections of the Act. See id. at 61-62 (" [W]hen the second section [of the Sherman Act] is thus harmonized with ... the first, it becomes obvious that the criteria to be resorted to in any given case for the purpose of ascertaining whether violations of the section have been committed, is the rule of reason guided by the established law...."). As the Fifth Circuit more recently explained, " [i]t is clear ... that the analysis under section 2 is similar to that under section 1 regardless whether the rule of reason label is applied...." Mid-Texas Communications Sys., Inc. v. AT & T, 615 F.2d 1372, 1389 n.13 (5th Cir. 1980) (citing Byars v. Bluff City News Co., 609 F.2d 843, 860 (6th Cir. 1979)); see also Cal. Computer Prods., Inc. v. IBM Corp., 613 F.2d 727, 737 (9th Cir. 1979).

Finally, in considering whether the monopolist's conduct on balance harms competition and is therefore condemned as exclusionary for purposes of 2, our focus is upon the effect of that conduct, not upon the intent behind it. Evidence of the intent behind the conduct of a monopolist is relevant only to the extent it helps us understand the likely effect of the monopolist's conduct. See, e.g., Chicago Bd. of Trade v. United States, 246 U.S. 231, 238 (1918) ("knowledge of intent may help the court to interpret facts and to predict consequences"); Aspen Skiing Co. v. Aspen Highlands Skiing Corp., 472 U.S. 585, 603 (1985).

With these principles in mind, we now consider Microsoft's objections to the District Court's holding that Microsoft violated 2 of the Sherman Act in a variety of ways.

1. Licenses Issued to Original Equipment Manufacturers

The District Court condemned a number of provisions in Microsoft's agreements licensing Windows to OEMs, because it found that Microsoft's imposition of those provisions (like many of Microsoft's other actions at issue in this case) serves to reduce usage share of Netscape's browser and, hence, protect Microsoft's operating system monopoly. The reason market share in the browser market affects market power in the operating system market is complex, and warrants some explanation.

Browser usage share is important because, as we explained in Section II.A above, a browser (or any middleware product, for that matter) must have a critical mass of users in order to attract software developers to write applications relying upon the APIs it exposes, and away from the APIs exposed by Windows. Applications written to a particular browser's APIs, however, would run on any computer with that browser, regardless of the underlying operating system. "The overwhelming majority of consumers will only use a PC operating system for which there already exists a large and varied set of ... applications, and for which it seems relatively certain that new types of applications and new versions of existing applications will continue to be marketed...."

Findings of Fact p 30. If a consumer could have access to the applications he desired--regardless of the operating system he uses--simply by installing a particular browser on his computer, then he would no longer feel compelled to select Windows in order to have access to those applications; he could select an operating system other than Windows based solely upon its quality and price. In other words, the market for operating systems would be competitive.

Therefore, Microsoft's efforts to gain market share in one market (browsers) served to meet the threat to Microsoft's monopoly in another market (operating systems) by keeping rival browsers from gaining the critical mass of users necessary to attract developer attention away from Windows as the platform for software development. Plaintiffs also argue that Microsoft's actions injured competition in the browser market--an argument we will examine below in relation to their specific claims that Microsoft attempted to monopolize the browser market and unlawfully tied its browser to its operating system so as to foreclose competition in the browser market. In evaluating the 2 monopoly maintenance claim, however, our immediate concern is with the anticompetitive effect of Microsoft's conduct in preserving its monopoly in the operating system market.

In evaluating the restrictions in Microsoft's agreements licensing Windows to OEMs, we first consider whether plaintiffs have made out a prima facie case by demonstrating that the restrictions have an anticompetitive effect. In the next subsection, we conclude that plaintiffs have met this burden as to all the restrictions. We then consider Microsoft's proffered justifications for the restrictions and, for the most part, hold those justifications insufficient.

a. Anticompetitive effect of the license restrictions

The restrictions Microsoft places upon Original Equipment Manufacturers are of particular importance in determining browser usage share because having an OEM pre-install a browser on a computer is one of the two most cost-effective methods by far of distributing browsing software. (The other is bundling the browser with internet access software distributed by an IAP.) Findings of Fact p 145. The District Court found that the restrictions Microsoft imposed in licensing Windows to OEMs prevented many OEMs from distributing browsers other than IE. Conclusions of Law, at 39-40. In particular, the District Court condemned the license provisions prohibiting the OEMs from: (1) removing any desktop icons, folders, or "Start" menu entries; (2) altering the initial boot sequence; and (3) otherwise altering the appearance of the Windows desktop. Findings of Fact p 213.

The District Court concluded that the first license restriction--the prohibition upon the removal of desktop icons, folders, and Start menu entries--thwarts the distribution of a rival browser by preventing OEMs from removing visible means of user access to IE. Id. p 203. The OEMs cannot practically install a second browser in addition to IE, the court found, in part because "[p]re-installing more than one product in a given category ... can significantly increase an OEM's support costs, for the redundancy can lead to confusion among novice users." Id. p 159; see also id. p 217. That is, a certain number of novice computer users, seeing two browser icons, will wonder which to use when and will call the OEM's support line. Support calls are extremely expensive and, in the highly competitive original equipment market, firms have a strong incentive to minimize costs. Id. p 210.

Microsoft denies the "consumer confusion" story; it observes that some OEMs do install multiple browsers and that executives from two OEMs that do so denied any knowledge of consumers being confused by multiple icons. See 11/5/98 pm Tr. at 41-42 (trial testimony of Avadis Tevanian of Apple), reprinted in 9 J.A. at 5493-94; 11/18/99 am Tr. at 69 (trial testimony of John Soyring of IBM), reprinted in 10 J.A. at 6222.

Other testimony, however, supports the District Court's finding that fear of such confusion deters many OEMs from pre-installing multiple browsers. See, e.g., 01/13/99 pm Tr. at 614-15 (deposition of Microsoft's Gayle McClain played to the court) (explaining that redundancy of icons may be confusing to end users); 02/18/99 pm Tr. at 46-47 (trial testimony of John Rose of Compaq), reprinted in 21 J.A. at 14237-38 (same); 11/17/98 am Tr. at 68 (deposition of John Kies of Packard Bell-NEC played to the court), reprinted in 9 J.A. at 6016 (same); 11/17/98 am Tr. at 67-72 (trial testimony of Glenn Weadock), reprinted in 9 J.A. at 6015-20 (same). Most telling, in presentations to OEMs, Microsoft itself represented that having only one icon in a particular category would be "less confusing for endusers." See Government's Trial Exhibit ("GX") 319 at MS98 0109453. Accordingly, we reject Microsoft's argument that we should vacate the District Court's Finding of Fact 159 as it relates to consumer confusion.

As noted above, the OEM channel is one of the two primary channels for distribution of browsers. By preventing OEMs from removing visible means of user access to IE, the license restriction prevents many OEMs from pre-installing a rival browser and, therefore, protects Microsoft's monopoly from the competition that middleware might otherwise present. Therefore, we conclude that the license restriction at issue is anticompetitive. We defer for the moment the question whether that anticompetitive effect is outweighed by Microsoft's proffered justifications.

The second license provision at issue prohibits OEMs from modifying the initial boot sequence--the process that occurs the first time a consumer turns on the computer. Prior to the imposition of that restriction, "among the programs that many OEMs inserted into the boot sequence were Internet sign-up procedures that encouraged users to choose from a list of IAPs assembled by the OEM." Findings of Fact p 210. Microsoft's prohibition on any alteration of the boot sequence thus prevents OEMs from using that process to promote the services of IAPs, many of which--at least at the time Microsoft imposed the restriction--used Navigator rather than IE in their internet access software. See id. p 212; GX 295, reprinted in 12 J.A. at 14533 (Upon learning of OEM practices including boot sequence modification, Microsoft's Chairman, Bill Gates, wrote: "Apparently a lot of OEMs are bundling non-Microsoft browsers and coming up with offerings together with [IAPs] that get displayed on their machines in a FAR more prominent way than MSN or our Internet browser."). Microsoft does not deny that the prohibition on modifying the boot sequence has the effect of decreasing competition against IE by preventing OEMs from promoting rivals' browsers. Because this prohibition has a substantial effect in protecting Microsoft's market power, and does so through a means other than competition on the merits, it is anticompetitive. Again the question whether the provision is nonetheless justified awaits later treatment.

Finally, Microsoft imposes several additional provisions that, like the prohibition on removal of icons, prevent OEMs from making various alterations to the desktop: Microsoft prohibits OEMs from causing any user interface other than the Windows desktop to launch automatically, from adding icons or folders different in size or shape from those supplied by Microsoft, and from using the "Active Desktop" feature to promote third-party brands. These restrictions impose significant costs upon the OEMs; prior to Microsoft's prohibiting the practice, many OEMs would change the appearance of the desktop in ways they found beneficial. See, e.g., Findings of Fact p 214; GX 309, reprinted in 22 J.A. at 14551 (March 1997 letter from Hewlett-Packard to Microsoft: "We are responsible for the cost of technical support of our customers, including the 33% of calls we get related to the lack of quality or confusion generated by your product.... We must have more ability to decide how our system is presented to our end users. If we had a choice of another supplier, based on your actions in this area, I assure you [that you] would not be our supplier of choice.").

The dissatisfaction of the OEM customers does not, of course, mean the restrictions are anticompetitive. The anticompetitive effect of the license restrictions is, as Microsoft itself recognizes, that OEMs are not able to promote rival browsers, which keeps developers focused upon the APIs in Windows. Findings of Fact p 212 (quoting Microsoft's Gates as writing, " [w]inning Internet browser share is a very very important goal for us," and emphasizing the need to prevent OEMs from promoting both rival browsers and IAPs that might use rivals' browsers); see also 01/13/99 Tr. at 305-06 (excerpts from deposition of James Von Holle of Gateway) (prior to restriction Gateway had pre-installed non-IE internet registration icon that was larger than other desktop icons). This kind of promotion is not a zero-sum game; but for the restrictions in their licenses to use Windows, OEMs could promote multiple IAPs and browsers. By preventing the OEMs from doing so, this type of license restriction, like the first two restrictions, is anticompetitive: Microsoft reduced rival browsers' usage share not by improving its own product but, rather, by preventing OEMs from taking actions that could increase rivals' share of usage.

b. Microsoft's justifications for the license restrictions

Microsoft argues that the license restrictions are legally justified because, in imposing them, Microsoft is simply "exercising its rights as the holder of valid copyrights." Appellant's Opening Br. at 102. Microsoft also argues that the licenses "do not unduly restrict the opportunities of Netscape to distribute Navigator in any event." Id.

Microsoft's primary copyright argument borders upon the frivolous. The company claims an absolute and unfettered right to use its intellectual property as it wishes: " [I]f intellectual property rights have been lawfully acquired," it says, then "their subsequent exercise cannot give rise to antitrust liability." Appellant's Opening Br. at 105. That is no more correct than the proposition that use of one's personal property, such as a baseball bat, cannot give rise to tort liability. As the Federal Circuit succinctly stated: "Intellectual property rights do not confer a privilege to violate the antitrust laws." In re Indep. Serv. Orgs. Antitrust Litig., 203 F.3d 1322, 1325 (Fed. Cir. 2000).

Although Microsoft never overtly retreats from its bold and incorrect position on the law, it also makes two arguments to the effect that it is not exercising its copyright in an unreasonable manner, despite the anticompetitive consequences of the license restrictions discussed above. In the first variation upon its unqualified copyright defense, Microsoft cites two cases indicating that a copyright holder may limit a licensee's ability to engage in significant and deleterious alterations of a copyrighted work. See Gilliam v. ABC, 538 F.2d 14, 21 (2d Cir. 1976); WGN Cont'l Broad. Co. v. United Video, Inc., 693 F.2d 622, 625 (7th Cir. 1982). The relevance of those two cases for the present one is limited, however, both because those cases involved substantial alterations of a copyrighted work, see Gilliam, 538 F.2d at 18, and because in neither case was there any claim that the copyright holder was, in asserting its rights, violating the antitrust laws, see WGN Cont'l Broad., 693 F.2d at 626; see also Cmty. for Creative NonViolence v. Reid, 846 F.2d 1485, 1498 (D.C. Cir. 1988) (noting, again in a context free of any antitrust concern, that "an author [ ] may have rights against" a licensee that "excessively mutilated or altered" the copyrighted work).

The only license restriction Microsoft seriously defends as necessary to prevent a "substantial alteration" of its copyrighted work is the prohibition on OEMs automatically launching a substitute user interface upon completion of the boot process. See Findings of Fact p 211 (" [A] few large OEMs developed programs that ran automatically at the conclusion of a new PC system's first boot sequence. These programs replaced the Windows desktop either with a user interface designed by the OEM or with Navigator's user interface."). We agree that a shell that automatically prevents the Windows desktop from ever being seen by the user is a drastic alteration of Microsoft's copyrighted work, and outweighs the marginal anticompetitive effect of prohibiting the OEMs from substituting a different interface automatically upon completion of the initial boot process. We therefore hold that this particular restriction is not an exclusionary practice that violates 2 of the Sherman Act.

In a second variation upon its copyright defense, Microsoft argues that the license restrictions merely prevent OEMs from taking actions that would reduce substantially the value of Microsoft's copyrighted work: that is, Microsoft claims each license restriction in question is necessary to prevent OEMs from so altering Windows as to undermine "the principal value of

Windows as a stable and consistent platform that supports a broad range of applications and that is familiar to

users." Appellant's Opening Br. at 102. Microsoft, however, never substantiates this claim, and, because an OEM's altering the appearance of the desktop or promoting programs in the boot sequence does not affect the code already in the product, the practice does not self-evidently affect either the "stability" or the "consistency" of the platform. See Conclusions of Law, at 41; Findings of Fact p 227. Microsoft cites only one item of evidence in support of its claim that the OEMs' alterations were decreasing the value of Windows. Defendant's Trial Exhibit ("DX") 2395 at MSV0009378A, reprinted in 19 J.A. at 12575. That document, prepared by Microsoft itself, states: "there are quality issues created by OEMs who are too liberal with the pre-install process," referring to the OEMs' installation of Windows and additional software on their PCs, which the document says may result in "user concerns and confusion." To the extent the OEMs' modifications cause consumer confusion, of course, the OEMs bear the additional support costs. See Findings of Fact p 159. Therefore, we conclude Microsoft has not shown that the OEMs' liberality reduces the value of Windows except in the sense that their promotion of rival browsers undermines Microsoft's monopoly--and that is not a permissible justification for the license restrictions.

Apart from copyright, Microsoft raises one other defense of the OEM license agreements: It argues that, despite the restrictions in the OEM license, Netscape is not completely blocked from distributing its product. That claim is insufficient to shield Microsoft from liability for those restrictions because, although Microsoft did not bar its rivals from all means of distribution, it did bar them from the cost-efficient ones.

In sum, we hold that with the exception of the one restriction prohibiting automatically launched alternative interfaces, all the OEM license restrictions at issue represent uses of Microsoft's market power to protect its monopoly, unredeemed by any legitimate justification. The restrictions therefore violate 2 of the Sherman Act.

Although Microsoft's license restrictions have a significant effect in closing rival browsers out of one of the two primary channels of distribution, the District Court found that "Microsoft's executives believed ... its contractual restrictions placed on OEMs would not be sufficient in themselves to reverse the direction of Navigator's usage share. Consequently, in late 1995 or early 1996, Microsoft set out to bind [IE] more tightly to Windows 95 as a technical matter." Findings of Fact p 160.

Technologically binding IE to Windows, the District Court found, both prevented OEMs from pre-installing other browsers and deterred consumers from using them. In particular, having the IE software code as an irremovable part of Windows meant that pre-installing a second browser would "increase an OEM's product testing costs," because an OEM must test and train its support staff to answer calls related to every software product preinstalled on the machine; moreover, pre-installing a browser in addition to IE would to many OEMs be "a questionable use of the scarce and valuable space on a PC's hard drive." Id. p 159.

Although the District Court, in its Conclusions of Law, broadly condemned Microsoft's decision to bind "Internet Explorer to Windows with ... technological shackles," Conclusions of Law, at 39, its findings of fact in support of that conclusion center upon three specific actions Microsoft took to weld IE to Windows: excluding IE from the "Add/Remove Programs" utility; designing Windows so as in certain circumstances to override the user's choice of a default browser other than IE; and commingling code related to browsing and other code in the same files, so that any attempt to delete the files containing IE would, at the same time, cripple the operating system. As with the license restrictions, we consider first whether the suspect actions had an anticompetitive effect, and then whether Microsoft has provided a procompetitive justification for them.

a. Anticompetitive effect of integration

As a general rule, courts are properly very skeptical about claims that competition has been harmed by a dominant firm's product design changes. See, e.g., Foremost Pro Color, Inc. v. Eastman Kodak Co., 703 F.2d 534, 544-45 (9th Cir. 1983). In a competitive market, firms routinely innovate in the hope of appealing to consumers, sometimes in the process making their products incompatible with those of rivals; the imposition of liability when a monopolist does the same thing will inevitably deter a certain amount of innovation. This is all the more true in a market, such as this one, in which the product itself is rapidly changing. See Findings of Fact p 59. Judicial deference to product innovation, however, does not mean that a monopolist's product design decisions are per se lawful. See Foremost Pro Color, 703 F.2d at 545; see also Cal. Computer Prods., 613 F.2d at 739, 744; In re IBM Peripheral EDP Devices Antitrust Litig., 481 F. Supp. 965, 1007-08 (N.D. Cal. 1979).

The District Court first condemned as anticompetitive Microsoft's decision to exclude IE from the "Add/Remove Programs" utility in Windows 98. Findings of Fact p 170. Microsoft had included IE in the Add/Remove Programs utility in Windows 95, see id. p p 175-76, but when it modified Windows 95 to produce Windows 98, it took IE out of the Add/Remove Programs utility. This change reduces the usage share of rival browsers not by making Microsoft's own browser more attractive to consumers but, rather, by discouraging OEMs from distributing rival products. See id. p 159. Because Microsoft's conduct, through something other than competition on the merits, has the effect of significantly reducing usage of rivals' products and hence protecting its own operating system monopoly, it is anticompetitive; we defer for the moment the question whether it is nonetheless justified.

Second, the District Court found that Microsoft designed Windows 98 "so that using Navigator on Windows 98 would have unpleasant consequences for users" by, in some circumstances, overriding the user's choice of a browser other than IE as his or her default browser. Id. p p 171-72. Plaintiffs argue that this override harms the competitive process by deterring consumers from using a browser other than IE even though they might prefer to do so, thereby reducing rival browsers' usage share and, hence, the ability of rival browsers to draw developer attention away from the APIs exposed by Windows. Microsoft does not deny, of course, that overriding the user's preference prevents some people from using other browsers. Because the override reduces rivals' usage share and protects Microsoft's monopoly, it too is anticompetitive.

Finally, the District Court condemned Microsoft's decision to bind IE to Windows 98 "by placing code specific to Web browsing in the same files as code that provided operating system functions." Id. p 161; see also id. p p 174, 192. Putting code supplying browsing functionality into a file with code supplying operating system functionality "ensure [s] that the deletion of any file containing browsing-specific routines would also delete vital operating system routines and thus cripple Windows...." Id. p 164. As noted above, preventing an OEM from removing IE deters it from installing a second browser because doing so increases the OEM's product testing and support costs; by contrast, had OEMs been able to remove IE, they might have chosen to pre-install Navigator alone. See id. p 159.

Microsoft denies, as a factual matter, that it commingled browsing and non-browsing code, and it maintains the District Court's findings to the contrary are clearly erroneous. According to Microsoft, its expert "testified without contradiction that ' [t]he very same code in Windows 98 that provides Web browsing functionality' also performs essential operating system functions--not code in the same files, but the very same software code." Appellant's Opening Br. at 79 (citing 5 J.A. 3291-92).

Microsoft's expert did not testify to that effect "without contradiction," however. A Government expert, Glenn Weadock, testified that Microsoft "design [ed] [IE] so that some of the code that it uses co-resides in the same library files as other code needed for Windows." Direct Testimony p 30. Another Government expert likewise testified that one library file, SHDOCVW.DLL, "is really a bundle of separate functions. It contains some functions that have to do specifically with Web browsing, and it contains some general user interface functions as well." 12/14/98 am Tr. at 60-61 (trial testimony of Edward Felten), reprinted in 11 J.A. at 6953-54. One of Microsoft's own documents suggests as much. See Plaintiffs' Proposed Findings of Fact p 131.2.vii (citing GX 1686 (under seal) (Microsoft document indicating some functions in SHDOCVW.DLL can be described as "IE only," others can be described as "shell only" and still others can be described as providing both "IE" and "shell" functions)).

In view of the contradictory testimony in the record, some of which supports the District Court's finding that Microsoft commingled browsing and non-browsing code, we cannot conclude that the finding was clearly erroneous. See Anderson v. City of Bessemer City, 470 U.S. 564, 573-74 (1985) ("If the district court's account of the evidence is plausible in light of the record viewed in its entirety, the court of appeals may not reverse it even though convinced that had it been sitting as the trier of fact, it would have weighed the evidence differently."). Accordingly, we reject Microsoft's argument that we should vacate Finding of Fact 159 as it relates to the commingling of code, and we conclude that such commingling has an anticompetitive effect; as noted above, the commingling deters OEMs from pre-installing rival browsers, thereby reducing the rivals' usage share and, hence, developers' interest in rivals' APIs as an alternative to the API set exposed by Microsoft's operating system.

b. Microsoft's justifications for integration

Microsoft proffers no justification for two of the three challenged actions that it took in integrating IE into Windows--excluding IE from the Add/Remove Programs utility and commingling browser and operating system code. Although Microsoft does make some general claims regarding the benefits of integrating the browser and the operating system, see, e.g., Direct Testimony of James Allchin p 94, reprinted in 5 J.A. at 3321 ("Our vision of deeper levels of technical integration is highly efficient and provides substantial benefits to customers and developers."), it neither specifies nor substantiates those claims. Nor does it argue that either excluding IE from the Add/Remove Programs utility or commingling code achieves any integrative benefit. Plaintiffs plainly made out a prima facie case of harm to competition in the operating system market by demonstrating that Microsoft's actions increased its browser usage share and thus protected its operating system monopoly from a middleware threat and, for its part, Microsoft failed to meet its burden of showing that its conduct serves a purpose other than protecting its operating system monopoly. Accordingly, we hold that Microsoft's exclusion of IE from the Add/Remove Programs utility and its commingling of browser and operating system code constitute exclusionary conduct, in violation of 2.

As for the other challenged act that Microsoft took in integrating IE into Windows--causing Windows to override the user's choice of a default browser in certain circumstances--Microsoft argues that it has "valid technical reasons." Specifically, Microsoft claims that it was necessary to design Windows to override the user's preferences when he or she invokes one of "a few" out "of the nearly 30 means of accessing the Internet." Appellant's Opening Br. at 82. According to Microsoft:

The Windows 98 Help system and Windows Update feature depend on ActiveX controls not supported by Navigator, and the now-discontinued Channel Bar utilized Microsoft's Channel Definition Format, which Navigator also did not support. Lastly, Windows 98 does not invoke Navigator if a user accesses the Internet through "My Computer" or "Windows Explorer" because doing so would defeat one of the purposes of those features-enabling users to move seamlessly from local storage devices to the Web in the same browsing window.

Id. (internal citations omitted). The plaintiff bears the burden not only of rebutting a proffered justification but also of demonstrating that the anticompetitive effect of the challenged action outweighs it. In the District Court, plaintiffs appear to have done neither, let alone both; in any event, upon appeal, plaintiffs offer no rebuttal whatsoever. Accordingly, Microsoft may not be held liable for this aspect of its product design.

3. Agreements with Internet Access Providers

The District Court also condemned as exclusionary Microsoft's agreements with various IAPs. The IAPs include both Internet Service Providers, which offer consumers internet access, and Online Services ("OLSs") such as America Online ("AOL"), which offer proprietary content in addition to internet access and other services. Findings of Fact p 15. The District Court deemed Microsoft's agreements with the IAPs unlawful because:

Microsoft licensed [IE] and the [IE] Access Kit [(of which, more below)] to hundreds of IAPs for no charge. [Findings of Fact] p p 250-51. Then, Microsoft extended valuable promotional treatment to the ten most important IAPs in exchange for their commitment to promote and distribute [IE] and to exile Navigator from the desktop. Id. p p 255-58, 261, 272, 288-90, 305-06. Finally, in exchange for efforts to upgrade existing subscribers to client software that came bundled with [IE] instead of Navigator, Microsoft granted rebates--and in some cases made outright payments--to those same IAPs. Id. p p 259-60, 295.

Conclusions of Law, at 41.

The District Court condemned Microsoft's actions in (1) offering IE free of charge to IAPs and (2) offering IAPs a bounty for each customer the IAP signs up for service using the IE browser. In effect, the court concluded that Microsoft is acting to preserve its monopoly by offering IE to IAPs at an attractive price. Similarly, the District Court held Microsoft liable for (3) developing the IE Access Kit ("IEAK"), a software package that allows an IAP to "create a distinctive identity for its service in as little as a few hours by customizing the [IE] title bar, icon, start and search pages," Findings of Fact p 249, and (4) offering the IEAK to IAPs free of charge, on the ground that those acts, too, helped Microsoft preserve its monopoly. Conclusions of Law, at 41-42. Finally, the District Court found that (5) Microsoft agreed to provide easy access to IAPs' services from the Windows desktop in return for the IAPs' agreement to promote IE exclusively and to keep shipments of internet access software using Navigator under a specific percentage, typically 25%. See Conclusions of Law, at 42 (citing Findings of Fact p p 258, 262, 289). We address the first four items--Microsoft's inducements--and then its exclusive agreements with IAPs.

Although offering a customer an attractive deal is the hallmark of competition, the Supreme Court has indicated that in very rare circumstances a price may be unlawfully low, or "predatory." See generally Brooke Group, 509 U.S. at 220-27. Plaintiffs argued before the District Court that Microsoft's pricing was indeed predatory; but instead of making the usual predatory pricing argument--that the predator would drive out its rivals by pricing below cost on a particular product and then, sometime in the future, raise its prices on that product above the competitive level in order to recoup its earlier losses--plaintiffs argued that by pricing below cost on IE (indeed, even paying people to take it), Microsoft was able simultaneously to preserve its stream of monopoly profits on Windows, thereby more than recouping its investment in below-cost pricing on IE. The District Court did not assign liability for predatory pricing, however, and plaintiffs do not press this theory on appeal.

The rare case of price predation aside, the antitrust laws do not condemn even a monopolist for offering its product at an attractive price, and we therefore have no warrant to condemn Microsoft for offering either IE or the IEAK free of charge or even at a negative price. Likewise, as we said above, a monopolist does not violate the Sherman Act simply by developing an attractive product. See Grinnell, 384 U.S. at 571 (" [G]rowth or development as a consequence of a superior product [or] business acumen" is no violation.). Therefore, Microsoft's development of the IEAK does not violate the Sherman Act.

We turn now to Microsoft's deals with IAPs concerning desktop placement. Microsoft concluded these exclusive agreements with all "the leading IAPs," Findings of Fact p 244, including the major OLSs. Id. p 245; see also id. p p 305, 306. The most significant of the OLS deals is with AOL, which, when the deal was reached, "accounted for a substantial portion of all existing Internet access subscriptions and ... attracted a very large percentage of new IAP subscribers." Id. p 272. Under that agreement Microsoft puts the AOL icon in the OLS folder on the Windows desktop and AOL does not promote any non-Microsoft browser, nor provide software using any non-Microsoft browser except at the customer's request, and even then AOL will not supply more than 15% of its subscribers with a browser other than IE. Id. p 289.

The Supreme Court most recently considered an antitrust challenge to an exclusive contract in Tampa Electric Co. v. Nashville Coal Co., 365 U.S. 320 (1961). That case, which involved a challenge to a requirements contract, was brought under 3 of the Clayton Act and 1 and 2 of the Sherman Act. The Court held that an exclusive contract does not violate the Clayton Act unless its probable effect is to "foreclose competition in a substantial share of the line of commerce affected." Id. at 327. The share of the market foreclosed is important because, for the contract to have an adverse effect upon competition, "the opportunities for other traders to enter into or remain in that market must be significantly limited." Id. at 328. Although " [n]either the Court of Appeals nor the District Court [had] considered in detail the question of the relevant market," id. at 330, the Court in Tampa Electric examined the record and, after defining the relevant market, determined that the contract affected less than one percent of that market. Id. at 333. After concluding, under the Clayton Act, that this share was "conservatively speaking, quite insubstantial," id., the Court went on summarily to reject the Sherman Act claims. Id. at 335 (" [I]f [the contract] does not fall within the broader prescription of 3 of the Clayton Act it follows that it is not forbidden by those of the [Sherman Act].").

Following Tampa Electric, courts considering antitrust challenges to exclusive contracts have taken care to identify the share of the market foreclosed. Some courts have indicated that 3 of the Clayton Act and 1 of the Sherman Act require an equal degree of foreclosure before prohibiting exclusive contracts. See, e.g., Roland Mach. Co. v. Dresser Indus., Inc., 749 F.2d 380, 393 (7th Cir. 1984) (Posner, J.). Other courts, however, have held that a higher market share must be foreclosed in order to establish a violation of the Sherman Act as compared to the Clayton Act. See, e.g., Barr Labs. v. Abbott Labs., 978 F.2d 98, 110 (3d Cir. 1992); 11 Herbert Hovenkamp, Antitrust Law p 1800c4 (1998) (" [T]he cases are divided, with a likely majority stating that the Clayton Act requires a smaller showing of anticompetitive effects.").

Though what is "significant" may vary depending upon the antitrust provision under which an exclusive deal is challenged, it is clear that in all cases the plaintiff must both define the relevant market and prove the degree of foreclosure. This is a prudential requirement; exclusivity provisions in contracts may serve many useful purposes. See, e.g., Omega Envtl., Inc. v.

Gilbarco, Inc., 127 F.3d 1157, 1162 (9th Cir. 1997) ("There are, however, well-recognized economic benefits to exclusive dealing arrangements, including the enhancement of interbrand competition."); Barry Wright Corp. v. ITT Grinnell Corp., 724 F.2d 227, 236 (1st Cir. 1983) (Breyer, J.) (" [V]irtually every contract to buy 'forecloses' or 'excludes' alternative sellers from some portion of the market, namely the portion consisting of what was bought."). Permitting an antitrust action to proceed any time a firm enters into an exclusive deal would both discourage a presumptively legitimate business practice and encourage costly antitrust actions. Because an exclusive deal affecting a small fraction of a market clearly cannot have the requisite harmful effect upon competition, the requirement of a significant degree of foreclosure serves a useful screening function. Cf. Frank H. Easterbrook, The Limits of Antitrust, 63 Tex. L. Rev. 1, 2123 (1984) (discussing use of presumptions in antitrust law to screen out cases in which loss to consumers and economy is likely outweighed by cost of inquiry and risk of deterring procompetitive behavior).

In this case, plaintiffs challenged Microsoft's exclusive dealing arrangements with the IAPs under both 1 and 2 of the Sherman Act. The District Court, in analyzing the 1 claim, stated, "unless the evidence demonstrates that Microsoft's agreements excluded Netscape altogether from access to roughly forty percent of the browser market, the Court should decline to find such agreements in violation of 1." Conclusions of Law, at 52. The court recognized that Microsoft had substantially excluded Netscape from "the most efficient channels for Navigator to achieve browser usage share," id. at 53; see also Findings of Fact p 145 (" [N]o other distribution channel for browsing software even approaches the efficiency of OEM pre-installation and IAP bundling."), and had relegated it to more costly and less effective methods (such as mass mailing its browser on a disk or offering it for download over the internet); but because Microsoft has not "completely excluded Netscape" from reaching any potential user by some means of distribution, however ineffective, the court concluded the agreements do not violate 1. Conclusions of Law, at 53. Plaintiffs did not cross-appeal this holding.

Turning to 2, the court stated: "the fact that Microsoft's arrangements with various [IAPs and other] firms did not foreclose enough of the relevant market to constitute a 1 violation in no way detracts from the Court's assignment of liability for the same arrangements under 2.... [A]ll of Microsoft's agreements, including the non-exclusive ones, severely restricted Netscape's access to those distribution channels leading most efficiently to the acquisition of browser usage share." Conclusions of Law, at 53.

On appeal Microsoft argues that "courts have applied the same standard to alleged exclusive dealing agreements under both Section 1 and Section 2," Appellant's Opening Br. at 109, and it argues that the District Court's holding of no liability under 1 necessarily precludes holding it liable under 2. The District Court appears to have based its holding with respect to 1 upon a "total exclusion test" rather than the 40% standard drawn from the caselaw. Even assuming the holding is correct, however, we nonetheless reject Microsoft's contention.

The basic prudential concerns relevant to 1 and 2 are admittedly the same: exclusive contracts are commonplace-particularly in the field of distribution--in our competitive, market economy, and imposing upon a firm with market power the risk of an antitrust suit every time it enters into such a contract, no matter how small the effect, would create an unacceptable and unjustified burden upon any such firm. At the same time, however, we agree with plaintiffs that a monopolist's use of exclusive contracts, in certain circumstances, may give rise to a 2 violation even though the contracts foreclose less than the roughly 40% or 50% share usually required in order to establish a 1 violation. See generally Dennis W. Carlton, A General Analysis of Exclusionary Conduct and Refusal to Deal--Why Aspen and Kodak Are Misguided, 68 Antitrust L.J. 659 (2001) (explaining various scenarios under which exclusive dealing, particularly by a dominant firm, may raise legitimate concerns about harm to competition).

In this case, plaintiffs allege that, by closing to rivals a substantial percentage of the available opportunities for browser distribution, Microsoft managed to preserve its monopoly in the market for operating systems. The IAPs constitute one of the two major channels by which browsers can be distributed. Findings of Fact p 242. Microsoft has exclusive deals with "fourteen of the top fifteen access providers in North America [, which] account for a large majority of all Internet access subscriptions in this part of the world." Id. p 308. By ensuring that the "majority" of all IAP subscribers are offered IE either as the default browser or as the only browser, Microsoft's deals with the IAPs clearly have a significant effect in preserving its monopoly; they help keep usage of Navigator below the critical level necessary for Navigator or any other rival to pose a real threat to Microsoft's monopoly. See, e.g., id. p 143 (Microsoft sought to "divert enough browser usage from Navigator to neutralize it as a platform."); see also Carlton, at 670.

Plaintiffs having demonstrated a harm to competition, the burden falls upon Microsoft to defend its exclusive dealing contracts with IAPs by providing a procompetitive justification for them. Significantly, Microsoft's only explanation for its exclusive dealing is that it wants to keep developers focused upon its APIs--which is to say, it wants to preserve its power in the operating system market. 02/26/01 Ct. Appeals Tr. at 45-47. That is not an unlawful end, but neither is it a procompetitive justification for the specific means here in question, namely exclusive dealing contracts with IAPs. Accordingly, we affirm the District Court's decision holding that Microsoft's exclusive contracts with IAPs are exclusionary devices, in violation of 2 of the Sherman Act.

4. Dealings with Internet Content Providers, Independent Software Vendors, and Apple Computer

The District Court held that Microsoft engages in exclusionary conduct in its dealings with ICPs, which develop websites; ISVs, which develop software; and Apple, which is both an OEM and a software developer. See Conclusions of Law, at 42-43 (deals with ICPs, ISVs, and Apple "supplemented Microsoft's efforts in the OEM and IAP channels"). The District Court condemned Microsoft's deals with ICPs and ISVs, stating: "By granting ICPs and ISVs free licenses to bundle [IE] with their offerings, and by exchanging other valuable inducements for their agreement to distribute, promote [,] and rely on [IE] rather than Navigator, Microsoft directly induced developers to focus on its own APIs rather than ones exposed by Navigator." Id. (citing Findings of Fact p p 334-35, 340).

With respect to the deals with ICPs, the District Court's findings do not support liability. After reviewing the ICP agreements, the District Court specifically stated that "there is not sufficient evidence to support a finding that Microsoft's promotional restrictions actually had a substantial, deleterious impact on Navigator's usage share." Findings of Fact p 332. Because plaintiffs failed to demonstrate that Microsoft's deals with the ICPs have a substantial effect upon competition, they have not proved the violation of the Sherman Act.

As for Microsoft's ISV agreements, however, the District Court did not enter a similar finding of no substantial effect. The District Court described Microsoft's deals with ISVs as follows:

In dozens of "First Wave" agreements signed between the fall of 1997 and the spring of 1998, Microsoft has promised to give preferential support, in the form of early Windows 98 and Windows NT betas, other technical information, and the right to use certain Microsoft seals of approval, to important ISVs that agree to certain conditions. One of these conditions is that the ISVs use Internet Explorer as the default browsing software for any software they develop with a hypertext-based user interface. Another condition is that the ISVs use Microsoft's "HTML Help," which is accessible only with Internet Explorer, to implement their applications' help systems.

Id. p 339. The District Court further found that the effect of these deals is to "ensure [ ] that many of the most popular Web-centric applications will rely on browsing technologies found only in Windows," id. p 340, and that Microsoft's deals with ISVs therefore "increase [ ] the likelihood that the millions of consumers using [applications designed by ISVs that entered into agreements with Microsoft] will use Internet Explorer rather than Navigator." Id. p 340.

The District Court did not specifically identify what share of the market for browser distribution the exclusive deals with the ISVs foreclose. Although the ISVs are a relatively small channel for browser distribution, they take on greater significance because, as discussed above, Microsoft had largely foreclosed the two primary channels to its rivals. In that light, one can tell from the record that by affecting the applications used by "millions" of consumers, Microsoft's exclusive deals with the ISVs had a substantial effect in further foreclosing rival browsers from the market. (Data introduced by Microsoft, see Direct Testimony of Cameron Myhrvold p 84, reprinted in 6 J.A. at 3922-23, and subsequently relied upon by the District Court in its findings, see, e.g., Findings of Fact p 270, indicate that over the two-year period 1997-98, when Microsoft entered into the First Wave agreements, there were 40 million new users of the internet.) Because, by keeping rival browsers from gaining widespread distribution (and potentially attracting the attention of developers away from the APIs in Windows), the deals have a substantial effect in preserving Microsoft's monopoly, we hold that plaintiffs have made a prima facie showing that the deals have an anticompetitive effect.

Of course, that Microsoft's exclusive deals have the anticompetitive effect of preserving Microsoft's monopoly does not, in itself, make them unlawful. A monopolist, like a competitive firm, may have a perfectly legitimate reason for wanting an exclusive arrangement with its distributors. Accordingly, Microsoft had an opportunity to, but did not, present the District Court with evidence demonstrating that the exclusivity provisions have some such procompetitive justification. See Conclusions of Law, at 43 (citing Findings of Fact p p 339-40) ("With respect to the ISV agreements, Microsoft has put forward no procompetitive business ends whatsoever to justify their exclusionary terms."). On appeal Microsoft likewise does not claim that the exclusivity required by the deals serves any legitimate purpose; instead, it states only that its ISV agreements reflect an attempt "to persuade ISVs to utilize Internet-related system services in Windows rather than Navigator." Appellant's Opening Br. at 114. As we explained before, however, keeping developers focused upon Windows--that is, preserving the Windows monopoly-is a competitively neutral goal. Microsoft having offered no procompetitive justification for its exclusive dealing arrangements with the ISVs, we hold that those arrangements violate 2 of the Sherman Act.

Finally, the District Court held that Microsoft's dealings with Apple violated the Sherman Act. See Conclusions of Law, at 42-43. Apple is vertically integrated: it makes both software (including an operating system, Mac OS), and hardware (the Macintosh line of computers). Microsoft primarily makes software, including, in addition to its operating system, a number of popular applications. One, called "Office," is a suite of business productivity applications that Microsoft has ported to Mac OS. The District Court found that "ninety percent of Mac OS users running a suite of office productivity applications [use] Microsoft's Mac Office." Findings of Fact p 344. Further, the District Court found that:

In 1997, Apple's business was in steep decline, and many doubted that the company would survive much long er.... [M]any ISVs questioned the wisdom of continuing to spend time and money developing applications for the Mac OS. Had Microsoft announced in the midst of this atmosphere that it was ceasing to develop new versions of Mac Office, a great number of ISVs, customers, developers, and investors would have interpreted the announcement as Apple's death notice.

Id. p 344. Microsoft recognized the importance to Apple of its continued support of Mac Office. See id. p 347 (quoting internal Microsoft e-mail) (" [We] need a way to push these guys [, i.e., Apple] and [threatening to cancel Mac Office] is the only one that seems to make them move."); see also id. (" [Microsoft Chairman Bill] Gates asked whether Microsoft could conceal from Apple in the coming month the fact that Microsoft was almost finished developing Mac Office 97."); id. at p 354 ("I think ... Apple should be using [IE] everywhere and if they don't do it, then we can use Office as a club.").

In June 1997 Microsoft Chairman Bill Gates determined that the company's negotiations with Apple " 'have not been going well at all.... Apple let us down on the browser by making Netscape the standard install.' Gates then reported that he had already called Apple's CEO ... to ask 'how we should announce the cancellation of Mac Office....' " Id. at p 349. The District Court further found that, within a month of Gates' call, Apple and Microsoft had reached an agreement pursuant to which

Microsoft's primary obligation is to continue releasing up-to-date versions of Mac Office for at least five years.... [and] Apple has agreed ... to "bundle the most current version of [IE] ... with [Mac OS]"... [and to] "make [IE] the default [browser]".... Navigator is not installed on the computer hard drive during the default installation, which is the type of installation most users elect to employ.... [The] Agreement further provides that ... Apple may not position icons for nonMicrosoft browsing software on the desktop of new Macintosh PC systems or Mac OS upgrades.

Id. p p 350-52. The agreement also prohibits Apple from encouraging users to substitute another browser for IE, and states that Apple will "encourage its employees to use [IE]." Id. p 352.

This exclusive deal between Microsoft and Apple has a substantial effect upon the distribution of rival browsers. If a browser developer ports its product to a second operating system, such as the Mac OS, it can continue to display a common set of APIs. Thus, usage share, not the underlying operating system, is the primary determinant of the platform challenge a browser may pose. Pre-installation of a browser (which can be accomplished either by including the browser with the operating system or by the OEM installing the browser) is one of the two most important methods of browser distribution, and Apple had a not insignificant share of worldwide sales of operating systems. See id. p 35 (Microsoft has 95% of the market not counting Apple and "well above" 80% with Apple included in the relevant market). Because Microsoft's exclusive contract with Apple has a substantial effect in restricting distribution of rival browsers, and because (as we have described several times above) reducing usage share of rival browsers serves to protect Microsoft's monopoly, its deal with Apple must be regarded as anticompetitive. See Conclusions of Law, at 42 (citing Findings of Fact p 356) ("By extracting from Apple terms that significantly diminished the usage of Navigator on the Mac OS, Microsoft helped to ensure that developers would not view Navigator as truly cross-platform middleware.").

Microsoft offers no procompetitive justification for the exclusive dealing arrangement. It makes only the irrelevant claim that the IE-for-Mac Office deal is part of a multifaceted set of agreements between itself and Apple, see Appellant's Opening Br. at 61 ("Apple's 'browsing software' obligation was [not] the quid pro quo for Microsoft's Mac Office obligation [;] ... all of the various obligations ... were part of one 'overall agreement' between the two companies."); that does not mean it has any procompetitive justification. Accordingly, we hold that the exclusive deal with Apple is exclusionary, in violation of 2 of the Sherman Act.

Java, a set of technologies developed by Sun Microsystems, is another type of middleware posing a potential threat to Windows' position as the ubiquitous platform for software development. Findings of Fact p 28. The Java technologies include: (1) a programming language; (2) a set of programs written in that language, called the "Java class libraries," which expose APIs; (3) a compiler, which translates code written by a developer into "bytecode"; and (4) a Java Virtual Machine ("JVM"), which translates bytecode into instructions to the operating system. Id. p 73. Programs calling upon the Java APIs will run on any machine with a "Java runtime environment," that is, Java class libraries and a JVM. Id. p p 73, 74.

In May 1995 Netscape agreed with Sun to distribute a copy of the Java runtime environment with every copy of Navigator, and "Navigator quickly became the principal vehicle by which Sun placed copies of its Java runtime environment on the PC systems of Windows users." Id. p 76. Microsoft, too, agreed to promote the Java technologies--or so it seemed. For at the same time, Microsoft took steps "to maximize the difficulty with which applications written in Java could be ported from Windows to other platforms, and vice versa." Conclusions of Law, at 43. Specifically, the District Court found that Microsoft took four steps to exclude Java from developing as a viable cross-platform threat: (a) designing a JVM incompatible with the one developed by Sun; (b) entering into contracts, the so-called "First Wave Agreements," requiring major ISVs to promote Microsoft's JVM exclusively; (c) deceiving Java developers about the Windows-specific nature of the tools it distributed to them; and (d) coercing Intel to stop aiding Sun in improving the Java technologies.

a. The incompatible JVM

The District Court held that Microsoft engaged in exclusionary conduct by developing and promoting its own JVM. Conclusions of Law, at 43-44. Sun had already developed a JVM for the Windows operating system when Microsoft began work on its version. The JVM developed by Microsoft allows Java applications to run faster on Windows than does Sun's JVM, Findings of Fact p 389, but a Java application designed to work with Microsoft's JVM does not work with Sun's JVM and vice versa. Id. p 390. The District Court found that Microsoft "made a large investment of engineering resources to develop a high-performance Windows JVM," id. p 396, and, " [b]y bundling its ... JVM with every copy of [IE] ... Microsoft endowed its Java runtime environment with the unique attribute of guaranteed, enduring ubiquity across the enormous Windows installed base," id. p 397. As explained above, however, a monopolist does not violate the antitrust laws simply by developing a product that is incompatible with those of its rivals. See supra Section II.B.1. In order to violate the antitrust laws, the incompatible product must have an anticompetitive effect that outweighs any procompetitive justification for the design. Microsoft's JVM is not only incompatible with Sun's, it allows Java applications to run faster on Windows than does Sun's JVM. Microsoft's faster JVM lured Java developers into using Microsoft's developer tools, and Microsoft offered those tools deceptively, as we discuss below. The JVM, however, does allow applications to run more swiftly and does not itself have any anticompetitive effect. Therefore, we reverse the District Court's imposition of liability for Microsoft's development and promotion of its JVM.

b. The First Wave Agreements

The District Court also found that Microsoft entered into First Wave Agreements with dozens of ISVs to use Microsoft's JVM. See Findings of Fact p 401 (" [I]n exchange for costly technical support and other blandishments, Microsoft induced dozens of important ISVs to make their Java applications reliant on Windows-specific technologies and to refrain from distributing to Windows users JVMs that complied with Sun's standards."). Again, we reject the District Court's condemnation of low but non-predatory pricing by Microsoft.

To the extent Microsoft's First Wave Agreements with the ISVs conditioned receipt of Windows technical information upon the ISVs' agreement to promote Microsoft's JVM exclusively, they raise a different competitive concern. The District Court found that, although not literally exclusive, the deals were exclusive in practice because they required developers to make Microsoft's JVM the default in the software they developed. Id. p 401.

While the District Court did not enter precise findings as to the effect of the First Wave Agreements upon the overall distribution of rival JVMs, the record indicates that Microsoft's deals with the major ISVs had a significant effect upon JVM promotion. As discussed above, the products of First Wave ISVs reached millions of consumers. Id. p 340. The First Wave ISVs included such prominent developers as Rational Software, see GX 970, reprinted in 15 J.A. at 999410000, "a world leader" in software development tools, see Direct Testimony of Michael Devlin p 2, reprinted in 5 J.A. at 3520, and Symantec, see GX 2071, reprinted in 22 J.A. at 14960-66 (sealed), which, according to Microsoft itself, is "the leading supplier of utilities such as anti-virus software," Defendant's Proposed Findings of Fact p 276, reprinted in 3 J.A. at 1689. Moreover, Microsoft's exclusive deals with the leading ISVs took place against a backdrop of foreclosure: the District Court found that " [w]hen Netscape announced in May 1995 [prior to Microsoft's execution of the First Wave Agreements] that it would include with every copy of Navigator a copy of a Windows JVM that complied with Sun's standards, it appeared that Sun's Java implementation would achieve the necessary ubiquity on Windows." Findings of Fact p 394. As discussed above, however, Microsoft undertook a number of anticompetitive actions that seriously reduced the distribution of Navigator, and the District Court found that those actions thereby seriously impeded distribution of Sun's JVM. Conclusions of Law, at 43-44. Because Microsoft's agreements foreclosed a substantial portion of the field for JVM distribution and because, in so doing, they protected Microsoft's monopoly from a middleware threat, they are anticompetitive.

Microsoft offered no procompetitive justification for the default clause that made the First Wave Agreements exclusive as a practical matter. See Findings of Fact p 401. Because the cumulative effect of the deals is anticompetitive and because Microsoft has no procompetitive justification for them, we hold that the provisions in the First Wave Agreements requiring use of Microsoft's JVM as the default are exclusionary, in violation of the Sherman Act.

c. Deception of Java developers

Microsoft's "Java implementation" included, in addition to a JVM, a set of software development tools it created to assist ISVs in designing Java applications. The District Court found that, not only were these tools incompatible with Sun's cross-platform aspirations for Java--no violation, to be sure-but Microsoft deceived Java developers regarding the Windows-specific nature of the tools. Microsoft's tools included "certain 'keywords' and 'compiler directives' that could only be executed properly by Microsoft's version of the Java runtime environment for Windows." Id. p 394; see also Direct Testimony of James Gosling p 58, reprinted in 21 J.A. at 13959 (Microsoft added "programming instructions ... that alter the behavior of the code."). As a result, even Java "developers who were opting for portability over performance ... unwittingly [wrote] Java applications that [ran] only on Windows." Conclusions of Law, at 43. That is, developers who relied upon Microsoft's public commitment to cooperate with Sun and who used Microsoft's tools to develop what Microsoft led them to believe were cross-platform applications ended up producing applications that would run only on the Windows operating system.

When specifically accused by a PC Week reporter of fragmenting Java standards so as to prevent cross-platform uses, Microsoft denied the accusation and indicated it was only "adding rich platform support" to what remained a crossplatform implementation. An e-mail message internal to Microsoft, written shortly after the conversation with the reporter, shows otherwise:

[O]k, i just did a followup call.... [The reporter] liked that i kept pointing customers to w3c standards [(commonly observed internet protocols)].... [but] he accused us of being schizo with this vs. our java approach, i said he misunderstood [--] that [with Java] we are merely trying to add rich platform support to an interop layer.... this plays well.... at this point its [sic] not good to create MORE noise around our win32 java classes. instead we should just quietly grow j [(Microsoft's development tools)] share and assume that people will take more advantage of our classes without ever realizing they are building win32-only java apps.

GX 1332, reprinted in 22 J.A. at 14922-23.

Finally, other Microsoft documents confirm that Microsoft intended to deceive Java developers, and predicted that the effect of its actions would be to generate Windows-dependent Java applications that their developers believed would be cross-platform; these documents also indicate that Microsoft's ultimate objective was to thwart Java's threat to Microsoft's monopoly in the market for operating systems. One Microsoft document, for example, states as a strategic goal: "Kill cross-platform Java by grow [ing] the polluted Java market." GX 259, reprinted in 22 J.A. at 14514; see also id. ("Cross-platform capability is by far the number one reason for choosing/using Java.") (emphasis in original).

Microsoft's conduct related to its Java developer tools served to protect its monopoly of the operating system in a manner not attributable either to the superiority of the operating system or to the acumen of its makers, and therefore was anticompetitive. Unsurprisingly, Microsoft offers no procompetitive explanation for its campaign to deceive developers. Accordingly, we conclude this conduct is exclusionary, in violation of 2 of the Sherman Act.

d. The threat to Intel

The District Court held that Microsoft also acted unlawfully with respect to Java by using its "monopoly power to prevent firms such as Intel from aiding in the creation of cross-platform interfaces." Conclusions of Law, at 43. In 1995 Intel was in the process of developing a highperformance, Windows-compatible JVM. Microsoft wanted Intel to abandon that effort because a fast, cross-platform JVM would threaten Microsoft's monopoly in the operating system market. At an August 1995 meeting, Microsoft's Gates told Intel that its "cooperation with Sun and Netscape to develop a Java runtime environment ... was one of the issues threatening to undermine cooperation between Intel and Microsoft." Findings of Fact p 396. Three months later, "Microsoft's Paul Maritz told a senior Intel executive that Intel's [adaptation of its multimedia software to comply with] Sun's Java standards was as inimical to Microsoft as Microsoft's support for non-Intel microprocessors would be to Intel." Id. p 405.

Intel nonetheless continued to undertake initiatives related to Java. By 1996 "Intel had developed a JVM designed to run well ... while complying with Sun's cross-platform standards." Id. p 396. In April of that year, Microsoft again urged Intel not to help Sun by distributing Intel's fast, Suncompliant JVM. Id. And Microsoft threatened Intel that if it did not stop aiding Sun on the multimedia front, then Microsoft would refuse to distribute Intel technologies bundled with Windows. Id. p 404.

Intel finally capitulated in 1997, after Microsoft delivered the coup de grace.

[O]ne of Intel's competitors, called AMD, solicited support from Microsoft for its "3DX" technology.... Microsoft's Allchin asked Gates whether Microsoft should support 3DX, despite the fact that Intel would oppose it. Gates responded: "If Intel has a real problem with us supporting this then they will have to stop supporting Java Multimedia the way they are. I would gladly give up supporting this if they would back off from their work on JAVA."

Id. p 406.

Microsoft's internal documents and deposition testimony confirm both the anticompetitive effect and intent of its actions. See, e.g., GX 235, reprinted in 22 J.A. at 14502 (Microsoft executive, Eric Engstrom, included among Microsoft's goals for Intel: "Intel to stop helping Sun create Java

Multimedia APIs, especially ones that run well ... on Windows."); Deposition of Eric Engstrom at 179 ("We were successful [in convincing Intel to stop aiding Sun] for some period of time.").

Microsoft does not deny the facts found by the District Court, nor does it offer any procompetitive justification for pressuring Intel not to support cross-platform Java. Microsoft lamely characterizes its threat to Intel as "advice." The District Court, however, found that Microsoft's "advice" to Intel to stop aiding cross-platform Java was backed by the threat of retaliation, and this conclusion is supported by the evidence cited above. Therefore we affirm the conclusion that Microsoft's threats to Intel were exclusionary, in violation of 2 of the Sherman Act.

The District Court held that, apart from Microsoft's specific acts, Microsoft was liable under 2 based upon its general "course of conduct." In reaching this conclusion the court relied upon Continental Ore Co. v. Union Carbide & Carbon Corp., 370 U.S. 690, 699 (1962), where the Supreme Court stated, " [i]n [Sherman Act cases], plaintiffs should be given the full benefit of their proof without tightly compartmentalizing the various factual components and wiping the slate clean after scrutiny of each."

Microsoft points out that Continental Ore and the other cases cited by plaintiffs in support of "course of conduct" liability all involve conspiracies among multiple firms, not the conduct of a single firm; in that setting the "course of conduct" is the conspiracy itself, for which all the participants may be held liable. See Appellant's Opening Br. at 112-13. Plaintiffs respond that, as a policy matter, a monopolist's unilateral "campaign of [acts intended to exclude a rival] that in the aggregate has the requisite impact" warrants liability even if the acts viewed individually would be lawful for want of a significant effect upon competition. Appellees' Br. at 8283.

We need not pass upon plaintiffs' argument, however, because the District Court did not point to any series of acts, each of which harms competition only slightly but the cumulative effect of which is significant enough to form an independent basis for liability. The "course of conduct" section of the District Court's opinion contains, with one exception, only broad, summarizing conclusions. See, e.g., Conclusions of Law, at 44 ("Microsoft placed an oppressive thumb on the scale of competitive fortune...."). The only specific acts to which the court refers are Microsoft's expenditures in promoting its browser, see id. ("Microsoft has expended wealth and foresworn opportunities to realize more...."), which we have explained are not in themselves unlawful. Because the District Court identifies no other specific acts as a basis for "course of conduct" liability, we reverse its conclusion that Microsoft's course of conduct separately violates 2 of the Sherman Act.

As a final parry, Microsoft urges this court to reverse on the monopoly maintenance claim, because plaintiffs never established a causal link between Microsoft's anticompetitive conduct, in particular its foreclosure of Netscape's and Java's distribution channels, and the maintenance of Microsoft's operating system monopoly. See Findings of Fact p 411 ("There is insufficient evidence to find that, absent Microsoft's actions, Navigator and Java already would have ignited genuine competition in the market for Intel-compatible PC operating systems."). This is the flip side of Microsoft's earlier argument that the District Court should have included middleware in the relevant market. According to Microsoft, the District Court cannot simultaneously find that middleware is not a reasonable substitute and that Microsoft's exclusionary conduct contributed to the maintenance of monopoly power in the operating system market. Microsoft claims that the first finding depended on the court's view that middleware does not pose a serious threat to Windows, see supra Section II.A, while the second finding required the court to find that Navigator and Java would have developed into serious enough cross-platform threats to erode the applications barrier to entry. We disagree.

Microsoft points to no case, and we can find none, standing for the proposition that, as to 2 liability in an equitable enforcement action, plaintiffs must present direct proof that a defendant's continued monopoly power is precisely attributable to its anticompetitive conduct. As its lone authority, Microsoft cites the following passage from Professor Areeda's antitrust treatise: "The plaintiff has the burden of pleading, introducing evidence, and presumably proving by a preponderance of the evidence that reprehensible behavior has contributed significantly to the ... maintenance of the monopoly." 3 Phillip E. Areeda & Herbert Hovenkamp, Antitrust Law p 650c, at 69 (1996) (emphasis added).

But, with respect to actions seeking injunctive relief, the authors of that treatise also recognize the need for courts to infer "causation" from the fact that a defendant has engaged in anticompetitive conduct that "reasonably appear [s] capable of making a significant contribution to ... maintaining monopoly power." Id. p 651c, at 78; see also Morgan v. Ponder, 892 F.2d 1355, 1363 (8th Cir. 1989); Barry Wright, 724 F.2d at 230. To require that 2 liability turn on a plaintiff's ability or inability to reconstruct the hypothetical marketplace absent a defendant's anticompetitive conduct would only encourage monopolists to take more and earlier anticompetitive action.

We may infer causation when exclusionary conduct is aimed at producers of nascent competitive technologies as well as when it is aimed at producers of established substitutes.

Admittedly, in the former case there is added uncertainty, inasmuch as nascent threats are merely potential substitutes. But the underlying proof problem is the same--neither plaintiffs nor the court can confidently reconstruct a product's hypothetical technological development in a world absent the defendant's exclusionary conduct. To some degree, "the defendant is made to suffer the uncertain consequences of its own undesirable conduct." 3 Areeda & Hovenkamp, Antitrust Law p 651c, at 78.

Given this rather edentulous test for causation, the question in this case is not whether Java or Navigator would actually have developed into viable platform substitutes, but (1) whether as a general matter the exclusion of nascent threats is the type of conduct that is reasonably capable of contributing significantly to a defendant's continued monopoly power and (2) whether Java and Navigator reasonably constituted nascent threats at the time Microsoft engaged in the anticompetitive conduct at issue. As to the first, suffice it to say that it would be inimical to the purpose of the Sherman Act to allow monopolists free reign to squash nascent, albeit unproven, competitors at will--particularly in industries marked by rapid technological advance and frequent paradigm shifts. Findings of Fact p p 59-60. As to the second, the District Court made ample findings that both Navigator and Java showed potential as middleware platform threats. Findings of Fact p p 68-77. Counsel for Microsoft admitted as much at oral argument. 02/26/01 Ct. Appeals Tr. at 27 ("There are no constraints on output. Marginal costs are essentially zero. And there are to some extent network effects. So a company like Netscape founded in 1994 can be by the middle of 1995 clearly a potentially lethal competitor to Windows because it can supplant its position in the market because of the characteristics of these markets.").

Microsoft's concerns over causation have more purchase in connection with the appropriate remedy issue, i.e., whether the court should impose a structural remedy or merely enjoin the offensive conduct at issue. As we point out later in this opinion, divestiture is a remedy that is imposed only with great caution, in part because its long-term efficacy is rarely certain. See infra Section V.E. Absent some measure of confidence that there has been an actual loss to competition that needs to be restored, wisdom counsels against adopting radical structural relief. See 3 Areeda & Hovenkamp, Antitrust Law p 653b, at 91-92 (" [M]ore extensive equitable relief, particularly remedies such as divestiture designed to eliminate the monopoly altogether, raise more serious questions and require a clearer indication of a significant causal connection between the conduct and creation or maintenance of the market power."). But these queries go to questions of remedy, not liability. In short, causation affords Microsoft no defense to liability for its unlawful actions undertaken to maintain its monopoly in the operating system market.

Microsoft further challenges the District Court's determination of liability for "attempt [ing] to monopolize ... any part of the trade or commerce among the several States." 15 U.S.C. 2 (1997). To establish a 2 violation for attempted monopolization, "a plaintiff must prove (1) that the defendant has engaged in predatory or anticompetitive conduct with (2) a specific intent to monopolize and (3) a dangerous probability of achieving monopoly power." Spectrum Sports, Inc. v. McQuillan, 506 U.S. 447, 456 (1993); see also Times Picayune Pub. Co. v. United States, 345 U.S. 594, 626 (1953); Lorain Journal Co. v. United States, 342 U.S. 143, 153-55 (1951). Because a deficiency on any one of the three will defeat plaintiffs' claim, we look no further than plaintiffs' failure to prove a dangerous probability of achieving monopoly power in the putative browser market.

The determination whether a dangerous probability of success exists is a particularly fact-intensive inquiry. Because the Sherman Act does not identify the activities that constitute the offense of attempted monopolization, the court "must examine the facts of each case, mindful that the determination of what constitutes an attempt, as Justice Holmes explained, 'is a question of proximity and degree.' " United States v. Am. Airlines, Inc., 743 F.2d 1114, 1118 (5th Cir. 1984) (quoting Swift & Co. v. United States, 196 U.S. 375, 402 (1904)). The District Court determined that " [t]he evidence supports the conclusion that Microsoft's actions did pose such a danger." Conclusions of Law, at 45. Specifically, the District Court concluded that "Netscape's assent to Microsoft's market division proposal would have, instanter, resulted in Microsoft's attainment of monopoly power in a second market," and that "the proposal itself created a dangerous probability of that result." Conclusions of Law, at 46 (citation omitted). The District Court further concluded that "the predatory course of conduct Microsoft has pursued since June of 1995 has revived the dangerous probability that Microsoft will attain monopoly power in a second market." Id.

At the outset we note a pervasive flaw in the District Court's and plaintiffs' discussion of attempted monopolization. Simply put, plaintiffs have made the same argument under two different headings--monopoly maintenance and attempted monopolization. They have relied upon Microsoft's 2 liability for monopolization of the operating system market as a presumptive indicator of attempted monopolization of an entirely different market. The District Court implicitly accepted this approach: It agreed with plaintiffs that the events that formed the basis for the 2 monopolization claim "warrant [ed] additional liability as an illegal attempt to amass monopoly power in 'the browser market.' " Id. at 45 (emphasis added). Thus, plaintiffs and the District Court failed to recognize the need for an analysis wholly independent of the conclusions and findings on monopoly maintenance.

To establish a dangerous probability of success, plaintiffs must as a threshold matter show that the browser market can be monopolized, i.e., that a hypothetical monopolist in that market could enjoy market power. This, in turn, requires plaintiffs (1) to define the relevant market and (2) to demonstrate that substantial barriers to entry protect that market. Because plaintiffs have not carried their burden on either prong, we reverse without remand.

A court's evaluation of an attempted monopolization claim must include a definition of the relevant market. See Spectrum Sports, 506 U.S. at 455-56. Such a definition establishes a context for evaluating the defendant's actions as well as for measuring whether the challenged conduct presented a dangerous probability of monopolization. See id. The District Court omitted this element of the Spectrum Sports inquiry.

Defining a market for an attempted monopolization claim involves the same steps as defining a market for a monopoly maintenance claim, namely a detailed description of the purpose of a browser--what functions may be included and what are not--and an examination of the substitutes that are part of the market and those that are not. See also supra Section II.A. The District Court never engaged in such an analysis nor entered detailed findings defining what a browser is or what products might constitute substitutes. In the Findings of Fact, the District Court (in a section on whether IE and Windows are separate products) stated only that "a Web browser provides the ability for the end user to select, retrieve, and perceive resources on the Web." Findings of Fact p 150. Furthermore, in discussing attempted monopolization in its Conclusions of Law, the District Court failed to demonstrate analytical rigor when it employed varying and imprecise references to the "market for browsing technology for Windows," "the browser market," and "platform-level browsing software." Conclusions of Law, at 45.

Because the determination of a relevant market is a factual question to be resolved by the District Court, see, e.g., All Care Nursing Serv., Inc. v. High Tech Staffing Servs., Inc., 135 F.3d 740, 749 (11th Cir. 1998); Tunis Bros. Co., Inc. v. Ford Motor Co., 952 F.2d 715, 722-23 (3d Cir. 1991); Westman Comm'n Co. v. Hobart Int'l, Inc., 796 F.2d 1216, 1220 (10th Cir. 1986), we would normally remand the case so that the District Court could formulate an appropriate definition. See Pullman-Standard v. Swint, 456 U.S. 273, 291-92 & n.22 (1982); Janini v. Kuwait Univ., 43 F.3d 1534, 1537 (D.C. Cir. 1995); Palmer v. Shultz, 815 F.2d 84, 103 (D.C. Cir. 1987). A remand on market definition is unnecessary, however, because the District Court's imprecision is directly traceable to plaintiffs' failure to articulate and identify evidence before the District Court as to (1) what constitutes a browser (i.e., what are the technological components of or functionalities provided by a browser) and (2) why certain other products are not reasonable substitutes (e.g., browser shells or viewers for individual internet extensions, such as Real Audio Player or Adobe Acrobat Reader). See Plaintiffs' Joint Proposed Findings of Fact, at 817-19, reprinted in 2 J.A. at 1480-82; Plaintiffs' Joint Proposed Conclusions of Law IV (No. 981232); see also Lee v. Interstate Fire & Cas. Co., 86 F.3d 101, 105 (7th Cir. 1996) (stating that remand for development of a factual record is inappropriate where plaintiff failed to meet burden of persuasion and never suggested that additional evidence was necessary). Indeed, when plaintiffs in their Proposed Findings of Fact attempted to define a relevant market for the attempt claim, they pointed only to their separate products analysis for the tying claim. See, e.g., Plaintiffs' Joint Proposed Findings of Fact, at 818, reprinted in 2 J.A. at 1481. However, the separate products analysis for tying purposes is not a substitute for the type of market definition that Spectrum Sports requires. See infra Section IV.A.

Plaintiffs' proposed findings and the District Court's actual findings on attempted monopolization pale in comparison to their counterparts on the monopoly maintenance claim. Compare Findings of Fact p 150, and Plaintiffs' Joint Proposed Findings of Fact, at 817-819, reprinted in 2 J.A. at 1480-82, with Findings of Fact p p 18-66, and Plaintiffs' Joint Proposed Findings of Fact, at 20-31, reprinted in 1 J.A. at 658-69. Furthermore, in their brief and at oral argument before this court, plaintiffs did nothing to clarify or ameliorate this deficiency. See, e.g., Appellees' Br. at 93-94.`

Because a firm cannot possess monopoly power in a market unless that market is also protected by significant barriers to entry, see supra Section II.A, it follows that a firm cannot threaten to achieve monopoly power in a market unless that market is, or will be, similarly protected. See Spectrum Sports, 506 U.S. at 456 ("In order to determine whether there is a dangerous probability of monopolization, courts have found it necessary to consider ... the defendant's ability to lessen or destroy competition in that market.") (citing cases). Plaintiffs have the burden of establishing barriers to entry into a properly defined relevant market. See 2A Phillip E. Areeda et al., Antitrust Law p 420b, at 57-59 (1995); 3A Phillip E. Areeda & Herbert Hovenkamp, Antitrust Law p 807g, at 361-62 (1996); see also Neumann v. Reinforced Earth Co., 786 F.2d 424, 429 (D.C. Cir. 1986). Plaintiffs must not only show that barriers to entry protect the properly defined browser market, but that those barriers are "significant." See United States v. Baker Hughes Inc., 908 F.2d 981, 987 (D.C. Cir. 1990). Whether there are significant barriers to entry cannot, of course, be answered absent an appropriate market definition; thus, plaintiffs' failure on that score alone is dispositive. But even were we to assume a properly defined market, for example browsers consisting of a graphical interface plus internet protocols, plaintiffs nonetheless failed to carry their burden on barriers to entry.

Contrary to plaintiffs' contention on appeal, see Appellees' Br. at 91-93, none of the District Court's statements constitutes a finding of barriers to entry into the web browser market. Finding of Fact 89 states:

At the time Microsoft presented its proposal, Navigator was the only browser product with a significant share of the market and thus the only one with the potential to weaken the applications barrier to entry. Thus, had it convinced Netscape to accept its offer of a "special relationship," Microsoft quickly would have gained such control over the extensions and standards that networkcentric applications (including Web sites) employ as to make it all but impossible for any future browser rival to lure appreciable developer interest away from Microsoft's platform.

This finding is far too speculative to establish that competing browsers would be unable to enter the market, or that Microsoft would have the power to raise the price of its browser above, or reduce the quality of its browser below, the competitive level. Moreover, it is ambiguous insofar as it appears to focus on Microsoft's response to the perceived platform threat rather than the browser market. Finding of Fact 144, on which plaintiffs also rely, is part of the District Court's discussion of Microsoft's alleged anticompetitive actions to eliminate the platform threat posed by Netscape Navigator. This finding simply describes Microsoft's reliance on studies indicating consumers' reluctance to switch browsers, a reluctance not shown to be any more than that which stops consumers from switching brands of cereal. Absent more extensive and definitive factual findings, the District Court's legal conclusions about entry barriers amount to nothing more than speculation.

In contrast to their minimal effort on market definition, plaintiffs did at least offer proposed findings of fact suggesting that the possibility of network effects could potentially create barriers to entry into the browser market. See Plaintiffs' Joint Proposed Findings of Fact, at 822-23, 825-27, reprinted in 2 J.A. at 1485-86, 1488-90. The District Court did not adopt those proposed findings. See Findings of Fact p 89. However, the District Court did acknowledge the possibility of a different kind of entry barrier in its Conclusions of Law:

In the time it would have taken an aspiring entrant to launch a serious effort to compete against Internet Explorer, Microsoft could have erected the same type of barrier that protects its existing monopoly power by adding proprietary extensions to the browsing software under its control and by extracting commitments from OEMs, IAPs and others similar to the ones discussed in [the monopoly maintenance section].

Conclusions of Law, at 46 (emphasis added).

Giving plaintiffs and the District Court the benefit of the doubt, we might remand if the possible existence of entry barriers resulting from the possible creation and exploitation of network effects in the browser market were the only concern. That is not enough to carry the day, however, because the District Court did not make two key findings: (1) that network effects were a necessary or even probable, rather than merely possible, consequence of high market share in the browser market and (2) that a barrier to entry resulting from network effects would be "significant" enough to confer monopoly power. Again, these deficiencies are in large part traceable to plaintiffs' own failings. As to the first point, the District Court's use of the phrase "could have" reflects the same uncertainty articulated in testimony cited in plaintiffs' proposed findings. See Plaintiffs' Joint Proposed Findings of Fact, at 822 (citing testimony of Frederick

Warren-Boulton), at 826 (citing testimony of Franklin Fisher), reprinted in 2 J.A. at 1485, 1489. As to the second point, the cited testimony in plaintiffs' proposed findings offers little more than conclusory statements. See id. at 822-27, reprinted in 2 J.A. at 1485-90. The proffered testimony contains no evidence regarding the cost of "porting" websites to different browsers or the potentially different economic incentives facing ICPs, as opposed to ISVs, in their decision to incur costs to do so. Simply invoking the phrase "network effects" without pointing to more evidence does not suffice to carry plaintiffs' burden in this respect.

Any doubt that we may have had regarding remand instead of outright reversal on the barriers to entry question was dispelled by plaintiffs' arguments on attempted monopolization before this court. Not only did plaintiffs fail to articulate a website barrier to entry theory in either their brief or at oral argument, they failed to point the court to evidence in the record that would support a finding that Microsoft would likely erect significant barriers to entry upon acquisition of a dominant market share.

Plaintiffs did not devote the same resources to the attempted monopolization claim as they did to the monopoly maintenance claim. But both claims require evidentiary and theoretical rigor. Because plaintiffs failed to make their case on attempted monopolization both in the District Court and before this court, there is no reason to give them a second chance to flesh out a claim that should have been fleshed out the first time around. Accordingly, we reverse the District Court's determination of 2 liability for attempted monopolization.

Microsoft also contests the District Court's determination of liability under 1 of the Sherman Act. The District Court concluded that Microsoft's contractual and technological bundling of the IE web browser (the "tied" product) with its Windows operating system ("OS") (the "tying" product) resulted in a tying arrangement that was per se unlawful. Conclusions of Law, at 47-51. We hold that the rule of reason, rather than per se analysis, should govern the legality of tying arrangements involving platform software products. The Supreme Court has warned that " ' [i]t is only after considerable experience with certain business relationships that courts classify them as per se violations....' " Broad. Music, Inc. v. CBS, 441 U.S. 1, 9 (1979) (quoting United States v. Topco Assocs., 405 U.S. 596, 607-08 (1972)). While every "business relationship" will in some sense have unique features, some represent entire, novel categories of dealings. As we shall explain, the arrangement before us is an example of the latter, offering the first up-close look at the technological integration of added functionality into software that serves as a platform for third-party applications. There being no close parallel in prior antitrust cases, simplistic application of per se tying rules carries a serious risk of harm. Accordingly, we vacate the District Court's finding of a per se tying violation and remand the case. Plaintiffs may on remand pursue their tying claim under the rule of reason.

The facts underlying the tying allegation substantially overlap with those set forth in Section II.B in connection with the 2 monopoly maintenance claim. The key District Court findings are that (1) Microsoft required licensees of Windows 95 and 98 also to license IE as a bundle at a single price, Findings of Fact p p 137, 155, 158; (2) Microsoft refused to allow OEMs to uninstall or remove IE from the Windows desktop, id. p p 158, 203, 213; (3) Microsoft designed Windows 98 in a way that withheld from consumers the ability to remove IE by use of the Add/Remove Programs utility, id. p 170; cf. id. p 165 (stating that IE was subject to Add/Remove Programs utility in Windows 95); and (4) Microsoft designed Windows 98 to override the user's choice of default web browser in certain circumstances, id. p p 171, 172. The court found that these acts constituted a per se tying violation. Conclusions of Law, at 47-51. Although the District Court also found that Microsoft commingled operating system-only and browser-only routines in the same library files, Findings of Fact p p 161, 164, it did not include this as a basis for tying liability despite plaintiffs' request that it do so, Plaintiffs' Proposed Findings of Fact, p p 131-32, reprinted in 2 J.A. at 941-47.

There are four elements to a per se tying violation: (1) the tying and tied goods are two separate products; (2) the defendant has market power in the tying product market; (3) the defendant affords consumers no choice but to purchase the tied product from it; and (4) the tying arrangement forecloses a substantial volume of commerce. See Eastman Kodak Co. v. Image Tech. Servs., Inc., 504 U.S. 451, 461-62 (1992); Jefferson Parish Hosp. Dist. No. 2 v. Hyde, 466 U.S. 2, 12-18 (1984).

Microsoft does not dispute that it bound Windows and IE in the four ways the District Court cited. Instead it argues that Windows (the tying good) and IE browsers (the tied good) are not "separate products," Appellant's Opening Br. at 69-79, and that it did not substantially foreclose competing browsers from the tied product market, id. at 79-83. (Microsoft also contends that it does not have monopoly power in the tying product market, id. at 84-96, but, for reasons given in Section II.A, we uphold the District Court's finding to the contrary.)

We first address the separate-products inquiry, a source of much argument between the parties and of confusion in the cases. Our purpose is to highlight the poor fit between the separate-products test and the facts of this case. We then offer further reasons for carving an exception to the per se rule when the tying product is platform software. In the final section we discuss the District Court's inquiry if plaintiffs pursue a rule of reason claim on remand.

A. Separate-Products Inquiry Under the Per Se Test

The requirement that a practice involve two separate products before being condemned as an illegal tie started as a purely linguistic requirement: unless products are separate, one cannot be "tied" to the other. Indeed, the nature of the products involved in early tying cases--intuitively distinct items such as a movie projector and a film, Motion Picture Patents Co. v. Universal Film Mfg. Co., 243 U.S. 502 (1917)-led courts either to disregard the separate-products question, see, e.g., United Shoe Mach. Corp. v. United States, 258 U.S. 451 (1922), or to discuss it only in passing, see, e.g., Motion Picture Patents, 243 U.S. at 508, 512, 518. It was not until Times-Picayune Publishing Co. v. United States, 345 U.S. 594 (1953), that the separate-products issue became a distinct element of the test for an illegal tie. Id. at 614. Even that case engaged in a rather cursory inquiry into whether ads sold in the morning edition of a paper were a separate product from ads sold in the evening edition.

The first case to give content to the separate-products test was Jefferson Parish, 466 U.S. 2. That case addressed a tying arrangement in which a hospital conditioned surgical care at its facility on the purchase of anesthesiological services from an affiliated medical group. The facts were a challenge for casual separate-products analysis because the tied service--anesthesia--was neither intuitively distinct from nor intuitively contained within the tying service--surgical care. A further complication was that, soon after the Court enunciated the per se rule for tying liability in International Salt Co. v. United States, 332 U.S. 392, 396 (1947), and Northern Pacific Railway Co. v. United States, 356 U.S. 1, 57 (1958), new economic research began to cast doubt on the assumption, voiced by the Court when it established the rule, that " 'tying agreements serve hardly any purpose beyond the suppression of competition,'

" id. at 6 (quoting Standard Oil of Cal. v. United States, 337 U.S. 293, 305-06 (1949)); see also Jefferson Parish, 466 U.S. at 15 n.23 (citing materials); Fortner Enters. v. U.S. Steel Corp., 394 U.S. 495, 524-25 (1969) (Fortas, J., dissenting) ("Fortner I").

The Jefferson Parish Court resolved the matter in two steps. First, it clarified that "the answer to the question whether one or two products are involved" does not turn "on the functional relation between them...." Jefferson Parish, 466 U.S. at 19; see also id. at 19 n.30. In other words, the mere fact that two items are complements, that "one ... is useless without the other," id., does not make them a single "product" for purposes of tying law. Accord Eastman Kodak, 504 U.S. at 463. Second, reasoning that the "definitional question [whether two distinguishable products are involved] depends on whether the arrangement may have the type of competitive consequences addressed by the rule [against tying]," Jefferson Parish, 466 U.S. at 21, the Court decreed that "no tying arrangement can exist unless there is a sufficient demand for the purchase of anesthesiological services separate from hospital services to identify a distinct product market in which it is efficient to offer anesthesiological services separately from hospital service," id. at 21-22 (emphasis added); accord Eastman Kodak, 504 U.S. at 462.

The Court proceeded to examine direct and indirect evidence of consumer demand for the tied product separate from the tying product. Direct evidence addresses the question whether, when given a choice, consumers purchase the tied good from the tying good maker, or from other firms. The Court took note, for example, of testimony that patients and surgeons often requested specific anesthesiologists not associated with a hospital. Jefferson Parish, 466 U.S. at 22. Indirect evidence includes the behavior of firms without market power in the tying good market, presumably on the notion that (competitive) supply follows demand. If competitive firms always bundle the tying and tied goods, then they are a single product. See id. at 22 n.36; see also Eastman Kodak, 504 U.S. at 462; Fortner I, 394 U.S. at 525 (Fortas, J., dissenting), cited in Jefferson Parish, 466 U.S. at 12, 22 n.35; United States v. Jerrold Elecs. Corp., 187 F. Supp. 545, 559 (E.D. Pa. 1960), aff'd per curiam, 365 U.S. 567 (1961); 10 Phillip E. Areeda et al., Antitrust Law p 1744, at 197-201 (1996). Here the Court noted that only 27% of anesthesiologists in markets other than the defendant's had financial relationships with hospitals, and that, unlike radiologists and pathologists, anesthesiologists were not usually employed by hospitals, i.e., bundled with hospital services. Jefferson Parish, 466 U.S. at 22 n.36. With both direct and indirect evidence concurring, the Court determined that hospital surgery and anesthesiological services were distinct goods.

To understand the logic behind the Court's consumer demand test, consider first the postulated harms from tying. The core concern is that tying prevents goods from competing directly for consumer choice on their merits, i.e., being selected as a result of "buyers' independent judgment," id. at 13 (internal quotes omitted). With a tie, a buyer's "freedom to select the best bargain in the second market [could be] impaired by his need to purchase the tying product, and perhaps by an inability to evaluate the true cost of either product...." Id. at 15. Direct competition on the merits of the tied product is foreclosed when the tying product either is sold only in a bundle with the tied product or, though offered separately, is sold at a bundled price, so that the buyer pays the same price whether he takes the tied product or not. In both cases, a consumer buying the tying product becomes entitled to the tied product; he will therefore likely be unwilling to buy a competitor's version of the tied product even if, making his own price/quality assessment, that is what he would prefer.

But not all ties are bad. Bundling obviously saves distribution and consumer transaction costs. 9 Phillip E. Areeda, Antitrust Law p 1703g2, at 51-52 (1991). This is likely to be true, to take some examples from the computer industry, with the integration of math co-processors and memory into microprocessor chips and the inclusion of spell checkers in word processors. 11/10/98 pm Tr. at 18-19 (trial testimony of Steven McGeady of Intel), reprinted in 9 J.A. at 5581-82 (math co-processor); Cal. Computer Prods., Inc. v. IBM Corp., 613 F.2d 727, 744 & n.29 (9th Cir. 1979) (memory). Bundling can also capitalize on certain economies of scope. A possible example is the "shared" library files that perform OS and browser functions with the very same lines of code and thus may save drive space from the clutter of redundant routines and memory when consumers use both the OS and browser simultaneously. 11/16/98 pm Tr. at 44 (trial testimony of Glenn Weadock), reprinted in 9 J.A. at 5892; Direct Testimony of Microsoft's James Allchin p p 10, 97, 100, 106116, app. A (excluding p p f, g.vi), reprinted in 5 J.A. at 3292, 3322-30, 3412-17. Indeed, if there were no efficiencies from a tie (including economizing on consumer transaction costs such as the time and effort involved in choice), we would expect distinct consumer demand for each individual component of every good. In a competitive market with zero transaction costs, the computers on which this opinion was written would only be sold piecemeal--keyboard, monitor, mouse, central processing unit, disk drive, and memory all sold in separate transactions and likely by different manufacturers.

Recognizing the potential benefits from tying, see Jefferson Parish, 466 U.S. at 21 n.33, the Court in Jefferson Parish forged a separate-products test that, like those of market power and substantial foreclosure, attempts to screen out false positives under per se analysis. The consumer demand test is a rough proxy for whether a tying arrangement may, on balance, be welfare-enhancing, and unsuited to per se condemnation. In the abstract, of course, there is always direct separate demand for products: assuming choice is available at zero cost, consumers will prefer it to no choice. Only when the efficiencies from bundling are dominated by the benefits to choice for enough consumers, however, will we actually observe consumers making independent purchases. In other words, perceptible separate demand is inversely proportional to net efficiencies. On the supply side, firms without market power will bundle two goods only when the cost savings from joint sale outweigh the value consumers place on separate choice. So bundling by all competitive firms implies strong net efficiencies. If a court finds either that there is no noticeable separate demand for the tied product or, there being no convincing direct evidence of separate demand, that the entire "competitive fringe" engages in the same behavior as the defendant, 10 Areeda et al., Antitrust Law p 1744c4, at 200, then the tying and tied products should be declared one product and per se liability should be rejected.

Before concluding our exegesis of Jefferson Parish's separate-products test, we should clarify two things. First, Jefferson Parish does not endorse a direct inquiry into the efficiencies of a bundle. Rather, it proposes easy-toadminister proxies for net efficiency. In describing the separate-products test we discuss efficiencies only to explain the rationale behind the consumer demand inquiry. To allow the separate-products test to become a detailed inquiry into possible welfare consequences would turn a screening test into the very process it is expected to render unnecessary. 10 Areeda et al., Antitrust Law p p 1741b & c, at 180-85; see also Jefferson Parish, 466 U.S. at 34-35 (O'Connor, J., concurring).

Second, the separate-products test is not a one-sided inquiry into the cost savings from a bundle. Although Jefferson Parish acknowledged that prior lower court cases looked at cost-savings to decide separate products, see id. at 22 n.35, the Court conspicuously did not adopt that approach in its disposition of tying arrangement before it. Instead it chose proxies that balance costs savings against reduction in consumer choice.

With this background, we now turn to the separateproducts inquiry before us. The District Court found that many consumers, if given the option, would choose their browser separately from the OS. Findings of Fact p 151 (noting that "corporate consumers ... prefer to standardize on the same browser across different [OSs]" at the workplace). Turning to industry custom, the court found that, although all major OS vendors bundled browsers with their OSs, these companies either sold versions without a browser, or allowed OEMs or end-users either not to install the bundled browser or in any event to "uninstall" it. Id. p 153. The court did not discuss the record evidence as to whether OS vendors other than Microsoft sold at a bundled price, with no discount for a browserless OS, perhaps because the record evidence on the issue was in conflict. Compare, e.g., Direct Testimony of Richard Schmalensee p 241, reprinted in 7 J.A. at 4315 (" [A]ll major operating system vendors do in fact include Web-browsing software with the operating system at no extra charge.") (emphasis added), with, e.g., 1/6/99 pm Tr. at 42 (trial testimony of Franklin Fisher of MIT) (suggesting all OSs but Microsoft offer discounts).

Microsoft does not dispute that many consumers demand alternative browsers. But on industry custom Microsoft contends that no other firm requires non-removal because no other firm has invested the resources to integrate web browsing as deeply into its OS as Microsoft has. Appellant's Opening Br. at 25; cf. Direct Testimony of James Allchin p p 262-72, reprinted in 5 J.A. at 3385-89 (Apple, IBM); 11/5/98 pm Tr. at 55-58 (trial testimony of Apple's Avadis Tevanian, Jr.), reprinted in 9 J.A. at 5507-10 (Apple). (We here use the term "integrate" in the rather simple sense of converting individual goods into components of a single physical object (e.g., a computer as it leaves the OEM, or a disk or sets of disks), without any normative implication that such integration is desirable or achieves special advantages. Cf. United States v. Microsoft Corp., 147 F.3d 935, 950 (D.C. Cir. 1998) ("Microsoft II").) Microsoft contends not only that its integration of IE into Windows is innovative and beneficial but also that it requires non-removal of IE. In our discussion of monopoly maintenance we find that these claims fail the efficiency balancing applicable in that context. But the separate-products analysis is supposed to perform its function as a proxy without embarking on any direct analysis of efficiency. Accordingly, Microsoft's implicit argument--that in this case looking to a competitive fringe is inadequate to evaluate fully its potentially innovative technological integration, that such a comparison is between apples and oranges--poses a legitimate objection to the operation of Jefferson Parish's separate-products test for the per se rule.

In fact there is merit to Microsoft's broader argument that Jefferson Parish's consumer demand test would "chill innovation to the detriment of consumers by preventing firms from integrating into their products new functionality previously provided by standalone products--and hence, by definition, subject to separate consumer demand." Appellant's Opening Br. at 69. The per se rule's direct consumer demand and indirect industry custom inquiries are, as a general matter, backward-looking and therefore systematically poor proxies for overall efficiency in the presence of new and innovative integration. See 10 Areeda et al., Antitrust Law p 1746, at 224-29; Amicus Brief of Lawrence Lessig at 24-25, and sources cited therein (brief submitted regarding Conclusions of Law). The direct consumer demand test focuses on historic consumer behavior, likely before integration, and the indirect industry custom test looks at firms that, unlike the defendant, may not have integrated the tying and tied goods. Both tests compare incomparables--the defendant's decision to bundle in the presence of integration, on the one hand, and consumer and competitor calculations in its absence, on the other. If integration has efficiency benefits, these may be ignored by the Jefferson Parish proxies. Because one cannot be sure beneficial integration will be protected by the other elements of the per se rule, simple application of that rule's separate-products test may make consumers worse off.

In light of the monopoly maintenance section, obviously, we do not find that Microsoft's integration is welfare-enhancing or that it should be absolved of tying liability. Rather, we heed Microsoft's warning that the separate-products element of the per se rule may not give newly integrated products a fair shake.

B. Per Se Analysis Inappropriate for this Case.

We now address directly the larger question as we see it: whether standard per se analysis should be applied "off the shelf" to evaluate the defendant's tying arrangement, one which involves software that serves as a platform for thirdparty applications. There is no doubt that "[i]t is far too late in the history of our antitrust jurisprudence to question the proposition that certain tying arrangements pose an unacceptable risk of stifling competition and therefore are unreasonable 'per se.' " Jefferson Parish, 466 U.S. at 9 (emphasis added). But there are strong reasons to doubt that the integration of additional software functionality into an OS falls among these arrangements. Applying per se analysis to such an amalgamation creates undue risks of error and of deterring welfare-enhancing innovation.

The Supreme Court has warned that " ' [i]t is only after considerable experience with certain business relationships that courts classify them as per se violations....' " Broad. Music, 441 U.S. at 9 (quoting Topco Assocs., 405 U.S. at 60708); accord Cont'l T.V., Inc. v. GTE Sylvania Inc., 433 U.S. 36, 47-59 (1977); White Motor Co. v. United States, 372 U.S. 253, 263 (1963); Jerrold Elecs., 187 F. Supp. at 555-58, 56061; see also Frank H. Easterbrook, Allocating Antitrust Decisionmaking Tasks, 76 Geo. L.J. 305, 308 (1987). Yet the sort of tying arrangement attacked here is unlike any the Supreme Court has considered. The early Supreme Court cases on tying dealt with arrangements whereby the sale or lease of a patented product was conditioned on the purchase of certain unpatented products from the patentee. See Motion Picture Patents, 243 U.S. 502 (1917); United Shoe Mach., 258 U.S. 451 (1922); IBM Corp. v. United States, 298 U.S. 131 (1936); Int'l Salt, 332 U.S. 392 (1947). Later Supreme Court tying cases did not involve market power derived from patents, but continued to involve contractual ties. See Times-Picayune, 345 U.S. 594 (1953) (defendant newspaper conditioned the purchase of ads in its evening edition on the purchase of ads in its morning edition); N. Pac. Ry., 356 U.S. 1 (1958) (defendant railroad leased land only on the condition that products manufactured on the land be shipped on its railways); United States v. Loew's Inc., 371 U.S. 38 (1962) (defendant distributor of copyrighted feature films conditioned the sale of desired films on the purchase of undesired films); U.S. Steel Corp. v. Fortner Enters., Inc., 429 U.S. 610 (1977) ("Fortner II") (defendant steel company conditioned access to low interest loans on the purchase of the defendant's prefabricated homes); Jefferson Parish, 466 U.S. 2 (1984) (defendant hospital conditioned use of its operating rooms on the purchase of anesthesiological services from a medical group associated with the hospital); Eastman Kodak, 504 U.S. 451 (1992) (defendant photocopying machine manufacturer conditioned the sale of replacement parts for its machines on the use of the defendant's repair services).

In none of these cases was the tied good physically and technologically integrated with the tying good. Nor did the defendants ever argue that their tie improved the value of the tying product to users and to makers of complementary goods. In those cases where the defendant claimed that use of the tied good made the tying good more valuable to users, the Court ruled that the same result could be achieved via quality standards for substitutes of the tied good. See, e.g., Int'l Salt, 332 U.S. at 397-98; IBM, 298 U.S. at 138-40. Here Microsoft argues that IE and Windows are an integrated physical product and that the bundling of IE APIs with Windows makes the latter a better applications platform for third-party software. It is unclear how the benefits from IE APIs could be achieved by quality standards for different browser manufacturers. We do not pass judgment on Microsoft's claims regarding the benefits from integration of its APIs. We merely note that these and other novel, purported efficiencies suggest that judicial "experience" provides little basis for believing that, "because of their pernicious effect on competition and lack of any redeeming virtue," a software firm's decisions to sell multiple functionalities as a package should be "conclusively presumed to be unreasonable and therefore illegal without elaborate inquiry as to the precise harm they have caused or the business excuse for their use." N. Pac. Ry., 356 U.S. at 5 (emphasis added).

Nor have we found much insight into software integration among the decisions of lower federal courts. Most tying cases in the computer industry involve bundling with hardware. See, e.g., Digital Equip. Corp. v. Uniq Digital Techs., Inc., 73 F.3d 756, 761 (7th Cir. 1996) (Easterbrook, J.) (rejecting with little discussion the notion that bundling of OS with a computer is a tie of two separate products); Datagate, Inc. v. Hewlett-Packard Co., 941 F.2d 864, 870 (9th Cir. 1991) (holding that plaintiff's allegation that defendant conditioned its software on purchase of its hardware was sufficient to survive summary judgment); Digidyne Corp. v. Data Gen. Corp., 734 F.2d 1336, 1341-47 (9th Cir. 1984) (holding that defendant's conditioning the sale of its OS on the purchase of its CPU constitutes a per se tying violation); Cal. Computer Prods., 613 F.2d at 743-44 (holding that defendant's integration into its CPU of a disk controller designed for its own disk drives was a useful innovation and not an impermissible attempt to monopolize); ILC Peripherals Leasing Corp. v. IBM Corp., 448 F. Supp. 228, 233 (N.D. Cal. 1978) (finding that defendant's integration of magnetic disks and a head/disk assembly was not an unlawful tie), aff'd per curiam sub. nom. Memorex Corp. v. IBM Corp., 636 F.2d 1188 (9th Cir. 1980); see also Transamerica Computer Co. v. IBM Corp., 698 F.2d 1377, 1382-83 (9th Cir. 1983) (finding lawful defendant's design changes that rendered plaintiff peripheral maker's tape drives incompatible with the defendant's CPU). The hardware case that most resembles the present one is Telex Corp. v. IBM Corp., 367 F. Supp. 258 (N.D. Okla. 1973), rev'd on other grounds, 510 F.2d 894 (10th Cir. 1975). Just as Microsoft integrated web browsing into its OS, IBM in the 1970s integrated memory into its CPUs, a hardware platform. A peripheral manufacturer alleged a tying violation, but the District Court dismissed the claim because it thought it inappropriate to enmesh the courts in product design decisions. Id. at 347. The court's discussion of the tying claim was brief and did not dwell on the effects of the integration on competition or efficiencies. Nor did the court consider whether per se analysis of the alleged tie was wise.

We have found four antitrust cases involving arrangements in which a software program is tied to the purchase of a software platform--two district court cases and two appellate court cases, including one from this court. The first case, Innovation Data Processing, Inc. v. IBM Corp., 585 F. Supp. 1470 (D.N.J. 1984), involved an allegation that IBM bundled with its OS a utility used to transfer data from a tape drive to a computer's disk drive. Although the court mentioned the efficiencies achieved by bundling, it ultimately dismissed the per se tying claim because IBM sold a discounted version of the OS without the utility. Id. at 1475-76. The second case, A.I. Root Co. v. Computer/Dynamics, Inc., 806 F.2d 673 (6th Cir. 1986), was brought by a business customer who claimed that an OS manufacturer illegally conditioned the sale of its OS on the purchase of other software applications. The court quickly disposed of the case on the ground that defendant Computer/Dynamics had no market power. Id. at 675-77. There was no mention of the efficiencies from the tie. The third case, Caldera, Inc. v. Microsoft Corp., 72 F. Supp. 2d 1295 (D. Utah 1999), involved a complaint that the technological integration of MS-DOS and Windows 3.1 into Windows 95 constituted a per se tying violation. The court formulated the "single product" issue in terms of whether the tie constituted a technological improvement, ultimately concluding that Microsoft was not entitled to summary judgment on that issue. Id. at 1322-28.

The software case that bears the greatest resemblance to that at bar is, not surprisingly, Microsoft II, 147 F.3d 935, where we examined the bundling of IE with Windows 95. But the issue there was whether the bundle constituted an "integrated product" as the term was used in a 1994 consent decree between the Department of Justice and Microsoft. Id. at 939. We did not consider whether Microsoft's bundling should be condemned as per se illegal. We certainly did not make any finding that bundling IE with Windows had "no purpose except stifling of competition," White Motor, 372 U.S. at 263, an important consideration in defining the scope of any of antitrust law's per se rules, see Cont'l T.V., 433 U.S. at 57-59. While we believed our interpretation of the term "integrated product" was consistent with the test for separate products under tying law, we made clear that the "antitrust question is of course distinct." Microsoft II, 147 F.3d at 950 n.14. We even cautioned that our conclusion that IE and Windows 95 were integrated was "subject to reexamination on a more complete record." Id. at 952. To the extent that the decision completely disclaimed judicial capacity to evaluate "high-tech product design," id., it cannot be said to conform to prevailing antitrust doctrine (as opposed to resolution of the decree-interpretation issue then before us). In any case, mere review of asserted breaches of a consent decree hardly constitutes enough "experience" to warrant application of per se analysis. See Broad. Music, 441 U.S. at 10-16 (refusing to apply per se analysis to defendant's blanket licenses even though those licenses had been thoroughly

investigated by the Department of Justice and were the subject of a consent decree that had been reviewed by numerous courts).

While the paucity of cases examining software bundling suggests a high risk that per se analysis may produce inaccurate results, the nature of the platform software market affirmatively suggests that per se rules might stunt valuable innovation. We have in mind two reasons.

First, as we explained in the previous section, the separateproducts test is a poor proxy for net efficiency from newly integrated products. Under per se analysis the first firm to merge previously distinct functionalities (e.g., the inclusion of starter motors in automobiles) or to eliminate entirely the need for a second function (e.g., the invention of the stainresistant carpet) risks being condemned as having tied two separate products because at the moment of integration there will appear to be a robust "distinct" market for the tied product. See 10 Areeda et al., Antitrust Law p 1746, at 224. Rule of reason analysis, however, affords the first mover an opportunity to demonstrate that an efficiency gain from its "tie" adequately offsets any distortion of consumer choice. See Grappone, Inc. v. Subaru of New England, Inc., 858 F.2d 792, 799 (1st Cir. 1988) (Breyer, J.); see also Town Sound & Custom Tops, Inc. v. Chrysler Motor Corp., 959 F.2d 468, 482 (3d Cir. 1992); Kaiser Aluminum & Chem. Sales, Inc. v. Avondale Shipyards, Inc., 677 F.2d 1045, 1048-49 n.5 (5th Cir. 1982).

The failure of the separate-products test to screen out certain cases of productive integration is particularly troubling in platform software markets such as that in which the defendant competes. Not only is integration common in such markets, but it is common among firms without market power. We have already reviewed evidence that nearly all competitive OS vendors also bundle browsers. Moreover, plaintiffs do not dispute that OS vendors can and do incorporate basic internet plumbing and other useful functionality into their OSs. See Direct Testimony of Richard Schmalensee p 508, reprinted in 7 J.A. at 4462-64 (disk defragmentation, memory management, peer-to-peer networking or file sharing); 11/19/98 am Tr. at 82-83 (trial testimony of Frederick Warren-Boulton), reprinted in 10 J.A. at 6427-28 (TCP/IP stacks). Firms without market power have no incentive to package different pieces of software together unless there are efficiency gains from doing so. The ubiquity of bundling in competitive platform software markets should give courts reason to pause before condemning such behavior in less competitive markets.

Second, because of the pervasively innovative character of platform software markets, tying in such markets may produce efficiencies that courts have not previously encountered and thus the Supreme Court had not factored into the per se rule as originally conceived. For example, the bundling of a browser with OSs enables an independent software developer to count on the presence of the browser's APIs, if any, on consumers' machines and thus to omit them from its own package. See Direct Testimony of Richard Schmalensee p p 230-31, 234, reprinted in 7 J.A. at 4309-11, 4312; Direct Testimony of Michael Devlin p p 12-21, reprinted in 5 J.A. at 3525-29; see also Findings of Fact p 2. It is true that software developers can bundle the browser APIs they need with their own products, see id. p 193, but that may force consumers to pay twice for the same API if it is bundled with two different software programs. It is also true that OEMs can include APIs with the computers they sell, id., but diffusion of uniform APIs by that route may be inferior. First, many OEMs serve special subsets of Windows consumers, such as home or corporate or academic users. If just one of these OEMs decides not to bundle an API because it does not benefit enough of its clients, ISVs that use that API might have to bundle it with every copy of their program. Second, there may be a substantial lag before all OEMs bundle the same set of APIs--a lag inevitably aggravated by the first phenomenon. In a field where programs change very rapidly, delays in the spread of a necessary element (here, the APIs) may be very costly. Of course, these arguments may not justify Microsoft's decision to bundle APIs in this case, particularly because Microsoft did not merely bundle with Windows the APIs from IE, but an entire browser application (sometimes even without APIs, see id.). A justification for bundling a component of software may not be one for bundling the entire software package, especially given the malleability of software code. See id. p p 162-63; 12/9/98 am Tr. at 17 (trial testimony of David Farber); 1/6/99 am Tr. at 6-7 (trial testimony of Franklin Fisher), reprinted in 11 J.A. at 7192-93; Direct Testimony of Joachim Kempin p 286, reprinted in 6 J.A. at 3749. Furthermore, the interest in efficient API diffusion obviously supplies a far stronger justification for simple price-bundling than for Microsoft's contractual or technological bars to subsequent removal of functionality. But our qualms about redefining the boundaries of a defendant's product and the possibility of consumer gains from simplifying the work of applications developers makes us question any hard and fast approach to tying in OS software markets.

There may also be a number of efficiencies that, although very real, have been ignored in the calculations underlying the adoption of a per se rule for tying. We fear that these efficiencies are common in technologically dynamic markets where product development is especially unlikely to follow an easily foreseen linear pattern. Take the following example from ILC Peripherals, 448 F. Supp. 228, a case concerning the evolution of disk drives for computers. When IBM first introduced such drives in 1956, it sold an integrated product that contained magnetic disks and disk heads that read and wrote data onto disks. Id. at 231. Consumers of the drives demanded two functions--to store data and to access it all at once. In the first few years consumers' demand for storage increased rapidly, outpacing the evolution of magnetic disk technology. To satisfy that demand IBM made it possible for consumers to remove the magnetic disks from drives, even though that meant consumers would not have access to data on disks removed from the drive. This componentization enabled makers of computer peripherals to sell consumers removable disks. Id. at 231-32. Over time, however, the technology of magnetic disks caught up with demand for capacity, so that consumers needed few removable disks to store all their data. At this point IBM reintegrated disks into their drives, enabling consumers to once again have immediate access to all their data without a sacrifice in capacity. Id. A manufacturer of removable disks sued. But the District Court found the tie justified because it satisfied consumer demand for immediate access to all data, and ruled that disks and disk heads were one product. Id. at 233. A court hewing more closely to the truncated analysis contemplated by Northern Pacific Railway would perhaps have overlooked these consumer benefits.

These arguments all point to one conclusion: we cannot comfortably say that bundling in platform software markets has so little "redeeming virtue," N. Pac. Ry., 356 U.S. at 5, and that there would be so "very little loss to society" from its ban, that "an inquiry into its costs in the individual case [can be] considered [ ] unnecessary." Jefferson Parish, 466 U.S. at 33-34 (O'Connor, J., concurring). We do not have enough empirical evidence regarding the effect of Microsoft's practice on the amount of consumer surplus created or consumer choice foreclosed by the integration of added functionality into platform software to exercise sensible judgment regarding that entire class of behavior. (For some issues we have no data.) "We need to know more than we do about the actual impact of these arrangements on competition to decide whether they ... should be classified as per se violations of the Sherman Act." White Motor, 372 U.S. at 263. Until then, we will heed the wisdom that "easy labels do not always supply ready answers," Broad. Music, 441 U.S. at 8, and vacate the District Court's finding of per se tying liability under Sherman Act 1. We remand the case for evaluation of Microsoft's tying arrangements under the rule of reason. See Pullman-Standard v. Swint, 456 U.S. 273, 292 (1982) (" [W]here findings are infirm because of an erroneous view of the law, a remand is the proper course unless the record permits only one resolution of the factual issue."). That rule more freely permits consideration of the benefits of bundling in software markets, particularly those for OSs, and a balancing of these benefits against the costs to consumers whose ability to make direct price/quality tradeoffs in the tied market may have been impaired. See Jefferson Parish, 466 U.S. at 25 nn.41-42 (noting that per se rule does not broadly permit consideration of procompetitive justifications); id. at 34-35 (O'Connor, J., concurring); N. Pac. Ry., 356 U.S. at 5.

Our judgment regarding the comparative merits of the per se rule and the rule of reason is confined to the tying arrangement before us, where the tying product is software whose major purpose is to serve as a platform for third-party applications and the tied product is complementary software functionality. While our reasoning may at times appear to have broader force, we do not have the confidence to speak to facts outside the record, which contains scant discussion of software integration generally. Microsoft's primary justification for bundling IE APIs is that their inclusion with Windows increases the value of third-party software (and Windows) to consumers. See Appellant's Opening Br. at 41-43. Because this claim applies with distinct force when the tying product is platform software, we have no present basis for finding the per se rule inapplicable to software markets generally. Nor should we be interpreted as setting a precedent for switching to the rule of reason every time a court identifies an efficiency justification for a tying arrangement. Our reading of the record suggests merely that integration of new functionality into platform software is a common practice and that wooden application of per se rules in this litigation may cast a cloud over platform innovation in the market for PCs, network computers and information appliances.

Should plaintiffs choose to pursue a tying claim under the rule of reason, we note the following for the benefit of the trial court:

First, on remand, plaintiffs must show that Microsoft's conduct unreasonably restrained competition. Meeting that burden "involves an inquiry into the actual effect" of Microsoft's conduct on competition in the tied good market, Jefferson Parish, 466 U.S. at 29, the putative market for browsers. To the extent that certain aspects of tying injury may depend on a careful definition of the tied good market and a showing of barriers to entry other than the tying arrangement itself, plaintiffs would have to establish these points. See Jefferson Parish, 466 U.S. at 29 ("This competition [among anesthesiologists] takes place in a market that has not been defined."); id. at 29 n.48 (" [N]either the District Court nor the Court of Appeals made any findings concerning the contract's effect on entry barriers."). But plaintiffs were required--and had every incentive--to provide both a definition of the browser market and barriers to entry to that market as part of their 2 attempted monopolization claim; yet they failed to do so. See supra Section III. Accordingly, on remand of the 1 tying claim, plaintiffs will be precluded from arguing any theory of harm that depends on a precise definition of browsers or barriers to entry (for example, network effects from Internet protocols and extensions embedded in a browser) other than what may be implicit in Microsoft's tying arrangement.

Of the harms left, plaintiffs must show that Microsoft's conduct was, on balance, anticompetitive. Microsoft may of course offer procompetitive justifications, and it is plaintiffs' burden to show that the anticompetitive effect of the conduct outweighs its benefit.

Second, the fact that we have already considered some of the behavior plaintiffs allege to constitute tying violations in the monopoly maintenance section does not resolve the 1 inquiry. The two practices that plaintiffs have most ardently claimed as tying violations are, indeed, a basis for liability under plaintiffs' 2 monopoly maintenance claim. These are Microsoft's refusal to allow OEMs to uninstall IE or remove it from the Windows desktop, Findings of Fact p p 158, 203, 213, and its removal of the IE entry from the Add/Remove Programs utility in Windows 98, id. p 170. See supra Section II.B. In order for the District Court to conclude these practices also constitute 1 tying violations, plaintiffs must demonstrate that their benefits--if any, see supra Sections II.B.1.b and II.B.2.b; Findings of Fact p p 176, 186, 193--are outweighed by the harms in the tied product market. See Jefferson Parish, 466 U.S. at 29. If the District Court is convinced of net harm, it must then consider whether any additional remedy is necessary.

In Section II.B we also considered another alleged tying violation--the Windows 98 override of a consumer's choice of default web browser. We concluded that this behavior does not provide a distinct basis for 2 liability because plaintiffs failed to rebut Microsoft's proffered justification by demonstrating that harms in the operating system market outweigh Microsoft's claimed benefits. See supra Section II.B. On remand, however, although Microsoft may offer the same procompetitive justification for the override, plaintiffs must have a new opportunity to rebut this claim, by demonstrating that the anticompetitive effect in the browser market is greater than these benefits.

Finally, the District Court must also consider an alleged tying violation that we did not consider under 2 monopoly maintenance: price bundling. First, the court must determine if Microsoft indeed price bundled--that is, was Microsoft's charge for Windows and IE higher than its charge would have been for Windows alone? This will require plaintiffs to resolve the tension between Findings of Fact p p 136-37, which Microsoft interprets as saying that no part of the bundled price of Windows can be attributed to IE, and Conclusions of Law, at 50, which says the opposite. Compare Direct Testimony of Paul Maritz p p 37, 296, reprinted in 6 J.A. at 3656, 3753-54 (Microsoft did not "charge separately" for IE, but like all other major OS vendors included browsing software at "no extra charge"), with GX 202 at MS7 004343, esp. 004347, reprinted in 22 J.A. at 14459, esp. 14463 (memo from Christian Wildfeuer describing focus group test used to price Windows 98 with IE 4), and GX 1371 at MS7 003729-30, 003746, 003748, esp. 003750, reprinted in 15 J.A. at 10306-07, 10323, 10325, esp. 10327 (Windows 98 pricing and marketing memo), and Findings of Fact p 63 (identifying GX 202 as the basis for Windows 98 pricing).

If there is a positive price increment in Windows associated with IE (we know there is no claim of price predation), plaintiffs must demonstrate that the anticompetitive effects of Microsoft's price bundling outweigh any procompetitive justifications the company provides for it. In striking this balance, the District Court should consider, among other things, indirect evidence of efficiency provided by "the competitive fringe." See supra Section IV.A. Although this inquiry may overlap with the separate-products screen under the per se rule, that is not its role here. Because courts applying the rule of reason are free to look at both direct and indirect evidence of efficiencies from a tie, there is no need for a screening device as such; thus the separate-products inquiry serves merely to classify arrangements as subject to tying law, as opposed to, say, liability for exclusive dealing. See Times-Picayune, 345 U.S. at 614 (finding a single product and then turning to a general rule of reason analysis under 1, though not using the term "tying"); Foster v. Md. State Sav. & Loan Ass'n, 590 F.2d 928, 931, 933 (D.C. Cir. 1978), cited in Jefferson Parish, 466 U.S. at 40 (O'Connor, J., concurring) (same); see also Chawla v. Shell Oil Co., 75 F. Supp. 2d 626, 635, 643-44 (S.D. Tex. 1999) (considering a rule of reason tying claim after finding a single product under the per se rule); Montgomery County Ass'n of Realtors v. Realty Photo Master Corp., 783 F. Supp. 952, 961 & n.26 (D. Md. 1992), aff'd mem. 993 F.2d 1538 (4th Cir. 1993) (same).

If OS vendors without market power also sell their software bundled with a browser, the natural inference is that sale of the items as a bundle serves consumer demand and that unbundled sale would not, for otherwise a competitor could profitably offer the two products separately and capture sales of the tying good from vendors that bundle. See 10 Areeda et al., Antitrust Law p 1744b, at 197-98. It does appear that most if not all firms have sold a browser with their OSs at a bundled price, beginning with IBM and its OS/2 Warp OS in September 1994, Findings of Fact p 140; see also Direct Testimony of Richard Schmalensee p 212, reprinted in 7 J.A. at 4300-01, and running to current versions of Apple's Mac OS, Caldera and Red Hat's Linux OS, Sun's Solaris OS, Be's BeOS, Santa Cruz Operation's UnixWare, Novell's NetWare OS, and others, see Findings of Fact p 153; Direct Testimony of Richard Schmalensee p p 215-23, 230, esp. table 5, reprinted in 7 J.A. at 4302-05, 4310; Direct Testimony of James Allchin p p 261-77, reprinted in 5 J.A. at 3384-92.

Of course price bundling by competitive OS makers would tend to exonerate Microsoft only if the sellers in question sold their browser/OS combinations exclusively at a bundled price. If a competitive seller offers a discount for a browserless version, then--at least as to its OS and browser--the gains from bundling are outweighed by those from separate choice. The evidence on discounts appears to be in conflict. Compare Direct Testimony of Richard Schmalensee p 241, reprinted in 7 J.A. at 4315, with 1/6/99 pm Tr. at 42 (trial testimony of Franklin Fisher). If Schmalensee is correct that nearly all OS makers do not offer a discount, then the harm from tying--obstruction of direct consumer choice--would be theoretically created by virtually all sellers: a customer who would prefer an alternate browser is forced to pay the full price of that browser even though its value to him is only the increment in value over the bundled browser. (The result is similar to that from non-removal, which forces consumers who want the alternate browser to surrender disk space taken up by the unused, bundled browser.) If the failure to offer a price discount were universal, any impediment to direct consumer choice created by Microsoft's price-bundled sale of IE with Windows would be matched throughout the market; yet these OS suppliers on the competitive fringe would have evidently found this price bundling on balance efficient. If Schmalensee's assertions are ill-founded, of course, no such inference could be drawn.

Microsoft additionally challenges the District Court's procedural rulings on two fronts. First, with respect to the trial phase, Microsoft proposes that the court mismanaged its docket by adopting an expedited trial schedule and receiving evidence through summary witnesses. Second, with respect to the remedies decree, Microsoft argues that the court improperly ordered that it be divided into two separate companies. Only the latter claim will long detain us. The District Court's trial-phase procedures were comfortably within the bounds of its broad discretion to conduct trials as it sees fit. We conclude, however, that the District Court's remedies decree must be vacated for three independent reasons: (1) the court failed to hold a remedies-specific evidentiary hearing when there were disputed facts; (2) the court failed to provide adequate reasons for its decreed remedies; and (3) this Court has revised the scope of Microsoft's liability and it is impossible to determine to what extent that should affect the remedies provisions.

On April 3, 2000, the District Court concluded the liability phase of the proceedings by the filing of its Conclusions of Law holding that Microsoft had violated 1 and 2 of the Sherman Act. The court and the parties then began discussions of the procedures to be followed in the imposition of remedies. Initially, the District Court signaled that it would enter relief only after conducting a new round of proceedings. In its Conclusions of Law, the court stated that it would issue a remedies order "following proceedings to be established by further Order of the Court." Conclusions of Law, at 57. And, when during a post-trial conference, Microsoft's counsel asked whether the court "contemplate [d] further proceedings," the judge replied, "Yes. Yes. I assume that there would be further proceedings." 4/4/00 Tr. at 8-9, 11, reprinted in 4 J.A. at 2445-46, 2448. The District Court further speculated that those proceedings might "replicate the procedure at trial with testimony in written form subject to crossexamination." Id. at 11, reprinted in 4 J.A. at 2448.

On April 28, 2000, plaintiffs submitted their proposed final judgment, accompanied by six new supporting affidavits and several exhibits. In addition to a series of temporary conduct restrictions, plaintiffs proposed that Microsoft be split into two independent corporations, with one continuing Microsoft's operating systems business and the other undertaking the balance of Microsoft's operations. Plaintiffs' Proposed Final Judgment at 2-3, reprinted in 4 J.A. at 2473-74. Microsoft filed a "summary response" on May 10, contending both that the proposed decree was too severe and that it would be impossible to resolve certain remedies-specific factual disputes "on a highly expedited basis." Defendant's Summary Response at 6-7, reprinted in 4 J.A. at 2587-88. Another May 10 submission argued that if the District Court considered imposing plaintiffs' proposed remedy, "then substantial discovery, adequate time for preparation and a full trial on relief will be required." Defendant's Position as to Future Proceedings at 2, reprinted in 4 J.A. at 2646.

After the District Court revealed during a May 24 hearing that it was prepared to enter a decree without conducting "any further process," 5/24/00 pm Tr. at 33, reprinted in 14 J.A. at 9866, Microsoft renewed its argument that the underlying factual disputes between the parties necessitated a remedies-specific evidentiary hearing. In two separate offers of proof, Microsoft offered to produce a number of pieces of evidence, including the following:

* Testimony from Dr. Robert Crandall, a Senior Fellow at the Brookings Institution, that divestiture and dissolution orders historically have "failed to improve economic welfare by reducing prices or increasing output." Defendant's Offer of Proof at 2, reprinted in 4 J.A. at 2743.

* Testimony from Professor Kenneth Elzinga, Professor of Economics at the University of Virginia, that plaintiffs' proposed remedies would not induce entry into the operating systems market. Id. at 4, reprinted in 4 J.A. at 2745.

* Testimony from Dean Richard Schmalensee, Dean of MIT's Sloan School of Management, that dividing Microsoft likely would "harm consumers through higher prices, lower output, reduced efficiency, and less innovation" and would "produce immediate, substantial increases in the prices of both Windows and Office." Id. at 8, reprinted in 4 J.A. at 2749. Indeed, it would cause the price of Windows to triple. Id. . Testimony from Goldman, Sachs & Co. and from Morgan Stanley Dean Witter that dissolution would adversely affect shareholder value. Id. at 17, 19, reprinted in 4 J.A. at 2758, 2760.

* Testimony from Microsoft Chairman Bill Gates that dividing Microsoft "along the arbitrary lines proposed by the Government" would devastate the company's proposed Next Generation Windows Services platform, which would allow software developers to write web-based applications that users could access from a wide range of devices. Id. at 21-22, reprinted in 4 J.A. at 2762-63.

* Testimony from Steve Ballmer, Microsoft's President and CEO, that Microsoft is organized as a unified company and that "there are no natural lines along which Microsoft could be broken up without causing serious problems." Id. at 23, reprinted in 4 J.A. at 2764.

* Testimony from Michael Capellas, CEO of Compaq, that splitting Microsoft in two "will make it more difficult for OEMs to provide customers with the tightly integrated product offerings they demand" in part because "complementary products created by unrelated companies do not work as well together as products created by a single company." Defendant's Supplemental Offer of Proof at 2, reprinted in 4 J.A. at 2823.

Over Microsoft's objections, the District Court proceeded to consider the merits of the remedy and on June 7, 2000 entered its final judgment. The court explained that it would not conduct "extended proceedings on the form a remedy should take," because it doubted that an evidentiary hearing would "give any significantly greater assurance that it will be able to identify what might be generally regarded as an optimum remedy." Final Judgment, at 62. The bulk of Microsoft's proffered facts were simply conjectures about future events, and " [i]n its experience the Court has found testimonial predictions of future events generally less reliable even than testimony as to historical fact, and crossexamination to be of little use in enhancing or detracting from their accuracy." Id. Nor was the court swayed by Microsoft's "profession of surprise" at the possibility of structural relief. Id. at 61. "From the inception of this case Microsoft knew, from well-established Supreme Court precedents dating from the beginning of the last century, that a mandated divestiture was a possibility, if not a probability, in the event of an adverse result at trial." Id.

The substance of the District Court's remedies order is nearly identical to plaintiffs' proposal. The decree's centerpiece is the requirement that Microsoft submit a proposed plan of divestiture, with the company to be split into an "Operating Systems Business," or "OpsCo," and an "Applications Business," or "AppsCo." Final Judgment, Decree 1.a, l.c.i, at 64. OpsCo would receive all of Microsoft's operating systems, such as Windows 98 and Windows 2000, while AppsCo would receive the remainder of Microsoft's businesses, including IE and Office. The District Court identified four reasons for its "reluctant [ ]" conclusion that "a structural remedy has become imperative." Id. at 62. First, Microsoft "does not yet concede that any of its business practices violated the Sherman Act." Id. Second, the company consequently "continues to do business as it has in the past." Id. Third, Microsoft "has proved untrustworthy in the past." Id. And fourth, the Government, whose officials "are by reason of office obliged and expected to consider-and to act in--the public interest," won the case, "and for that reason alone have some entitlement to a remedy of their choice." Id. at 62-63.

The decree also contains a number of interim restrictions on Microsoft's conduct. For instance, Decree 3.b requires Microsoft to disclose to third-party developers the APIs and other technical information necessary to ensure that software effectively interoperates with Windows. Id. at 67. "To facilitate compliance," 3.b further requires that Microsoft establish "a secure facility" at which third-party representatives may "study, interrogate and interact with relevant and necessary portions of [Microsoft platform software] source code." Id. Section 3.e, entitled "Ban on Exclusive Dealing," forbids Microsoft from entering contracts which oblige third parties to restrict their "development, production, distribution, promotion or use of, or payment for" non-Microsoft platformlevel software. Id. at 68. Under Decree 3.f--"Ban on Contractual Tying"--the company may not condition its grant of a Windows license on a party's agreement "to license, promote, or distribute any other Microsoft software product." Id. And 3.g imposes a "Restriction on Binding Middleware Products to Operating System Products" unless Microsoft also offers consumers "an otherwise identical version" of the operating system without the middleware. Id.

Microsoft's first contention--that the District Court erred by adopting an expedited trial schedule and receiving evidence through summary witnesses--is easily disposed of. Trial courts have extraordinarily broad discretion to determine the manner in which they will conduct trials. "This is particularly true in a case such as the one at bar where the proceedings are being tried to the court without a jury." Eli Lilly & Co., Inc. v. Generix Drug Sales, Inc., 460 F.2d 1096, 1105 (5th Cir. 1972). In such cases, " [a]n appellate court will not interfere with the trial court's exercise of its discretion to control its docket and dispatch its business ... except upon the clearest showing that the procedures have resulted in actual and substantial prejudice to the complaining litigant." Id. Microsoft fails to clear this high hurdle. Although the company claims that setting an early trial date inhibited its ability to conduct discovery, it never identified a specific deposition or document it was unable to obtain. And while Microsoft now argues that the use of summary witnesses made inevitable the improper introduction of hearsay evidence, the company actually agreed to the District Court's proposal to limit each side to 12 summary witnesses. 12/2/98 am Tr. at 11, reprinted in 21 J.A. at 14083 (court admonishing Microsoft's counsel to " [k]eep in mind that both sides agreed to the number of witnesses"). Even absent Microsoft's agreement, the company's challenge fails to show that this use of summary witnesses falls outside the trial court's wide latitude to receive evidence as it sees fit. General Elec. Co. v. Joiner, 522 U.S. 136, 141-42 (1997). This is particularly true given the presumption that a judge who conducts a bench trial has ignored any inadmissible evidence, Harris v. Rivera, 454 U.S. 339, 346 (1981)--a presumption that Microsoft makes no serious attempt to overcome. Indeed, under appropriate circumstances with appropriate instructions, we have in the past approved the use of summary witnesses even in jury trials. See, e.g., United States v. Lemire, 720 F.2d 1327 (D.C. Cir. 1983). Therefore, neither the use of the summary witnesses nor any other aspect of the District Court's conduct of the trial phase amounted to an abuse of discretion.

The District Court's remedies-phase proceedings are a different matter. It is a cardinal principle of our system of justice that factual disputes must be heard in open court and resolved through trial-like evidentiary proceedings. Any other course would be contrary "to the spirit which imbues our judicial tribunals prohibiting decision without hearing." Sims v. Greene, 161 F.2d 87, 88 (3d Cir. 1947).

A party has the right to judicial resolution of disputed facts not just as to the liability phase, but also as to appropriate relief. "Normally, an evidentiary hearing is required before an injunction may be granted." United States v. McGee, 714 F.2d 607, 613 (6th Cir. 1983); see also Charlton v. Estate of Charlton, 841 F.2d 988, 989 (9th Cir. 1988) ("Generally the entry or continuation of an injunction requires a hearing. Only when the facts are not in dispute, or when the adverse party has waived its right to a hearing, can that significant procedural step be eliminated." (citation and internal quotation marks omitted)). Other than a temporary restraining order, no injunctive relief may be entered without a hearing. See generally Fed. R. Civ. P. 65. A hearing on the merits-i.e., a trial on liability--does not substitute for a relief-specific evidentiary hearing unless the matter of relief was part of the trial on liability, or unless there are no disputed factual issues regarding the matter of relief.

This rule is no less applicable in antitrust cases. The Supreme Court "has recognized that a 'full exploration of facts is usually necessary in order (for the District Court) properly to draw (an antitrust) decree' so as 'to prevent future violations and eradicate existing evils.' " United States

v. Ward Baking Co., 376 U.S. 327, 330-31 (1964) (quoting Associated Press v. United States, 326 U.S. 1, 22 (1945)). Hence a remedies decree must be vacated whenever there is "a bona fide disagreement concerning substantive items of relief which could be resolved only by trial." Id. at 334; cf. Sims, 161 F.2d at 89 ("It has never been supposed that a temporary injunction could issue under the Clayton Act without giving the party against whom the injunction was sought an opportunity to present evidence on his behalf.").

Despite plaintiffs' protestations, there can be no serious doubt that the parties disputed a number of facts during the remedies phase. In two separate offers of proof, Microsoft identified 23 witnesses who, had they been permitted to testify, would have challenged a wide range of plaintiffs' factual representations, including the feasibility of dividing Microsoft, the likely impact on consumers, and the effect of divestiture on shareholders. To take but two examples, where plaintiffs' economists testified that splitting Microsoft in two would be socially beneficial, the company offered to prove that the proposed remedy would "cause substantial social harm by raising software prices, lowering rates of innovation and disrupting the evolution of Windows as a software development platform." Defendant's Offer of Proof at 6, reprinted in 4 J.A. at 2747. And where plaintiffs' investment banking experts proposed that divestiture might actually increase shareholder value, Microsoft proffered evidence that structural relief "would inevitably result in a significant loss of shareholder value," a loss that could reach "tens--possibly hundreds--of billions of dollars." Id. at 19, reprinted in 4 J.A. at 2760.

Indeed, the District Court itself appears to have conceded the existence of acute factual disagreements between Microsoft and plaintiffs. The court acknowledged that the parties were "sharply divided" and held "divergent opinions" on the likely results of its remedies decree. Final Judgment, at 62. The reason the court declined to conduct an evidentiary hearing was not because of the absence of disputed facts, but because it believed that those disputes could be resolved only through "actual experience," not further proceedings. Id. But a prediction about future events is not, as a prediction, any less a factual issue. Indeed, the Supreme Court has acknowledged that drafting an antitrust decree by necessity "involves predictions and assumptions concerning future economic and business events." Ford Motor Co. v. United States, 405 U.S. 562, 578 (1972). Trial courts are not excused from their obligation to resolve such matters through evidentiary hearings simply because they consider the bedrock procedures of our justice system to be "of little use." Final Judgment, at 62.

The presence of factual disputes thus distinguishes this case from the decisions plaintiffs cite for the proposition that Microsoft was not entitled to an evidentiary hearing. Indeed, far from assisting plaintiffs, these cases actually confirm the proposition that courts must hold evidentiary hearings when they are confronted with disputed facts. In Ford Motor Co., the Supreme Court affirmed a divestiture order after emphasizing that the District Court had "held nine days of hearings on the remedy." 405 U.S. at 571. In Davoll v. Webb, 194 F.3d 1116 (10th Cir. 1999), the defendant both failed to submit any offers of proof, and waived its right to an evidentiary hearing by expressly agreeing that relief should be determined based solely on written submissions. Id. at 114243. The defendants in American Can Co. v. Mansukhani, 814 F.2d 421 (7th Cir. 1987), were not entitled to a hearing on remedies because they failed "to explain to the district court what new proof they would present to show" that the proposed remedy was unwarranted. Id. at 425. And in Socialist Workers Party v. Illinois State Board of Elections, 566 F.2d 586 (7th Cir. 1977), aff'd, 440 U.S. 173 (1979), the Seventh Circuit held that a remedies-specific hearing was unnecessary because that case involved a pure question of legal interpretation and hence " [t]here was no factual dispute as to the ground on which the injunction was ordered." Id. at 587.

Unlike the parties in Davoll, American Can, and Socialist Workers Party, Microsoft both repeatedly asserted its right to an evidentiary hearing and submitted two offers of proof. The company's "summary response" to the proposed remedy argued that it would be "impossible" to address underlying factual issues "on a highly expedited basis," Defendant's Summary Response at 6-7, reprinted in 4 J.A. at 2587-88, and Microsoft further maintained that the court could not issue a decree unless it first permitted "substantial discovery, adequate time for preparation and a full trial on relief." Defendant's Position as to Future Proceedings at 2, reprinted in 4 J.A. at 2646. And in 53 pages of submissions, Microsoft identified the specific evidence it would introduce to challenge plaintiffs' representations.

Plaintiffs further argue--and the District Court held--that no evidentiary hearing was necessary given that Microsoft long had been on notice that structural relief was a distinct possibility. It is difficult to see why this matters. Whether Microsoft had advance notice that dissolution was in the works is immaterial to whether the District Court violated the company's procedural rights by ordering it without an evidentiary hearing. To be sure, "claimed surprise at the district court's decision to consider permanent injunctive relief does not, alone, merit reversal." Socialist Workers, 566 F.2d at 587. But in this case, Microsoft's professed surprise does not stand "alone." There is something more: the company's basic procedural right to have disputed facts resolved through an evidentiary hearing.

In sum, the District Court erred when it resolved the parties' remedies-phase factual disputes by consulting only the evidence introduced during trial and plaintiffs' remediesphase submissions, without considering the evidence Microsoft sought to introduce. We therefore vacate the District Court's final judgment, and remand with instructions to conduct a remedies-specific evidentiary hearing.