EN

Case No
COMP/M.5529 –
ORACLE/ SUN MICROSYSTEMS

Only the English text is authentic.

REGULATION (EC) No 139/2004
MERGER PROCEDURE

Article 8 (1)
Date: 21/01/2010

EUROPEAN COMMISSION

Brussels, 21.01.2010

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PUBLIC VERSION

COMMISSION DECISION

of 21.01.2010

declaring a concentration to be compatible with the common market and the functioning of the EEA Agreement

(Case No COMP/M.5529 - Oracle/ Sun Microsystems)

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(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to the Agreement on the European Economic Area, and in particular Article 57 thereof,

Having regard to Council Regulation (EC) No 139/2004 of 20 January 2004 on the control of concentrations between undertakings[1], and in particular Article 8(1) thereof,

Having regard to the Commission's decision of 3 September 2009 to initiate proceedings in this case,

Having given the undertakings concerned the opportunity to make known their views on the objections raised by the Commission,

Having regard to the opinion of the Advisory Committee on Concentrations[2],

Having regard to the final report of the Hearing Officer in this case[3],

WHEREAS:

1. On 30 July 2009 the Commission received a notification of a proposed concentration pursuant to Article 4 of the Regulation (EC) No 139/2004 ("the Merger Regulation") by which the undertaking Oracle Corporation ("Oracle" or the "notifying party", USA) acquires within the meaning of Article 3(1)(b) of the Merger Regulation control of the

1 OJ L 24, 29.1.2004, p. 1
2 OJ C ...,...2010, , p.
3 OJ C ...,...2010, , p.

whole of the undertaking Sun Microsystems, Inc. ("Sun", USA) by way of purchase of shares.

I. THE PARTIES

2. Oracle is a US publicly listed company, whose common stocks are traded on the NASDAQ. It develops and distributes enterprise software solutions and related services, including middleware, databases and enterprise application software ("EAS").

3. Sun is a US publicly listed company that provides hardware (servers, desktops, microelectronics, and storage devices) and software, including operating systems, Java technology, middleware, database software and related services.

II. THE OPERATION

4. The transaction comprises the acquisition by Oracle of 100% of the outstanding voting securities of Sun for a total value of approximately USD 7 400 million. To this end Oracle entered into an agreement with Soda Acquisition Corporation, its wholly owned subsidiary, and Sun pursuant to which Soda Acquisition Corporation will merge with and into Sun whereupon the separate existence of Soda Acquisition Corporation will cease and Sun will continue as the surviving corporation and become a wholly owned subsidiary of Oracle.

III. CONCENTRATION

5. As a result of the proposed transaction, Sun will be solely controlled by Oracle. The operation therefore constitutes a concentration within the meaning of Article 3(1)(b) of the Merger Regulation.

IV. COMMUNITY DIMENSION

6. The transaction has a Community dimension within the meaning of Article 1(2) of the Merger Regulation. The parties have a combined aggregate worldwide turnover in excess of EUR 5 000 million (Oracle EUR 16 981 million; Sun EUR 9 582 million) and a Community-wide turnover in excess of EUR 250 million (Oracle EUR 4 331 million; Sun EUR 2 992 million). The parties do not achieve more than two thirds of their Community-wide turnover within one and the same Member State.

V. PROCEDURE AND INVESTIGATION

A. Pre-notification

7. On 20 April 2009, Oracle announced that it had reached an agreement with Sun pursuant to which Oracle would acquire Sun. Oracle had a first meeting with the Commission to present the rationale of the deal on 24 April 2009. A second meeting took place on 14 May 2009. Oracle submitted a first draft Form CO on 25 June 2009 on which the Commission submitted questions and comments on 3 July 2009. Oracle submitted the second draft of the Form CO on 24 July 2009, on which the Commission submitted questions and comments on 28 and 29 July 2009.

8. During the pre-notification phase, the Commission sent questions to Oracle on 19 May, 3 July and 29 July 2009, enquiring *inter alia* about the market for database products (also “databases”).

B. First phase investigation

9. The concentration was notified on 30 July 2009. The Commission sent requests for information to database competitors and customers on 31 July 2009[4]. Another request for information was sent to database customers on 13 August 2009[5]. In addition, the Commission sent several requests for information to the notifying party and to Sun.

10. In a meeting on 20 August 2009, Oracle was informed that the Commission Services had serious doubts as to the compatibility of the proposed concentration with the common market and the EEA Agreement in relation to the market for databases as well as to the strengthened position of Oracle in the IT stack.

11. On 3 September 2009, the Commission adopted a decision finding that the concentration raised serious doubts as to its compatibility with the common market and the EEA Agreement due to competition concerns in the market for databases and the strengthened position of the merged entity in the IT stack[6]. The Commission therefore decided to initiate proceedings under Article 6(1)(c) of the Merger Regulation.

C. Second phase investigation

12. On 26 September 2009, Oracle submitted its preliminary written comments[7] on the Commission decision to initiate proceedings under Article 6(1)(c) of the Merger Regulation (the "Article 6(1)(c) decision") and the lack of any anticompetitive effects in the database market arising from the proposed transaction. On 2 October 2009, Oracle submitted "Observations on the Commission's Theory of Harm"[8] responding at more length to the issues raised by the Commission in the Article 6(1)(c) decision.

13. During its in-depth investigation, the Commission sent a number of requests for information to Oracle. The first of these requests, which was sent on 13 September 2009, addressed a range of substantive issues that had been raised in the Article 6(1)(c) decision[9]. Subsequent requests addressed issues including the underlying data for Oracle's data collection systems CRM and HQ Apps[10], internal documents relating to Oracle's analysis of competition in the database market and in particular the competitive

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4 Request for information to competitors databases of 31 July 2009, and request for information to customers databases of 31 July 2009.

5 Request for information to customers databases of 13 August 2009.

6 The so-called "IT stack" or "technology stack" consists of the various hardware and software components necessary for companies to ultimately use business software applications.

7 Doc_ID 1959.

8 Oracle, Observations on the Commission's Theory of Harm, 2 October 2009 (doc_ID 2427).

9 Request for information to Oracle of 11 September 2009 (doc_ID 2310).

10 Questions sent to Oracle by email from a case team member on 23 September 2009, requests for information of 8 October 2009 (doc_ID 3327), 12 October 2009 (doc_ID 2984), 14 October 2009 (doc_ID 3058), 13 November 2009 (doc_ID 3858) and 9 December 2009 (doc_ID 5082).

constraint exerted by MySQL and Oracle's strategy for databases[11]and the business case for previous attempts to acquire MySQL[12].

14. On 17 September 2009, the Commission sent a request for information to database customers[13]. On 18 September 2009, the Commission sent a request for information to database competitors[14], to database integrators[15] and to providers of storage engines[16]. On 2 October 2009, the Commission sent a further request for information to database competitors about Oracle's positioning of MySQL[17]. The Commission also conducted several conference calls with third parties to further explore the issues raised in their written replies to the Commission's requests for information pursuant to Article 11 of the Merger Regulation.

15. On 28 September 2009, the Commission commissioned an expert study from the company TAEUS with the task to provide a comparison of the technical features and of the total cost of ownership ("TCO") of the Oracle and Sun database offerings and of their competitors, as well as an analysis of the technical ability of Oracle to hamper the migration of current MySQL users to non-Oracle databases[18]. The TAEUS report was provided on 11 October 2009[19].

16. On 21 October 2009, Oracle was informed that the Commission envisaged issuing a Statement of Objections since, according to its preliminary conclusions the concentration would significantly impede effective competition in the market for databases.

17. On 29 October 2009, Oracle submitted further information to address the Commission's concerns raised in the Article 6(1)(c) decision including a business plan that it had drawn up subsequent to notification of the proposed transaction. The information submitted at that time did not alter the Commission's preliminary assessment that the proposed transaction would significantly impede effective competition with regard to the market for databases.

18. On 9 November 2009, the Commission addressed a Statement of Objections to Oracle pursuant to Article 18 of the Merger Regulation.

19. Thereafter, nine third parties applied for the right to be heard and were found to have demonstrated a sufficient interest to be heard as a third party within the meaning of Article 18(4) of the Merger Regulation. They were invited to submit comments on a non-confidential version of the Statement of Objections. Four of them submitted comments in writing on the Statement of Objections.

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11 Requests for information to Oracle of 9 September 2009 (doc_ID 1296) and 25 September 2009 (doc_ID 2591), e-mail of 2 October 2009 (doc_ID 2265), requests for information of 8 October 2009 (doc_ID 3327) and 9 October 2009 (doc_ID 3061).

12 See in particular the request for information to Oracle of 9 September 2009 (doc_ID 1296).

13 Request for information to customers databases of 17 September 2009.

14 Request for information to competitors databases of 18 September 2009.

15 Request for information to database integrators of 18 September 2009.

16 Request for information to providers of storage engines of 18 September 2009.

17 Request for information to competitors databases about Oracle's positioning of MySQL of 2 October 2009.

18 See task description for TAEUS report (doc_ID 1906).

19 TAEUS report (doc_ID 3011).

20. On 30 November 2009 and on 8 December 2009, the Commission addressed a letter of facts to Oracle in which it gave details of additional evidence it had collected since the adoption of the Statement of Objections[20]. In the Commission's opinion, this additional evidence supported the preliminary conclusions it had reached in the Statement of Objections. Oracle was given the opportunity to respond to each letter if it so wished. Oracle replied to the first letter of facts on 8 December 2009.

21. Oracle replied to the Statement of Objections on 3 December 2009.

22. At the request of the notifying party, an Oral Hearing took place on 10 and 11 December 2009. Six third parties also requested the opportunity to participate in the Oral Hearing.

VI. COMPETITIVE ASSESSMENT

A. Introduction

23. Oracle is active in the development, manufacture and distribution of business software, including middleware, database software and enterprise applications systems (EAS), and related services. Sun is active in enterprise hardware, including servers and storage, and in business software. Its business software offerings comprise operating systems (Sun's own operating system is called Solaris), database software, and middleware.

24. The product offerings of Oracle and Sun are part of the so-called "IT stack" or "technology stack" which consists of the various hardware and software components necessary for companies to ultimately use business software applications. Hardware products, including servers, storage units and client PCs, constitute the first layer. In order to function, servers then need an operating system ("OS", like Unix, open source[21] Linux, Sun's Solaris or Microsoft's Windows). Databases operate on these systems and enable storing and sorting of data. The next layer on the stack is middleware, which is a wide category of software products that provide the infrastructure for applications to

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20 The first letter of facts addressed a number of issues including: the number of downloads of certain database products of the parties to the transaction and their competitors; the technology and functionalities of MySQL; the Commission's analysis of internal datasets provided by the parties and Oracle's financial incentives after the proposed transaction. (doc_ID 4656). The second letter of facts concerned the results of a survey of developers carried out by an independent market research company (doc_ID 5060).

21 "Open Source" denotes a specific way of developing and distributing software. A distribution of open source software (OSS, sometimes augmented as FOSS = Free and Open Source Software) contains at least the source code of the distributed software. (It often additionally contains binary versions of the software, that is to say the result of compiling (translating) the source code into a language understood by the machine on which the binary version of the software is supposed to run.) For developing software, in many settings this approach has the advantage that it is very simple for users to adapt software to their needs. The availability of source code also facilitates the treatment of software bugs (that is to say programming errors) by essentially enlisting many of the software's users as co-developers. The Open Source Initiative operates a license review process to determine whether a given software license complies with the Open Source Definition (http://opensource.org/docs/osd): there are several dozen approved open source licenses (http://opensource.org/licenses/alphabetical). In addition to the requirement of openly available source code the Open Source Definition also ensures that OSS can be modified and redistributed under the same license terms by its users. The best known OSS license is the General Public License (GPL) which not only allows but indeed requires that modified versions of software licensed under the GPL be also governed by the GPL. Essentially, this means that software that has once been made available under the GPL cannot be made "unfree" again because the rights under the GPL are promoted downstream. However, the copyright owner (the person who originally released the software under the GPL) is free to offer his software under different licenses in parallel (dual- or multilicensing).

run on a server, be accessed from a variety of clients over a network and be able to connect a variety of information sources[22]. Middleware, together with operating systems and databases is sometimes referred to as "infrastructure software." The last layer of the stack is the EAS which supports the major functions needed by commercial organisations to manage their business effectively (for example customer relationship management ("CRM"), enterprise resource planning ("ERP"), supply chain management ("SCM"), etc.)[23].

25. Considering the offerings of Oracle and Sun the proposed transaction leads to overlaps in the field of databases and middleware. Moreover, the transaction may have vertical effects relating to the licensing of Java as an input for middleware and EAS. In addition, under a theory of vertical and conglomerate effects, all markets in the technology stack would be potentially concerned.

26. The remainder of this Decision will be divided into four sections dealing with the effects of the transaction in the different markets potentially concerned by the transaction (Section B. Databases, Section C. Middleware, Section D. Java, and Section E. IT stack).

B. Databases

1. Introduction

1.1. Description of relational databases

Relational vs. non-relational databases

27. Databases are software programmes designed to store, organise, analyse and retrieve information held in an electronic format as opposed to traditional paper-based filing methods. A complete data storage system consists of data storage (for example hard disks) in which the data is physically kept and a system (the "database management system" or "DBMS") to manage the organisation, storage, access, security and integrity of data.

28. The most common system for organising databases today are relational database management systems (often abbreviated to "RDBMS") which store data in separate tables instead of placing all data in one large table and define relationships between these tables. This makes it possible to combine the data from several tables for querying and reporting. Relational database technology allows databases to be larger, faster and more efficient.

29. Other types of non-relational database management systems ("non-RDBMS") exist, such as object-oriented databases. Non-RDBMS do not have the same advantages and they are not as prevalent as RDBMS[24]. Unless indicated to the contrary, further references in this Decision to 'databases' relate to RDBMS.

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22 See Commission decision in case M.5080 – *Oracle/BEA* of 29 April 2008.

23 See Commission decision in case M.3216 – *Oracle/Peoplesoft* of 26 October 2004: "EAS is software that supports the major business functions needed to manage a business effectively at a corporate or branch level, such as managing corporate finances, automating the sales and marketing functions of a company, or managing the resources involved in corporate projects.", para. 17.

24 An example taken from a third party submission in the first phase market investigation, "Request to protect disruptive innovation in the overall information technology sector" (doc_ID 841) illustrates the

Technical aspects of relational databases

30. In order to be able to "communicate" with a RDBMS, database administrators and/or applications need to employ a 'language'. The standardized language for defining and manipulating (reading, changing, deleting) data in a RDBMS is known as SQL (Structured Query Language). SQL commands (or search query strings) are either typed by administrators into a tool that communicates them to the database server and then returns the result in text form or communicated to the RDBMS by software applications (in this way application developers do not have to deal with the specificities of data storage but can implement it in a generic way by using RDBMS as back end storage).

31. Even though SQL has been adopted by several leading standardization groups and institutes (including ANSI and ISO), it is virtually impossible to find a single implementation of the official definition of SQL. Almost every RDBMS product leaves some parts of the SQL unimplemented but adds unique features and characteristics of its own, thereby creating a new 'dialect' instead of strictly adhering to a common standard[25].

32. A relational database conceptually consists of three different layers: a top layer with tools for the monitoring and administration of the database (assisting users to work with the data), a middle layer consisting of a core server, and a third layer (storage engine) that manages storage. In most instances, the three layers are integrated into one unit.

33. Most databases are compatible with the main operating systems, such as Unix, Microsoft Windows, Linux or mainframe systems. The exception is Microsoft's database which is exclusively compatible with Microsoft's proprietary operating system, Windows.

The role of databases in modern organisations

34. Databases play an important part in the functioning of many enterprises and organisations ranging from banks and stock exchanges to public sector organisations and websites.

35. Databases form part of the so-called "technology stack" which consists of the various hardware and software components necessary for companies to ultimately use business software applications (see paragraph 24). Databases support a variety of applications including most importantly online transaction processing ("OLTP") and online analytical processing ("OLAP") and data warehousing.

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difference between a RDBMS and non-RDBMS as follows: *"there could be one table containing the customers of an online shop (i.e. their names and addresses) and a second table containing all purchases. In a non-relational database, it would be necessary to store the customer data for each individual purchase. In a relational database with the two aforementioned tables, each customer would have a unique number assigned (a number since names are never guaranteed to be unique), and for each purchase it is then sufficient to store that customer number since the RDBMS is able to look up the customer table whenever needed (such as for printing an invoice, for which not only the data of the purchase itself but also the name and address of the customer are needed). This relational structure represents an efficiency in terms of storage space by eliminating to store address data along with every one of multiple orders placed by the same customer and ensures that any change of a customer's address only needs to be made once to apply 'systemwide'."*

25 See inter alia "Request to protect disruptive innovation in the overall information technology sector", document submitted by Monty Program Ab (doc_ID 841) and IBM website (doc_ID 3024) at http://publib.boulder.ibm.com/infocenter/db2luw/v9/index.jsp?topic=/com.ibm.db2.udb.admin.doc/doc/c0004100.htm

36. Databases with transactional capabilities provide assurance to the user (i) that an initiated transaction ("write" operation on the database) is either completed entirely and correctly, or not at all[26], (ii) that each transaction is isolated from other transactions (that might be initiated by different users concurrently) so as to maintain the integrity of the data; and (iii) that successfully completed transactions are written to durable storage. These database transaction properties are referred to by the acronym 'ACID' (atomic, consistent, isolated and durable). This is important for all systems that handle data related to business processes (for example stock exchanges, banking systems, e-commerce, airline ticketing, etc.).

37. Data warehouses contain (often massive amounts of) historical data that normally does not change much. Therefore databases optimised for data warehousing need to be able to read large amounts of data very quickly. They are frequently needed for "data mining", where data are used for business intelligence, analytics and other decision support requirements. OLAP refers to a sub-segment of data warehousing where the interaction with the data and the analysis needs to take place in real-time such as self-service reporting and analysis whereby a user interrogates the data via a suitable interface.

38. Databases can also be "embedded" in another hardware or software product and therefore not sold as a standalone product to end users. Embedded databases are databases which are acquired to be made part of a specific software or appliance and then resold, and which as a result cannot be distinguished from or used apart from this specific software or appliance from the end user's perspective.[27] RDBMS vendors provide versions of their general purpose RDBMS products fit for embedding by independent software vendors ("ISVs") in their applications software[28]. RDBMS may also be embedded for sale in specific software programmes or devices such as mobile phones, consumer electronics, telecommunications gear, industrial equipment and vehicles. Where embedded databases are completely integrated into the final product, they are not noticeable to the end user.

The sales and marketing of databases including license fees and product support

39. Database producers typically sell their DBMS products through both direct and indirect sales channels. The direct sales channel typically comprises the producer's own field

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26 If a transactional database system loses power half-way through a transaction, the partially completed operation will be rolled back and the database will be restored to the state it was in before the transaction started. For example, this will be the case if a CRM system sends a customer order to a database system and the product is subtracted from inventory, but the system crashes before the request to create an invoice for the customer is sent to the database.

27 The second phase market investigation has shown that there is some debate as to the precise meaning of the term 'embedded' in the context of databases. Although many respondents agreed with the definition proposed by the Commission an alternative definition was suggested by some according to whether the database is truly embedded into an application in a technical sense or simply running alongside it as illustrated by the following quote taken from the reply of Monty Program Ab (doc_ID 1891): *"The term Embedded database is not well defined. For instance, the product called "MySQL Embedded" is actually the exact same database product as "MySQL Enterprise", except that it is licensed to be embedded into a specific application, in order to function as the data store for that application. Typically, the database is not technically speaking embedded into the application, rather is running as a separate process on the same computer, however, it may for instance often have been installed automatically from the same installation file together with the application. Or the database could even run on a separate computer. Separately there are databases which are indeed embedded into an application in the technical sense. A consequence of this is that only the application can use the data in the database, nobody else could connect to the database as is possible with a separately running database server process."*

28 The selection of the RDBMS to be embedded by the ISV may be dictated by the final customer.

sales force as well as centralised telesales teams that make sales over the telephone and/or internet. In the indirect sales distribution channel, database producers may make use of a range of third parties to address different market segments, industries, geographies and customer opportunities more efficiently and effectively. The range of third parties used in this way may include resellers, ISVs, systems integrators ("SIs") and hardware and infrastructure vendors[29].

40. Proprietary RDBMS are typically licensed on a “perpetual” basis by either the number of named users or server processing capacity (for example, in an externally facing application where named users cannot be counted). A database license has no set duration. A newer practice is to offer customers the choice of an Enterprise License Agreement (ELA), which gives customers the right to use an unlimited number of licenses for a set fee. These fees are typically negotiated based on anticipated use and expire after two or three years[30].

41. After-sales support (for example bug fixing and upgrades) is important. It is provided principally by the software vendors (and to a limited extent by their partner distributors) and independent service providers. In the case of ISVs and other third parties that build and sell their own products on top of a database manufactured by a DBMS producer (such as Oracle) these companies are often the first line of support in that they initially determine whether the customer's issue relates to their own product or to the DBMS. Only in the latter situation is the customer referred directly to the DBMS producer.

42. In many organisations, the responsibility for the design, implementation, maintenance and upkeep of the DBMS rests with a database administrator ("DBA"). DBMS vendors, including Oracle, offer training and certification programmes for DBAs[31]. The DBA, who normally reports to a chief information officer ("CIO") or chief technology officer ("CTO") within the organisation, may work with colleagues (acting as "developers") to develop or fine tune DBMS for the particular needs of their organisation. The degree of database expertise within an organisation may have an indirect influence on the level of support that organisation requires from the DBMS vendor or another third party.

1.2. Description of the parties and main competitors

1.2.1. Oracle and its database products

43. Oracle was incorporated in 2005 as a Delaware corporation and is the successor to operations originally begun in June 1977. The company describes itself as the "world's largest enterprise software company" and develops, manufactures, markets, distributes and services database and middleware software as well as applications software designed to help its customers manage and grow their business operations[32].

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29 ISVs typically supply software products that run on one or more computer hardware or operating system platforms. SIs provide guidance to end users on the software, hardware and implementation service options available to them in order to create the best solution for the end users' needs.

30 Form CO, Annex 1.

31 http://education.oracle.com/pls/web_prod-plq-ad/db_pages.getpage?pagedoc_ID=84&groupdoc_ID=4 (doc_ID 3025)

32 FY 2009 Annual Report for Oracle Corporation, Form 10-K, Annex 19 to the Form CO (doc_ID 327)

44. Oracle is organised into two businesses, software and services[33] which accounted for 81% and 19% of total company revenues in the fiscal year 2009, or USD 18 877 million and USD 4 375 million respectively. The software business is further divided into two operating segments: (i) new software licenses and (ii) software license updates and product support.

45. In the software business, new software licenses amounted to USD 7 123 million or 31% of total company revenues in the fiscal year 2009. More than two-thirds of this amount was accounted for by new license revenues from database and middleware products. Software license updates and product support revenues amounted to USD 11 754 million or 50% of total revenues in the fiscal year 2009. A more detailed analysis of database revenues for the same period shows total database revenues of […]* comprised of new license revenues of […]* and product support revenues of […]*[34].

46. Oracle offers a number of DBMS products of which the most important is the RDBMS, Oracle Database. Oracle Database is offered in four editions: Enterprise Edition, Standard Edition, Standard Edition One and Express Edition. As acknowledged by Oracle, all editions are built using the same underlying code, which means that the company's database software can easily scale from small, single processor servers to clusters of multi-processor servers[35]. There are, however, differences in the level of functionality offered by each edition that is reflected in their price and influences the situations in which they can be deployed.

47. Oracle Database Enterprise Edition is by far Oracle's most important database product in terms of revenues and provides relational database support on a choice of clustered or single-servers with unlimited restrictions on use. The current version of the product is commercialised as Oracle Database 11*g* Release 2 Enterprise Edition. A number of optional offerings are available with the Enterprise Edition to address specific customer requirements in the areas of performance and scalability, high availability, data security and compliance, data warehousing, information management and systems management[36].

48. Oracle Database Standard Edition is more restricted than the Enterprise Edition in that it may be used on multiple servers with up to four sockets[37] only.

49. Oracle Database Standard Edition One targets entry-level customers with a lower-cost product that is full-featured. The license restricts the use of the database to one server with at most two connections to the network.

50. Oracle Database Express Edition ("Oracle XE") is a "starter" version that is free to develop, deploy and distribute. It is based on the Oracle Database 10*g* Release 2 code,

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33 The services business is organised into three operating segments: (i) consulting, (ii) On Demand and (iii) education. See FY 2009 Annual Report for Oracle Corporation, Form 10-K, Annex 19 to the Form CO (doc_ID 327)

* Parts of this text have been edited to ensure that confidential information is not disclosed; those parts are enclosed in square brackets and marked with an asterisk.

34 See Oracle reply to request for information of 27 October 2009, (doc_ID 3549). EUR amounts converted to USD at EUR 1 = USD 1.3855.

35 FY 2009 Annual Report for Oracle Corporation, Form 10-K, Annex 19 to the Form CO (doc_ID 327).

36 FY 2009 Annual Report for Oracle Corporation, Form 10-K, Annex 19 to the Form CO (doc_ID 327).

37 A socket refers to the number of central processing units (CPUs) that can be installed in a given machine. The CPU or processor is the portion of a computer system that carries out the instructions of a computer program, and is the primary element carrying out the computer's functions.

that is to say one version below the current version 11 on which the other three editions are based. As shown in the table below, Oracle has limited the database engine of the Express Edition to use only one CPU. In addition, the Express Edition can store only up to 4GB of user data. Unlike the other three versions of Oracle Database, the Express Edition cannot run on the Unix operating system.

Table 1: Summary of certain key features of Oracle Database[38]

Key Feature Summary	**Express Edition 10*g***	**Standard Edition One**	**Standard Edition**	**Enterprise Edition**
Maximum	1 CPU	2 Sockets	4 Sockets	No Limit
RAM	1GB	OS Max	OS Max	OS Max
Database Size	4GB	No Limit	No Limit	No Limit
Windows	•	•	•	•
Linux	•	•	•	•
Unix		•	•	•
64 Bit Support		•	•	•

51. In addition to the four editions of Oracle Database, Oracle also offers a selection of specialised databases. Oracle Database Lite offers a small footprint SQL database for extending enterprise applications to mobile devices for standalone or occasionally connected embedded applications[39].

52. Oracle TimesTen In-Memory Database is a memory-optimised relational database targeted at applications requiring instant responsiveness and very high throughput in industries such as telecom, capital markets, and defence applications. It can also be used as an in-memory database cache for the Oracle database in order to enhance the response time and throughput of user applications[40].

53. Oracle Berkeley DB is a family of open source, embeddable, non-relational databases that allows developers to incorporate a fast, scalable and reliable database engine within their applications and devices[41].

54. Oracle charges a license fee for its database software and offers a separate "maintenance" contract (described in public filings as "license updates and support"). As with all enterprise software, the license fee is typically negotiated off a list price and is adjusted for all of the typical reasons such as volume[42]. Oracle's maintenance price is typically 22% of the […]* license […]* and is renewed annually. Maintenance includes technical support (phone, web knowledge base), bug fixes, updates (that is to say tax

38 Derived from Oracle website at: http://www.oracle.com/database/product_editions.html (doc_ID 3115).

39 TAEUS report, p. 23 (doc_ID 3011).

40 TAEUS report, p. 23 (doc_ID 3011).

41 FY 2009 Annual Report for Oracle Corporation, Form 10-K, Annex 19 to the Form CO (doc_ID 327).

42 The license fees of the four editions of the Oracle Database are priced per processor as follows: Enterprise Edition: USD 47 500; Standard Edition: USD 17 500; Standard Edition One: USD 5 800; Express Edition: free.

rate changes / other legal changes) and perpetual upgrade rights to all future versions of the software without customers paying an additional license fee[43].

55. According to the notifying party, license revenues (that is to say excluding support) for the various editions of Oracle Database in the fiscal year 2009 were as follows: Enterprise Edition […]*; Standard Edition […]*; Standard Edition One […]*. License revenues for other database products were as follows: Berkeley Database […]*; Database Lite […]* and TimesTen In Memory […]*[44].

1.2.2. Sun and its database products

56. Sun's main database product is MySQL. Sun acquired MySQL for approximately USD 1 billion[45] in 2008 when it purchased the Swedish company MySQL AB[46]. Sun describes MySQL on its website as the "world's most popular open source database" with more than 11 million active installations and 60 000 downloads per day[47]. MySQL now runs on more than 20 platforms, including Linux, Windows, OS X, Solaris OS, HP-UX, AIX and Netware[48].

57. The first version of MySQL (based on program code previously in use by a small number of consulting clients) became publicly available in August 1996 initially only for the Solaris operating system and shortly thereafter for Linux. The first Windows version was published in January 1998. The program code on which MySQL was based already had a history of more than a decade. One of the needs for which it had been particularly optimized was that of data warehousing, that is to say predominantly based on "read" operations. This made MySQL particularly suited to web applications where its adoption was further facilitated by the use of Linux as web developers embraced MySQL as a free RDBMS for a free operating system[49].

58. MySQL has since developed by adding new functionality which has made it more suited to applications beyond the web. For example, in 2001 a special programming

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43 Form CO, Annex 1.

44 See Oracle reply to request for information of 27 October 2009, (doc_ID 3549) and subsequent email of 4 November 2009 (doc_ID 3623). EUR amounts converted to USD at EUR 1 = USD 1.3855. The sum of the database products revenues reported here […]* does not equal the total database revenue figure of […]* reported in paragraph 37 as Oracle also reports within the overall database product category revenues derived from the sale of ancillary products including Real Application Clusters […]*, Partitioning […]* and applications and systems management […]*.

45 In this decision the term "billion" refers to 1 000 million.

46 See http://www.sun.com/aboutsun/pr/2008-01/sunflash.20080116.1.xml (doc_ID 3088).

47 See Sun website, http://www.sun.com/software/products/mysql/(doc_ID 3356). It must however be noted the Form CO indicates that Sun estimates that there are 60 000 daily downloads and 12 million active installations worldwide (Form CO, p. 88). A Sun White Paper estimates that there are 65 000 downloads per day and 12 million active installations (Sun White Paper, A guide to lower TCO, How the Open Source Database MySQL Reduces Costs by as Much as 90%, Annex 3 to Microsoft submission of 8 July 2009, doc_ID 130, p.3). Another third party report from 21 April 2009 (Jefferies, doc_ID 3038, submitted by anonymous complainant) estimates that there are 13 million installations for MySQL. Despite these elements suggesting that there may in fact be even more active installations of MySQL, the Commission adopts a conservative approach and refers to 60 000 downloads per day and 11 million active installations throughout the text of this Statement of Objections.

48 Sun also offers a supported distribution of the open-source Apache Derby 100% Java technology database (which Sun calls Java DB, and PostgreSQL for Solaris). Form CO.

49 See inter alia "*Request to protect disruptive innovation in the overall information technology sector*", document submitted by Monty Program Ab (doc_ID 841). MySQL is the "M" in LAMP, an acronym coined in April 1998, for an open source web server software bundle comprised of the GNU/Linux operating system, the Apache HTTP server software, the database program MySQL, and PHP, a web scripting language.

interface enabled MySQL to offer a choice of storage engines such as BerkeleyDB and InnoDB which improved its transactional capabilities[50]. In 2003, MySQL acquired the Cluster product[51] from a start-up previously funded by Ericsson. In 2005, MySQL 5.0 was launched with important new features (such as stored procedures, views, triggers, information schemata and cursors). The current version of MySQL is version 5.1. MySQL 5.1, released in December 2008, improved version 5.0 in some areas including support for extremely large (terabyte-size) databases through partitioning. In April 2009, MySQL 5.4 went into alpha testing[52]. This version is intended to improve scalability on multi-core CPUs.

59. According to one of the founders of MySQL, by the time the database was able to support transactions by means of its pluggable storage engine architecture, it had already been used to power an estimated several million websites and was therefore well known to software developers and had a strong following amongst the Free and Open Source Software (FOSS) community.

60. From 2001 onwards, MySQL also quickly expanded its sales with licenses to embed representing the most important revenue source at that stage[53]. This suggests that even at that time, the ability of the owner of the MySQL code to derive revenues from the sale of proprietary licenses, which is possible under a "dual licensing model", was an important factor in the continued development of the product and the company. The other side of the dual licensing model is the distribution of the product under a free open source license (or more specifically the GNU General Public License or GPL v2)[54].

61. The availability of MySQL for free under the open source license has encouraged the adoption of the product not only amongst web developers but also other members of the FOSS community. The large community of users which has developed around MySQL, especially those using the product under the GPL v2, has resulted in improvements to the source code and shows how the community-based FOSS development model has formed a symbiotic relationship with the commercial part of the IT sector[55]. The position of MySQL as a leading open source database with the largest 'ecosystem' of all open source databases has also been acknowledged by Oracle in an internal document[56].

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50 InnoDB was first developed by the Finland-based company Innobase OY. Oracle acquired Innobase OY in 2005 (doc_ID 3088). Oracle subsequently acquired Sleepycat, the owner of BerkeleyDB, in February 2006 (doc_ID 3254).

51 This "carrier grade" real-time database is particularly suited to the needs of telecommunications operators.

52 Software typically undergoes various test stages (for example alpha and beta) before commercial release.

53 See "Request to protect disruptive innovation in the overall information technology sector" (doc_ID 841).

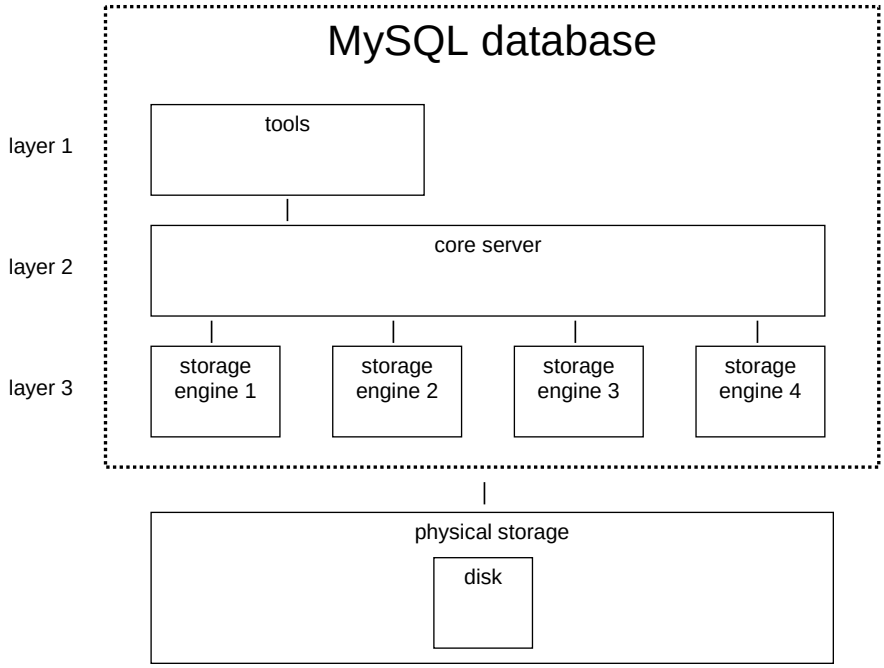
54 One of the principal differences between the proprietary license and GPL v2 concerns the 'freedom' that a user has to make changes to the code and commercialise the resulting product. This is because when a user takes MySQL under the GPLv2 and makes any changes/improvements to the code and wishes to commercialise the resulting product, it must under the terms of the GPLv2 make the entire code of the commercialised product available. This is known as the 'viral' or 'contaminating' effect of the open source version of MySQL. Licensees under the proprietary license avoid this obligation.

55 According to one party, certain users have made important contributions to the MySQL code base which they have released to the public in accordance with FOSS 'give and take' principles. See "Request to protect disruptive innovation in the overall information technology sector" (doc_ID 841).

56 See "Detailed comparison: Oracle 11g vs MySQL Enterprise v5.1" (doc_ID 346). In this document, it is noted that MySQL has been downloaded more than […]* and that MySQL has the largest numbers of third party vendors and community members providing/licensing tools and applications in support of its database.

62. As noted in paragraph 32, most RDBMS vendors provide integrated RDBMS in the sense that the three layers of the RDBMS are integrated into one unit. MySQL's modular approach is different. The specificity is that MySQL's interfaces/connectors between the three different layers are documented and can be used by software developed by other parties. This allows customisation of the tools and storage engines layers. The constant of MySQL databases is the MySQL core server, the middle layer, which remains the same regardless of the chosen tools and storage engine and thus ensures that the database remains a MySQL database. Many applications written to work with a MySQL database will function regardless of the concrete tools and/or storage engines used.

63. MySQL emphasises the attractiveness of its unique pluggable storage engine architecture which gives users the flexibility to choose from a portfolio of storage engines and tools that are optimized for specific applications[57].



64. The pluggable nature of MySQL's architecture has resulted in a wide offer of storage engines which have often been designed to address specific requirements. In addition to a number of storage engines developed and offered by MySQL itself (so-called "native" storage engines), storage engines are also available from third parties as well as developers working in the MySQL open source community. In addition, users of MySQL are able to develop customized in-house storage engines to address their specific needs.

65. Sun describes a number of native storage engines on its website including MyISAM (which is the MySQL default storage engine); Cluster (a clustered database engine suited for applications that require the highest possible degree of uptime and availability); Memory (which stores all data in RAM for extremely fast access in environments that require quick lookups) and Archive (which is described as a solution

57 See http://solutions.mysql.com/engines.html (doc_ID 3030). In contrast, Oracle provides a single general purpose storage engine which automates many of the storage engine choices. However, Oracle itself is aware of the advantages of such a pluggable architecture as evidenced by an internal document in which […]* (see slide 13 of doc_ID 2917).

for storing and retrieving large amounts of seldom-referenced historical, archived, or security audit information).

66. Storage engines developed by third parties include InnoDB (which is described as a transaction-safe ACID compliant storage engine)[58] as well as solidDB, NitroEDB, Infobright, Calpont and ScaleDB.

67. MySQL as a general purpose database is available in different editions:

- MySQL Community Server is available as a free download on the Sun website under the open source General Public License v2 ("GPLv2").

- MySQL Enterprise is available on a subscription basis for users wishing to benefit from continued product support. MySQL Enterprise includes Certified Software, updates and upgrades, proactive alerts and advisors, the online MySQL Knowledge Base, and full production-level technical support. The Certified Software (database server, connectors) is provided under the GPL License or under a Commercial License at the option of customers[59].

68. In addition to MySQL Enterprise, Sun also offers an embedded version of the MySQL database, MySQL Embedded Server 5.1. MySQL Embedded retains most of MySQL's features such as the ability to use multiple database engines. MySQL Embedded is available under the GPLv2 (open source) license free of charge or under a commercial license.

69. MySQL Cluster allows a number of servers to be grouped so that they appear and act as a single server with increased capacity and reliability[60]. MySQL Cluster is available under the GPLv2 (open source) license free of charge or alternatively as a commercial version in one of two editions: MySQL Cluster Standard Edition (SE) and Carrier Grade Edition (CGE)[61]. The latter allows servers to be added to a running cluster without taking the application off-line. This capability allows such customers as telecommunications carriers reach the "five nines" (99.999%) reliability they require[62].

70. Sun offers four tiers of support subscriptions for its MySQL Enterprise products which vary in price according to the level of functionality and support offered: Basic Support which provides updates, patches and email support for two incidents is priced at USD 599; Silver Support which provides support during business hours is prices at USD 1 999; Gold Support which provides support around the clock is priced at USD 2 999 whilst Platinum Support which also provides management and consultative support is priced at USD 4 999[63].

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58 InnoDB was first developed by the Finland-based company Innobase OY. Oracle acquired Innobase OY in 2005 (doc_ID 3088).

59 MySQL Enterprise Server is available in a number of editions (MySQL Enterprise Server Pro for OLTP applications; MySQL Enterprise Server Advanced which adds to MySQL Enterprise Server Pro horizontal table and index partitioning for improving the performance and management of VLDBs (Very Large Databases); and MySQL Classic which is an edition of MySQL without InnoDB (a storage engine) but with the other features of MySQL Pro). See TAEUS report, pp. 28-29, (doc_ID 3011).

60 A database can be partitioned across servers, aggregating the bandwidth of the servers and allowing it to exceed the size of any individual server's available memory, thereby improving performance.

61 See MySQL website at: http://dev.mysql.com/downloads/select.php?id=14 (doc_ID 3029).

62 See TAEUS report, p. 31 (doc_ID 3011).

63 Form CO, p. 147.

71. In addition, due to the open source nature of MySQL, there are third companies providing technical support for MySQL in competition with Sun. These include: Novell, Red Hat, HP, Monty Program, Percona, Linagora, and Mayflower[64].

72. According to industry surveys (which are discussed in more detail in section 4.3.4.1.2. Surveys), the adoption of open source software in general and MySQL in particular in many European countries has been significant. In addition, the use of open source software is expected to grow in the years to come. For example, a survey carried out in the Nordic and Benelux countries revealed that 44% of the overall sample was using open source software with 46% thereof having deployed MySQL. The same survey showed that 25% of the non users of open source software expect to start using it within two years whilst one third of current open source software users are expected to increase their use of OSS within the same timeframe[65]. A second survey covering the use of open source software by small and medium-sized business in seven European countries found that more than 50% of the sampled companies were using open source software and that it accounts for more than 50% of their IT infrastructure[66].

73. These elements, taken together with examples from the market investigation of switching by customers from proprietary to open source RDBMS[67], are indicative of the growing acceptance on the part of European companies and organisations to deploy open source software including MySQL. This may also be a factor in explaining why a number of European companies have expressed concerns regarding the proposed transaction.

1.2.3 Other main competitors

74. In addition to Oracle and Sun, a number of other companies are active in the supply of RDBMS. The principal suppliers of proprietary RDBMS after Oracle on the basis of revenue market shares are IBM, Microsoft and Sybase (although the latter has a less significant market presence than the Oracle, IBM or Microsoft). There are two additional open source RDBMS, namely PostgreSQL and Ingres. The Commission's market investigation has indicated however that these alternative open source RDBMS are not as prevalent as MySQL at the moment.

1.2.3.1. IBM

75. IBM's main database is DB2. Like the Oracle Database, DB2 is available in a number of editions which seek to address different end-user requirements. The "flagship" Enterprise Server Edition is described by IBM on its website as being *"ideal for high-performing, robust, on-demand enterprise solutions."* Other editions of DB2 include the Workgroup Server Edition which is *"ideal for departmental, workgroup, or medium-sized business environments"*, an Express Edition which offers *" an attractive entry-level price for small and medium businesses"* and DB2 Express-C which is a free, entry-level edition for the developer and partner community[68].

64 Form CO, p. 158.
65 TNS Technology – Open Source Software Barometer 2009 – Nordic and Benelux Report (doc_ID 2143).
66 TNS Technology – Open Source Barometer 2009 – European SMB Report (doc_ID 2673).
67 See for example reply of the Swedish National Police to the request for information to customers databases (doc_ID 1984).
68 http://www-01.ibm.com/software/data/db2/9/ (doc_ID 3026).

76. IBM also offers another range of database products under the Informix brand. The Informix Dynamic Server (IDS) Enterprise Edition is described as delivering *"unlimited scalability for the highest OLTP performance… outstanding reliability, scalability and manageability for the enterprise"*[69]. IBM also offers a variety of editions of its Informix database with a reduced number of features, functionality or capacity, usually at correspondingly lower price points.

77. IBM also offers a relational in-memory database known as solidDB.

1.2.3.2. Microsoft

78. According to the notifying party, Microsoft's SQL Server 2008 Enterprise Edition offers a comprehensive database platform that meets the high demands of enterprise online transaction processing and data warehousing applications. Microsoft offers a variety of editions of its flagship SQL Server database with reduced features, functionality or capacity, usually at correspondingly lower price points[70]. Microsoft SQL Server Compact is available as a free download for use as an embedded database for developing desktop and mobile applications.

79. Microsoft is the largest proprietary software company in the world and according to a market report quoted by the notifying party in its reply to the Statement of Objections, Microsoft is also the largest database vendor by shipment share (though not by revenue) in the world with a share greater than IBM and Oracle combined[71].

1.2.3.3. Sybase

80. Sybase is a US-based database supplier founded in 1984. Sybase offers two lines of enterprise class RDBMS: Adaptive Server Enterprise (ASE) for mission-critical transactions and Sybase IQ for data warehousing applications, as well as two lines of embedded RDBMS, SQL Anywhere and Advantage Database Server[72]. Sybase also offers a variety of editions of its flagship Adaptive Server Enterprise database with a reduced features, functionality or capacity, usually at correspondingly lower price points[73].

1.2.3.4. PostgreSQL

81. PostgreSQL is an open source RDBMS originally derived from the Ingres project at the University of California, Berkeley. PostgreSQL is supported by a number of sponsors which are ranked into four tiers according to the length and nature of their support[74].

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69 http://www-01.ibm.com/software/data/informix/ (doc_ID 3027).

70 See Oracle reply to question 9 of the request for information to Oracle of 25 September 2009 (doc_ID 2264). These include SQL Server Standard, Workgroup, Web, Developer and Express (a free download targeted for SMEs and developers building desktop and small server applications and for re-distribution by ISVs). For a comparison of the various editions of SQL Server, see: http://www.microsoft.com/sqlserver/2008/en/us/editions.aspx (doc_ID 3028).

71 IDC, Server and Workload Forecasts and Analysis Study 2002-2010, July 2007 quoted in Oracle's reply to the Statement of Objections, pp. 53 and 69. (doc_ID 4828).

72 See Sybase reply to question 2 of the request for information to competitors databases of 31 July 2009 (doc_ID 966).

73 See Oracle reply to question 9 of the request for information to Oracle of 25 September 2009 (doc_ID 2264).

74 A list of sponsors can be found on PostgreSQL's website at http://www.postgresql.org/about/sponsors (doc_ID 5220)

PostgreSQL is a RDBMS capable of running the enterprise and is a development platform upon which to develop in-house, web or commercial software products that require a RDBMS.

82. PostgreSQL runs on all major operating systems including Linux, UNIX and Windows. PostgreSQL is highly customizable, giving users the freedom to use, modify and distribute PostgreSQL in any form desired, and as closed or open source. PostgreSQL is not controlled by any single company but several companies, including EnterpriseDB and Greenplum, have developed proprietary products based on PostgreSQL[75].

1.2.3.5. Ingres

83. Ingres is an open source enterprise database that is commercially-supported by Ingres Corporation ("Ingres"). The Ingres Database is said to offer high-volume transaction processing, high availability, multi-platform support, and security for mission-critical application deployments[76].

84. Ingres utilises a dual licensing model. The open source version of the Ingres Database is available without charge to the end users pursuant to the terms and conditions of the GPL ("Open Source Version"). The commercial version of the Ingres Database is available to paying customers under the terms and conditions of Ingres' proprietary licensing agreement ("Commercial Version"). The primary difference between the Open Source Version and the Commercial Version is that the Commercial Version undergoes Ingres' internal quality assurance process. For the Commercial Version, Ingres therefore offers warranty and intellectual property indemnification.

1.2.3.6. Other RDBMS vendors

85. In addition to the principal suppliers of proprietary and open source RDBMS, the RDBMS market is also characterised by a large number of vendors, many of which are focused on particular market segments or niches. These vendors include for instance Teradata, which is known for its data warehousing capabilities, SAS (business analytics), and Fujitsu. Analyst reports also list many other RDBMS vendors although the market shares of these companies, based on revenues, are not significant[77].

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75 See Oracle's consolidated reply to the request for information of 13 September 2009 (doc_ID 2264). According to the company's own publicity, EnterpriseDB is the leading provider of enterprise-class products and services based on PostgreSQL. The company was founded in 2004 with the goal of creating a single, affordable database that was plug-compatible with leading commercial DBMSs. The company chose PostgreSQL as its technology foundation because PostgreSQL was proven by over 20 years of large-scale commercial deployments, its thriving developer community, and its reputation for being the strongest open source database available. See http://www.enterprisedb.com/company/enterprisedb.do (doc_ID 5222)

According to the company's own publicity, Greenplum Database is a software solution built to support the next generation of data warehousing and large-scale analytics processing. Greenplum Database offers industry-leading performance at a low cost for companies managing Terabytes to Petabytes of data. Greenplum Database utilizes a shared-nothing MPP (massively parallel processing) architecture optimized for business intelligence and analytical processing. See http://www.greenplum.com/products/greenplum-database/ (doc_ID 5221)

76 Ingres Corporation reply to the request for information to competitors databases (doc_ID 702)

77 See IDC Worldwide Database Management Systems 2007 Vendor Shares (doc_ID 2432).

2. Market Definition

2.1. Product market definition

86. As stated in the Article 6(1)(c) decision the Commission has addressed the issue of product market definition for databases in the context of a merger proceeding in only one prior decision, *IBM/Informix*. In that case, however, the precise product market definition was ultimately left open[78].

87. In this case, although the market investigation undertaken by the Commission in the first phase indicated that databases are differentiated products from the perspective of both suppliers and users, it "*…did not identify a single appropriate approach to delineating the database market. On the contrary it pointed towards a continuum of database substitutability and hence competition*"[79].

88. This conclusion therefore accorded with the notifying party's submission at the time of the notification that "*the appropriate market definition for database includes all database products, which is consistent with the practices of analysts and database distributors*"[80].

89. Oracle submitted that a database product market definition based on other criteria, for example based on operating systems "*…would be at odds with the manner in which customers choose software, at odds with the way database software is developed and at odds with considerable Commission precedent in both merger and Article 82 cases."* Indeed, as one competitor has remarked, Oracle itself has argued in a previous case (*Oracle/PeopleSoft*) that artificial segmentation or "tiering" of a software market based on sales and marketing segmentation (for example large enterprises with complex functional needs) is inappropriate[81].

90. Oracle reiterated its position that RDBMS constitute a single relevant product market when it gave its initial reaction to the Article 6(1)(c) decision. In its submission dated 26 September 2009, it stated that "*Oracle agrees with the finding that the relevant*

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78 See Commission decision of 19 June 2001 in Case COMP/M.2460 – *IBM/Informix*. The Commission considered whether separate markets existed for databases based on a centralised or so-called "legacy" computer system (such as a mainframe computer) or on a non-centralised or "distributed" client/server network (for example Windows NT or Unix). In the absence of competition concerns, however, the precise product market definition was left open. Neither the notifying party in the present case nor market participants have suggested that a distinction along the lines considered in *IBM/Informix* is relevant for the assessment of the proposed transaction.
The Commission also referred to databases in Case COMP/M.3978 - *Oracle/Siebel*, decision of 22 December 2005. Given the absence, however, of a horizontal overlap between the merging parties in databases and the focus of the investigation on Customer Relationship Management (CRM) applications, the Commission did not discuss a product market definition for databases.

79 Article 6(1)(c) decision of 3 September 2009, paragraph 18.

80 Form CO, p. 77.

81 See Microsoft reply to the request for information about Oracle's positioning of MySQL (doc_ID 2653) which refers to the Commission decision of 26 October 2004 in Case COMP/M.3216 - *Oracle/PeopleSoft*, paragraph 84 where it is noted: *"…Oracle stated that the Commission had disregarded the stringent requirements for market definition that must be met where a product market is defined by reference to a distinct customer group (namely, large enterprises with complex functional needs), that is to say, that it must be (i) possible to identify clearly to which group the individual customer belongs, (ii) trade among customers and arbitrage by third parties (through system integrators and consultants) must not be feasible and (iii) competitive conditions for the clearly identified customer group must be appreciably different when compared to other customer groups."*

product market encompasses all RDBMS (Decision para. 22)"[82]. One week later, however, the notifying party changed its view and submitted that a distinct market should be defined for embedded databases[83].

91. For the reasons discussed in section 2.1.1., however, it is not appropriate for the purposes of assessing the proposed transaction to define either a distinct product market for embedded databases or indeed alternative product markets according to operating system, customer group or any of the other criteria mentioned in the Article 6(1)(c) decision.

92. On the contrary, the relevant product market in this case is one comprising all RDBMS notwithstanding the fact that products may be differentiated and sub-segments of the overall market may be identified in which the dynamic of competition may be different.

2.1.1. Embedded vs. non-embedded RDBMS

93. In its detailed reply to the Article 6(1)(c) decision, Oracle submitted that embedded databases, or at least those developed specifically for embedding in software programs or devices, should be treated as a separate market.

94. Oracle submitted that the proposed market for embedded databases should include both relational and non-relational databases. Although this contrasts with Oracle's position regarding the RDBMS market where non-relational DBMS are excluded, it did not elaborate from either a demand or supply-side perspective why the distinction should not apply in the embedded segment. Rather, it noted that analysts such as IDC combine relational and non-relational DBMS revenues in their reports on embedded databases and that the Commission has implicitly acknowledged this is correct by including Oracle's Berkeley DB (a non-relational DBMS) "in the relevant market" at paragraph 30 of the Article 6(1)(c) decision[84].

95. Oracle further submitted in its detailed reply to the Article 6(1)(c) decision that many of the observations made by the Commission with respect to the overall RDBMS market do not hold for a separate market of embedded databases only.

96. It noted that many DBMS products have been developed specifically for embedding in software programs or devices and the structure and competitive choices in the embedded database market are quite distinct and highly application-specific. Oracle acknowledged, however, that there is some overlap between embedded and non-embedded databases in that some RDBMS vendors have embedded versions of their

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82 Summary of arguments in response to Article 6(1)(c) decision, 26 September 2009 (doc_ID 1959).

83 Oracle, Observations on the Commission's Theory of Harm, 2 October 2009 (doc_ID 2427).

84 Oracle, Observations on the Commission's Theory of Harm, 2 October 2009 (doc_ID 2427).
The Commission notes that paragraph 30 of the Article 6(1)(c) decision falls within the "competitive assessment" section of the decision and more precisely in a part of the decision where Oracle's range of database products is presented. The paragraph comes after the section dealing with the relevant product market for databases in which the Commission found strong indications that "the relevant product market encompasses all RDBMS." The notifying party's claim that the Commission has included Berkeley DB (a non-relational DBMS) in the relevant product market is therefore somewhat misleading in the sense that the relevant product market was defined in the Article 6(1)(c) decision as comprising all RDBMS and no distinct product market for embedded databases (whether relational or non-relational) was considered. Moreover, subsequent discussions of the relevant product market in the decision including the market shares of database vendors (based for example on IDC data and reported at paragraph 41 of the Article 6(1)(c) decision) refer solely to RDBMS. In other words, the revenue figures and market positions of DBMS vendors exclude all non-relational DBMS but do include embedded RDBMS.

general purpose RDBMS products that ISVs ship with applications software. Oracle submitted that this kind of embedded database could be viewed as part of the general RDBMS market although it did not provide any quantification as to what impact this would have on the market shares it had provided for (i) RDBMS and (ii) embedded databases.

97. Oracle submitted that for embedded databases the proposed transaction would not lead to the same degree of concentration as can be observed in the overall database market, as the main players in the overall database market (Oracle, IBM and Microsoft) are "*…respectively the first, third and fifth firms in the Embedded DBMS Software market according to IDC, with a combined share of [40-50]*%, just over half the revenue share the Commission claims these firms have in the RDBMS market*[85]." It argued that MySQL is not an important embedded DBMS supplier with a market share of only [0-5]*% according to IDC. Furthermore, it questioned the importance attached by the Commission to the concerns raised by some telecoms customers in the segment of embedded databases for a number of reasons. Firstly it submitted that these customers are buying a niche product. Second, it considered that the products of the merging parties are "not strong substitutes and are often not interchangeable at all". Finally it submitted that there is a substantial list of competitors providing similar databases and 'it would be misleading to proceed as if the specialized, niche product is part of the general RDBMS market'[86].

98. An embedded database is a database that may be integrated with an application that requires access to stored data and the database is typically “hidden” from the application’s end-user and requires little or no ongoing maintenance. Generally speaking, embedded databases are databases that are bundled, sold and supported as part of the product offering of a third party software ISV or hardware original equipment manufacturer ("OEM") on the basis of a license granted by the database vendor.

99. Embedded databases typically run without a human database administrator by controlling the embedded database through its management APIs (application program interface). There is a wide variety of embedded databases because there is a wide variety of situations in which a database may be embedded, including within mobile devices, consumer electronics, desktop applications, enterprise software, metering equipment, telecommunications gear, industrial equipment, vehicles, etc[87]. As one respondent to the second phase market investigation noted:

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85 Observations on the Commission's Theory of Harm, 2 October 2009 (doc_ID 2427).

86 See Observations on the Commission's Theory of Harm, 2 October 2009 (doc_ID 2427); The concerns raised by respondents relate inter alia to MySQL Cluster which was originally developed by Ericsson and later purchased by MySQL. MySQL Cluster is considered to be the best database in some settings by these customers with Oracle's TimesTen database possibly the only alternative which would suggest that the merging parties' products are seen as potential substitutes. See Alcatel Lucent reply to the request for information to customers databases (doc_ID 2006) and minutes of telephone call with a company (doc_ID 3272).

87 See Oracle reply to question 20 of the request for information to Oracle of 11 September 2009 (doc_ID 1649).

"Embedding is indispensable if an ISV targets an audience including technically non-sophisticated users who do not have access to a system administrator. It is also the only way to provide a "turnkey" device such as a mobile telephone or navigation system"[88].

100. As the notifying party itself admitted "…*an embedded database is not a different product than a non-embedded or enterprise database. All of Oracle's database products are used in both embedded and non-embedded contexts, with the mix of use varying depending on the product and the customer's requirements"*[89]. This implicitly acknowledges the inherent difficulties of making appropriate distinctions for competition purposes between embedded and non-embedded databases as well as the degree of supply-side substitutability between the two.

101. The market investigation has shown that the selection of a database for use in an embedded context depends to a large extent on the particular application. In this regard, several respondents have noted that whether a given database offering could be used for an embedded purpose depends on the customer's business requirements and parameters which may or may not be flexible and cite the example of a mobile phone where a database with a small memory footprint would be the logical choice[90]. In other contexts, however, the business or technical requirements are less stringent and a broader set of databases could be considered[91].

102. Although a majority of customers that expressed an opinion considered that embedded and non-embedded databases do *not* compete[92], a greater proportion acknowledged that it could be possible that a database used by one customer as an embedded database could be used by another customer as a non-embedded database, thereby again underlining the inherent difficulty of drawing a clear-cut distinction for competition purposes between embedded and non-embedded databases[93].

103. Responses from competitors to the same two questions were even more indicative that embedded and non-embedded databases should be considered as forming part of one and the same product market with a majority of respondents confirming both that the two types of database compete with each other and that a database used by one customer as an embedded database could be used by another customer as a non-

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88 See submission of Monty Program Ab "Request to protect disruptive innovation in the overall information technology sector" (doc_ID 841). This company also notes that there are various other reasons why an ISV would desire to embed a database server, such as preventing (or at least substantially complicating) tampering with a database utilized in a mission-critical or security-sensitive context.

89 See Oracle reply to question 20 of the request for information to Oracle of 11 September 2009 (doc_ID 1649). In this reply, Oracle submits that its Oracle Database (all editions) is mainly for enterprise use though it is occasionally embedded; Oracle Berkeley DB is mainly used in embedded whilst Oracle TimesTen In-Memory Database and Oracle Database Lite are more equally balanced between enterprise and embedded use.
In its response to question 27 Oracle explained that MySQL offers two products for embedded use: MySQL Embedded and MySQL Cluster. It noted that MySQL Embedded is simply a "rebranding" of MySQL targeted specifically at the OEM/Embedded market and that it is identical in terms of source code, APIs and features to MySQL Server (Enterprise or Community versions). MySQL Cluster is targeted at specialised telecom use cases. All the MySQL Cluster code is also included in MySQL Server. Both MySQL Embedded and MySQL Cluster are available under a commercial license as well as on an open source basis.

90 See for example the replies of IBM and Monty Program AB to question 12 of the request for information to competitors databases (doc_IDs 2044 and 1891 respectively).

91 See IBM reply to question 12 of the request for information to competitors databases (doc_ID 2044).

92 See replies to question 18 of the request for information to customers databases (doc_ID 2320).

93 See replies to question 17 of the request for information to customers databases (doc_ID 2320).

embedded database[94]. As one competitor that is active in the supply of both embedded and non-embedded databases noted *"the competition is not over embedded or non-embedded databases. Rather the competition is whether the customer wants packaged applications or custom applications. This choice determines their choice of the type of database"*[95].

104. On the basis of the elements discussed in the preceding paragraphs, the Commission reached the preliminary conclusion when adopting the Statement of Objections that it would not be appropriate to define separate product markets for embedded and non-embedded databases. This conclusion was subsequently supported by a number of third parties which made comments on the non-confidential version of the Statement of Objections. The notifying party itself did not contest the Commission's findings when replying to the Statement of Objections. The Commission therefore remains of the opinion that for the purposes of this Decision it is not appropriate to define distinct product markets for embedded and non-embedded databases.

2.1.2. Product market definition on the basis of other criteria

105. The Commission's first phase market investigation revealed a number of database products' characteristics that could possibly serve to further delineate the database market with no single criterion being preponderant. In addition to the distinction between the embedded and non-embedded use of databases which has been addressed in the preceding section 2.1.1., other criteria referred to in the Article 6(1)(c) decision included:

- the type of application such as databases for web applications, databases for online analytical processing (OLAP) and databases for online transaction processing (OLTP);
- the compatibility with customers' existing IT infrastructure;
- general purpose databases vs. specialised databases such as for data warehousing;
- mission critical vs. non-mission critical applications.

106. The market investigation in the second phase did not reveal any new elements that enable the Commission to conclude that any one or more of the criteria listed in paragraph 105 would serve as an appropriate basis on which to define a product market that would be narrower than one consisting of all RDBMS. This conclusion has not been contested by the notifying party with the exception of its position when replying to the Article 6(1)(c) decision that a distinct product market should be defined for embedded databases (including both relational and non-relational variants)[96].

107. Whilst responses to the second phase market investigation again demonstrated that the RDBMS market can be examined from a number of angles, each of which could lead to the identification of possible sub-segments for example by type of customer and/or the use to which a particular database will be put in that organisation, the market investigation has not provided sufficient evidence that these sub-segments should be

94 See replies to questions 12 and 11 of the request for information to competitors databases (doc_ID 2325).

95 See Sybase reply to question 12 of the request for information to competitors databases (doc_ID 2071). A packaged application in this context is considered to be a standard solution purchased from an external supplier as opposed to a custom application designed at the specific request of the customer.

96 Oracle, Observations on the Commission's Theory of Harm, 2 October 2009 (doc_ID 2427).

considered as representing distinct product markets. In this respect it is important to recall from the supply-side perspective that although certain database vendors may seek to differentiate their products by offering them in different editions or versions ostensibly to address certain niches, the underlying code of these versions is essentially the same. This would suggest, in line with the Commission Notice on the definition of the relevant market for the purposes of Community competition law[97], that all such products should therefore be considered as forming part of one and the same relevant product market. Moreover, these sub-segments cannot be considered to be discrete in that no clear dividing lines can be drawn between them. Indeed there is not always consensus as to how certain terms should be defined. In this regard, the issue of mission-critical versus non-mission-critical deployments is perhaps illustrative.

108. Similarly when considering the issue of database compatibility with a customer's existing IT infrastructure, although a number of respondents noted that Microsoft's database offering can only run on Microsoft's operating systems and therefore might not be a credible option for some customers using another operating system, other respondents indicated that their selection of a database would be driven by their business requirements and therefore would not be dependent on the operating system in their company[98]. At the same time, it should be recalled that most RDBMS vendors support multiple operating platforms[99].

2.1.3. Conclusion on product market definition

109. In the light of the results of the market investigations in the first and second phase of the investigation in this case, it is concluded that the relevant product market in this case is that comprising all RDBMS. Given the differentiated nature of RDBMS, however, various sub-segments of the overall RDBMS market should be taken into account for the purposes of assessing the competitive effects of the proposed transaction.

2.2. Geographic market definition

110. The notifying party claims that the geographic market is worldwide.

111. In a previous decision[100] the Commission concluded that the market for databases is at least EEA-wide and probably worldwide.

112. The market investigation in this case has confirmed that the relevant geographic market is worldwide as the IT industry is a global industry and databases can be purchased and used anywhere and any database software can be licensed and installed at any specific geographic location.

113. The scope of the relevant geographic market for RDBMS is therefore worldwide.

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97 OJ C 372, 9.12.1997, paragraph 20 et seq.

98 See responses to question 6 of the request for information to customers databases (doc_ID 2320). It is recalled that the notifying party itself has submitted that it would not be appropriate to define a database product market by operating system. See Form CO, p. 77.

99 See Gartner report *RDBMS Software Market Surpasses $17 Billion in 2007* (doc_ID 162).

100 See Commission decision of 19 June 2001 in Case M.2460 – *IBM/Informix*.

2.3. Conclusion on market definition

114. For the purposes of this Decision, the relevant market is therefore the worldwide RDBMS market.

3. Market characteristics and structure

3.1. Market size and market shares

115. The worldwide RDBMS market measured in terms of revenues amounted to approximately USD 16.4 billion in 2006[101]; USD 18.8 billion in 2007[102] and USD 20.5 billion in 2008[103]. Revenues for RDBMS have increased considerably. Enterprises in all sectors of the economy have increasing needs connected to the management of the data generated by their day-to-day activities. As one industry observer has noted, the increase in demand for databases from 2003 to 2007 was "*driven by increasing investments in business intelligence aimed at streamlining processes and business decision making; data management projects used originally for compliance purposes, now also used for better business management; sheer growth of business data, in size and retained volume, requiring larger databases with better performance and scalability characteristics*"[104].

116. According to several analyst reports, RDBMS revenues are expected to continue growing in the coming years. Although the global economic crisis has affected how companies spend their IT budget, spending is not expected to decrease, but rather to be flat or even increase in the next few years. Gartner reports that *"one reason for this is the realization of the real value of IT and demonstrable results from the use of the data warehouse to transform business process (increasing productivity and profitability) and to create new competitive business opportunities."*[105] Gartner explains that ongoing attention to and investment in databases is necessary because the RDBMS is fundamental to success in data intensive initiatives, such as corporate performance management, business intelligence (BI) and data warehousing, as well as for regulatory compliance initiatives, or industry specific requirements (for example the Basel II accords for banking [106]).

117. Forrester estimates that *"the DBMS market will grow at 8% annually through 2012 as enterprises deploy new applications, expand existing ones, and deal with increasing data volume"*[107].

118. Gartner and IDC provide the following worldwide market shares on the basis of revenues for the year 2008:

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101 IDC, Worldwide RDBMS vendor analysis, p. 4 (doc_ID 600).

102 IDC, 2007 vendor analysis, p. 4 (doc. ID_602).

103 Oracle reply to the request for information to Oracle of 25 September 2009, p. 5 (doc. ID_2123).

104 IDC, Database Management Systems 2007 vendor shares (doc_ID 2432).

105 Gartner study, 28 July 2008, Annex 7 to Oracle's Observations on the Commission's Theory of Harm, 2 October 2009 (doc_ID 2434).

106 Annex 2 from anonymous complainant's submission of 14 August 2009, Gartner, How open source impacts the RDBMS forecast, p. 2 (doc_ID 848).

107 Forrester Research "The Forrester Wave: Enterprise Database Management Systems, Q2 2009" (doc_ID 2444).

Table 2: Database vendors' market shares in terms of revenues

Database Vendors	Gartner		IDC	
	Revenues (USD million)	Market share	Revenues (USD million)	Market share
Oracle	**[…]***	**[40-50]*%**	**[…]***	**[40-50]*%**
IBM	[…]*	[20-30]*%	[…]*	[20-30]*%
Microsoft	[…]*	[10-20]*%	[…]*	[10-20]*%
Sybase	[…]*	[0-5]*%	[…]*	[0-5]*%
Teradata	[…]*	[0-5]*%	[…]*	[0-5]*%
Sun (MySQL)	**[…]***	**[0-5]*%**	**[…]***	**[0-5]*%**
Others	[…]*	[5-10]*%	[…]*	[5-10]*%
Total	[18 000 – 20 000]*	100%	[20 000 – 22 000]*	100%

Source: Gartner - Database worldwide shares by vendor – 2008[108]
IDC - Worldwide Database Management Systems 2009-2013 Forecast and 2008 Vendor Shares - July 2009[109]

119. The database market is highly concentrated: Oracle, IBM and Microsoft together controlled approximately [80-90]*% of the market in terms of revenues in 2008.

120. While Oracle's 2008 market share by revenue in an overall market for databases is estimated between [40-50]*% and [40-50]*%, Sun's MySQL market share, when calculated on the basis of revenues, seems low.

121. However, market shares on the basis of revenues are not a good proxy to reflect the competitive position of MySQL and other open source RDBMS in the market. As MySQL is predominantly distributed under a GPL license free of charge, the majority of its installations do not lead to direct revenues for Sun. Direct revenues are achieved to a limited extent through commercial licenses and subscriptions and through support services.

122. On the other hand, there is no data available either on the total size of the database market measured in active installations as open source vendors do not have the ability to track whether, once downloaded, the open source database is actually installed and used. According to the notifying party, while Sun knows the number of downloads of MySQL (approximately 60 000 daily downloads), there is no exact information on the actual number of MySQL installations. Sun estimates that there are 11 million active installations of MySQL.

123. In addition, according to Gartner, MySQL is the most deployed open-source database. It is the third most deployed database, behind Microsoft SQL Server and Oracle but ahead of IBM DB2 and Sybase[110].

124. During the course of the investigation the Commission also obtained evidence in the form of a survey carried out by an independent market research company indicating the increasing use of MySQL amongst developers and IT managers in the EMEA region

[108] Gartner – Annex 2 to Microsoft White Paper (doc_ID 972).
[109] Oracle reply to the request for information to Oracle of 25 September 2009, p. 6 (doc. ID_2123); original report (doc_ID 3380).
[110] Sun White Paper, A guide to lower TCO, How the Open Source Database MySQL Reduces Costs by as Much as 90%, Annex 3 to Microsoft submission of 8 July 2009, p. 3 (doc_ID 130).

(Europe, Middle East and Africa) [111]. The survey reported that overall in 2009 in the EMEA region, 45.6% of respondents answered that MySQL was the database they had used most often in the past year, second only to Microsoft SQL with 48.3% with Oracle a distant third with 25.7%. When replies to the same question were analysed according to company size, the survey showed that Oracle and Microsoft were the most frequently used databases (43.9%) in companies with more than 1 000 employees whilst MySQL was preponderant (54.4%) in smaller enterprises with fewer than 100 employees.

125. According to the same survey, MySQL is the most frequently used database amongst developers of customised applications, systems integrators and value added resellers (VARs) with 55% of developers citing MySQL compared to 49% citing Microsoft SQL Server. MySQL is also frequently used by Integrated Software Vendors (ISV) and Original Equipment Manufacturers (OEM).

126. The increasing use of MySQL amongst the developer community is further supported by comments on MySQL's own website where it is stated that "according to Evans Data research firm, MySQL has gained 25% in two years. Its market share has increased from 32% in 2004 to 40% in 2006"[112].

127. These elements taken together indicate that MySQL's competitive significance is much greater than its very small market share based on revenue would suggest. As a consequence, the market position of all other players, including Oracle, would then be less than suggested by their market shares based on revenue.

3.2. Barriers to entry

128. The RDBMS market is characterized by a number of barriers to entry related to the technology, the need to build up a reputation of reliability, and the high switching costs faced by customers when trying to migrate their data to another database product.

3.2.1. Technology

129. The basic technology on the basis of which RDBMS are built was invented in the 1970s and still constitutes the core of the products offered by RDBMS vendors. This is not to say that there are no innovations in database products. In particular, the database industry has had to adapt constantly to ever growing and changing database needs.

130. The companies which are today present in the market with proprietary products (Oracle, IBM, Microsoft) have been investing and researching in this area for 20 to 30 years, in order to reach the mature, highly sophisticated products they offer in the market today. The development of databases requires large, long-term investments in order to achieve incremental improvements of speed, reliability and security[113].

111 Source Evans Data Corp. EMEA Development Survey, Volume I 2009. The scores of the other database vendors are: PostgreSQL 12.5%, IBM 7.3%, Firebird 6.7%, Sybase 3.7%, Informix 2.8% and Ingres 0.9%. The question allowed the developers to select as many responses as they wished meaning that the total exceeds 100%. In terms of the percent of total responses, the picture is as follows: Microsoft SQL 29.6%, MySQL 28%, Oracle 15.8%, PostgreSQL 7.7%, IBM 4.5%, Firebird 4.1%, Sybase 2.3%, Informix 1.7% and Ingres 0.6%.

112 See http://www-fr.mysql.com/why-mysql/marketshare/

113 Request For Protection Of Disruptive Innovation, p. 3 (doc_ID 841); Forrester Research "The Forrester Wave: Enterprise Database Management Systems, Q2 2009" (doc_ID 2444).

131. Oracle's flagship product, the Oracle 11g database (2007), represents an incremental evolution over the database's previous versions 10g (2003) and 9i (2001). Oracle itself submitted that it "*is responsible for most of the major innovations in database technology over the past thirty years, has spent tens of billions developing database technologies and has the largest group of database developers in the world*"[114].

132. As a result, there has been no major entry or exit from the market in recent years.

3.2.2. Reputation

133. The market investigation has shown that database software is crucial software which needs to be reliable, particularly as regards mission-critical applications[115]. One of the factors that contribute to maintaining the market position of the three main database vendors (Oracle, IBM, and Microsoft) is the risk-aversion of certain companies and their loyalty to the large databases suppliers, which are perceived as guaranteeing better reliability and support. Oracle refers to this factor as "vendor barrier to adoption"[116].

134. The market investigation confirmed the presence of a certain "resistance": RBS submitted that in its infrastructure it expects "[…] *the major vendors (e.g. IBM, Oracle, Microsoft) to underwrite the support and service propositions. Open Source solutions can be deployed but they need to be endorsed by the major players (much in the same way Linux has become widely adopted)*"[117]. The advantages of proprietary databases are considered by Renault to derive from the "*historical installed base*", "*assurance of support for critical applicat*ions" and "*facility to get package upgrades*"[118].

135. It should be noted that developers are often viewed by RDBMS vendors as important actors in that they are open to innovation and experimenting with new products and may influence the procurement decisions of the organisations in which they work[119]. Developers play a particularly important role as regards the adoption of open source products. Typically, an open source product is first experimented with on a small scale and gains in reputation before being more widely adopted due to its advantages.

3.2.3. Switching costs

136. Migrating to a new database is in most cases a very burdensome and costly exercise. In reverse order of importance, migration involves the following:

- Moving the data itself. The data itself represents the most important asset, because it typically contains the business's core information, such as customer records, user data, billing information, research data, accounts, and so on. In the worst case, any

114 Form CO, p. 14, footnote 10.

115 See, for example the reply of Deutsche Börse to questions 13 and 45 of the request for information to customers databases of 17 September 2009 (doc_ID 1897).

116 Form CO, p. 15.

117 See RBS reply to question 17 of the request for information to customers databases of 31 July 2009 (doc_ID 643).

118 See Renault reply to the request for information to customers databases of 17 September 2009 (doc_ID 1831).

119 See for example the submission of Sun entitled "Preliminary Comments from Greg Papadopoulos (CTO, Sun) on Monty Program AB's Submission on Disruptive Innovation" (doc_ID 2900).

requirement to recreate or modify the data manually could be prohibitively expensive for a company, especially one that stored many terabytes of data[120].

– Porting or recreating the schemas that describe the data's content and relationships to the database manager. While standards (such as SQL2003) provide a large amount of commonality between database schema languages, no RDBMS implements the entire standard, and all RDBMS implement their own extensions. Therefore, except in the most trivial cases, it is never possible simply to copy the same schema from one database to another. Migration usually involves in any case a line-by-line, manual examination of all of a schema's definitions. Schema-language incompatibility (defining schema broadly to include items like stored procedures and triggers) already hampers migration from any RDBMS to another, regardless of the licensing status.

– Recreating the software to manage the database infrastructure, such as load-balancing, clustering, replication, and backup[121]. This infrastructure is not standardized at all, and will probably need to be recreated from scratch for a new database, unless a user happens to be using products designed to support more than one RDBMS product. For a simple RDBMS running in a single copy on a server, this task is usually trivial; however, for a large enterprise or web site running a cluster of dozens of database servers with load balancing[122], replication, hot-swapping[123], geographical distribution, and other features, it could involve a significant amount of effort.

137. In addition, the IT assistants or DBAs are usually trained to support one type of database system in the company: re-training or substitution is costly for any commercial entity. Hence, once the product is deployed, the customer tends to prefer a "stable" model by renewing the license and maintaining the internal and external support. Even if the customer's needs increase, it is more likely that it would revert to the initial vendor in order to expand (scale) its RDBMS rather than looking for a different type of offer. Since the database lies at the core of the IT system, all types of enterprise applications are plugged onto the database system. This creates a database "legacy" that favours loyalty to the supplier.

138. Database customers therefore only rarely engage in migration of their existing databases. It is therefore not surprising that several respondents to the Commission's market investigations have noted the high switching costs and difficulties involved in migrating databases[124].

120 TAEUS report submits, in this respect, that the most effective way to prevent a customer from migrating to a different RDBMS would be to lock in the customer's data (doc_ID 3011).

121 TAEUS report, p. 81 et seq. (doc_ID 3011).

122 This is a specific feature that allows distribution of workload evenly across two or more computers, network links, CPUs, hard drives, or other resources, in order to get optimal resource utilization, maximize throughput, minimize response time, and avoid overload.

123 Hot swapping describes changing components without significant interruption to the system.

124 See replies to question 12 of request for information to customers databases of 31 July 2009, in particular, replies from Ericsson (doc_ID 688); Sabre (doc_ID 1104); Google (doc_ID 1147); Aruba (doc_ID 795); Vodafone (doc_ID 819); France Telecom (doc_ID 757); and Citigroup (doc_ID 951).

3.3. Maturity of the database market

3.3.1. Sophistication of database products

139. Proprietary databases have reached a very high level of sophistication which does not seem to be necessarily needed by some of their customers. While some customers do have highly sophisticated needs that can only be addressed by the advanced features of proprietary databases, it seems that some customers purchase products with complicated, unused features they do not need, and that result in a high TCO.

140. A MySQL document submitted by a competitor explains that "*[F]or years, proprietary database companies have been adding new features that are seldom, if ever, used.* […] *the continued addition of unnecessary features has resulted in overly complicated systems that are slower, more resource intensive, harder to maintain and more prone to failure*" [125].

141. Oracle itself […]*[126]. Oracle […]*.

3.3.2. Margins of proprietary database vendors

142. Proprietary databases vendors currently obtain very high margins on sales of databases. A proxy of Oracle's own margins is contained in an Oracle internal document in which Oracle's overall projected earnings before interest and taxes (EBIT) for the latest twelve months (LTM) are forecast at 46.2% for 2009[127]. Two complainants identify Oracle's gross margins in the support services for databases as around 90%[128]. Furthermore, quoting Oracle's Co-President Ms. Safra Catz[129], one of these complainants highlights how the revenues derived from support services are particularly high for Oracle.

3.3.3. Expectation regarding further inroads of open source databases

143. Both Gartner[130] and Datamonitor[131] have registered an increased interest in open source relational database management systems in recent years. According to Gartner, the use of open source databases is increasing. From 2007 to 2008 open-source RDBMS vendor revenue grew by 49.2% compared to an overall market growth of 11.9% and compared to 42.4% in the previous year.[132] However, open-source RDBMS only represent about 0.84% of the total RDBMS market in terms of revenue. Gartner also believes that the growth of open-source RDBMS will continue and that revenue of open-source databases will reach more than USD 1 billion in 2014. These elements demonstrate a tendency towards an increased use of open source products in a business environment, as *"the only parties interested in subscription support would be using it for production applications"*.

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125 "A guide to lower database TCO, how the open source database MySQL reduces costs by 90% - A MySQL White Paper from 2009" (doc_ID 2657).

126 Annex 1.2 of Oracle's internal documents, slides 26 and 27 (doc_ID 1479).

127 Doc_ID 2617. See also Annex 5 of anonymous complainant's submission of 16 June 2009, p. 21 et seq. (doc_ID 149).

128 Anonymous complainant's submission of 16 June 2009, doc_ID 144, p. 9; Microsoft's White Paper of 22 June 2009, p.1 (doc_ID 127).

129 "*We get to keep virtually all of that [maintenance] money*", see Anonymous complainant's submission of 16 June 2009, p. 9 (doc_ID 144).

130 New Gartner Report, p.2 (doc_ID 2276).

131 Annex 8, p.5 (doc_ID 2435).

132 New Gartner Report, p.2 (doc_ID 2276).

144. The key driving factors for the increasing deployment of open source databases are (i) increased maturity in the open source DBMS engines, (ii) availability of management software and (iii) lower TCO.

145. According to Datamonitor, in the mature RDBMS market customers in need of business-critical, highly transactional offers *"typically look no further than the current major commercial offerings from Microsoft, IBM, and Oracle. However, the open source database market has become fruitful ground for the next tier of requirements and in many cases is still running applications developed over the years that are business critical, of significant scale, and high performance. One reason for this is the maturity of the open source products themselves."*

4. Compatibility of the concentration in the field of databases with the common market

146. This section is structured as follows:

- Section 4.1 presents the views of the notifying party.
- Section 4.2 sets out the legal test and its application to the specifics of the worldwide database market.
- Section 4.3 analyses the competitive situation prior to the transaction.
- Section 4.4 assesses the competitive situation after the transaction.

4.1. Notifying party's view

147. Oracle considers that the proposed concentration will not have any anticompetitive effects in the database market.

148. The starting point of Oracle's considerations is that anticompetitive effects could only arise if Oracle and MySQL were close competitors. In the notification, Oracle states that significant non-coordinated effects are only possible if the merging parties are particularly close competitors for a substantial group of customers[133].

149. Oracle considers that the parties are not close competitors and that their respective products are placed at different ends of the market. It considers that Oracle and MySQL hardly compete with each other at all for the same database applications[134]. Moreover, in the few database segments where MySQL and Oracle do compete there are many significant competitors[135]. Oracle further argues that, due to the open source character of MySQL databases it will not be able to degrade MySQL after the proposed transaction and that in any event it does not have any incentive to damage or degrade MySQL[136].

150. Oracle submitted in the Form CO that the appropriate market definition in the field of databases is an overall market for database products and mainly referred to market

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133 Form CO page 88.

134 Form CO pp. 89-91; Oracle, Observations on the Commission's Theory of Harm, 2 October 2009, p. 22 et seq. (doc_ID 2427).

135 Form CO, pp. 89-91; Oracle, Observations on the Commission's Theory of Harm, 2 October 2009, pp. 57 et seq. (doc_ID 2427).

136 Form CO pp. 89-91; Oracle, Observations on the Commission's Theory of Harm, 2 October 2009, pp. 87 et seq. and p. 112 et seq. (doc_ID 2427).

information provided by Gartner and IDC[137] which is based on revenues. Apart from the parties with estimated market shares of 48.9% or 43.5% for Oracle and 0.4% or 0.2% for MySQL, Gartner and IDC list IBM (21.9% or 21.7%) and Microsoft (16.6% or 19.5%) as the most important competitors. In addition, Sybase and Teradata are mentioned with market shares below 5%[138]. As regards MySQL's market position, Oracle states that it cannot estimate the total number of MySQL installations but recalls that Sun estimates the total number of active installations to be 11 million. As regards other open source alternatives to MySQL Oracle refers to Ingres and PostgreSQL as competitors.

151. In terms of market concentration levels, Oracle points out that, based on IDC data, the post-transaction Herfindahl-Hirschman Index (HHI) would be approximately 2809, with an HHI delta of 27. Oracle submitted that when the delta is below 150, the Commission is generally unlikely to identify horizontal competition concerns[139].

152. Oracle further argues that even if Oracle's database offerings and MySQL were found to be competing, the proposed transaction would not have anticompetitive effects in the database markets due to the open source nature of MySQL[140]. Due to the GPLv2 license, Oracle would not, via the proposed transaction, gain the ability to reduce output, as the open source MySQL code is already beyond the control of Sun. Should Oracle stop improving MySQL development or attempt to degrade MySQL, MySQL would very likely evolve from a vendor-led to a community-led open source project, similar to Linux. Alternatively, MySQL users could move to businesses offering branches of MySQL like MariaDB or Percona or use other open source products. In addition, Oracle could not prevent forking[141] of MySQL and fork vendors would develop viable business models without a need for commercial licenses.

153. As regards its incentives, Oracle argues that degrading MySQL would inflict significant harm on Oracle as it would be a blow to its reputation and many businesses using both Oracle's and MySQL's products would reconsider their general commitment to Oracle across all Oracle products.

154. Oracle reiterated many of its claims in its reply to the Statement of Objections. It stressed that MySQL does not exert an important competitive constraint on Oracle's database products but rather is complementary in nature. It quoted extensively from analysts' reports and replies from customers to the Commission's requests for information in support of its position. Oracle also submitted the results of an analysis which in its opinion demonstrated that Oracle's databases and MySQL serve different needs in terms of workload and why MySQL, due to its architectural structure, could not be expected to evolve into a closer competitor to Oracle's 11g database offering which is primarily designed for enterprise applications[142].

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137 Form CO, p. 86.

138 In so far as Oracle refers to shipments as potential basis for measuring market power and presence of competitors the identity and number of significant competitors does not change, see Form CO, p. 86.

139 Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings ("Horizontal Guidelines"), OJ C 31, 5.2.2004, paragraph 20.

140 Oracle, Observations on the Commission's Theory of Harm, 2 October 2009, (doc_ID 2427).

141 Forking refers to the practice whereby a copy of the source code is taken and may subsequently be developed independently of the original source code.

142 "An Analysis of the Features and Architectures of the Oracle 11g and MySQL Database Management Systems", Annex 4 of Oracle's reply to the Statement of Objections

4.2. Legal test and application of the legal test to the specifics of the worldwide database market

155. Under Article 2 (2) and (3) of the Merger Regulation, the Commission must assess whether a proposed concentration would significantly impede effective competition in the common market or in a substantial part of it, in particular as a result of the creation or strengthening of a dominant position.

156. The Commission guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings ("the Horizontal Guidelines")[143] distinguish between two main ways in which mergers between actual or potential competitors on the same relevant market may significantly impede effective competition, namely non-coordinated effects and coordinated effects[144]. Non-coordinated effects may significantly impede effective competition by eliminating important competitive constraints on one or more firms, which consequently would have increased market power, without resorting to coordinated behaviour. In that regard, the Horizontal Guidelines consider not only the direct loss of competition between the merging firms but also the reduction in competitive pressure on non-merging firms in the same market that could be brought about by the merger[145].

157. The Horizontal Guidelines list a number of factors which may influence whether or not significant non-coordinated effects are likely to result from a merger, such as the large market shares of the merging firms, the fact that the merging firms are close competitors, the limited possibilities for customers to switch suppliers, or the fact that the merger would eliminate an important competitive force. This list of factors is however not exhaustive[146]. Furthermore, not all of these factors need to be present in order for significant horizontal effects to be likely[147].

158. The Horizontal Guidelines also recognize that some firms, despite having a relatively small market share, may be an important competitive force. A merger involving such a firm may change the competitive dynamics in a significant, anti-competitive way, in particular where the market is already concentrated[148]. This is of particular relevance to the assessment of the proposed transaction in this case.

159. Finally, according to the Horizontal Guidelines, in assessing the competitive effects of a merger, the Commission compares the competitive conditions that would result from the notified merger with the conditions that would have prevailed without the merger[149]. In order to determine whether the merger would cause a significant change in market conditions, the Commission is therefore required to conduct a prospective analysis, in which it has to compare the respective prospects for competition in the presence and in the absence of the merger.

160. As regards this case, Oracle considers the Commission's theory of harm as unusual, unprecedented and ultimately illegal under the Merger Regulation.

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[143] OJ C31, 5.2.2004, p.5.

[144] Horizontal Guidelines, paragraph 22.

[145] Horizontal Guidelines, paragraph 24.

[146] Horizontal Guidelines, paragraph 26.

[147] Horizontal Guidelines, paragraph 26.

[148] Horizontal Guidelines, paragraph 37.

[149] Horizontal Guidelines, paragraph 9.

161. In particular, Oracle claims that while up to now the Commission has nearly always relied on showing dominance and closeness of competition, in this case it is not seeking to show either. According to Oracle, even in those cases in which the Commission based its theory of harm on the elimination of an important competitive force through the acquisition of a maverick, the merger would have created or strengthened a dominant position or the maverick was a close competitor of the acquiring undertaking. Oracle further submits that the Horizontal Guidelines mention only, as factors potentially giving rise to an important competitive force, the fact that the maverick is either a recent entrant poised to exert an important competitive pressure in the future or an innovating firm. Oracle maintains that none of these requirements is met in this case.

162. The Commission considers that the theory of harm as set out in this Decision is fully in line with the legal test deriving from the Merger Regulation and the Horizontal Guidelines.

163. First, under the new substantive test introduced by the Merger Regulation (see Article 2 (2) and (3)), the Commission is no longer required to show, in all cases, the creation or strengthening of a dominant position in order to declare a merger to be incompatible with the common market. As expressly stated in the Horizontal Guidelines, the Commission must take into account in its assessment any significant impediment to effective competition likely to be caused by a concentration[150]. As explained in the Merger Regulation, beyond the concept of dominance, concentrations involving the elimination of important competitive constraints that the merging parties had exerted upon each other, as well as a reduction of competitive pressure on the remaining competitors, may, under certain circumstances, even in the absence of a likelihood of coordination between the members of the oligopoly, result in a significant impediment to effective competition[151].

164. Second, contrary to Oracle's claims, the Commission is not required, for the purposes of the assessment of this case, to show that the merging parties are the closest competitors on the relevant market. Closeness of competition is only one of the factors listed in the Horizontal Guidelines as conducive to influence whether significant non-coordinated effects are likely to result from a merger.

165. Third, also contrary to Oracle’s submission, it does not derive from the Horizontal Guidelines that, in order to characterize the target of a transaction as an important competitive force, the latter must necessarily be either a recent entrant or an innovating firm. It is clear from the wording of the relevant section of the Horizontal Guidelines[152] that the factors or scenarios enumerated therein merely constitute illustrations of mergers that may eliminate an important competitive force, and should not be understood as an exhaustive list. While the Horizontal Guidelines present the analytical approach used by the Commission in its appraisal of horizontal mergers, they cannot provide details of all possible applications of this approach[153].

166. Through the proposed transaction, Oracle, the largest and strongest proprietary database vendor with substantial market power, would be acquiring MySQL, the largest open source database.

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150 Horizontal Guidelines, paragraph 2.

151 Recital 25 to the Preamble of the Merger Regulation.

152 Horizontal Guidelines, paragraphs 37 and 38.

153 Horizontal Guidelines, paragraph 5.

167. In sum, applying the legal test to the proposed transaction, the Commission must assess whether or not the proposed transaction may significantly impede effective competition by eliminating an important competitive constraint, notably on the notifying party, which would consequently increase market power. Hence, in its in-depth investigation, for the purposes of this Decision, the Commission must examine the nature and degree of the competitive constraint exerted by MySQL before the proposed transaction, the extent to which such competitive constraint would be removed after the merger as well as the extent to which other actual or potential database competitors would constrain Oracle post-merger.

168. There are strong specificities of this case in particular due to the *open source nature of MySQL* that influence the assessment for each of these issues:

- First, taking into account the specifics of the database market and the market position of Oracle, the Commission examined whether MySQL might potentially exert a particular constraint on Oracle and other proprietary database vendors due to its open source nature making it an "important competitive force".

- Secondly, while in any horizontal merger case, it can be presumed that two previously competing products will no longer compete after the merger if they become owned by the same firm, it is necessary for the purposes of this Decision, given the open source nature of MySQL for the Commission to go further and to assess to what extent Oracle might have the ability and the incentive to degrade or eliminate MySQL post merger.

- Thirdly, given the specific nature of the constraint that might be exerted by MySQL on Oracle and other proprietary database vendors, in order to assess the likelihood of sufficient and timely replacement entry post merger, the Commission's assessment focused on the remaining open source vendors, in particular PostgreSQL, as well as on the possible new entrants that forks of MySQL (or threat of such forks) would constitute.

- As regards both Oracle's likely ability and incentives to degrade or eliminate MySQL and the likelihood of sufficient and timely replacement entry post merger, the public announcement made by Oracle on 14 December, which was transmitted to the Commission on 11 December 2009, must also be taken into account in the light of the strong specificities of open source software industry.

169. As shown below in Section 4.4, all the elements in the file taken together allow the Commission to conclude that the transaction will not lead to a significant impediment of competition in the common market as regards the worldwide database market.

Nature and degree of the competitive constraint exerted by MySQL pre-merger

170. As regards the pre-merger situation (see section 4.3), the Commission's investigation showed that MySQL is the largest open source database. It also appears that MySQL has the potential to exert an important and growing competitive constraint on Oracle and other proprietary database vendors due to inter alia its specific modular architecture, its business model resulting in low pricing and absence of lock-in, and the other strengths it derives from its open source nature. The nature of this constraint also has a dynamic aspect as MySQL's specific modular architecture favours innovation by third parties developing storage engines developing MySQL's functionalities for some targeted higher-end applications.

171. The Commission's investigation revealed that MySQL has the potential to be an important competitive force constraining Oracle in some important segments (in particular the small and medium enterprise ("SME") or low end segment and some parts of the embedded segment) but it does not currently constrain Oracle in all the segments of the database market (in particular in the high end segment). In any event, Oracle will continue to face competitive pressure from a number of other proprietary database vendors including Microsoft, IBM and Sybase.

Extent to which Oracle would have the ability and incentive to degrade or eliminate MySQL post merger

172. Oracle's ability and incentives with regard to the likely evolution of MySQL post-transaction are addressed in section 4.4.1.

173. It could be expected that the Oracle database and MySQL would stop competing after the merger as they would be offered by the same vendor. Some concerns have been expressed that Oracle might stop offering MySQL under a GPL license, that it might degrade or stop developing the GPL version of MySQL or that it might prevent constraint from third-party storage engines by modifying the interface or refusing to grant commercial licenses to storage engine vendors so as to allow them to market proprietary versions of their storage engines working with MySQL.

174. The Commission's investigation however found that Oracle's likely ability and incentives to remove MySQL as a competitive force in the database market after its acquisition of Sun would be constrained due to the open source nature of MySQL.

175. In this respect, the Commission also takes into account in its assessment the public announcement made by Oracle on 14 December in light of the strong specificities of the open source software industry. MySQL in particular is characterised by a vibrant ecosystem.

176. After the hearing in this case, on 14 December 2009, Oracle publicly announced ten pledges vis-à-vis MySQL's users, customers and developers[154]. Oracle has publicly

[154] 1. Continued Availability of Storage Engine APIs. Oracle shall maintain and periodically enhance MySQL's Pluggable Storage Engine Architecture to allow users the flexibility to choose from a portfolio of native and third party supplied storage engines.

MySQL's Pluggable Storage Engine Architecture shall mean MySQL's current practice of using publicly-available, documented application programming interfaces to allow storage engine vendors to "plug" into the MySQL database server. Documentation shall be consistent with the documentation currently provided by Sun.

2. Non-assertion. As copyright holder, Oracle will change Sun's current policy and shall not assert or threaten to assert against anyone that a third party vendor's implementations of storage engines must be released under the GPL because they have implemented the application programming interfaces available as part of MySQL's Pluggable Storage Engine Architecture.

A commercial license will not be required by Oracle from third party storage engine vendors in order to implement the application programming interfaces available as part of MySQL's Pluggable Storage Engine Architecture.

Oracle shall reproduce this commitment in contractual commitments to storage vendors who at present have a commercial license with Sun.

3. License commitment. Upon termination of their current MySQL OEM Agreement, Oracle shall offer storage vendors who at present have a commercial license with Sun an extension of their Agreement on the same terms and conditions for a term not exceeding December 10, 2014.

announced that it will comply with all of these pledges worldwide until the fifth anniversary of the closing of the proposed transaction. In addition, Oracle has also already taken action to implement three of these pledges in a legally binding way in the existing contracts of Sun with storage engine vendors.

177. The public announcement made by Oracle through which Oracle made specific pledges to users, customers and developers of MySQL as regards how it will manage and further enhance MySQL post merger does not constitute formal remedies in line with the Commission notice on remedies acceptable under the Council Regulation (EC) No 139/2004 and under Commission Regulation (EC) No 802/2004[155] ("Remedies Notice").

178. The Commission has a long established and consistent practice regarding the remedies that are necessary in order to clear a merger once competition concerns have been established at the end of the investigation. This practice is explained in detail in the Remedies Notice and is reflected in countless decisions adopted under the Merger Regulation. Commitments must be proportionate to the competition problems identified and entirely eliminate them.

179. Paragraph 13 of the Remedies Notice states that in order for commitments to comply with the principles of the Remedies Notice, there has to be an effective implementation

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Oracle shall reproduce this commitment in contractual commitments to storage vendors who at present have a commercial license with Sun.

4. Commitment to enhance MySQL in the future under the GPL. Oracle shall continue to enhance MySQL and make subsequent versions of MySQL, including Version 6, available under the GPL. Oracle will not release any new, enhanced version of MySQL Enterprise Edition without contemporaneously releasing a new, also enhanced version of MySQL Community Edition licensed under the GPL. Oracle shall continue to make the source code of all versions of MySQL Community Edition publicly available at no charge.

5. Support not mandatory. Customers will not be required to purchase support services from Oracle as a condition to obtaining a commercial license to MySQL.

6. Increase spending on MySQL research and development. Oracle commits to make available appropriate funding for the MySQL continued development (GPL version and commercial version). During each of the next three years, Oracle will spend more on research and development (R&D) for the MySQL Global Business Unit than Sun spent in its most recent fiscal year (USD 24 million) preceding the closing of the transaction.

7. MySQL Customer Advisory Board. No later than six months after the anniversary of the closing, Oracle will create and fund a customer advisory board, including in particular end users and embedded customers, to provide guidance and feedback on MySQL development priorities and other issues of importance to MySQL customers.

8. MySQL Storage Engine Vendor Advisory Board. No later than six months after the anniversary of the closing, Oracle will create and fund a storage engine vendor advisory board, to provide guidance and feedback on MySQL development priorities and other issues of importance to MySQL storage engine vendors.

9. MySQL Reference Manual. Oracle will continue to maintain, update and make available for download at no charge a MySQL Reference Manual similar in quality to that currently made available by Sun.

10. Preserve Customer Choice for Support. Oracle will ensure that end-user and embedded customers paying for MySQL support subscriptions will be able to renew their subscriptions on an annual or multi-year basis, according to the customer's preference.

http://www.oracle.com/us/corporate/press/042364 (doc_ID 5178). This announcement was also communicated to the Commission on 11 December 2009.

[155] OJ C 267, 22.10.2008, p. 1.

and ability to monitor the commitments. Otherwise, such commitments would have to be considered as mere declarations of intention by the parties and would not amount to binding obligations, as, due to the lack of effective monitoring mechanisms, any breach of them could not result in the revocation of the decision according to the provisions of the Merger Regulation.

180. These principles fully apply whenever the Commission has identified competition concerns. The situation, however, is different when the facts of the case allow the Commission to conclude that the merger will not raise competition concerns.

181. In this respect, the Commission considers that the public announcement made by Oracle on 14 December, addressed to the general public and in particular to the open source community, and the subsequent actions already taken to implement part of this announcement, constitute factual elements that the Commission must take into account in this case, along with all the other elements in its file in its assessment of the impact of the proposed transaction on the database market[156].

182. Although, with the exception of points 1, 2 and 3 (see below paragraph 184), Oracle's public announcement is not legally binding on Oracle, the Commission considers that the strong specificities of open source software and the vibrant ecosystem surrounding MySQL provide for a self-enforcing mechanism ensuring that Oracle would not have the ability and incentives to deviate from its announced future conduct. Reputation and trust is of utmost importance for the sponsor of an open source project which depends on contributions by a large ecosystem of users, developers and customers. After the merger Oracle will become the sponsor of a number of significant open source projects of Sun, including Java, MySQL and OpenSolaris, and will as such need to gain and retain the trust from the open source community. In this respect, it can be expected that all of the public pledges made by Oracle to reassure MySQL users, developers and storage engine vendors will be subject to close scrutiny from the open source community.

183. In this context it should be noted that the public announcement includes to a large extent some of the promises expected from Oracle by Monty Widenius, the founder of MySQL and owner of Monty Program AB, on his blog of 13 December 2009[157]. The

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[156] In this respect, it should be pointed out that, as is the case for any information which is material to the Commission's declaration of compatibility of a concentration, the Commission may be entitled to revoke the present decision pursuant to Article 8(6)(a) of the Merger Regulation, should Oracle fail to respect its public announcement. Article 8(6)(a) of the Merger Regulation contemplates a distinct situation from Article 8(4)(b) and Article 8(6)(b) of the Merger Regulation which deal, respectively, with the breach of a condition or an obligation attached to a decision under a decision adopted pursuant to Article 8(2).

[157] http://monty-says.blogspot.com/2009/12/help-saving-mysql.html. In his blog of 13 December 2009, Monty Widenius, the creator of MySQL and owner of Monty Program Ab, the company behind the MariaDB, expressed concerns about ownership by Oracle of MySQL, as Oracle had not promised:

- to keep (all of) MySQL under an open source license
- not to add closed source parts, modules or required tools
- to not raise MySQL license or MySQL support prices
- to release new MySQL versions in a regular and timely manner
- to continue with dual licensing and always provide affordable commercial licenses to MySQL to those who need them (to storage vendors and application vendors) or provide MySQL under a more permissive license
- to develop MySQL as an open source project
- to actively work with the community
- to apply submitted patches in a timely manner
- to not discriminate patches that make MySQL compete more with Oracle's other products

lively debate that has followed Oracle's public announcement testifies to the vibrancy of the open source community around MySQL and its ability to detect possible substantial deviations by Oracle from its public pledges and to provide sufficient enforcement mechanisms.

184. In the case of points 1, 2 and 3 of Oracle's public announcement, Oracle has immediately implemented them by sending letters to eight third parties[158], including four third-party storage engine vendors, pledging to amend the existing contractual terms by reproducing the relevant content of its public announcement. These elements are therefore legally binding on Oracle.

185. As will be explained in more detail in section 4.4., the public announcement and its partial implementation have an impact on the ability and incentives of Oracle as regards the further development of MySQL after the merger.

Extent to which other open source databases and forks of MySQL would constrain Oracle post merger

186. The Commission's investigation revealed that other open source databases, in particular PostgreSQL, have the potential to constrain Oracle to an important extent after the merger and to replace the competitive constraint currently exerted by MySQL in a timely and sufficient manner.

187. Finally, the Commission's investigation suggested that the possibility cannot be ruled out that forks of MySQL might also develop to exercise a constraint on Oracle to some extent.

4.3. Competitive situation pre-transaction

4.3.1. Specifics of the database market

188. Databases differ in their *architectural design*. Whereas most databases provide similar basic functionalities and are, thereby, largely technically substitutable for simple deployments, differences in database technical architecture tend to restrict substitutability as far as more demanding applications are concerned.

189. The market for databases is characterized by a high degree of price discrimination. Database vendors can achieve this by configuring their databases in different ways, resulting in different editions, mostly by disabling some features, or limiting the memory size of the database. Database vendors can also engage in a first degree commercial price discrimination, whereby they directly charge different prices to different users for the technically identical product[159].

190. It has to be noted that price discrimination is limited by the vendors' ability to precisely identify the usage of the database (for example a database purchased for web

- to ensure that MySQL is improved also in manners that make it compete even more with Oracle's main offerings.

158 Oracle, (doc_ID 5496).

159 The Commission notes a number of differently priced editions of Oracle's main database and a degree of price discrimination through direct sales representation (see for example HQ Apps). More generally, the main commercial database vendors (such as Oracle and Microsoft) propose various versions of their databases, mostly differing in terms of disabled features or limits in the memory size of the database.

deployment may well be deployed for other uses without the vendor necessarily knowing it).

191. Another feature of the software market is very low marginal costs for software licenses. This generates significant economies of scale, which gives the database vendors strong incentives to reach high volumes of sales.

192. The strong economies of scale, together with significant ability to price discriminate imply that the competition is likely to be strong for sales to less demanding users. These users typically use the basic features of the databases. At the same time, due to stronger differentiation of databases, in terms of functionality, from the point of view of the more demanding users, the competition is likely to be more limited in the market for high-end database deployments.

193. As already mentioned in section 3.2.3., another specificity of the database market is the significant relationship specific costs on the side of the customer. These costs are associated with an adoption of a particular database and are sunk and result in high switching costs. The costs arise as the customer invests in database specific learning and development of applications customized for the particular database.

194. A costly hold-up problem may result, due to the vendor's incentives to increase the price after the customer has been locked-in with its database. Both the database vendor and the locked-in user may have incentives to resolve this problem, but it cannot be resolved easily as credible commitments in the form of long-term contracts are costly. The industries marked by high switching costs are often characterized by strong ex-ante competition for the market in the form of very low prices for new adopters and higher prices for captive users.

195. It is well established in academic literature that network effects play a prominent role in many software markets, including the market for databases. Network effects describe the impact that one participant in a network has on the value of participation for other participants in the same network. Network effects also act as an effective barrier to entry. A large network of participants in the project is required, in order to generate value to participation and to compete effectively against established networks. Establishing a large network is costly time wise and may require very aggressive pricing. This reduces the incentives to enter for an independent developer even in an industry which is highly concentrated and where the incumbents are generating high margins. As a result the industries with strong network effects are often highly concentrated.

4.3.2. Oracle as the largest and strongest proprietary database vendor

196. Oracle is the leading supplier of RDBMS on a global basis with a market share based on revenues of between 43% and 49% in 2008. Its market share based on revenues is more than twice that of the second-placed supplier, IBM, which had a market share of around 22% in 2008. Microsoft, the third main supplier of RDBMS recorded a market share of between 16% and 19%. No other RDBMS supplier achieved a market share based on revenues in excess of 5% in 2008.[160].

197. With the exception of mainframe and other server systems where IBM's RDBMS are most prevalent, Oracle's RDBMS licence revenues are fairly evenly distributed across

[160] See Gartner and IDC data in section 3.1.

the remaining operating environments, namely Unix, Windows NT and Linux/open source systems. This makes it not only the leading RDBMS vendor overall but also the leading supplier for Unix (49.7%)[161] and Linux/open source environments (66.5%) and the number two supplier of RDBMS for Windows NT (26.2%) behind Microsoft (whose RDBMS only works in a Windows NT operating environment)[162].

198. In contrast to IBM and Microsoft, Oracle derives a greater proportion of its total RDBMS revenues from maintenance rather than licenses.

Table 3: Worldwide RDBMS product revenue, 2007[163]

	Total RDBMS license revenue (USD M)	As a percentage of total RDBMS revenue	Total maintenance revenue (USD M)	As a percentage of total RDBMS revenue	Total RDBMS product revenue (USD M)
Oracle	3 461	42%	4 875	58%	8 336
IBM	2 721	69%	1 232	31%	3 953
Microsoft	2 679	77%	800	23%	3 479

199. The picture for RDBMS revenues reflects the situation for the company's overall revenues as reported in its annual report where revenues from software license and updates (that is to say maintenance) are reported as representing nearly half of total revenues and new software licenses approximately one third[164]. As the company remarks in the same report "*Substantially all of our customers purchase software license updates and product support when they acquire new software licenses. In addition, substantially all of our customers renew their software license updates and product support contracts annually"*[165].

200. As is shown by the following quotes taken from replies to the Commission's first and second phase market investigations, a number of customers have commented on the fact that, as the market leader in RDBMS, Oracle is able to charge high prices for licenses and support and that the proposed transaction may reinforce this ability:

(1) *"We expect growing costs/prices for licences and maintenance for Oracle database product…. Oracle leading market position will grow and will influence the whole database market. Negotiations will become more difficult (e.g. inflexible licence models for large enterprises acting as service provider, growing support costs year by year)"*[166].

(2) *"Oracle's acquisition of Sun will allow Oracle to force customers to accept costly and unwanted maintenance to more products and services…Verizon has customarily paid more for the maintenance of that application than the license itself...This is an outcome that all Oracle customers are forced to accept. ...Oracle*

[161] These data are based on 2007 revenue figures because similar analyst reports for 2008 are not yet available.

[162] IDC, 2007 RDBMS Vendor Analysis (doc_ID 602).

[163] Data derived from IDC, 2007 RDBMS Vendor Analysis (doc_ID 602).

[164] FY 2009 Annual Report for Oracle Corporation, Form 10-K, Annex 19 to the Form CO (doc_ID 327).

[165] FY 2009 Annual Report for Oracle Corporation, Form 10-K, Annex 19 to the Form CO (doc_ID 327).

[166] See Deutsche Lufthansa AG reply to the request for information to customers databases (doc_ID 1888).

would seem to have a dominant position that it could leverage to Sun products if the transaction were consummated"[167].

201. In its public announcement of 14 December 2009, Oracle declared that it would further enhance MySQL under the GPL and not require customers to purchase support services from Oracle as a condition for obtaining a commercial license for MySQL. This will limit Oracle's ability to charge high prices for licenses and support.

4.3.3. Nature of the competitive constraint posed by MySQL

202. MySQL has certain features, in particular related to its technology and its business model, which determine the nature of the competitive constraint posed by MySQL. These features will be presented in this section.

4.3.3.1. Technology

203. MySQL has several specific technological features which have an impact on the nature of the competitive constraint exercised by MySQL.

204. MySQL runs on all major platforms, that is to say MySQL is not limited to certain operating systems, contrary to Microsoft SQL Server for example which only runs on Windows.

205. MySQL has a light footprint, that is to say it requires a relatively small amount of resources (whether it be disk space or memory required) to use the database. For example, MySQL has a substantially smaller footprint than Oracle's database[168].

206. MySQL is easy to install. This is illustrated by MySQL's claim that the time required for downloading and installing MySQL is not more than 15 minutes[169]. MySQL requires less expertise to use and administer. MySQL frequently comes packaged with other applications, for example with content management systems which would allow web sites to be set up quickly and easily with MySQL as the back-end data store with no requirement for specialized training for configuring or operating databases[170].

207. MySQL follows a modular approach which is different from the unitary approach chosen by most proprietary database vendors but also by other open source database vendors.

208. The specificity of MySQL's modular approach is that MySQL's interfaces/connectors between the three different layers are documented and can be used by software developed by other parties. This allows the customisation of the tools and storage engine layers. Although MySQL comes shipped with a number of storage engines (for example with the default storage engine MyISAM) and if requested with certain tools, users can choose which storage engine and tools to use. The core of MySQL databases is the MySQL server, that is to say the middle layer which remains the same regardless of the chosen tools and storage engine and thus ensures that the database remains a MySQL database. In this way applications that make use of the database are to a certain

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167 See Verizon reply to the request for information to customers databases (doc_ID 1935).

168 See TAEUS report, p. 56 (doc_ID 3011).

169 It should be noted though that this is only valid for installing the core server with the default features. As is the case for other RDBMS, after the first installation the system would additionally often have to be further configured in order to provide optimal performance for its intended tasks.

170 See TAEUS report, p. 32 and p. 42 (doc_ID 3011).

extent shielded from the complexity and specificity of the storage engines. If applications are developed to work with MySQL it will in many cases be possible to simply change the underlying storage engine, perhaps for a large performance gain, without any need to adapt the application.

209. Multiple storage engines are available for MySQL, allowing the customer to choose the one that is most effective for the customer's targeted application. These storage engines comprise storage engines developed by MySQL itself (like MyISAM, Falcon, Cluster, etc.), partner-developed storage engines (like for example InnoDB, now owned by Oracle), storage engines developed (and marketed) by third parties and custom storage engines developed by MySQL users to address their specific needs[171].

210. MySQL is currently available on favourable terms to a number of complementary product vendors. A particularly prominent group are independent vendors of storage engines (besides InnoDB owned by Oracle), which implement functionalities needed for higher end applications. These storage engines have considerably enhanced MySQL and can most likely be expected to further enhance MySQL in the future if MySQL is available in the present form and on favourable terms as is currently the case under independent ownership.

211. The modular architecture and the availability of multiple storage engines thus allows MySQL to target different technology segments of the market in parallel, thereby increasing MySQL's competitiveness in various segments of the database market.

4.3.3.2. Functionalities

212. MySQL is very popular for implementing back-end storage for web sites. In this market, the features of the default MyISAM storage engine are generally entirely adequate[172].

213. As regards use as general purpose databases, the default storage engine (MyISAM) lacks a number of features that are critical for competing with proprietary RDBMS. However, other storage engines such as InnoDB, Falcon or the IBM *DB2 engine for i13* (IBM DB2i) provide these features[173].

214. InnoDB, which was acquired by Oracle in 2005 and continues to be available under a dual license pursuant to an agreement with MySQL[174], is currently the most-used storage engine for development of transactional database applications with MySQL. The TAEUS report comes to the conclusion that MySQL has significant overlap with Oracle for OLTP applications, provided that it can continue to include the InnoDB storage engine[175].

215. An important storage engine for certain high-end developments is the cluster storage engine which is part of the MySQL Cluster product offered by Sun and which adds clustering abilities to MySQL. A cluster is a means to increase the reliability of an overall computer system, to improve performance, or both. Clustering capabilities are

171 See TAEUS report, p. 29 (doc_ID 3011).
172 See TAEUS report, p. 41 (doc_ID 3011).
173 See TAEUS report, p. 33 (doc_ID 3011).
174 See Section 4.6.
175 See TAEUS report, p. 56 (doc_ID 3011).

included with, or can be bought in conjunction with some of the high-end proprietary databases[176].

216. With its MySQL Cluster product MySQL is successful as an embedded database for a sub-segment of the market that is made up of equipment vendors for telecommunication companies. MySQL Cluster, being a specialized in-memory database, is tailored specifically to the needs of such users, and includes a number of features to improve reliability and performance for such applications[177]. However, the deployment of MySQL Cluster is not limited to telecommunications vendors.

217. Currently, there are also technical limitations for MySQL. For instance, for data warehousing a standard installation of MySQL would currently be much less capable than a standard installation of Oracle (including applicable technical add-ons as offered by Oracle). There are, nevertheless, a number of indications that MySQL can currently be used for data warehousing.[178] Moreover, third-party products are available that can be combined with MySQL to increase its competitiveness in this segment.[179]

218. As regards scaling out, that is to say the ability to fully translate additional hardware units (servers) into additional performance/speed, TAEUS considers MySQL's ability to be more limited than Oracle's for example.[180] The scaling out category is important for applications that require a level of reliability and availability beyond what a single computer (even with redundant components) can provide, that is to say usually for transactional applications.[181]

219. As regards scaling up, that is to say to make use of additional processing power added to the computer on which the database is installed, the current version of MySQL appears capable of competing directly with Oracle products for most applications with little further development effort.[182]

220. As regards remote scale-out for databases running on multiple geographically dispersed computers TAEUS considers MySQL not to be very competitive.[183]

221. In its reply to the Statement of Objections Oracle submitted a report by an independent expert on database systems, who conducted an investigation into the inherent

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176 See TAEUS report, p. 31 (doc_ID 3011).

177 See TAEUS report, p. 40 (doc_ID 3011).

178 See the "MySQL Zoomerang Enterprise Customer Survey", reporting (answer to question 64 of the survey) that data warehousing applications are run on MySQL (17% of respondents for "historical" and 11% for "real-time" data warehousing) (doc_ID 2149). Also the "Ziff Davis Enterprise-Peerstone Database Survey" reports (answer to question 5 of the survey) that 14% of the respondents run data warehousing applications on MySQL (doc_ID 973).

179 See TAEUS report, p. 56 (doc_ID 3011).

180 See TAEUS report, p. 56 (doc_ID 3011).

181 See TAEUS report, p. 44. (doc_ID 3011)

182 See TAEUS report, p. 53 (doc_ID 3011). This is confirmed by Forrester. In the Excel data sheet on which the report "The Forrester Wave: Enterprise Database Management Systems, Q2 2009" (doc_ID 2444, for the data sheet doc_ID 3266) is based Forrester says, when rating MySQL for the criterion "Symmetric multiprocessor (SMP) scalability/scale-up" that *"MySQL does scale up, and with the new upcoming version MySQL 5.1, it offers increased scalability past eight cores. A new SPEC app server benchmark was recently released, showing MySQL the leader in price/performance in that test."* This invites two comments. First, this Forrester report appears to be based on an earlier version of MySQL, given that its version 5.1 was already released in November 2008. Secondly, it is difficult to understand why despite this comment Forrester rates MySQL at 1/5 for this criterion.

183 See TAEUS report, p. 53 (doc_ID 3011).

differences between MySQL and Oracle 11g[184]. According to the report's main findings Oracle 11 g and MySQL serve very different needs, there is no technically meaningful evolution path that would make MySQL into a viable Oracle replacement and the gap between 11 g and MySQL is likely to widen in the future.

222. Oracle claims that MySQL cannot be used for transactional purposes. However, depending on the storage engine used, the Commission considers that MySQL can be used for transactional purposes. First, the TAEUS report comes to the conclusion that MySQL in combination with the InnoDB storage engine is competitive for transactional purposes. Secondly, MySQL is used by customers as a transactional database for example by companies such as Aruba Wireless Network, Deutsche Lufthansa and Sabre Holding.

223. Oracle also claims that MySQL cannot be used in the enterprise application segment. None of the high end pre-packaged enterprise resource planning applications (SAP, PeopleSoft, Baan etc.) is currently certified for usage with MySQL, which restricts the use of MySQL in this domain. However, a significant share of business critical applications (also high end) is custom-developed (by the user internally, or by its contractors) for the users. In these cases MySQL can be used.

224. The fact that MySQL has not been certified for the high end, pre-packaged enterprise applications does not in itself imply that MySQL is architecturally not well suited for this purpose.

225. Application vendors incur costs for each certified database because certification implies changes in the application itself that enable it to use an additional database. It also necessitates extensive testing before certification is given. Once a database has been certified the application vendors' customers have a legitimate expectation that the use of the application with that database will also be supported by the application vendor, that is to say that it will not simply point to the database vendor if something goes wrong. This consideration shows that even if an application could be made to work with a given database this will not automatically happen. Rather, it is the result of an *economic* assessment by the application vendor that balances the costs and benefits of such a step.

226. Strategic considerations may also play a role in such decision. For instance, the fact that Oracle's own applications are not supported for use with MySQL is hardly surprising, given that Oracle prefers users to use its own database offerings. For other application vendors the logic may work the other way round, that is to say they may wish to make available a cheaper database as storage solution for their own application so that they gain flexibility in the pricing for that application.

227. This scenario appears to apply to SAP. Indeed, *"[o]n 22 April 2003, SAP and MySQL AB signed a development agreement, whereby MySQL would enhance MySQL on a schedule with 12 milestones, with the end goal of MySQL server becoming certified to run SAP's R/3 enterprise applications. […] In October 2005, the project was abandoned."*[185] The timing of this project is highly significant because it points to what appears to be the more likely reason why SAP abandoned the joint development efforts: In October 2005, Oracle's acquisition of Innobase, the maker of the InnoDB storage

184 Kossmann report (doc_ID 4932).

185 Oracle, Observations on the Commission's Theory of Harm, pp. 83-84 (doc_ID 2427).

engine (one of the most important storage engines for MySQL), was announced. Indeed […]*[186], […]*.

228. As SAP's applications require a transactional RDBMS, certification of MySQL when deployed with SAP's applications would not have allowed it to strongly undercut Oracle's own prices – which was probably its initial rationale for investing in developing MySQL – because due to InnoDB the implementations of MySQL would not be truly independent of Oracle.[187] At the time when SAP stopped the project, due to Oracle's acquisition of InnoDB, 10 out of 12 milestones had already been successfully completed[188].

229. Oracle claims that MySQL is not able to improve its scaling up abilities or to improve its ability to better scale out beyond the requirements of a web database or a database with only modest transactional needs[189]. TAEUS disagrees: Improvements are possible in both directions, even though it would seem much easier and involve less risk to increase the ability of MySQL to scale out than to increase its ability to scale up, which would require a larger development effort with larger associated risks[190].

230. Several companies are currently developing storage engines for MySQL. For example, ScaleDB claims that it will provide a pluggable storage engine that enables MySQL to operate like Oracle RAC, a high-end database product[191]. ScaleDB's storage engine will provide features that no other MySQL storage engine provides so far. Another company, Calpont, develops a storage engine for use in analytics and data warehousing environments which, according to Calpont, will enhance the MySQL database management system for use in three main data warehousing markets: business intelligence, high-performance computing, and storage applications. The Calpont Storage Engine is being developed to scale to hundreds of terabytes[192].

231. The development of these third-party storage engines seems to have been encouraged by MySQL in reaction to Oracle's acquisition of the InnoDB storage engine in October 2005. […]*[193]. Also as of MySQL 5.1, which was released in November 2008, MySQL uses a pluggable storage engine architecture which allows for dynamic addition of storage engines to an existing MySQL server, that is to say no recompilation for MySQL or the storage engine would be required to make the two work together.

232. To conclude, MySQL appears not to be limited to applications where it acts as storage for web servers or web applications. The features of a combination of MySQL with

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186 Doc_ID 3945, p. 1.

187 Oracle simply asserts that *"SAP concluded that it was technologically not feasible to scale up MySQL to support the workloads for which SAP's applications were designed, and therefore it cancelled the development agreement"* (Oracle, Observations on the Commission's Theory of Harm, p. 84 (doc_ID 2427)), but does not provide any reference or other evidence for this view. Indeed, Oracle's assertions seem to be contradicted by indications that SAP applications in fact are successfully run on MySQL in some companies, "Ziff Davis Enterprise-Peerstone Database Survey" (doc_ID 973), p.3.

188 See presentation of SAP at the oral hearing on 10 and 11 October 2009.

189 Oracle, Observations on the Commission's Theory of Harm, pp. 76-82 (doc_ID 2427).

190 See TAEUS report, p. 54 (doc_ID 3011).

191 Reply of ScaleDB to the request for information to storage engine providers (doc_ID 2489). Minutes of conference call (doc_ID 3036).

192 Reply of Calpont to the request for information to storage engine providers (doc_ID 1939). Minutes of conference call (doc_ID 2896).

193 (Doc_ID 3126). Also see a MySQL press release, "MySQL to Promote New Open Source DB Engines from its Partners and Dev Community" (doc_ID 3351), that announces a certification program for third-party storage engines.

various storage engines make it a technical option for other segments of the database market, such as OLTP, data warehousing and embedded use. Nevertheless, the Commission acknowledges that there are high-end applications for which MySQL is not suitable.

233. As both storage engines and the MySQL core server continue to be developed, the part of the overall database market for which MySQL is a relevant option is likely to continue to expand. The modular architecture of MySQL means that any competitive constraint exercised by MySQL does not only include MySQL as offered by Sun but also includes the ecosystem of third party storage engine providers. When reference is made to MySQL in the remainder of this Decision it thus should be understood to implicitly also refer to MySQL's ecosystem, where applicable.

4.3.3.3. MySQL's open source business model and pricing

234. Databases, such as MySQL, that are distributed as open source are based on a particular *business model*. An open source business model connects end users, software vendors using the product as input, service providers and the owner of the intellectual property ("IP") rights to the source code into a network. All of these participants in the network can act as developers depending on their skill and their incentives. The contribution of one developer improves the product for both users and contributors. Under the open source license the source code of MySQL is also publicly available to end users for free use, with certain restrictions.

235. MySQL operates under the GPL dual licensing model: customers can chose to either pay for MySQL Server or to obtain an open source license for free. Paying customers are charged for a subscription which includes the database license (either proprietary or open source), certain tools as well as support. The open source license on the other hand is available free of charge, does not include support and follows the terms of the GPLv2 license.

236. The GPLv2 has the limitation that if a product, which contains modified or unmodified MySQL source code that had been licensed under GPLv2 and thus is a “derived work” in the sense of copyright law, is commercialised, then the code of the entire, commercialised product needs to be disclosed[194]. This is called the "viral" or "contaminating" effect of the open source version of MySQL. The GPL license, however, imposes no restriction on the end use of the product, including any modification of the product for own use.

237. Dual licensing models such as the one adopted by MySQL, where both commercial and GPL licenses are available, allow commercial licensees to resell in binary format (that is to say, closed source) the modified code or any applications/products embedding the original code. MySQL has targeted licensing specifically for OEM customers/embedded use which cannot or do not want to abide by the terms of the GPLv2 but buy a proprietary license for MySQL.

[194] GPL is the best known open source software license and not only allows but indeed requires that modified versions of software licensed under the GPL be also governed by the GPL. Essentially, this means that software that has once been made available under the GPL cannot be made "unfree" again because the rights under the GPL are promoted downstream. However, the copyright owner (the person who originally released the software under the GPL) is free to offer his software under different licenses in parallel (dual- or multi-licensing).

238. As regards contributions to the development of MySQL, a contributor who is not the owner of the IP is generally unable to fully appropriate returns on its improvement, as only the IP owner can issue commercial licenses. Moreover, the IP owner can free ride, to a certain extent, on the contributions of the independent developers and appropriate the returns on their investment. The limited ability of the developer, under the GPL license, to appropriate value from its innovation, limits the incentives of independent developers to participate in the development. Therefore the owner of the IP is often the biggest contributor to the code.

239. Because of its open source nature and in contrast to proprietary vendors, MySQL grants licenses to its database software free of charge. The only limitations which users face are those stemming from the GPLv2. Only some MySQL users pay a license fee, and only some users pay for MySQL support. Proprietary vendors generally charge a license fee for their database. In addition they also charge support fees and do not grant access to their products' source code.

240. Even for users that buy a proprietary license, the license price of MySQL may often be significantly lower than the license price of other proprietary databases. MySQL claims that its MySQL Enterprise subscription service is offered under much friendlier terms than proprietary offerings. According to MySQL, it is sold on a per server basis and not by the number of CPUs, chips or cores. For example, Oracle pricing would use complex formulas based on cores per server, taxing users for using more powerful hardware.[195]

241. The first phase market investigation illustrated the very large price difference between Oracle's database products and MySQL. The license for MySQL Enterprise Edition ranges from USD 599 per server per year for MySQL Enterprise Basic to USD 4 999 per server per year for MySQL Enterprise Platinum[196]. The pricing for Oracle's Database editions, for perpetual licenses, per processor, range from USD 5 800 for Standard Edition One to USD 47 500 for the Enterprise Edition[197].

242. It is important to note that these are list prices. The major database vendors usually give important rebates to a large number of customers for their databases. Such a system of rebates allows database vendors like Oracle to price-discriminate among their customers. A comparison of list prices therefore overstates the difference in prices between proprietary and open source database vendors.

243. Costs are an important factor for customers choosing a database. Evidence of this can be found in two surveys. In a survey conducted by TNS Technology on behalf of Sun on the use of open source software by Small and Medium Sized Businesses, costs were the most frequently named key motive (60% of respondents) to use open source software.[198] This is confirmed by another survey conducted by TNS Technology on behalf of Sun in the Nordic and Benelux countries, finding that cost savings are the most frequently named motive for using open source software.[199] Moreover, during the second phase market investigation a significant number of customers indicated the TCO as one of the key decision factors when deciding to work with a free open source

195 MySQL – A guide to lower database TCO (doc_ID 130), p. 9. Also see TAEUS report (doc_ID 3011), Appendices B and H.

196 Form CO, p. 147 (doc_ID 305).

197 See Annex 1 to Form CO, p. 14 (doc_ID 307).

198 TNS Technology – Open Source Barometer 2009 – European SMB Report, p.12 (doc_ID 2673).

199 TNS Technology – Open Source Software Barometer 2009 – Nordic and Benelux Report, p. 19 (doc_ID 2143).

database. An example in this field is how Linux penetrated the market for operating systems.

244. Costs for a database are not limited to licensing costs. A common means to compare the cost of databases and achieve pricing transparency is to calculate a database's TCO. The TCO can comprise diverse items such as computer hardware and programs as well as operational costs (which can range from electricity and downtime to information technology related personnel). There is however no single agreed definition about which items a TCO calculation should include. Whilst acknowledging that one of the major 'selling' points of open source database products is their apparent low cost due to the absence of license fees when compared to proprietary database products, the adoption and subsequent utilisation of an open source product may require in-house expertise that should also be weighed against the cost saving in terms of license fees. In addition, a TCO calculation based on list prices does not take into account rebates or discounts against list prices that a proprietary database vendor may offer to existing or potential customers.

245. MySQL on its website claims that, according to IDC, MySQL has the following impact on TCO:

- Reducing database licensing costs by over 90%;
- Cutting systems downtime by 60%;
- Lowering hardware expenditure by 70%;
- Reducing administration, engineering and support costs by up to 50%.[200]

246. TAEUS provides a total cost of ownership analysis of the major database vendors assessing three hypothetical users, representing a typical small user, a medium-sized user and a large and growing user. The analysis includes costs for product acquisition and three years of operation, with the stipulation that service was required for all users. The analysis is based on list prices and does not take into account potential rebates.

247. TAEUS finds that the TCO is slightly lower for Oracle than for MySQL in the case of the small user. The picture changes for the medium-sized user and the large user. In the case of the medium-sized user MySQL's TCO amounts to less than 5% of Oracle's TCO and in the case of the larger user MySQL's TCO amounts to around 25% of Oracle's TCO.[201]

248. Overall, TAEUS comes to the conclusion that IBM provides virtually identical features across their product line. Probably due in large part to this, IBM's pricing is much closer to constant than most of the other vendors, so they cannot compete for the smallest deployments, but become progressively more comparable as regards pricing when it comes to larger deployments.

249. Oracle's pricing is rather the opposite of IBM's. Oracle's pricing is relatively low for the smaller deployments, but for larger deployments their prices increase faster than for most of the vendors. For the largest deployment, their price is second only to Sybase's price.

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200 MySQL – A guide to lower database TCO, p. 3 (doc_ID 2143).

201 See TAEUS report, pp. 68–78 (doc_ID 3011).

250. Sybase uses a per-core licensing model. This gives a more extreme increase than Oracle's as the deployment size grows. Sybase competes quite well on price for the smallest deployments. In the largest deployment, their prices become substantially higher than those of any other vendor studied.

251. MySQL and PostgreSQL are comparable in terms of price for the smallest deployments, and have by far the lowest prices for the largest. While the price levels of MySQL and PostgreSQL are directly comparable with each other, none of the other vendors comes close to either of these software packages for a large deployment.

4.3.3.4. Reduction of vendor lock-in

252. The open source form of MySQL implies that MySQL is less subject to hold-ups than closed source databases. The IP owner of the open source database is constrained in the extent to which it can raise prices (more precisely, raise TCO) to locked-in customers, because the source code is freely available and the independent developers within the community (or the customers themselves) are able to provide alternative upgrades and patches (even if these are of lower quality than those provided by the IP owner) and support.

253. The open source form of MySQL and the fact that anyone can inspect the code also implies that anyone can provide support services. Due to the transparency of the product design many firms can compete in the provision of services related to the product which is likely to result in relatively strong competition in provision of support.

254. The competition in the market for support services for a given open source database is likely to be strong. For closed source databases, the extent of competition in the support market depends, among other factors, on the ability of the IP owner to extract rents by selling licenses only. If the database vendor cannot extract all or most of the rents this way, it may have an incentive to monopolise the market for support of its own database product as well, rather than fostering competition for such support services[202].

255. However, in its public announcement of 14 December 2009, Oracle declares that its customers will not be required to purchase support services from Oracle as a condition to obtain a commercial license for MySQL and that the source code of MySQL will continue to be made available at no charge. Third parties will still be able to compete in the provision of services related to MySQL after the transaction.

4.3.3.5. Product innovation and flexibility of deployment

256. The open source model allows third party developers and indeed end users to contribute code improvements and report errors. MySQL has a strong developer community. According to MySQL's website the latest annual MySQL Conference which took place in 2009 brought together over 2 000 open source and database experts. It claims to be the biggest conference of this type.[203]

257. The open source nature and the ecosystem of developers creating a network of MySQL users allow MySQL to profit from third-party contributions for further development of its product. Users of the free product report errors (bugs) to MySQL and also demand

[202] In fact, a number of customers of Oracle complained that they are forced to purchase support contracts from Oracle at high prices, together with the purchase of database licenses.

[203] http://www.mysqlconf.com/mysql2009/ (doc_ID 3493).

features they require. This contributes to the improvement of MySQL in addition to its in-house resources and allows MySQL to directly reap the benefits of the network effects that typically surround software products. Proprietary vendors typically cannot leverage their user base in the same way.

258. MySQL like other open source software is distributed to the user in a way that allows him in principle to edit and change the code. This also allows third parties to inspect and change the code which enables easier and better customization of the code by skilled users.

259. The modularity of MySQL, in particular at the level of storage engines, makes MySQL flexible. Storage engines are not only developed and commercialised by Sun but also by third parties, although currently to a limited extent. This flexibility in turn contributes to MySQL's adoption rate, strengthens the network effect and allows MySQL to compete in many segments of the overall database market at the same time.

260. Providers of storage engines play a key role for MySQL and its community. As MySQL benefits from its modularity, the choice of storage engines adds to the attractiveness of MySQL and a number of targeted storage engines have been released or are under development. The providers of storage engines are an important part of the MySQL community, as they have an interest in a vibrant community, while their storage engines allow for differentiation of the MySQL database. However, the majority of third-party storage providers indicated that they consider that they need a commercial license from the owner of MySQL to be able to distribute their storage engine with MySQL commercially[204]. They would thus be dependent on the owner of MySQL to be able to bring their storage engines to market in a commercially viable way.

261. As to open source software in general, a distinction can be made between community-led and corporate-led open source projects. In the light of the fact that Sun is the sole owner of all IP rights in MySQL, but that the source code of the open source version of MySQL is freely accessible, MySQL can be described as a corporate-led open source project.

262. The counterfactual is therefore not Sun alone, but the ecosystem of MySQL including third-party storage engine providers, given that Sun has an interest in such storage engines being developed and thriving.

4.3.3.6. Conclusions

263. To conclude, from a technology point of view, MySQL appears to be able to compete in part of the database market. However, MySQL also has certain limitations, in particular it is not able to compete in the high end of the database market. MySQL's open source nature and its pricing make it a particular competitor as does its modular architecture and the system of third-party storage engine providers. The reduction of vendor lock-in increases its attractiveness for customers. MySQL is expected to further develop making MySQL potentially a dynamic competitive constraint.

[204] See for example replies from Prime Base Technologies (doc_ID 1837), Schooner (doc_ID 2186), Calpont (doc_ID 1939).

4.3.4. Evidence of the competitive constraint exerted by MySQL on Oracle and other proprietary database vendors

4.3.4.1. Evidence for the overall database market

264. It appears from the analysis in Section 4.3.3., that from a technology and functionality point of view MySQL is a substitute for Oracle in part of the database market and that, in such cases, due to its specific nature MySQL could constitute a special competitive force.

265. In its in-depth investigation, the Commission has analysed various sources of information and found evidence that prior to the transaction MySQL appears to compete with Oracle in the overall database market. These sources comprise in particular an internal Oracle dataset, HQ Apps, internal documents of Oracle and Sun, surveys as well as input provided by competitors and customers of Oracle and MySQL responding to Commission's questionnaires[205].

4.3.4.1.1. HQ Apps and CRM

266. The notifying party has submitted two datasets that in its view demonstrate that MySQL does not constrain Oracle. According to the notifying party: *"there can be no better evidence of a customer's perception of closeness of competition between database vendors than a contemporaneous record of the competitive alternatives actually considered at the time of purchase. Oracle acquires information about this every day in two forms: (a) data entered in Oracle's customer relationship management (or CRM) database, which typically list competitors in any given sales opportunity; and (b) e-mail requests submitted by sales personnel to a centralised email address (HQ Apps) for executive approval of price discounts to customers."*[206]

267. The notifying party also submits that both datasets *"prove that MySQL rarely registers with Oracle in the purchasing cycle, and not at all in respect of mission-critical deployments."*[207] The notifying party suggests that MySQL is competitive with respect to Oracle only in market segments where there is abundant competition from third parties (such as embedded applications for mobile phones and web applications) and therefore MySQL does not constrain Oracle with respect to high-end deployments.

268. The Commission's analysis of HQ Apps in contrast shows that *MySQL and Oracle appear to compete in some segments of the overall database market*, for different types of database uses (web, transactional, enterprise, embedded), across different sectors, for small and large companies, and for small and large projects. Furthermore, HQ Apps shows that, in those segments of the overall database market where MySQL and Oracle compete, MySQL appears to impose an important competitive constraint on Oracle.

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205 Market share data (based on revenues) has been taken from the reports of industry analysts (such as IDC and Gartner) which have been provided by the notifying party. In addition to their normal reporting on the industry, many industry analysts and commentators have also remarked on the possible effects (or absence thereof) of the proposed transaction on the database market. As these opinions may differ between commentators and the views expressed may even change over time, it is difficult to appreciate the evidentiary value of these opinions. The competitive assessment of the notified concentration therefore focuses on the other sources of evidence and information specified in paragraph 264.

206 See e-mail from Oracle to the Commission of 26 August 2009 (doc_ID 1080).

207 Oracle, Observations on the Commission's Theory of Harm, 2 October 2009, p. 33 (doc_ID 2427).

269. In past cases the Commission has often relied on analogous CRM data as one element to assess a competitive constraint. In this case, the Commission's analysis of Oracle's CRM data suggests that CRM data alone might not provide a fully reliable estimate of the competitive constraint exerted by MySQL for several reasons, potentially also due to the open source nature of MySQL. (see paragraphs 335 to 362). This is further confirmed by a comparison with data from Oracle HQ Apps (see paragraphs 363 to 365).

4.3.4.1.1.1. HQ Apps

Description of HQ Apps

270. HQ Apps is an internal "dataset" of Oracle that contains the communications between sales teams and Oracle headquarters relating to non-standard rebates offered by Oracle to its customers for all Oracle products (and not only for databases). The notifying party submitted that discounts of more than […]* off the list price require approval from the corporate approvals team known as "HQ Apps" (Headquarters Approvals). This team also deals with requests for non-standard contract terms unrelated to price[208]. According to Oracle the HQ Apps process includes all sales channels […]*.

271. The notifying party stated that HQ Apps is a vast collection of over […]* unstructured emails sent to a centralised email address. There were a total of […]* documents in the period January 2008 to May 2009.

272. The Commission requested to have access to the complete set of HQ Apps documents.

273. The notifying party provided access to Oracle's HQ Apps documents that contain at least one of the five main competing database products: MySQL, DB2, SQL Server, Sybase, and EnterpriseDB[209]. The notifying party was also invited to include any other competitor that it deemed important in its search query[210]. However, the notifying party indicated that *"while not exhaustive, the search queries that you* [the Commission] *have requested and we have executed should be sufficient to provide the benchmark that you* [the Commission] *seek to establish"*.[211]

274. Access to the complete list of [30 000 – 40 000]* HQ Apps documents that met the search parameters was provided on 1 October 2009[212].

The notifying party's view on HQ Apps

275. Oracle claimed that HQ Apps demonstrates that Oracle and MySQL do not compete. On several occasions in correspondence with the Commission, Oracle underlined this view. For example, in an email to the Commission Oracle argued that: *"* […] *at the request of the U.S. Department of Justice, Oracle reviewed nearly […]* HQ Apps*

208 Oracle reply to the request for information to Oracle of 8 October 2009, p. 8 (doc_ID 2854).

209 See e-mail of the Commission to Oracle of 29 September 2009 (doc_ID 2199). The search query was for the following terms: MySQL, BD2, SQL server or SQLserver, Sybase, EnterpriseDB or Enterprise DB or Postgres or PostgresSQL or Postgre SQL. The direct hit documents were expanded to include document families (set of related documents that do not include any of these competitor database products). Finally, the parties examined the documents that included one or more of the in house attorney names to determine whether they are privileged.

210 See e-mail of the Commission to Oracle of 1 October 2009 (doc_ID 2199).

211 See e-mail of Oracle to the Commission of 2 October 2009 (doc_ID 2479).

212 See e-mail of Oracle to the Commission of 1 October 2009 (doc_ID 2961).

documents (email and attachments) covering the period from January 2008 to May 2009, representing all the documents that existed in the "Sent" folder of the HQ Apps email account for that period. Of those, only […] documents (representing [0-5]*% of the documents analysed) contained any mention of MySQL as an actual or potential competitor. It is difficult to imagine how MySQL is such a close competitor of Oracle when it only shows up in less than [0-5]*% of competitive bids and less than [0-5]*% of requests for discounts on Oracle databases. In our view, this data is simply insurmountable…".*[213]

276. On the other hand, Oracle claimed that HQ Apps has several limitations. It suggested that the only reasonable search is a search of instances in which MySQL appears in the "justification" for granting the non-standard discount (a specific field which is however not systematically filled in). The notifying party also submitted that *"HQ Apps are of limited utility for determining the identity and frequency of competitors. HQ APPS emails are necessarily incomplete and subjective. The goal of the sales rep submitting the HQ APPS request is neither completeness nor accuracy for the sake of providing a record of competition, but simply to obtain approval to close a deal at a greater than usual discount. As a result one should not expect the HQ APPS emails to include a complete account for competitors faced, nor should one place undue reliance on the email's ability to capture actual competition within an account."*[214] Oracle further claimed that *"the sales rep will often be over-inclusive in his/her description of competitive justifications to obtain the requested discount …"*[215].

277. In its reply to the Statement of Objections[216], Oracle took the view that "since the HQ Apps emails are by design a small subset of all Oracle sales opportunities, they cannot overturn the conclusions from the analysis of the CRM database".

The Commission's view on HQ Apps

278. The Commission does not consider that Oracle's argument concerning the incentives of the sales reps to provide incomplete and subjective information on competitors is sufficiently robust to invalidate HQ Apps as relevant evidence.

279. While it is possible that sales representatives have incentives to systematically inflate the degree of competition in order to ensure that the discount is granted and the transaction is closed, they would realize that the headquarters would only grant discounts on the basis of credible justifications. Avoiding unnecessary and costly discounts on poor justifications is precisely the reason why these requests have to be made in a structured way and credibly justified before they can possibly be approved by the headquarters. In fact, it is clear from the emails in HQ Apps inbox that the headquarters often query the details before granting a discount and sometimes contest the justification. Furthermore, even if it is accepted that sales representatives do not have the incentives to provide completely objective information to HQ Apps this does not imply that the aggregate figures would bias the benchmark results in any particular direction.

280. HQ Apps seem to be particularly indicative for competition for large accounts. As confirmed by an internal document from Oracle[217], […]*.

[213] E-mail of Oracle to the Commission of 26 August 2009 (doc_ID 1080).
[214] E-mail of Oracle to the Commission of 5 August 2009 (doc_ID 570).
[215] E-mail of Oracle to the Commission of 5 August 2009 (doc_ID 570).
[216] doc_ID 4828

281. Moreover, it appears that HQ Apps are likely to underestimate the competitive constraint exerted by MySQL. Customers can in many cases use the open source software at low costs or for free under the GPL license by simply downloading the software. It is plausible that in many of those instances the customers would not be in contact with sales representatives and ask for rebates, but would still be comparing (at least implicitly) the costs and features across different alternatives.

282. By design HQ Apps will capture only a subset of all opportunities. However, this dataset is of particular interest since sales representatives appear to discuss the competitive constraint in much greater detail than Oracle's CRM does. The fact that it is a smaller dataset than CRM does not invalidate its informative value.

283. The Commission therefore takes the view that in this case Oracle's HQ Apps dataset provides useful information as to the degree of competitive constraint exerted by MySQL on Oracle in the database market.

Competitors of Oracle appearing in HQ Apps

284. The Commission first performed aggregate searches on how often the main competing databases are mentioned in the HQ Apps documents. Given the sample of HQ Apps documents made available to the Commission and the purpose of the analysis, the most meaningful aggregate comparisons are performed in the set of documents where at least one competitor product is mentioned. This screening of the dataset provides a dataset of [10 000 – 20 000]* documents.

285. Furthermore, the Commission based its searches on database names rather than the names of Oracle's competitors (for example SQLServer instead of Microsoft). This was done in order to avoid hits where Microsoft, IBM or Sun are mentioned in a document but the rebate relates to non-database products. The keyword "Sun" produces more hits in the submitted collection of documents; however the Commission does not consider that such a search would be representative of the competitive constraint exerted by MySQL[218] [219].

286. The aggregate searches on the dataset of [10 000 – 20 000]* documents are as follows:

- "MySQL" is mentioned […]* times (or [20-30]*%);
- IBM's "DB2" is mentioned […]* times (or [40-50]*%);
- Microsoft's SQL Server is mentioned […]* times (or [30-40]*%);
- Sybase is mentioned […]* times (or [10-20]*%); and
- PostgreSQL is mentioned […]* times (or [0-5]*%).

287. In aggregate searches the term "MySQL" therefore appears in [20-30]*% of the documents where at least one competing database is mentioned. IBM’s DB2, the most

217 Oracle Annex 3.5 (doc_ID 1528).

218 The Commission has also invited the notifying party to make available all the documents included under HQ Apps in order to assess the extent of the possible problems regarding this issue, however, the notifying party has declined to provide such an extended access to its HQ Apps documents.

219 For example, Sun may refer to the day Sunday (abbreviated as "Sun") rather than the company Sun Microsystems.

commonly cited competitor database, is mentioned […]* as many times as MySQL, Microsoft's SQL Server is mentioned in […]* documents. The share of documents that mention PostgreSQL, the second most cited open source competitor, is only one […]* of that of MySQL. Sybase, which is viewed by the notifying party as a strong competitor[220] is mentioned less often than MySQL (around [10-20]*% of the documents).

288. Furthermore, in [10-20]*% of those documents where at least one competing database is quoted, MySQL is in fact the only database (among the five databases) that is mentioned. Similarly, SQL Server is the only database mentioned in [10-20]*% of the documents, DB2 in [30-40]*%, Sybase in [5-10]*% and PostgreSQL in [0-5]*%.

289. However, in such an aggregate analysis, several documents may refer to the same customer/HQ Apps request[221]. In order to address this concern, the Commission examined the HQ Apps documents that quote MySQL to identify the customers/opportunities to which the documents relate and eliminate instances of double-counting.

290. In an in-depth analysis, the Commission identified [200-400]* customers (end users or partners) for which MySQL is quoted[222].

291. The Commission requested the notifying party to carry out the same exercise of identifying the customers for whom the other main competing databases (SQLServer, DB2, Sybase and EnterpriseDB / PostgreSQL) appear in the HQ Apps documents in order to create benchmarks for relevant comparisons.

292. The notifying party initially submitted that there are approximately [150-300]*[223] customer names in HQ Apps that mention Microsoft's SQL Server and only [0-50]* customers for PostgreSQL[224]. For Sybase the notifying party submitted [100-200]* customer names and for IBM's DB2 about [300-600]* customer names[225].

293. However, in the Statement of Objections, the Commission noted that the lists of customers for which DB2 SQL Server, Sybase and Postgres are mentioned in HQ Apps submitted by the notifying party did not appear complete and that the number of

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220 Oracle, Observations on the Commission's Theory of Harm, 2 October 2009, pp. 47-49 (doc_ID 2427).

221 Aggregate searches should provide a rough estimate of how often each competing database appears in requests for granting non-standard discounts. One caveat of this analysis is that some of the documents are duplicates or chains of emails. The Commission has requested from Oracle to provide a folder which excludes all duplicates (see e-mail of Oracle to the Commission of 1 October 2009, doc_ID 2961). This was performed by computing the hash code of each document and removing all duplicates. However, the Commission has observed that this procedure did not remove all duplicate documents. In any event the aggregate search results provide similar figures for the competing databases (MySQL appearing in approximately [20-30]*% of the documents). Furthermore, at the request of the Commission, Oracle has identified the documents that belong to the same thread of email (through the identification of its hash code). Given that […]* documents of […]* documents were identified as belonging to the same thread (chain) the Commission did not pursue this further.

222 See Oracle reply to the request for information to Oracle of 8 October 2009, Annex 14 (doc_ID 2856). Oracle identifies only [100-200]* customers in the set of HQ App emails in which MySQL appears.

223 Oracle has identified [150-300]* names; however, the Commission has identified some double counting.

224 See Oracle reply to the request for information to Oracle of 12 October 2009, Annex A (doc_ID 3113) and Annex D (doc_ID 3114).

225 Oracle submitted that there are [350-700]* customer names; however, the Commission identified some double counting.

customers for which some of these databases are mentioned as competitors could actually be larger.

294. Following the Commission's request to confirm these numbers, the notifying party submitted revised lists one month after the adoption of the Statement of Objections, that is to say on 9 December 2009[226]. In the revised lists, there were [500-1000]* customers in relation to IBM's DB 2, [450-900]* customers for Microsoft's SQL Server, [200-400]* customers for MySQL, [150-300] customers for Sybase and [50-100]* customers for Postgres.

295. In order to perform additional robustness checks, the Commission also requested the notifying party to provide a full list of customers for which a non-standard discount has been requested or provided. However, the notifying party submitted that it does not keep such records[227].

296. The figures related to the number of customers indicate that MySQL is not a marginal player in the database market.

297. While Oracle submitted that "Ingres and EnterpriseDB (PostgreSQL) are the most competitive OSS DBs"[228], it is striking that MySQL appears approximately 4 times more often in terms of customer names than EnterpriseDB (PostgreSQL) in the documents of HQ Apps that include at least one of the 5 principal competing databases.

298. However, it is possible that where MySQL is mentioned in an HQ Apps document it is mentioned in a different context than as a competitive justification for the discount[229]. To address this potential problem the Commission performed an in-depth analysis of the documents related to MySQL. While this may be a somewhat subjective exercise the Commission found that for [200-400]* out of [200-400]* customers it could be concluded that they refer to MySQL as a competitive justification for the discount.

299. In the documents which refer to MySQL, MySQL can appear in different contexts.

300. In some cases it is the only competitor identified and in others it appears together with other competing databases. Even in the cases where it appears alongside other competing databases, the Commission believes that MySQL must be a competitive justification for the discount as it must have been considered by the customer as a viable alternative.

301. In some cases, MySQL is the database currently used by the customer which Oracle wants to replace. In other cases, Oracle is the database currently used and the sales representatives argue that the discount is justified by MySQL's threat to replace Oracle. In some cases, MySQL and Oracle compete for a new opportunity. In other cases, Oracle perceives the long term threat of MySQL's gaining a foothold with the customer. The Commission believes that in all these cases MySQL represents a pricing constraint on Oracle.

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[226] See Oracle reply to the request for information to Oracle of 13 November 2009 (doc_ID 5071)

[227] "Oracle does not track discounts (standard or non-standard) granted to its database (or other) customers, in its CRM database or otherwise"; see Oracle reply to the questions sent by e-mail on 13 October 2009 (doc_ID 2942).

[228] Observations on the Commission's Theory of Harm, 2 October 2009, p. 49 (doc_ID 2427).

[229] This issue also arises with respect to other competing databases, which would similarly tend to overstate their number of hits in the aggregate searches.

302. The Commission also performed an independent analysis of the HQ Apps documents for SQL Server and Sybase. The figures obtained are similar to those submitted by the notifying party in its latest submission[230].

303. SQL Server is mentioned in relation to [600-1200]* different actual or potential customers of Oracle. The Commission analysed these documents and estimates[231] that there are altogether about [400-800]* customers in the HQ Apps dataset for which SQL Server was a relevant consideration in a request for a discount or special conditions.

304. The Commission performed a similar exercise for Sybase and identified approximately [150-300]* customers for whom Sybase was mentioned as one of the competitors to Oracle.

Qualitative analysis of HQ Apps documents in which MySQL appears

305. In its reply to the Statement of Objections, the notifying party took the view that "the 'qualitative analysis' of HQ Apps documents only serves to provide anecdotes, not evidence"[232].

306. However, the Commission takes the view that Oracle's sales representatives, who are intimately familiar with the competitive situation in their accounts, must provide a credible justification for the discount requested. This fact and the large number of quotes turn what Oracle describes as anecdotal evidence into a significant characterisation of the competitive landscape.

307. Analysis of the HQ Apps documents in which MySQL appears first shows that Oracle is likely to face competition from MySQL for some of its main customers.

308. […]* is Oracle's largest direct customer (that is to say, non integrator/partner):

"[…]*"[233]

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230 See Oracle reply to the request for information to Oracle of 13 November 2009 (doc_ID 5071)

231 The Commission extracted the HQ Apps document text around the mention of SQL Server for each of the customers or Oracle's partners (note that in several documents the same competing database may be mentioned more than once). This was done in a way that the part of the text discussing SQL Server as being in strong competition with Oracle had priority to be extracted over the part of the text where SQL Server was i) not mentioned in the context of competition or ii) SQL Server was viewed as a weak competitor.

The Commission ordered the customers in alphabetical order and analysed the extracted text for the first [150-400]* customers and for customers numbered [250-500]* through [350-700]*, which yielded a sample of [300-600]* customers with quotes discussing the context in which SQL Server appeared for the particular customer.

For these [300-600]* customers the Commission analysed the text and determined that in [250-500]* cases (in about [70-80]*%) SQL Server appeared in a context which allowed the Commission to conclude that SQL Server was indeed a competitive constraint relevant for the discount requested of for special contractual conditions. While this is somewhat subjective an exercise, the Commission notes that this ratio of competitive mentions is comparable to the one obtained for MySQL ([80-90]*%) in an analogous exercise for documents which mention MySQL.

The Commission also notes that it appears that SQL Server is mentioned in a context other than as a justification for a discount or special conditions in a larger share of relevant documents than this is the case for MySQL.

232 Doc_ID 4828, p. 82.

309. Similar quotes can be found for several large customers of Oracle, such as […]*[234].

310. A great majority of the quotes relates to a specific application and not to the whole range of database purchases of these customers. In a number of such instances the Commission has identified quotes that imply that even if the current competition is for a small segment/application, providing such a non-standard rebate would deny MySQL a foothold in the customer's account. For example, this is illustrated in the document that relates to the […]* non-standard discount:

"[…]*"[235]

311. The cases in which MySQL is mentioned in the HQ Apps documents refer to both small and large opportunities in terms of revenues. Indeed, […]* is mentioned in the context of the International Frame Agreement (alongside […]*):

"[…]*"[236]

312. For […]*, a large customer of the notifying party, HQ Apps correspondence states that:

"[…]*"[237]

313. Furthermore, it is interesting to note that for several customers the quotes from HQ Apps indicate that Oracle faces strong price competition from MySQL.

"[…]*"[238]

314. Even if some customers acknowledge some additional technical features of Oracle's databases they consider that the price difference is very significant:

"[…]*"[239]

315. Some quotes seem to indicate that Oracle is concerned with the dynamic impact of its pricing decisions and that due to the switching and learning costs in the database market it has to aggressively price today to compete with MySQL:

"[…]*"[240]

"[…]*"[241].

"[…]*"[242]

316. Also, Oracle's sales representatives seem to consider in several instances that MySQL constitutes a greater competitive challenge following the takeover of Sun, for example:

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233 See HQ Apps document no 1145, customer name […]*.
234 See HQ Apps documents no. 1460, 336197, 1857, 5276, 2597.
235 See HQ Apps document no. 2892, customer name […]*.
236 See HQ Apps document no. 2597, customer name […]*.
237 See HQ Apps document no. 91102, customer name […]*.
238 See HQ Apps document no. 1206, customer name […]*.
239 See HQ Apps document no. 1265, customer name […]*.
240 See HQ Apps document no 1501, customer name […]*.
241 See HQ Apps document no. 2618, customer name […]*.
242 See HQ Apps document no 1460, customer name […]*.

"[…]*"[243]

317. One element that the Commission has investigated in HQ Apps is whether the competitive constraint that MySQL exerts on Oracle extends to the whole range of database uses (rather than, for example, only for embedded use).

318. A preliminary analysis indicates that a significant number of the applications are for embedded use. However, from the HQ Apps inbox it is clear that there are also numerous customers that do not intend to use the database in an embedded application. For example, a significant number of customers are mentioned for web applications. This also supports the fact that Oracle also competes with MySQL for web applications (customers such as […]*). The following extract is from the exchange of HQ Apps correspondence for Qualcomm:

"[…]*"[244]

319. Overall, MySQL is mentioned in the HQ Apps correspondence for more than [200-400]* different customers. These customers are active in different fields including telecommunications, the internet, retail, banking and finance, government, academia, etc.

320. Furthermore, quotes from HQ Apps indicate that Oracle's sales representatives consider MySQL as a viable alternative in several fields such as

– SME banks:

"[…]*"[245]

– Government organisations:

"[…]*"[246]

– Retailers:

"[…]*"[247]

– Game developers:

"[…]*"[248]

321. Oracle's economic advisors, RBB Economics[249], raised the argument that a great number of opportunities where Oracle is seen to apparently compete with MySQL from HQ Apps refers to use of databases in embedded applications. RBB Economics further claimed that competition in the embedded segment is strong and concluded that the opportunities related to embedded use in HQApps are not relevant for the purpose of

[243] See HQ Apps document no 45, customer name […]*.
[244] See HQ Apps document no 3402, customer name […]*.
[245] See HQ Apps document no 2500, customer name […]*.
[246] See HQ Apps document no 2040, customer name […]*.
[247] See HQ Apps document no 1335, customer name […]*.
[248] See HQ Apps document no 1788, customer name […]*.
[249] RBB Economics, "Oracle/Sun: Evaluation of the claim in the Statement of Objections that MySQL represents an important competitive force", 2 December 2009, (doc_ID 4829).

assessing the competitive constraint exerted by MySQL on Oracle in the overall database market.

322. The Commission acknowledges that HQ Apps might not be a perfect representation of all the opportunities of Oracle, since it relates to opportunities where discounts greater than […]* and/or […]* terms and conditions are considered. Nevertheless, the sales opportunities in HQ Apps cover a wide variety of applications of databases, against a number of competitors and with customers from a number of different industries. For this reason, the discussion of competitive conditions in HQ Apps documents provides useful information regarding the competitive conditions beyond the set of documents itself.

323. The fact that MySQL frequently appears in HQApps documents in the context of embedded applications does not invalidate HQ Apps documents as a valuable source of information on the competitive landscape both for embedded database sales and beyond. Indeed, in many instances of sales of databases for embedded use Oracle database is a technically identical product to a database that is sold for non-embedded use. Moreover, the set of competitors that Oracle faces in sales of databases for a large share of embedded use as well as customers' technical requirements for such databases are comparable to the set of competitors and technical requirements for non-embedded use. This may differ somewhat in the case of some highly specialized database embedded uses. In any case, the Commission was not able to establish that such specialised database uses occur frequently in HQ Apps discount requests.

324. Nevertheless, to determine the extent of embedded versus non-embedded database opportunities across some of the major competitors of Oracle the Commission undertook a further analysis of the documents from the HQ Apps dataset.

325. Using Oracle's own definitions of different license types, the Commission noted that Oracle frequently licenses databases for embedded use to third party software vendors which use databases as inputs in the development of their own applications. The Commission identified three main license types used for Oracle's databases:

- The Oracle License and Services Agreement (OLSA) is the standard agreement that is used to license Oracle programmes and acquire related services.

- Many partners offer turnkey solutions based on Oracle Embedded Software Licensing (ESL), in which Oracle technology is fully integrated into the application or device. In this way, as characterised by Oracle, end users do not need to be involved in installing and using Oracle. The pre-packaged version allows the partners to control the underlying Oracle infrastructure that the end customer deploys.

- An Application Specific Full Use (ASFU) license is a restricted type of license sold by a Solution Provider in conjunction with its third-party Application Package.

326. On this basis, the Commission understands that there are […]*. Aggregate searches on these licenses for each of the main competing databases were undertaken.

327. The Commission found that out of […]* (unique[250]) documents which refer to MySQL and any of the three standard contracts (OLSA, ESL and ASFU), […]*.

328. Out of […]* (unique) documents which refer to SQL Server and any of the three standard contracts […]*.

329. Out of […]* (unique) documents which refer to Sybase and any of the three standard contract types […]*.

330. While it appears that the opportunities where MySQL is mentioned as a competitor are slightly more likely to be for embedded use than is the case for the Microsoft or Sybase benchmarks, the differences are not dramatic and in any case not large enough to limit the use of HQApps analysis to the embedded segment only. Moreover, competition in the embedded segment may also be indicative of the potential or actual competition in the overall database market.

331. In conclusion, the further analysis carried out by the Commission on the HQ Apps dataset supports its conclusion that the HQ Apps dataset provides useful information of the degree of competition exerted by MySQL on Oracle in the overall database market.

332. The notifying party argued[251] that only cases where MySQL is a primary competitor to Oracle provide useful information as to whether MySQL imposes a competitive constraint on Oracle and that there are only a few such cases (approximately 100).

333. The Commission agrees that if the primary competitor in a given sales opportunity could be determined with a high degree of certainty this would be important information to be considered. However, there is a degree of uncertainty on the side of the sales representative regarding the identity of the primary competitor. Under such circumstances, it would not be only the perceived primary competitor that would be of interest. In any case, to be useful, the result of a primary competitor analysis would have to be benchmarked against the results for other competing databases.

334. Furthermore, in the HQ App documents, the identity of the primary competitor is very often ambiguous. In any case, the Commission has found that in [10-20]*% of the relevant documents, MySQL is the only one of the five competing databases mentioned which amounts to approximately [60-70]*% of the total relevant documents where MySQL is mentioned (be it alone or together with other databases). SQL Server is the only one of the five competing databases mentioned in [20-30]*% of the relevant documents which is approximately [50-60]*% of all the documents that mention SQL Server. Given this result, it is highly likely that the comparison, also in terms of the number of customers, of the presence of MySQL with SQL Server or Sybase as a primary competitor would be of similar magnitude to the results established by the Commission's analysis on the total number of customers, which is described in paragraphs 290 to 304.

[250] The term "unique" refers to the sample provided by the notifying party, in which some, but not all, duplicate documents had been eliminated from the dataset.

251 See for example RBB Economics, "Oracle/Sun: Evaluation of the claim in the Statement of Objections that MySQL represents an important competitive force", 2 December 2009, doc_ID 4829.

4.3.4.1.1.2. CRM data

335. The Commission obtained and analysed the customer relationship management (CRM) datasets from both parties. In each dataset an observation is a set of characteristics[252], as seen by a sales person, of a database sales opportunity addressed by the corresponding party.

336. Oracle's economic advisors, RBB Economics, also provided a paper with an analysis of Oracle's CRM[253]. This paper argues that the CRM data provides, in itself, reliable evidence that the competitive constraint exercised by MySQL on Oracle is not significant. The argument that RBB Economics put forth is based on the relatively low frequency of market contacts between Oracle and MySQL registered in the CRM database and several other checks that they performed.

337. In its assessment, the Commission considered all available evidence on this issue including the CRM database. On the basis of careful balancing of evidence, it is concluded that the CRM data is only one of several sources of information, that it may not be reliable for the purpose of this assessment and that the conclusions derived by RBB Economics on the basis of CRM analysis conflicted with other available evidence. Moreover, the conclusions derived by RBB Economics from CRM data conflicted with some arguments submitted by the parties themselves. The following paragraphs set out the results of the Commission's of the CRM data submitted by both parties.

Oracle CRM

338. The CRM dataset submitted by the notifying party covers the period of the first quarter 2008 up to the fourth quarter 2009.

339. The first CRM dataset provided by the notifying party included [200 000 – 300 000]* observations. The Commission identified […]* ([30-40]*%) opportunities in which database products were a part of the sales opportunity and further analysed this subset[254].

340. On 29 October 2009, the notifying party submitted a new version of its CRM dataset, which covers the same time period as the original dataset. The revised CRM dataset includes [700 000 – 800 000]* observations of sales opportunities, for which the Commission identified [200 000 – 300 000]* observations which include database products according to the definition by RBB Economics.

341. A review of the revised Oracle CRM dataset identified MySQL/Sun as a competitor in […]* ([0-5]*%) opportunities of the subset. The most frequently mentioned competitor is Microsoft which appears in […]* sales opportunities ([20-30]* %), followed by IBM […]* ([10-20]*%) and Sybase […]* ([0-5]*%). In […]* ([50-60]*%) no competitor was specified[255]. Furthermore, in […]* (([0-5]*%) observations Oracle's CRM

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252 The following characteristics were of special interest within the analysis of the Commission: Primarycompetitor, allcompetitors, allproducts, accountnames, opportunityrevenue, opportunitystatus and partnerstranslatednames.

253 See submission by RBB Economics "Oracle/Sun: An economic assessment of the scope for unilateral effects", 02 October 2009 (doc_ID 2438).

254 Opportunities with database products include at least one of the following products of Oracle: (i) Database Enterprise Edition (Z10), (ii) Database Standard Edition (Z58), (iii) Standard Edition One (ZW3) and (iv) Database (Y49).

255 This includes no competitor, unknown, unidentified or unspecified competitor.

mentioned a "local competitor" and for […]* (([0-5]*%) "in-house-development" was specified as a competitor.

342. MySQL alone was identified in […]* (([0-5]*%) of the observations.

343. The descriptive statistics submitted by RBB Economics for the same dataset are very similar to the results of the analysis carried out by the Commission. Indeed, MySQL/Sun appears as a primary competitor in less than [0-5]*% of the opportunities for database sales[256]. Microsoft appears as a competitor in more than [20-30]*% and IBM in more than [10-20]*% of opportunities for database sales. Of the remaining competitors Sybase appears as a competitor for less than [0-5]*% of opportunities and all other competitors combined appear in little more than [0-5]*% of opportunities.

344. The CRM dataset has a gap in that in more than [50-60]*% of opportunities, no competitor is identified. If no systematic bias is assumed, these opportunities would have to be removed from the sample to create the basis for which the relevant frequencies of market contacts were computed. This would increase the percentage of market contacts between Oracle and MySQL (as well as in the same proportions between Oracle and other competing databases), to approximately [0-5]*% in the case of MySQL.

345. Moreover, it appears likely that MySQL would frequently be the competing database when "in-house-development" is specified as the competitor. The reason for this is that MySQL is comparatively better suited for custom development due to its low costs, strong and widespread developer community knowledge and open source nature (see for example section 4.3.4.1.2 on surveys). This is likely to result in higher relative frequency of MySQL deployment for in-house development. A similar argument could potentially be made for "local competitor".

346. While the Commission has relied upon similar datasets in past cases, in this case, the Commission expressed a number of concerns as to the reliability of CRM alone as an indicator of the degree of competition exerted by MySQL on Oracle in the database market.

347. First, the Commission expressed concerns about the fact that the CRM reflects less than half of Oracle's sales revenues[257]. RBB Economics' submission argued that even if the CRM dataset did not capture a significant part of the sales realized by Oracle, there

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256 Note that the Commission analysis is based on whether a competing company is mentioned as a competitor (in the "allcompetitors" variable) and not limited to a primary competitor. RBB Economics claims that given the bidding nature of the market only primary competitors should be taken into account when assessing the competitive constraint exercised by a competitor. The Commission, however, notes that this assumes certainty on the identification of order of the competitors, which is not a warranted assumption. Moreover it also relies on some other restrictive assumptions on the nature of competition.

257 The parties have submitted that "it is not possible to determine the "total number of database sales opportunities" since many indirect opportunities are not known by Oracle unless and until they are reported to Oracle by partner", see Oracle reply of 16 October 2009 to question 1 of the request for information to Oracle of 14 October 2009 (doc_ID 3165). Oracle has also submitted that "[it] estimates that approximately [80-90]*% of Oracle's total database license revenues in FY 2008 are attributable to opportunities that had been recorded in the CRM System", see Oracle reply of 16 October 2009 to question 2 of the request for information to Oracle of 14 October 2009 (doc_ID 3165). However, one should note that Oracle refers to licence and not total database sale turnover. Indeed in CRM for financial year 2008 the Commission has calculated that the upper bound of sales opportunities recorded in CRM is approximately USD […]* billion whereas Oracle's total database turnover is approximately USD […]* billion.

would ex-ante be no reason to believe that the results would be biased against Sun's presence. However, this concern was largely addressed by the submission of the revised CRM dataset.

348. The Commission also raised several concerns related to the reliability of CRM, with respect to the characterization of the competitive constraint imposed by MySQL and other open source software.

349. Customers can in many cases use the open source software at low costs or for free under the GPL license by simply downloading the software. It is plausible that in many of those instances the customers would not ask sales representatives of closed source vendors to bid for the opportunity, but would still be comparing (at least implicitly) the costs and features across different alternatives. Therefore, it appears possible that certain types of opportunities, which could also be those where MySQL is considered a particularly viable alternative, are less likely to be captured by CRM.

350. One of the reasons for the potential customer not to engage in a tender could be that the customer understands that Oracle would not be able to commit to a sufficiently low price in the long run, after the customer was locked-in.

351. The fact that the sales representative of Oracle is not present for such opportunities does not imply that MySQL does not constrain Oracle. In the absence of the open source alternative, Oracle and alternative closed source vendors would be able to raise prices. Clearly, for such customers Oracle is constrained by MySQL's presence and this is not reflected in the CRM database.

352. In this regard, at least one other major database provider observed and discussed in its contemporaneous internal documents that its sales representatives are often not aware of the evaluation of MySQL as an alternative to its database by customers[258]. This is clearly an argument in support of a potential bias of Oracle's CRM overall and in particular for the opportunities where the primary competitor is not identified.

353. The Commission's concern is further supported by an interview with Karin Padir, MySQL VP in April 2009[259]:

Question by the interviewer: *"Jonathan Schwartz has mentioned on his blog several times that people at the departmental level of companies are deploying and using MySQL on their own, without any decree or directives from IT departments. Is this happening, and what are the implications of that?"*

Reply of Karin Padir: *"Absolutely, we see this happening everywhere. MySQL and other open source technologies are adopted virally and are used in smaller applications. But what happens as these applications become wildly successful, they suddenly become more and more mission critical. What we find is that enterprises are now having to support these applications and are looking at Sun to provide this support."*

354. RBB Economics attempted to address a possible source of bias against MySQL in the CRM database, namely the possibility that CRM does not capture opportunities with low expected revenues. If the relative frequency of MySQL as a competitor is higher

258 Annex 8 "Clifford Chance", p. 10 (doc_ID 3216).

259 http://ostatic.com/blog/interview-karen-tegan-padir-mysql-vp-on-this-weeks-mysql-conference

for such opportunities, this would imply a likely bias towards underrepresentation of MySQL in CRM. RBB Economics showed that the relative frequency of contacts between MySQL and Oracle is relatively stable across revenue bands and concluded, on the basis of this result, that this particular source of bias is unlikely.

355. RBB Economics' argument is essentially a test of a hypothesis that MySQL is a closer competitor for Oracle for opportunities with lower expected revenue. RBB Economics' submission provides some indication as to the likelihood of the absence of possible bias due to MySQL being in competition to Oracle more frequently for transactions with lower expected values. However, it does not address the concern that Oracle's sales representatives would less often be present and aware of opportunities where an open source database is considered a particularly strong alternative to closed source databases.

356. The Commission also expressed concerns that the transactions in the CRM for which the identity of the primary competitor is unknown are biased against Sun. Given the large share of such records, a relatively small bias would cause a significant increase in effective presence of MySQL in relation to the presence as currently recorded. Even if there was no such bias, the overlap as presently evidenced in CRM, between MySQL and Oracle's databases, is likely to weaken Oracle's incentives after the merger, in comparison to those of Sun before the merger, to further develop MySQL towards cannibalizing Oracle's revenues.

357. To reject the hypothesis that the greater presence of MySQL as a competitor in opportunities with lower expected revenue drives this bias RBB Economics showed that the distribution of revenues for opportunities for which the primary competitor is not identified mirrors the distribution of revenues for opportunities where the competitor is identified. This, according to RBB Economics, indicates the absence of such source of bias. RBB Economics also showed that the relative frequency of market contacts between MySQL and Oracle does not vary significantly over different database products of Oracle.

358. While RBB Economics' result is again informative on the likely absence of the bias of the opportunities with unreported competitor towards MySQL due to the possible greater presence of MySQL on lower revenue opportunities, it is not informative on the absence of bias against MySQL and other open source vendors due to other possible reasons.

359. As such, RBB Economics' arguments do not dispel the Commission's concerns on the representativeness of the sample. This is particularly so since other empirical and qualitative sources of information, such as HQ Apps and surveys often give a significantly different picture than Oracle's CRM does. In addition, the interpretation of results by RBB Economics sometimes appears inconsistent with information provided elsewhere by the parties. Therefore, the CRM dataset should be assessed together with other available evidence[260].

360. Furthermore, Ingres and PostgreSQL, the two open source databases "were being developed specifically as substitutes for the major proprietary databases" according to

[260] Indeed, following the request of the Commission, the notifying party has submitted the opportunity management guide that provides instructions to sales personnel on how to insert opportunities in the CRM database. In the 76 page document the word competitor occurs twice. For the creation of an opportunity there is no need to specify a competitor.

the notifying party[261]. Oracle also suggests that "Ingres and PostgreSQL are much more capable of being disruptors in the high-end enterprise segment than MySQL"[262]. Ingres and PostgreSQL, however, do not appear at all as competitors in Oracle's CRM. Therefore, it would appear that MySQL is much more significant as a constraint than Ingres and PostgreSQL together if Oracle's CRM is to be taken as a reliable tool for the competitive assessment.

361. Similarly, Sybase whose database business according to the notifying party "generated $658 million in revenue, trailing only Oracle, IBM and Microsoft"[263] is cited only slightly more often than MySQL/Sun as a competitor ([0-5]*% vs. [0-5]*%). This seems to suggest that even in Oracle's CRM dataset, which appears to be biased against open source databases, MySQL constrains Oracle to an extent that is comparable to Sybase.

Sun CRM

362. The Commission also analysed Sun's CRM data. Sun CRM covers the period of first quarter 2008 to third quarter 2009. The database includes [18 000 – 19 000]* observations on sales opportunities. However in less than [0-5]*% of the opportunities is any competitor specified. This dataset is therefore of limited value for the analysis due to very extensive gaps in the identification of a competitor. However, it is still informative that in more than [40-50]*% of the observations, where a competitor to MySQL is identified, it is (among others possible) Oracle.

4.3.4.1.1.3. Comparison of CRM and HQ Apps

363. Furthermore, the Commission undertook a cross-check between HQ Apps and Oracle's CRM. For this purpose, the Commission identified [300-400]* customers/partners for which "MySQL" appears in HQ Apps documents as a competitor to Oracle. The majority of these customers were also identified in the CRM dataset ([200-300]* customers/partners). However, for only [20-30]*% ([…]*) of these customers is MySQL identified as a competitor of Oracle in Oracle's CRM[264].

364. Also, in HQ Apps the notifying party identified [50-100]* customers for which Postgres is mentioned. However, in CRM there is no customer for which Postgres is identified as a competitor.

365. This evidence is not in itself conclusive of a systematic bias of CRM. However, the sales person who makes an HQ Apps request could, in most cases, be expected to

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261 Oracle, Observations on the Commission's Theory of Harm, 2 October 2009, p. 49 (doc_ID 2427).

262 Oracle, Observations on the Commission's Theory of Harm, 2 October 2009, p. 50 (doc_ID 2427).

263 Oracle, Observations on the Commission's Theory of Harm, 2 October 2009, p. 47 (doc_ID 2427).

264 One should note that CRM has a special column that refers to the partner of the opportunity. In order to avoid that one customer is identified in HQ APPS as a customer and in CRM is placed under the "partner" variable, the Commission also extended the check including the partner variable. Therefore, even if a customer identified in HQ APPS is mentioned as a partner in CRM the Commission assumes that this might refer to the same opportunity. Also, it was not possible to identify the exact sale opportunity in each case. Several customers and partners are mentioned several times (since CRM records opportunities). The Commission assumes that even if in one of these opportunities MySQL is mentioned in Oracle's CRM then the two datasets (HQ APPS and CRM) match. Also, the Commission run this check for a time horizon of the CRM (January 2008 to December 2009) that extends beyond the time period under HQ APPS (January 2009 to May 2009). This procedure would provide a much greater chance for MySQL to be mentioned in both datasets.

register the opportunity in CRM. In such a case, CRM should contain a significant share of opportunities from HQ Apps. The fact that it does not may be an indication that CRM is not systematically completed, omitting a number of opportunities where MySQL is a competitor, and therefore making inference from this data alone may be misleading.

4.3.4.1.1.4. Conclusion on HQ Apps and CRM

366. All in all, the Commission considers that the analysis of the CRM and HQ Apps datasets provide an indication that, in those segments of the overall database market where MySQL and Oracle compete, MySQL has the potential to impose an important competitive constraint on Oracle.

4.3.4.1.2. Surveys

367. Given the open source nature of MySQL the market share in terms of revenues of MySQL does not appropriately reflect the diffusion of MySQL and its competitive constraint. Survey data might provide an alternative indication of MySQL's presence in the market. In general, the Commission considers surveys of database usage in companies an important evidence to be analysed for the purpose of the competitive assessment.

368. However, the assessment of the available surveys did not allow the Commission to draw significant conclusions for the case at hand. The available surveys suffer from certain limitations and, more importantly, they do not provide very clear answers to the questions of the current assessment. The Commission below presents some findings to test a number of claims that the parties have made during the investigation.

369. A survey by TNS (the "TNS-CIO" survey[265]) covers the use of open source software (OSS) in the Nordic countries (Sweden, Denmark, Finland and Norway) and Benelux. This survey is based on 310 interviews of Chief Information Officers (CIO) and IT-managers of 50 companies within the 500 largest private and public companies in each country (10 out of 70 largest for Luxembourg) and was conducted in April and May 2009. The sample is distributed among many different industries and excludes companies with less than 400 employees worldwide.

370. According to this survey, MySQL is deployed in 46% of the companies in the overall sample. This figure ranges by country from 34% for Sweden to 58% for Norway and by sector from 55% in the public sector to 48% in manufacturing. MySQL appears to be deployed consistently across all industries and firms of different sizes, including the largest companies.

371. The survey shows that multiple deployments (that is to say more than one database in the same company) is the rule rather than the exception. MySQL is deployed in about half of the cases where Oracle is also deployed (110 out of 211) while Oracle is deployed in about 2/3 of cases where MySQL is also deployed (110 out of 143).

372. The fact that a great majority of companies use multiple databases from different vendors side by side does not imply that they are not substitutable or even that they are complementary, as has erroneously been suggested by some during the investigation. In

[265] TNS Technology – Open Source Software Barometer 2009 – Nordic and Benelux Report (doc_ID 2143).

particular, the fact that MySQL, Microsoft SQL Server and Oracle 11g are all used at one firm does not imply that they are complementary. Firms optimize the use of the databases according to their different features and according to the license prices. If prices for Oracle's database were to increase the users would often be able to substitute away from Oracle, changing the mix of the databases in use.

373. The survey also reveals that whenever it is deployed, MySQL supports on average 12.2% of the applications in the company (ranging between 6.4% for Denmark and 16.9% for Belgium) while for Oracle the average is 41.1% (between 36.2% for Sweden and 49.3% for Norway).

374. The fact that MySQL is used in mission-critical applications in 27% of the deployments (relatively more in the Benelux with 32% and in particular in the Netherlands with 37%, than in the Nordic countries, where it is ~20-22%, apart from Norway with 33%) points in the direction of substitutability[266] between the two database competitors.

375. As to the foreseeable expansion in the number of database deployments, this appears not to be dramatic overall (for example 10 out of 210 Oracle users plan to deploy MySQL in the next 2 years and 4 out of 144 MySQL users plan to deploy Oracle).

376. The survey also tackles the reasons for using MySQL as well as the reasons not to use it. The most relevant reasons are cost savings (27% of total MySQL users), but also reliability and ease of use (12% and 17% of total, respectively) as well as flexibility (14% in Norway and 15% in Benelux).

377. The fact that the users quote cost reduction as the reason for MySQL adoption indicates that they benchmark MySQL against more costly proprietary databases category. This is a strong indication that they consider them as substitutes. The Commission cannot see whether Oracle's databases are included in the more costly proprietary database category, but it seems likely that they are.

378. Support is the main source of concern regarding MySQL adoption (10% of MySQL users in total). This is lower than the concern expressed by 20% of users for open source software in general. Reliability is clearly not a source of concern (not a single reply to that effect). The "residual" categories (other or don't know or no answer) represent about 85% of the replies. Thus the users seem to perceive MySQL as flexible and reliable.

379. Another survey by TNS (the "TNS-SMB" survey[267]) covers the use of open source software by small and medium businesses (SMBs), defined as companies with less than 500 employees, in seven Member States (the United Kingdom, France, Germany, Italy, Sweden, The Netherlands and Belgium). The survey is based on 657 interviews. The target group was the heads of IT department, which could be CIO or IT-manager. It was conducted in July and August 2009.

380. The TNS-SMB survey found that more than 50% of the companies use open source software, and can constitute more than 50% of their IT-infrastructure. Companies with more than 10 employees are more frequent users of open source software. Almost 60% of the companies interviewed use open source software for critical projects. The usage

266 This degree of adoption in mission critical applications is lower than for overall OSS (55%) but still very significant.

267 TNS Technology – Open Source Barometer 2009 – European SMB Report (doc_ID 2673).

of open source software is expected to increase. 42% of the companies interviewed expect the use of MySQL to increase, while only 2% of the companies expected the use of MySQL to decrease.

381. The survey indicates that the use of MySQL is likely to increase further in the future.

382. In the TNS-SMB survey 53% of the respondents who use MySQL quote costs savings among the reasons for usage of MySQL, 40% quote performance and scalability, and 38% of the respondents quote no lock-in (multiple choices possible). The fact that a significant share of the users of MySQL deems no lock-in an important factor is related to large switching costs and the ability of the closed source database vendors to raise prices after the user adopts and implements their database.

383. "MySQL's Zoomerang Enterprise Survey"[268] (December 2008) refers to 351 respondents, mostly current MySQL users (97%) and mostly commercial subscribers (86%). Among them 18% represent companies with more than 5 000 employees and about one third are companies with less than 500 employees; 11% have more than USD 1 billion revenue and 10% with less than USD 1 million revenue; 7% are public sector or non-profit organisations.

384. The survey confirms that multiple deployments are typical: Oracle (53% considering Enterprise and RAC editions) and Microsoft SQL Server (39%) are used in parallel to MySQL. This does not mean that the databases are not substitutable for a given use. Particularly with high switching costs a firm is not likely to change the database for an existing application, but will consider alternatives for new applications. This would lead to multiple vendor database deployments.

385. MySQL applications are customised / built in-house in 82% of cases. 62% of respondents intend to increase their existing deployment of MySQL, whereas only approximately 20% of respondents intend to do so for existing Microsoft SQL Server and Oracle deployments, respectively.

386. Looking at these results, it appears likely that MySQL plays a particular and increasing role in the in-house applications development projects and more generally. This is consistent with the absence of certification of MySQL for a number of pre-packaged business applications. The result is also indicative of the possible bias of the customer relationship (CRM) database of Oracle against MySQL, due to the category of "in-house competitor", which is discussed in section 4.3.4.1.1.2.

387. As to the main reasons for using MySQL (multiple choices possible), the most frequent are: cost savings (82%), performance (53%), independence from lock-in (42%), easier maintenance (40%) and reliability/uptime (38%).

388. The fact that the users of MySQL quote cost savings as the key reason for MySQL usage implies that they benchmark MySQL against other, most likely closed source, databases. It is concluded that this probably indicates that MySQL is in competition with closed source databases.

389. In 37% of responses, no concerns are raised as to the use of MySQL. When one or more concerns are raised, performance/scalability (39%) and missing enterprise features (30%) are the most frequent. Other concerns are related to GPL licensing issues (18%),

[268] Doc_ID 2149.

security (16%), availability of skilled developers (15%) and of 24x7 support (14%). Some concerns are also aired on company-wide policy aiming towards standardisation on Oracle / Microsoft / IBM (10%).

390. These results seem to indicate that MySQL still lacks some important enterprise features and scalability along some dimensions, when compared to some other databases, including Oracle's. Nevertheless, a large share of MySQL users considered performance as one of the main reasons for using MySQL.

391. MySQL appears to be mostly deployed for custom applications (58%) and web applications, both transactional (shopping, eCommerce, with 24%) and non-transactional (40%), content management (25%), IT infrastructure (22%) and Telecom (14%). Other more traditional enterprise applications are far from absent: Business Intelligence / Analytics (11%), CRM (11%), ERP (7%), Financials (7%).

392. This indicates that MySQL is used for a variety of different uses.

393. Another interesting survey[269] asked respondents to identify the database management system solutions used by their company in *general* as well as those used in connection with a *specific* enterprise software deployment.

394. Of the 790 responses to the general questionnaire, only 309 respondents answered the question about the general deployments and 249 the question about the specific deployments. The respondents are distributed among many different industries. The respondents cover different European and non-European countries, company sizes (with some possible bias towards smaller companies, with 1/3 in the smallest size category and another 1/3 not having communicated their size) and industries (most represented is Computer Software and Services with approximately 20%).

395. Despite a low rate of response, the survey provides useful indications. In particular, the share of MySQL's deployments is comparable to that of IBM DB2 and significantly higher than all of the other open source databases.

396. This finding is robust with respect to different company sizes (that is to say MySQL's share is not significantly lower for larger companies) and different industries.

397. Of the total population of databases used by customers, Oracle represents 18% and MySQL 9%, while PostgreSQL only represents 1%. Microsoft SQL Server represents 25%, IBM DB2 6% and Sybase 4% in the population of databases used by the respondents.

398. The responses to the question on specific deployments indicate how prevalent Oracle and MySQL are for a particular use and lend themselves readily to indicating head-to-head competition between Oracle and MySQL.

399. Of the total population of databases used by respondents for a specific deployment, Oracle represents 25% and MySQL 6%. Postgres (another open source database) represents 1%, while among alternative commercial databases Microsoft SQL Server represents 29%, IBM DB2 6% and Sybase also 6%.

269 ESMT paper on a product survey carried out by an anonymous EAS vendor, (Doc_ID 3674).

400. MySQL used in a specific enterprise deployment has a significant share both overall and within each of the reported firm size categories. The shares of MySQL used in this specific deployment are significantly above the other open source databases.

401. Another web-based survey, the "Ziff Davis Enterprise-Peerstone Database Survey"[270], refers to 269 respondents (201 of which completed the whole survey), mostly (about 2/3) occupying IT-related functions. In the survey, some profiles are slightly over-represented, such as consultants and IT vendors (27%) or Government / Non-profit organizations (22%). Respondents are mostly from North America (81%) and only very few of them are from Europe (3%). The majority of respondents are SMB (55% with less than 500 employees), although 15% of the respondents represent firms with 10,000 employees or more.

402. The survey confirms that MySQL is mostly deployed in web applications (37%, with Microsoft SQL Server used by 52.1% and Oracle by 23.6% of respondents[271]) and in customised applications (both using Java, 37.7% and scripting language 66.7%). However, use in data warehousing (14%) and packaged applications other than Oracle's packaged applications (19.3%) is quite significant. MySQL is considered as best performer in terms of costs (license, support and maintenance) by about 50% of respondents, and cost is considered to be the second most important reason to consider migration (extremely important for 44.8% of respondents, after 48.1% for better performance).

403. This is the only survey available to the Commission where the impact of the transaction is directly and explicitly tackled, although without really focusing on databases. Views on the impact of the transaction are far from unanimous. The most clear cut result is that Oracle is more likely than not (37.7% very likely and 24% somewhat likely) to raise prices of Sun's products. Also, Oracle is considered more likely than not to make Sun's products more proprietary (26.4% very likely and 29.9% somewhat likely). In addition, MySQL is the product where the impact for consumers is less likely to be good (18.5% very bad and 32.7% somewhat bad, for a total of 51.2%). In contrast, 56.8% of respondents consider that the transaction will be good for Oracle database users.

404. Another report that the Commission analysed is the EMEA Development Survey 2009 conducted by Evans Data Corporation (EDC). The results of this survey have been presented earlier in this Decision in section 3.1.

405. As regards the robustness of this survey, a panel of 406 developers from EMEA selected by EDC for their neutrality and representativeness participated in the online survey. This sample of respondents is a subsample from an EDC panel of 75 000 software developers from 85 countries. Although the number of respondents to the survey is not very high, the panel of developers from which the respondents are selected appears to be carefully constructed. Moreover, the survey has been performed on a regular basis twice a year for several years and the results of the present survey seem to be in line with the results of the previous editions of the survey.

406. Other surveys were submitted and considered, but they mostly or exclusively focus on overall open source software and are therefore of more limited interest. Among them a survey conducted by the Independent Oracle Users Group (IOUG) released in October

[270] Doc_ID 973.

[271] Multiple deployment possibility allowed in responses.

2007 (the "IOUG survey"[272]) found that there was an increase in the number of organizations reporting that they are running over half of their applications on open source software, increasing from 9 percent in 2006 to 13 percent in the 2007 report. Currently, more than one-third of the respondents report that they have deployed an open source database in production, with nearly three-quarters of that group having MySQL installed.

407. Oracle's economic advisers, RBB Economics, assessed two of the surveys; IOUG survey (submitted as Annex 34 to the Form CO) and TNS-CIO survey (conducted by TNS on behalf of Sun, submitted by Sun at the request of the Commission).

408. RBB Economics questions the overall reliability of the surveys, in particular with reference to possible limitations of the sampling method and a related selection bias (that is to say the group of respondents not being representative of the entire universe and possibly that respondents to web-surveys could be primarily users with an active interest in open-source databases). Moreover, RBB Economics questions the relevance of the questions raised in these surveys for evaluating the nature of the competitive constraints between Oracle and MySQL. They argue that in order to do that, "*a completely different set of questions would have been required. It would in particular have been necessary to evaluate the extent to which open source databases and MySQL in particular, are perceived to be a viable substitute for Oracle databases*".

409. The Commission notes RBB Economics' objections on the use of surveys for the purpose of this analysis due to possible sample selection bias. In this regard, RBB Economics has argued that web-surveys and surveys aimed at open source users attract users with an active interest in open source databases. It is possible that each individual survey exhibits a sample selection bias.

410. To address the concerns expressed by RBB Economics, the Commission has reviewed a number of different surveys, which employ different methodologies, target different groups and address different questions. The surveys seem roughly consistent in terms of their main findings, which reinforces their reliability. Moreover, the Commission does not directly interpret the answers to each question as if they were directly addressing the question of closeness of competition, but takes them as providing different elements for the purpose of the assessment.

411. Furthermore, RBB Economics contended that the results of the surveys cannot be used to conclude that MySQL exerts an important competitive constraint on Oracle, although RBB Economics agrees that "*…certain of the findings referred to by the Commission may imply some substitutability between Oracle and MySQL*[273]."

412. The Commission acknowledges the limitations of the surveys and does not rely on surveys alone to reach its conclusions. Instead, the surveys are used primarily in order to test a number of claims that the parties have made during the investigation. However, while these surveys provide certain useful information on actual or potential competition, they also suffer from limitations and their results do not allow the Commission to draw strong conclusions for the purpose of the present assessment.

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272 "Open Source in the Enterprise - New Software Disrupts the Technology Stack" by Joe McKendrick, September 2007 (doc_ID 372).

273 Reply to the Statement of Objections, Annex 2.

4.3.4.1.3. Replies to the market investigation

413. The first phase market investigation revealed that almost half of the customers see Oracle and MySQL as direct substitutes. All but one competitor see MySQL and Oracle as direct substitutes from the user's perspective, at least to a certain extent.

414. The first phase market investigation also revealed that almost half of the customers and almost all competitors see MySQL as one of Oracle's main competitors and Oracle as one of MySQL's main competitors. Nevertheless, only one customer and none of the competitors considered MySQL as the closest competitor of Oracle.

415. The second phase market investigation showed that the use of MySQL is not limited to web and lower-end general purpose database deployment. A number of customers responding to the market investigation such as Suzuki[274], Swedish National Police[275], Google[276], bwin[277] and others use MySQL as a transactional database and/or for mission critical applications[278].

416. The majority of customers (around 70% of the customers responding to the relevant question) in the second phase market investigation also indicated that they consider that database vendors can impose higher prices to their company for databases that are used for applications where free open source databases are considered to be unsuitable.

417. A number of customers expressed concerns with respect to the notified transaction[279].

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274 See reply of Suzuki to the request for information to customers databases (doc_ID 1976).

275 See Reply of Swedish National Police to the request for information to customers databases (doc_ID 1986).

276 See reply of Google to the request for information to customers databases (doc_ID 2833).

277 See reply of bwin to the request for information to customers databases (doc_ID 1749).

278 The Swedish National Police indicated that it uses both MySQL and Oracle in mission critical applications. It will use MySQL for web applications, CRM, Human Resources, and mission critical applications. In the future it is also planning to use MySQL for data warehousing. There is a decision from the head of the Swedish Police that all new IT-systems shall use MySQL except for GIS (geographic information system) and the Swedish National Police is are now in a process where it migrates a lot of IT-systems to MySQL (Reply of Swedish National Police to the request for information to customers databases (doc_ID 1986)).
Deutsche Börse plans to use MySQL as an OLTP database for one application in the future (Reply of Deutsche Börse to the request for information to customers databases (doc_ID 1897)).
Freenet, a vendor of mobile phones and fixed phones, indicates that it uses MySQL for Web applications, CRM, Human Resources, Mission critical applications. Freenet explains that MySQL 5.1. has extended cluster functions and supports tables with partitioning. These functionalities are (co-)decisive for the deployment of MySQL 5.1. Alternatives would be PostgreSQL, Oracle, IBM Informix, IBM DB2 (Reply of Freenet to the request for information to customers databases (doc_ID 1990)).
A limited number of customers in the telecommunications sector like Alcatel Lucent use MySQL Cluster to integrate it in their products which are then resold. Alcatel Lucent considers Oracle's TimesTen to be comparable to MySQL Cluster (Reply of Alcatel Lucent to the request for information to customers databases (doc_ID 2006))

279 The German airline company Deutsche Lufthansa considers: "*We expect growing costs/prices for licences and maintenance for Oracle database product itself as well as for MySQL support. Oracle leading market position will grow and will influence the whole database market. Negotiations will become more difficult (e.g. inflexible licence models for large enterprises acting as service provider, growing support costs year by year). It is expected that innovations into MySQL database will stop (*See reply of Deutsche Lufthansa to the request for information to customers databases (doc_ID 1888)).
Bwin, a big online sports betting and gaming site, indicates that it may be profitable for Oracle to stop developing an open source version of MySQL mainly since MySQL has reached a market acceptance so it actually threatens and/or disturbs the sales process for Oracle databases (See reply of Bwin to the request for information to customers databases (doc_ID 1749)).

418. However, it is also important to appreciate that many customers have indicated they are not concerned by the proposed in transaction as they consider it will not have any negative effects on their business.

419. The Commission's first phase and second phase market investigations also showed that many enterprises have deployed numerous databases and are using databases from different vendors side by side. Many companies use database products from Oracle and Sun in parallel and do not see them as competing but rather complementary.

420. As part of its reply to the Statement of Objections, Oracle included 165 letters that had been sent to the Commission in support of the proposed transaction[280]. At the same time, Oracle noted that several hundred other customers had indicated their intention to send similar letters to the Commission[281]. By including selected quotes from a number of these letters in the text of its reply alongside other customer quotes taken from replies to the Commission's requests for information, the impression was given that these letters had been received as part of the Commission's market investigation[282].

421. Almost all of the letters concerned were received after the adoption of the Statement of Objections. As such, they were not part of the Commission's file at the time the Statement of Objections was addressed to Oracle and could not have been taken into account in that document.

F-Secure, an anti-virus and computer security software company, considers the following: "*MySQL in our view is the most viable competitor to Oracle due to their functioning business structures and Open Source approach. The existence of a strong, cost-effective and well supported MySQL is causing the very expensively modeled Oracle to lose its business and revenues; even further now as MySQL is being more and more widely adapted due to its excellent business models.*" (See reply of F-Secure to the request for information to customers databases (doc_ID 1911)).

Verizon Communications, a broadband and telecommunications company, worries that Oracle will not embrace the open source culture: "*Given Oracle's history, Verizon worries that Oracle will not embrace the importance of free, open-source software, especially of those products which compete with and potentially cannibalise other Oracle proprietary products. Moreover, Oracle may be reluctant to continue to grow free, open source products if it is not able to leverage its market power and impose 'required' often costly, maintenance fees on customers*" (See reply of Verizon to the request for information to customers databases (doc_ID 1937)).

MyPoints, an advertisement company, submits that *"Oracle could force sales of Oracle databases for profit and cut expenses associated with MySQL development and support. […] Prices will go up with less competition."* (See reply of MyPoints to questions 66 and 69 of the request for information to customers databases of 17 September 2009 (doc_ID 1923)).

A large technology company is expecting price rises and less innovation: *"We believe that prices for database products would increase. Because Oracle would control database products for large enterprises as well as small and medium enterprises, consumers would have fewer choices. And because Oracle would own the intellectual property of MySQL, it could differentiate the functionality of commercial license and free open source versions of MySQL, and force customers to pay for the commercial license version in order to obtain the more advanced functionality of MySQL.* […] *We believe that product innovation may suffer because Oracle would have a more dominant market position, more leverage against customers, and thus less incentive to innovate. In order to encourage customers to pay for the commercial license version, Oracle may withhold new functionality from the free open source version of MySQL. In order to encourage larger customers to upgrade to Oracle database, Oracle may limit the innovation of MySQL."* (See reply of a large technology company to question 69 of the request for information to customers databases of 17 September 2009 (doc_ID 2454)).

A large software company points out that: *"Post-Transaction, Oracle could potentially render licensing conditions for MySQL more onerous compared to the licensing conditions that Sun offers."* (See reply of a large software company to the request for information to customers databases of 17 September 2009, p.3 (doc_ID 2514)).

280 Annex 6 of Oracle's reply to the Statement of Objections.

281 Footnote 309 of Oracle's reply to the Statement of Objections.

282 See for example paragraph 25 of Oracle's reply to the Statement of Objections.

422. In any event, there are reasons to question the evidentiary value of the letters. In the first instance, it appears that many of the senders of the letters were motivated to write to the Commission only after they had been contacted by Oracle and encouraged to do so[283]. Whilst it is not suggested that the senders of the letters received anything from Oracle in return for their support of the proposed transaction, it cannot be said that these letters provide a representative and unbiased sample of the position of database customers with respect to the proposed transaction that would have the same standing, for example, as a customer survey that the Commission services suggested on several occasions Oracle could submit as evidence of the lack of any negative effects arising from the proposed transaction in the database market.

423. Moreover, the letters were not received in response to a request for information from the Commission under Article 11 of the Merger Regulation. In the event that the addressees of such requests for information provide incorrect or misleading information, the Commission may by decision impose fines on the undertakings concerned pursuant to Article 14 of the Merger Regulation; there is no similar mechanism covering 'spontaneous' submissions to the Commission as is the case with the letters of support.

424. Comments similar to those on the issue of the letters of support could also be applied to the large number of e-mails received by the Commission after the Oral Hearing. These emails, which appear to have been sent in response to a call made by Monty Widenius, the founder of MySQL and owner of Monty Progam AB, on his blog, express concerns about the impact of the proposed transaction on competition in the database market.

425. Whilst it is acknowledged that persons have the right to make their views known to the Commission, it would not be appropriate to base the competitive assessment of a notified concentration solely on a simple count of the number of submissions received for or against the particular concentration, especially when such submissions appear to have been the result of orchestrated campaigns as in this case.

4.3.4.2. Evidence of the competitive constraint in different market segments of the overall database market

426. There are various criteria for a potential segmentation of the overall database market.

427. The notifying party argued that the database market is segmented, that the competitive situation varies significantly between the segments and that MySQL and Oracle only compete in a few segments, which are small, where Oracle's presence is weak and where many other competitors are active.

428. As concluded in section 2.1., the Commission considers the overall database market to be the relevant product market. The relevant competitive assessment for the purpose of this case is thus the competitive assessment of the overall database market.

429. Nevertheless, in the light of the product differentiation and the notifying party's proposition that a segmental approach would be a reasonable basis on which to assess the proposed transaction, sections 4.3.4.2.1 to 4.3.4.2.5 set out an assessment of the competitive situation in a number of potential segments of the overall database market.

283 This has been acknowledged by a number of the companies concerned in their response to the Commission's request for information. See replies to question 8 of the Commission's request for information of 30 November 2009 (doc_ID 4587).

430. The Commission asked the notifying party to provide a segmentation of the database market and to quantify the size of the different segments in terms of revenues and deployments. An analysis and quantification of the market segments, possibly accompanied by a competitive assessment for each of them, would allow the Commission to assess the economic importance of and the competitive situation in the market segments.

431. With the exception of certain asserted data for the embedded segment, the notifying party neither provided an estimate of the economic significance of the different segments, nor a quantified competitive assessment for them.

432. In its reply to the Article 6(1)(c) decision, the notifying party put forward certain arguments in relation to a segmentation of the database market.[284]

433. The notifying party submitted that focusing on and distinguishing three deployment scenarios would be sufficient for the purpose of assessing the proposed transaction: (a) mission critical enterprise database deployments, (b) web- and lower-end general purpose database deployments, (c) embedded database deployments.

434. On 29 October 2009 and upon repeated invitations from the Commission, the notifying party made a further submission that also contained certain arguments in relation to a segmental analysis.[285]

435. In that submission the notifying party submitted its view on the appropriate segmentation of the database market as well as the competitive landscape in the different segments. According to the descriptive analysis submitted, the notifying party considers the following segmentation of the database market to be appropriate: (a) enterprise databases, (b) departmental or small/medium enterprise databases, (c) databases to support websites, and (d) databases embedded in devices.

436. In its reply to the Statement of Objections, the notifying party reiterated its claim that with MySQL it would be better able to compete in the SME and web segment, where Oracle's current presence is weak.[286]

437. The notifying party also initially argued that its own database products and MySQL are not in direct competition for the same applications owing to important technical differences[287]. At a later stage the notifying party argued that while Oracle and MySQL compete in some market segments (web infrastructure, SME and embedded databases), Oracle's position in such segments is weak and there are many other competitive alternatives, as a result of which the notified transaction would not meaningfully reduce consumer choice.[288]

438. Besides the fact that the Commission finds the overall database market to be the relevant product market, it is important to note that the delineation of different segments is not clear-cut, as the investigation did not identify clear segment boundaries.

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284 Oracle, Observations on the Commission's Theory of Harm, 2 October 2009 (doc_ID 2427).

285 Letter of Oracle to the Commission (doc_ID 3498), and Tab1 - Oracle Database Competitive Analysis segment analysis (doc_ID 3499).

286 Oracle, Reply to the Statement of Objections, for instance p. 119 (doc_ID 4828).

287 Form CO, p. 93 (doc_ID 305).

288 Oracle, Observations on the Commission's Theory of Harm, 2 October 2009 (doc_ID 2427); letter of Oracle to the Commission (doc_ID 3498), and Tab1 - Oracle Database Competitive Analysis segment analysis (doc_ID 3499).

Consequently, the size of the various segments in terms of revenues or deployments cannot be precisely quantified. Whereas there are indicators for the relative importance of each segment in the overall database market, the segment boundaries are unclear and there are overlaps between various segments.

439. The Commission will therefore assess the following potential segments of the overall database market: (i) web, (ii) small and medium-sized enterprises, (iii) large enterprises, (iv) high-end and (v) embedded.

4.3.4.2.1. Web segment

440. The Commission's investigation revealed that there is no exact definition of the web segment for databases. Databases could for instance be considered as falling into the web segment because they serve as the underlying database for a website, but also if they serve an application that is accessible via a web-based user interface. The Commission therefore considers that the boundaries of the web segment are unclear.

441. Regardless of the precise definition of the web segment, the notifying party has been unable to provide a quantification of the web segment in terms of revenues or deployments.[289] No other elements obtained during the investigation enabled the Commission to precisely quantify the size of the web segment. However, for a significant share of websites, in particular for commercial websites, there needs to be an underlying database. The same applies to intranet sites, for instance to use an application via a web interface. Consequently, the Commission considers that, at least in terms demand, the web segment is a not insignificant part of the database market.

442. A very significant share of MySQL deployments in the web segment seems to use MySQL under the GPL. The competitive assessment of the web segment can therefore not be based on revenues. In the light of the unclear boundaries it can furthermore only be an approximation.

443. The notifying party acknowledges that Oracle and MySQL databases compete in the web segment.[290] According to the notifying party this is the primary use for MySQL.

444. However, the notifying party argues that Oracle is not a significant player in the web segment and that many competitive alternatives to Oracle and MySQL would remain after the transaction. Furthermore, in the web segment users choose an inexpensive and easy-to-use database. Microsoft SQL Server is often part of the infrastructure and thus easily available. Alternatives to MySQL are not proprietary databases such as Oracle but rather other free, open source products like PostgreSQL.

445. The Commission's investigation indicated that MySQL and Oracle are both present in the web segment. It furthermore revealed that MySQL is likely to be strong and the leading database in the web segment. It did not confirm the notifying party's argument that Oracle is an inappropriate database choice for the web segment and an insignificant player in the web segment. However it confirmed that Oracle's current presence in the web segment is comparatively less important.

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289 See for instance notifying party's reply of 11 October 2009 to question 3 of Commission request for information dated 8 October 2009 (doc_ID 2854), as well as notifying party's submission of 29 October 2009 (doc_ID 3498 and 3499).

290 Oracle, Observations on the Commission's Theory of Harm, 2 October 2009 (doc_ID 2427).

446. As described in section 1.2.2., the starting point for MySQL's development was the web segment and MySQL has traditionally been comparatively very strong in the web segment. The Commission considers that in view of MySQL's history and today's importance of the LAMP[291] stack it is likely that a significant number of MySQL's 11 million active installations[292] could be considered part of the web segment.

447. The notifying party referred to the "State of the Web 2008" survey of web designers and developers, which measures the percentage of users of the different databases.[293] According to this survey, MySQL is used by approximately 70% of web designers and developers.

448. A competitor provided an analysis of the databases used by 31 of the 45 largest web properties worldwide. It found that MySQL was the most frequently used database, with 57% of the web properties using MySQL.[294]

449. The "Ziff Davis Enterprise-Peerstone Database Survey"[295], already mentioned in section 4.3.4.1.2., asked respondents about the database they considered best for web sites or portals. 35% of respondents considered MySQL the best database, which puts MySQL in second place after Microsoft.

450. Moreover, a competitor submitted an internal document with an overview of MySQL. This document clearly confirms MySQL's origin and strength in the web segment.[296]

451. As regards customers, MySQL appears to be widely used for web deployments[297]. Google, Amazon and Facebook are among the many large users of the database. Furthermore, customers like Google seem to have considerable in-house expertise for MySQL and to customize the code heavily[298], which is easier with MySQL due to its open source code.

452. It is therefore concluded that MySQL appears to be the leading database in the web segment.

453. At the same time, the Commission's investigation revealed that Oracle can serve the web segment of the database market and that Oracle is already present in the web segment. A number of customers indicated that they use Oracle for all kinds of applications, including web.[299]

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291 LAMP is an acronym for an open source web server software bundle comprised of the GNU/Linux operating system, the Apache HTTP server software, the database program MySQL, and PHP, a web scripting language.

292 See http://www.sun.com/software/products/mysql/ (doc_ID 3375).

293 Oracle, Observations on the Commission's Theory of Harm, 2 October 2009 (doc_ID 2427).

294 Microsoft reply to questionnaire database competitors, p. 21-22 (doc_ID 2013).

295 See question 9 (doc_ID 973).

296 Annex 8 "Clifford Chance" (doc_ID 3216).

297 See reply to questions 22 and 23 of phase II Questionnaire to Customers Databases.

298 See minutes of conference call with Google (doc_ID 2869).

299 See reply to question 32 of phase II Questionnaire to Customers Databases.

454. In the "State of the Web 2008" survey, to which the notifying party referred, Oracle was found to be used for 9% of the websites. This put Oracle in fourth position behind MySQL, Microsoft and PostgreSQL.[300]

455. An analysis of the databases used by the largest web properties worldwide, which was created and submitted by a competitor, showed that Oracle followed MySQL as the second most deployed database, with a share of 22%.[301]

456. In the "Ziff Davis Enterprise-Peerstone Database Survey" 13% of respondents considered Oracle the best database for web sites or portals. This puts Oracle in third position after Microsoft with 45.6% and MySQL with 35%.[302]

457. Furthermore, Oracle internal HQ Apps documents indicate that Oracle is also targeting web companies and that Oracle databases appear to be able to compete in the web segment […]*. A few examples of companies mentioned in HQ Apps that, regardless of the precise use of the database, appear to clearly fall into the web segment due to their web-based business activity are […]*.

458. As regards Oracle's position in the web segment, it is concluded that Oracle databases can be deployed in the web segment and that Oracle seems to be a commercially significant database supplier in the web segment. However, the pricing characteristics of Oracle databases appear to reduce their appeal in the web segment. Oracle is significantly less present in the web segment than in other segments of the database market and the overall database market.

459. As regards competition in the web segment, Oracle and MySQL databases appear to be substitutable and it is concluded that MySQL, in particular in its free GPL version, might exert a significant competitive constraint on the proprietary database vendors active in this segment, including Oracle.

460. Significant suppliers in the web segment apart from MySQL and Oracle include Microsoft, PostgreSQL, as well as to a certain extent IBM.

461. PostgreSQL currently holds a certain presence in the web segment and appears substitutable to MySQL in this segment.

462. The Commission investigation also revealed that the web segment could be illustrative of the competitive impact of MySQL and its dynamic aspects.

463. The web segment was the starting point for MySQL. It was the first segment where MySQL was meaningfully present. A first dynamic aspect of MySQL is that it started spreading from the web segment to other segments of the overall database market. A second dynamic aspect is the familiarity with a certain database technology and resulting mindshare, standardisation and network effects, which seem to be significantly strengthened by the open source nature of MySQL.

464. Both dynamic aspects of MySQL's competitive impact are reflected in a third party database competitor internal document, which states "*MySQL: […] pains*"[303]; "*Threat*

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300 Oracle, Observations on the Commission's Theory of Harm, 2 October 2009, paragraph 107 (doc_ID 2427).

301 Microsoft reply to questionnaire database competitors, p. 21-22 (doc_ID 2013).

302 See question 9 (doc_ID 973).

303 Annex 8 "Clifford Chance", p. 3 (doc_ID 3216).

[…] websites"[304]; and "*Developers driving MySQL usage*"[305]. The document furthermore qualitatively illustrates the segments that MySQL is expected to further penetrate in the coming three years and the revenues at stake due to MySQL's spreading into these segments.

465. Oracle's internal documents also provide evidence of these two dynamic elements. An internal document sees […]*. Later in the document it is argued that […]*. The document concludes with an overview stating that the […]*.

466. In addition, the following selected quote, an extract from the exchange of HQ Apps correspondence for […]*, seem to confirm these findings:

467. […]**[306]*

468. It is concluded that developers in particular in the web segment appear to play an important role for dynamic competition in the overall database market and that proprietary database vendors including Oracle seem to be aware of it.

469. The fact that currently, even if not precisely quantifiable, the size of the web segment, both in terms of absolute revenues and relative revenues compared to the overall database market, is likely to be small, does not significantly reduce the importance of the competitive assessment of the web segment. On the contrary, the findings might be an illustration of the competitive impact that MySQL has achieved in the web segment and the fact that MySQL's entry or presence in a segment of the database market can reduce prices for databases very significantly. A significant part of the currently free database deployments in the web segment might risk incurring higher costs for databases as a result of the proposed transaction.

4.3.4.2.2. SME segment

470. In this section the Commission addresses the impact of the proposed transaction on a segment of the database market that consists of databases for small and medium-sized enterprises ("SME").

471. The notifying party referred to a market segment that could be *"variously called low-end, non-mission critical, mid range, SMB or SME"*.[307] The Commission investigation revealed that there is no agreed definition of such a segment by market participants. Even if low-end and non-mission critical encompass the same part of the overall database market, low-end, non-mission critical, on the one hand, and SMB or SME, on the other, would not necessarily coincide. Furthermore, even if one of these areas were chosen, a number of alternative criteria are chosen by market participants to define the respective segment.

472. In addition, as for many other segments of the database market contemplated, the SME segment could substantially overlap with other segments. For instance a database procured by an SME customer might, at the same time, belong to the web segment and to the high-end segment. Similarly, a low-end database might, at the same time, fall into the large enterprise segment.

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304 Annex 8 "Clifford Chance", p. 9 (doc_ID 3216).

305 Annex 8 "Clifford Chance", p. 11 (doc_ID 3216).

306 See HQ Apps document no 3402, customer name […]*.

307 Oracle, Observations on the Commission's Theory of Harm, 2 October 2009, p. 60 (doc_ID 2427).

473. This section will analyse a segment consisting of databases for SME. SME are commonly identified on the basis of indicators such as annual turnover or number of employees. However, even if one indicator is chosen, the precise threshold to define SME for the purpose of the assessment of this transaction remains unclear. For instance some market participants define SME as companies with less than 1 000 employees, less than 500 or less than 250.

474. Commission Recommendation 2003/361/EC of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises, provides a definition of SMEs[308]. However, as that definition is not widely applied by market participants in the database market, it does not seem appropriate for the assessment of the competitive impact of the transaction in this case to delineate the SME segment on this basis.

475. It is therefore concluded that the boundaries of the SME segment are unclear.

476. In the light of alternative definitions of the SME segment, its size is difficult to measure both in terms of revenues and deployments. The notifying party has been unable to provide a quantification of the SME segment.[309] No other elements obtained during the investigation enable the Commission to precisely quantify the size of the SME segment.

477. While no element of the Commission investigation revealed an estimate of the SME segment in terms of deployments, the following alternatives can serve to estimate the size of the segment in terms of revenues.

478. According to Gartner, if it is assumed that SME are those with less than 500 employees, the size of the SME segment in terms of revenues was approximately USD 0.9 billion in 2007.[310]

479. According to Gartner, if it is assumed that SME are those with less than 1 000 employees, the size of the SME segment in terms of revenues was approximately USD 3 billion in 2007.[311]

480. The notifying party estimates in an internal document that the size in terms of revenues of the database segment for enterprises with […]* employees was […]* in revenues in 2006.[312]

481. The notifying party estimates in an internal document that the size in terms of revenues of the database segment for enterprises with less than USD 100 million annual turnover was approximately USD 4.9 billion in 2006.[313]

482. These estimations illustrate that the SME segment accounts for a not insignificant amount of database revenues.

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308 OJ L 124, 20.5.2003, pp. 36-41.

309 See for instance notifying party's reply of 11 October 2009 to question 3 of Commission request for information dated 8 October 2009 ,(doc_ID 2854), as well as notifying party's submission of 29 October 2009 (doc_ID 3498 and 3499).

310 Gartner, RDBMS Revenue by customer company size, Annex 1 to Microsoft submission of 6 October 2009 (doc_ID 2654).

311 Gartner, RDBMS Revenue by customer company size, Annex 1 to Microsoft submission of 6 October 2009 (doc_ID 2654).

312 Oracle Annex 2.41 SMB Tech Market (doc_ID 1527).

313 Oracle presentation, Accelerate Your Business with Oracle, p. 3, available at http://www.techselect.com/root/smbaccess%20event%20recap/Oracle%20presentation%20-%20SMB.pdf (doc_ID 3428).

483. In terms of deployments, the SME segment also appears to be a not insignificant part of the database market, most likely relatively more than in terms of revenues.

484. The notifying party takes the view that although the SME segment is the most significant area in which the parties compete, it is also the most competitive part of the overall database market.

485. There are at least seven viable competitors, namely Oracle, MySQL, IBM, Ingres, Microsoft, PostgreSQL and Sybase.[314]

486. Furthermore, the notifying party argues that Microsoft is the leader in the SME segment and that the proposed acquisition of MySQL would help Oracle to better compete against Microsoft.[315]

487. In its reply to the Statement of Objections the notifying party reiterated these claims and furthermore asserted that Microsoft holds a dominant position in the SME segment of the database market.[316]

488. The Commission investigation of MySQL's position in the SME segment indicated that MySQL seems to be particularly strong in this segment.

489. A third party database competitor internal document indicates that in small organisations MySQL has now overtaken [*company name*].[317]

490. Ingres believes MySQL and Microsoft have the largest share of the SME segment.[318] IBM estimates that MySQL has a strong presence based on a high volume of shipments.[319]

491. As regards Oracle's position in the SME segment, according to an Oracle internal document Oracle's database revenues from companies with less than USD 100 million in annual turnover amounted to approximately USD 2 billion in 2006. In 2006 this corresponded to 26% of Oracle's database revenues. Oracle itself indicates that it is the leader holding a market share of approximately 40% in terms of revenues in the SME segment (identified as companies with less than USD 100 million in annual turnover).[320]

492. According to Gartner data, Oracle is the largest vendor of relational databases in terms of 2007 revenues in the SME segment, regardless of whether customers with less than 1 000, 500 or 100 employees are taken into account.[321] In the light of the notifying party's argument, the Commission also notes that, according to Gartner, Oracle's revenues were higher than Microsoft's revenues in each of the different customer categories considered.

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314 Oracle, Observations on the Commission's Theory of Harm, 2 October 2009, p. 60 ff. (doc_ID 2427).

315 Oracle, Observations on the Commission's Theory of Harm, 2 October 2009, p. 15, (doc_ID 2427).

316 Oracle, Reply to the Statement of Objections, p. 110 (doc_ID 4828).

317 Annex 8 "Clifford Chance", p. 5 (doc_ID 3216).

318 Ingres reply to database questionnaire positioning (doc_ID 2216).

319 IBM reply to database questionnaire positioning (doc_ID 2472).

320 Oracle presentation, "*Accelerate Your Business with Oracle*", p. 3, available at http://www.techselect.com/root/smbaccess%20event%20recap/Oracle%20presentation%20-%20SMB.pdf (doc_ID 3428).

321 Gartner, RDBMS Revenue by customer company size, Annex 1 to Microsoft submission of 6 October 2009 (doc_ID 2654).

493. Forrester Wave also considers that in the past three to four years, Oracle's focus has expanded to include SME through offering Oracle Express and Standard Edition One.[322]

494. IBM estimates that Oracle and Microsoft have a large presence in the SME segment.[323]

495. As regards Oracle's positioning in the SME, an Oracle internal document contains a table comparing the different versions of Oracle's database. […]*.[324] […]*[325]

496. The same document also confirms that Oracle considers Microsoft and MySQL to be its main competitors for certain customers: […]*.

497. As regards the competitive assessment in the SME segment, the notifying party did not thoroughly evaluate MySQL's position in that segment. Moreover, the notifying party neither quantified market shares (revenues or deployments) nor the significance of the competitive constraint exerted by any of the database vendors mentioned in relation to the SME segment.

498. IBM and Sybase do not seem to be amongst the important players in the SME segment. As regards IBM, TAEUS indicates that due to its pricing structure IBM is unlikely to meaningfully compete in the market for the smallest deployments[326]. The notifying party states that IBM, like Oracle, has "*had a tough time competing successfully*" in the SME segment.[327] The market investigation revealed that IBM and Sybase are not generally considered to be on par with the most likely leading three vendors in the SME segment, namely, Microsoft, Oracle and MySQL. While the investigation showed mixed results, it revealed that IBM and even more so Sybase are considered to have a weaker presence in the SME segment than in other segments of the overall database segment.[328]

499. Other open-source competitors like PostgreSQL and Ingres do not currently appear to have the same presence in the market as MySQL. This was indicated by the Commission's first phase market investigation. They currently lack a large installed base, a vibrant developer community and the same level of industry awareness and attention.

500. In this context the Commission furthermore notes the introduction by IBM, Microsoft, Oracle and Sybase of free or low-end versions of their respective database in recent years. The Commission considers this to possibly be a reaction to the presence of in particular MySQL but also other open source products, and to expansion originating at the low-end of the database market and partly in the SME segment.

322 Forrester Research "The Forrester Wave: Enterprise Database Management Systems, Q2 2009" (doc_ID 2444).

323 IBM reply to database questionnaire positioning (doc_ID 2472).

324 Oracle Annex 3.5 (doc_ID 1532).

325 Oracle Annex 3.5 (doc_ID 1532.)

326 See TAEUS report, p. 78 (doc_ID 3011).

327 Letter of Oracle to the Commission (doc_ID 3498), and Tab1 - Oracle Database Competitive Analysis segment analysis (doc_ID 3499).

328 See replies to database questionnaire positioning, question 5.

4.3.4.2.3. Large enterprise segment

501. The Commission investigation indicated that there is no exact definition of a large enterprise segment of the database market. A large number of alternative criteria could be used to define large enterprises, such as number of employees or annual turnover. However, even if one single indicator were to be identified as appropriate, the precise borderline of the market segment would remain unclear. In addition, it would also need to be clarified whether a definition would only apply to the private sector or also include public sector entities.

502. In addition, as for any other segments of the database market contemplated in section 4.3.4.2, the large enterprise segment could substantially overlap with other segments. For instance a database procured by a large enterprise might at the same time belong to the web segment and to the high-end segment.

503. The boundaries of the large enterprise segment are therefore unclear.

504. In the light of the unclear definition of the large enterprise segment, its size is difficult to estimate both in terms of revenues and deployments. The notifying party has been unable to provide a quantification of the size of the large enterprise segment.[329] No other elements obtained during the investigation enabled the Commission to precisely quantify its size.

505. However, in an attempt to estimate the size of the segment, the Commission considers that one approach could be to use the size of the overall database market as a starting point and to deduct the size of the SME segment. What remains could serve as a proxy for the size of the large enterprise segment, even if a relatively poor proxy.

506. As discussed there are various alternative definitions of SME. Consequently the definition of the SME segment varies, as do the estimates of its size. Logically, if the approach of deducting the size of the SME segment from the overall database market is followed, the same lack of precision applies to the large enterprise segment.

507. While no element of the Commission investigation revealed an estimate of the large enterprise segment in terms of deployment, the following alternatives can serve to estimate the size of the large enterprise segment in terms of revenues.

508. According to Gartner, if it is assumed that large enterprises are those with more than 500 employees, the size of the large enterprise segment in terms of revenues was USD 16.2 billion in 2007.[330]

509. The notifying party estimates in an internal document that the size in terms of revenues of the database segment for enterprises with more than 500 employees was approximately USD 8.6 billion in revenues in 2006.[331]

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329 See for instance notifying party's reply of 11 October 2009 to question 3 of Commission request for information dated 8 October 2009 (doc_ID 2854), as well as notifying party's submission of 29 October 2009 (doc_ID 3498 and 3499).

330 Gartner, RDBMS Revenue by customer company size, Annex 1 to Microsoft submission of 6 October 2009 (doc_ID 2654).

331 Oracle presentation, "*Accelerate Your Business with Oracle*", p. 3, available at http://www.techselect.com/root/smbaccess%20event%20recap/Oracle%20presentation%20-%20SMB.pdf (doc_ID 3428).

510. According to Gartner, if it is assumed that large enterprises are those with more than 1 000 employees, the size of the large enterprise segment in terms of revenues was USD 14.1 billion in 2007. [332]

511. The notifying party estimates in an internal document that the size in terms of revenues of the database segment for enterprises with more than USD 100 million annual turnover was approximately USD 11.6 billion in 2006.[333]

512. In view of these estimations of the size of the large enterprise segment in terms of revenues, it appears evident that large enterprises together account for a not insignificant part of total database revenues.

513. In terms of deployments, although most likely relatively less than in terms of revenues, the large enterprise segment also appears to be a significant part of the database market.

514. The notifying party did not explicitly submit a view on competition in a large enterprise segment. However, in the light of the notifying party's submission concerning the "enterprise database segment"[334], it is the Commission's impression that the notifying party's view is that MySQL does not meaningfully compete in the large enterprise segment.

515. As regards MySQL's position, several elements indicate that MySQL appears to be present in the large enterprise segment.

516. According to Gartner, out of its total revenues of USD 56 million in 2007, MySQL achieved USD 48 million (86%) with customers with more than 1 000 employees and USD 54 million (96%) with customers with more than 500 employees.[335]

517. As regards the share of MySQL's deployments, the Commission investigation did not reveal any precise estimates. However, a number of qualitative elements indicate that MySQL has a significant presence in the large enterprise segment in terms of deployment.

518. The TNS survey on the use of open source software in the Nordic countries and Benelux indicates that the use of MySQL is higher among larger companies with more than 2 000 employees.[336]

519. Other survey results presented in section 4.3.4.1.2. clearly confirm MySQL's presence in the large enterprise segment.

520. A competitor submitted an overview of Fortune 500 companies that appear to use MySQL. While it is neither a quantitative analysis nor an analysis of the importance of

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[332] Gartner, RDBMS Revenue by customer company size, Annex 1 to Microsoft submission of 6 October 2009 (doc_ID 2654).

[333] Oracle presentation, "*Accelerate Your Business with Oracle*", p. 3, available at http://www.techselect.com/root/smbaccess%20event%20recap/Oracle%20presentation%20-%20SMB.pdf (doc_ID 3428).

[334] Letter of Oracle to the Commission (doc_ID 3498), and Tab1 - Oracle Database Competitive Analysis segment analysis (doc_ID 3499).

[335] Gartner, RDBMS Revenue by customer company size, Annex 1 to Microsoft submission of 6 October 2009,(doc_ID 2654.)

[336] TNS Technology – Open Source Software Barometer 2009 – Nordic and Benelux Report (doc_ID 2143).

MySQL for each customer, it is an illustration that a substantial share of the Fortune 500 companies uses MySQL.[337]

521. A review of case studies presented on the MySQL website confirms that MySQL is used in large enterprises across various industries.[338]

522. In 2007 the notifying party considered an acquisition of MySQL. An Oracle internal document of November 2007, which had been prepared to discuss the potential acquisition with Oracle's executives, presents an overview of MySQL customers. The customer base at the time included 3 700 active customers, amongst them large companies from various industries such as pharmaceuticals, defence, manufacturing, telecoms, etc.[339]

523. Furthermore, the assessment of HQ Apps presented in section 4.3.4.1.1. confirms that MySQL is present in large enterprises, that MySQL exerts a significant competitive constraint on Oracle in the large enterprise segment and that the prospect of MySQL making further inroads into individual large enterprises is of concern to Oracle.

524. A third party database competitor submitted an internal document with an overview of MySQL. This document confirms that MySQL is present in large enterprises and that MySQL's presence is growing. This is evidenced by a number of statements in the document [340].

525. As regards Oracle's position in the large enterprise segment, Oracle appears to be an important database and possibly the leader in that segment. Based on the notifying party's submission, it seems that Oracle takes the same view.[341]

526. According to Gartner, Oracle's 2007 database sales to customers with more than 500 employees totalled approximately USD 7.9 billion, which corresponded to a market share of approximately 49% in terms of revenues.[342]

527. When considering enterprises with more than 1 000 employees, Gartner reports Oracle database sales of approximately USD 7 billion, which corresponded to a market share of 49.5% in terms of revenues.[343]

528. As mentioned in paragraph 511, an Oracle internal document assesses database revenues by size of customer, with a dividing line at USD 100 million annual turnover. This internal document shows that in 2006 Oracle derived approximately USD 5.6 billion in revenues from database sales to customers that had more than USD 100

337 Microsoft – Annex 5 to reply to database questionnaire positioning (doc_ID 2658).

338 http://www.mysql.com/why-mysql/case-studies/ (doc_ID 3429).

339 Oracle presentation, "*Project Mint: Discussion Materials*", 6 November 2007 (doc_ID 2621).

340 Annex 8 "Clifford Chance", p. 10 (doc_ID 3216).

341 See for instance Form CO (doc_ID 305), or Oracle, Observations on the Commission's Theory of Harm, 2 October 2009 (doc_ID 2427).

342 Gartner, RDBMS Revenue by customer company size, Annex 1 to Microsoft submission of 6 October 2009 (doc_ID 2654).

343 Gartner, RDBMS Revenue by customer company size, Annex 1 to Microsoft submission of 6 October 2009 (doc_ID 2654.)

million annual revenues. This corresponded to 74% of Oracle's 2006 database revenues and to a market share of 48.5% of database revenues in this segment.[344]

529. As regards other competitors, the internal document mentioned in the preceding paragraph would seem to display Microsoft as "*Vendor A*" and IBM as "*Vendor B*". No other competitors are named in that document, and remaining competitors are summarised as "*Other*". The respective market shares in terms of revenues in a segment for customers with more than USD 100 million annual revenues were 16.2% for Microsoft, 20.6% for IBM and 14.7% for others combined.

530. According to Gartner, the 2007 market shares in terms of revenues were the following amongst customers with more than 500 employees: 21% for IBM, 18% for Microsoft, 4.1% for Teradata, 3.1% for Sybase and 4.8% for others.[345]

531. According to Gartner, the 2007 market shares in terms of revenues were the following amongst customers with more than 1 000 employees: 21.4% for IBM, 17.5% for Microsoft, 4.4% for Teradata, 3.2% for Sybase and 4% for others[346].

4.3.4.2.4. High-end segment

532. The Commission investigation indicated that there is no exact definition of a high-end segment of the database market. A number of alternative criteria could be used to define the high-end segment. Criteria could include the technical complexity of the tasks to be executed by the database or the sophistication of the database in terms of technology features. Another approach could be to consider those databases whose usage would appear mission-critical for the customer, that is to say, the customer would incur a significant and unacceptable decrease in sales or increase in costs in the event of database downtime. However, even if one single indicator were to be identified as appropriate, the precise borderline of the market segment would remain unclear, as for instance a certain database might be mission-critical for some customers, but not for others.

533. As for any other segments of the database market contemplated in section 4.3.4.2, the high-end segment could substantially overlap with other segments. For instance a database considered high-end might at the same time be procured by a large or a small or medium-sized enterprise, and also be embedded. The boundaries of the high-end segment are therefore unclear.

534. In the light of the unclear definition of the high-end segment, its size is difficult to estimate both in terms of revenues and deployments. The notifying party has been unable to provide a quantification of the high-end segment.[347] No other elements obtained during the investigation enable the Commission to precisely quantify the size of the large enterprise segment.

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344 Oracle presentation, "*Accelerate Your Business with Oracle*", p. 3, available at http://www.techselect.com/root/smbaccess%20event%20recap/Oracle%20presentation%20-%20SMB.pdf (doc_ID 3428).

345 Gartner, RDBMS Revenue by customer company size, Annex 1 to Microsoft submission of 6 October 2009 (doc_ID 2654.)

346 Gartner, RDBMS Revenue by customer company size, Annex 1 to Microsoft submission of 6 October 2009 (doc_ID 2654).

347 See for instance notifying party's reply of 11 October 2009 to question 3 of Commission request for information dated 8 October 2009 (doc_ID 2854), as well as notifying party's submission of 29 October 2009 (doc_ID 3498 and 3499).

535. While no element of the Commission investigation revealed an estimate of the high-end enterprise segment in terms of deployment, the following can serve as an approach to estimate the size of the large enterprise segment in terms of revenues.

536. One very conservative approach could be to take the revenues derived by Oracle from certain high-end features. In particular Oracle's database feature "Real Application Cluster" ("RAC"), "partitioning" and "advance security" would appear to fall into the high-end segment. These could serve as a starting point to indicate the importance of the high-end segment in terms of revenues, even if a poor and very conservative proxy.

537. According to the notifying party's internal documents, Oracle derived the following license revenues from sales of the respective products:[348]

- […]*
- […]*
- […]*

538. Together these high-end sales therefore accounted for Oracle revenues of […]* in 2007/2008.

539. The notifying party argues that the core market for Oracle's database flagship product, currently in its version 11g, is in mission-critical database deployments. MySQL, in contrast, has an inconsequential presence in mission critical enterprise production database deployments and is not suitable for transactions and mission-critical usage.[349] In its assessment of the "enterprise database segment" the notifying party reiterates similar arguments, underlining Oracle's focus on performance, scalability, reliability and security and MySQL's alleged inability to offer such functionalities and consequently to compete in the enterprise database segment[350]. It is likely that the notifying party would have the same views when considering the high-end segment of the overall database market.

540. As regards MySQL's position in the high-end segment, the Commission investigation did not confirm the notifying party's argument that MySQL cannot technically and does not commercially compete in the high-end segment.

541. While the Commission investigation revealed that MySQL can to a certain extent in selected instances compete in the high end segment, it also revealed that it is not currently the most significant competitive constraint. There are indeed certain significant areas of the database market, where MySQL cannot compete. This has been confirmed by the TAEUS report and the results of the market investigation.

542. However, first, it is important to make a distinction between those areas that MySQL cannot currently serve for technological reasons and those areas MySQL does not currently serve for commercial reasons. Such commercial reasons could include the high switching cost associated with migrating from one database vendor to another and/or the risk averse nature of IT purchasing managers. In this context an important reason might be that MySQL, with the exception of certain solutions of smaller

348 Oracle […]*, Annex 1.7, p. 12, revenues for trailing […]* (doc_ID 1484).

349 Oracle, Observations on the Commission's Theory of Harm, 2 October 2009 (doc_ID 2427).

350 Letter of Oracle to the Commission (doc_ID 3498), and Tab1 - Oracle Database Competitive Analysis segment analysis (doc_ID 3499).

vendors, is not currently certified for use with the most popular Enterprise Application Software products.

543. Second, the TAEUS report confirmed that MySQL is currently not able to serve certain areas such as remote scale out and authentication and security, and that this is unlikely to change in the future due to MySQL's technology. However, the TAEUS report also revealed that MySQL's limitations in terms of technology are less important than argued by the notifying party. MySQL could therefore further develop into certain areas of the high-end segment.[351]

544. Third, the Commission investigation revealed that MySQL is already deployed or currently being considered by a small number of customers whose usage would fall into the high-end segment. While the market investigation on balance confirmed that MySQL is not currently a significant competitor in most parts of the high-end segment, it also showed that some respondents to Commission questionnaires appear to use MySQL as a transactional database. Furthermore, some potential MySQL customers have evaluated different database alternatives based on a number of evaluation criteria and identified MySQL as a competitive offer, including instances where the alternative would be Oracle.

545. The example of Deutsche Börse is striking. In view of the fact that the notifying party argues that MySQL is unsuitable for transactional use in the high-end segment and in its reply to the Statement of Objections strongly objected to the Commission's preliminary assessment of the information provided by Deutsche Börse[352], it is worth assessing the submission of Deutsche Börse Systems ("DB") in more detail.

546. DB replied to the Commission's phase II questionnaire to customers.[353] Question 19 asked whether customers have "*a structured evaluation/certification process to identify databases that you can use. If yes, please indicate which databases have been certified and for which uses […]*."

547. DB replied as follows:

"Yes. We have an evaluation (selection) and certification process in place which is valid for any product selection.

For general purpose, transactional databases (OLTP) and Data warehousing (OLAP): Oracle; Sybase and DB2 (done a few years ago).

For transactional databases (OLTP) – MySQL; Oracle; Postgres"

548. In response to question 22 which asked about how Sun's databases were used within the company, DB stated:

"We are not yet using MySQL in production but plan to do so (general purpose database and OLTP) in the future."

549. In response to question 30 a) about general purpose databases DB replied that due to MySQL's lack of certain features they would consider MySQL unsuitable for "*Financial Application; very heavy batch processing"*.

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351 See TAEUS report, p. 54 ff. (doc_ID 3011).

352 Oracle, Reply to the Statement of Objections, for instance p. 9 and 27 (doc_ID 4828).

353 Reply of Deutsche Börse to Questionnaire to Customers Databases (doc_ID 1897).

550. In response to question 34, which ascertained which other databases the customer would see as an acceptable substitute for their Oracle databases procured, DB stated:

"Considering our technical requirements and database workload, alternative choice would have been IBM; Sybase; Sun.

Key parameters:

[…]*"

551. In response to question 36 which asked whether the company had observed efforts on the part of Oracle to offer databases more particularly suited to small and medium-sized enterprises, DB stated:

"We are in the high-end Enterprise market, so not looking at what is happening in other market segments."

552. In response to question 69 about the effects and impact of the proposed transaction on competition in the database market, DB stated:

"*Providing Oracle continues to develop/support MySQL, we do not see a negative impact of the SUN/Oracle transaction. This statement is limited to the Database market.*"

553. In order to clarify certain elements of DB's reply to the Commission questionnaire to customers and to verify that its replies were still valid, the Commission and DB subsequently held a conference call on 23 November 2009[354].

554. During the call DB confirmed that they were planning to use the MySQL database in the future as part of their new IT trading platform. DB explained that due to its features, price and support, they were planning to use MySQL for a particular deployment.

555. DB highlighted, however, that this deployment of MySQL would not amount to any migration of existing applications, but would rather consist in adding a new MySQL database deployment to DB's existing portfolio of deployed databases.

556. DB also pointed out that while they were planning to use MySQL for one specific deployment, there were many other deployments where requirements were such that MySQL would not offer an appropriate solution. In those instances MySQL would hence not be substitutable with high-end proprietary databases.

557. DB added that from their perspective as a high-end enterprise user they would on balance see MySQL as appropriate where requirements were less demanding. For sophisticated applications with demanding requirements, MySQL would not be a substitute to Oracle. DB generally sees them as rather complementary.

558. DB furthermore stated that in those instances, where MySQL was an appropriate solution, the main reason for them to choose MySQL would be the ratio of offered features to price.

[354] Minutes of conference call with Deutsche Börse (doc_ID 5058).

559. Furthermore, DB reiterated that their general position would remain that provided that Oracle continues to support MySQL products, DB would not have any concerns about the proposed transaction.

560. In the light of these submissions and notwithstanding the fact that DB, subject to certain conditions, did not voice any objections to the proposed transaction, the following findings preliminarily expressed in the Statement of Objections remain true: (i) DB's database demand falls into the high-end segment of the overall database market; (ii) DB has an evaluation process for database procurement; (iii) DB stated they are planning to use MySQL as a general purpose database and for OLTP in the future (iv) Deutsche Börse is planning to use MySQL for one specific deployment, where Oracle and PostgreSQL would have been alternative databases, and (v) this illustrates that MySQL is considered for transactional use by a stock exchange in the high-end segment, an area that the notifying party argued MySQL would be unable to serve.[355]

561. The Commission investigation also showed that MySQL already offers a high-end database product, MySQL Cluster. An Oracle internal document acknowledges that […]*[356] As discussed in section 4.3.2.4.5. on the embedded segment, the Commission investigation revealed that MySQL Cluster appears to compete in the embedded segment and in particular the telecommunications sub-segment, which could be considered high-end.

562. Fourth, InnoDB itself, owned by Oracle, is advertised as a transactional storage engine for MySQL, that is to say, a storage engine to use MySQL for transactions.[357]

563. Finally, a number of storage engines are expected to allow MySQL, in the near future, to expand in terms of technology and to serve certain of those areas it currently does not. ScaleDB for instance is expected to launch shortly a new MySQL storage engine that would allow MySQL to compete with Oracle's RAC to a certain extent.[358] In addition, Calpont is expected to launch a storage engine in January 2010 that would allow MySQL to compete with Oracle in the data warehousing to a certain extent. While not necessarily high-end, this would allow MySQL to compete in more demanding parts of data warehousing, more precisely in the range up to 30 terabyte of data.[359]

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355 In its reply to the Statement of Objections the notifying party accused the Commission of misrepresenting Deutsche Börse's submissions in the Statement of Objections (doc_ID 4828; for instance p. 9 and 27). In footnote 8 of its reply the notifying party furthermore refers to and quotes from the "*Minutes of conversation between Deutsche Börse and Sophie Moonen and Adrian Lübbert of the Commission on 24 November 2009, provided to Oracle by Deutsche Börse"*. On 4 December 2009 the Commission requested a copy of those "minutes", which Oracle submitted on 7 December 2009 (doc ID 4979). These "minutes" of the call are in fact titled […]*, *Oracle*". The Commission notes that a copy of these "minutes" reveals that (i) they do not appear to be agreed minutes, but merely Oracle internal reporting about the alleged content of a call between DB and the Commission case team in which Oracle did not participate; and that (ii) these "minutes", in particular the introduction, are in sharp contradiction to non-confidential minutes of the call, as agreed between DB and the Commission case team and part of the Commission case file (doc_ID 5058). In addition, in its reply to the Statement of Objections the notifying party refers to a call on 24 November 2009, whereas the call took place on 23 November 2009.

356 Oracle presentation, […]* (doc_ID 2621).

357 http://www.innodb.com/ (doc_ID 3376).

358 See minutes of phone call with Scale DB (doc_ID 3036). Reply of ScaleDB to the request for information to storage engine providers (doc_ID 2489).

359 See minutes of phone call with Calpont (doc_ID 2896). Reply of Calpont to the request for information to storage engine providers (doc_ID 1939).

564. As regards Oracle's position in the high-end segment, the Commission investigation confirmed the notifying party's claim that Oracle holds a very strong position. The market investigation indicated that Oracle is likely to be the leader in the high-end segment, at least in terms of revenues.

565. As regards other database vendors active in the high-end segment, the Commission investigation showed that, in addition to Oracle, IBM in particular and, to a certain extent, Microsoft and Sybase are significant competitors. Furthermore, Ingres and to a certain extent PostgreSQL can compete in the high-end segment for certain usages and might technically even be more suitable than MySQL for certain usages. However, both Ingres and PostgreSQL currently lack MySQL's significant installed base.

4.3.4.2.5. Embedded segment

566. As explained in section 2.1.1. an embedded database is a database that may be integrated with an application that requires access to stored data and the database is typically "hidden" from the application's end user. Generally speaking, embedded databases are databases that are bundled, sold and supported as part of the product offering of a third party software ISV or hardware OEM on the basis of a license granted by the database vendor.

567. The Commission investigation indicated that it is not possible to clearly delineate an embedded segment and make a clear-cut distinction between embedded and non-embedded databases. Whether a database is embedded or non-embedded depends to a large extent on the use that the customer wants to make of the database and not on the technical characteristics of the database itself. A database used by one customer as an embedded database could be used by another customer as a non-embedded database. There is thus a significant degree of supply-side substitutability between embedded and non-embedded databases. Nevertheless, there are some databases that are specifically targeted for embedded uses.

568. Given the difficulties in delineating the embedded segment, the size of the embedded segment of the database market is difficult to estimate both in terms of revenues and deployment. The notifying party provided an IDC report that has studied the embedded database market.[360]

569. IDC defines the embedded database market as databases that are sold to ISVs for inclusion in their software products. This includes relational and non-relational databases. Typically, they are not visible to the end user. The IDC report estimates the overall embedded database market at around USD 1.97 billion in 2007, out of which USD 1.63 billion can be attributed to relational databases.

570. The IDC figures can give a proxy of the embedded database market although the IDC report has substantial limitations. First, the IDC report includes relational and non-relational databases. As explained in section 1.1. and section 2.1., non-relational databases do not have the same advantages as relational databases and are much less prevalent. The Commission does not consider non-relational databases to be part of the relevant product market for the assessment of the proposed transaction. If any proxy on the size of the embedded segment can be derived from the IDC report it should thus be related to the overall embedded database revenue for relational databases.

[360] Annex 2 - IDC Worldwide Embedded Database Management Systems (doc_ID 2429).

571. Second, the IDC definition of embedded databases does not appear to capture all sales of embedded databases. For example, if a database is entirely embedded in a product that is developed by the same software vendor that produces the database, then it is considered, in that instance, to be a component of the product in which it is contained, and revenue representing that particular configuration is not attributed to the database. Also, most embedded databases are not only sold to ISVs, but can be sold directly to the end-users. Such revenue does not count as embedded database sales in the IDC report, only those sold through third-party ISVs. The IDC report revenues for embedded databases (relational) thus seem to underestimate the size of this market segment. It also is not clear to what extent the IDC report captures the revenue for embedded databases sold to OEM.

572. Finally, the IDC report does not capture the embedded use of MySQL and other open source databases under open source licenses such as the GPL.

573. It is concluded that the IDC report most likely underestimates the size of the embedded segment for relational databases but can give an indication of its minimum size. On this basis the size of the embedded segment is likely to have amounted to at least USD 1.63 billion in 2007. The embedded segment thus constitutes a not insignificant part of the database market.

574. According to information obtained during the first and second phases of the market investigation, there seems to be an important sub-segment in the embedded segment relating to telecommunications customers. These customers have special needs in terms of requiring instant responsiveness and very high throughput. No analyst data are available on the size of this sub-segment. The notifying party estimates this sub-segment to be very small in terms of revenues, that is to say, below USD 100 million annually.

575. The notifying party acknowledges that both Oracle and MySQL are present in the embedded database segment and that there is an overlap between Oracle and MySQL's databases under proprietary license in the segment.[361] Nevertheless, the notifying party considers that the proposed transaction would not raise any competition problems in the segment, as based on the IDC report[362] Oracle's own market share is moderate and MySQL would not add greatly to this market share. In addition, several competitors are active in the market. Oracle's 2007 market share in terms of revenues on the basis of the IDC report is 26.3%, followed by Progress (13%), IBM (12%), Sybase (10%), Microsoft (10%), Empress (2%), Pervasive (1.3%) and then MySQL with a market share of only 1.1%.

576. The notifying party acknowledges that Oracle and MySQL compete in a sub-segment of the embedded segment, which is the market for in-memory databases with their TimesTen and MySQL Cluster offerings respectively. Customers in this segment usually come from the telecommunications industry. Nevertheless, the notifying party argues that these products are not close substitutes.[363]

577. The embedded and non-embedded segments overlap and database vendors often offer embedded versions of their general purpose databases. As such, the findings about the

361 Oracle, Observations on the Commission's Theory of Harm, p. 63 (doc_ID 2427).

362 Annex 2 - IDC Worldwide Embedded Database Management Systems (doc_ID 2429).

363 Oracle, Observations on the Commission's Theory of Harm, p. 20 (doc_ID 2427).

actual and dynamic competitive constraint exerted by MySQL concerning the overall database market remain largely valid for the embedded segment.

578. The market investigation revealed that customers use MySQL as an embedded database. This holds for the MySQL Server product as well as for MySQL Cluster. During the market investigation one customer indicated that while it does not currently use MySQL it is seriously studying MySQL in order to replace the company's Oracle database embedded within the range of systems/products/applications. From this company's perspective, MySQL can replace Oracle's database for the purpose of being embedded within systems, products, and applications. Among other issues, the very high level of the Oracle license fees is considered as a key driver to limit the deployment of Oracle databases.[364]

579. In the context of the assessment of the competitive constraint exerted by MySQL on Oracle, the HQ Apps indicate that a high number of the applications for rebates seem to be for embedded use.

580. In an Oracle internal e-mail […]*[365], […]*. Oracle thus considers its current database products in the embedded segment to be in competition with MySQL in that market segment.[366]

581. As regards the notifying party's argument that the embedded segment is not concentrated and that there is no competition problem resulting from the proposed transaction, the figures in the IDC report are not appropriate to assess the competitive situation in the embedded segment. First, the IDC report is based on revenues achieved by the database vendors through sales to ISVs. This may not include all sales of embedded databases and thus may not reflect the competitive situation in the embedded segment appropriately.

582. More importantly though the IDC report also includes non-relational databases which are hardly comparable to relational databases such as Oracle's database and MySQL. The Commission considers, in line with the notifying party's initial assertions, that the relational database market is considered to be the relevant market. The notifying party has not explained either from a demand or a supply-side perspective why the distinction between relational and non-relational databases should not apply in the embedded segment. Alcatel Lucent, for example, points out that one of the non-relational databases included in the IDC report and having a market share of 13% is an object-oriented database which cannot be compared to a relational database.[367]

583. Market shares in the embedded segment calculated on the basis of sales of relational and non-relational databases are thus no indication for the competitive strength of a vendor of relational database in the embedded segment.

584. Finally, while a large part of customers purchasing databases for embedded use obtain a commercial license for those databases, including for MySQL, there are still a number of customers who embed the MySQL database on the basis of the GPL license. The market shares based on revenue thus underestimate MySQL's presence in this segment.

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364 Reply to the request for information to customers databases (doc_ID 3221).

365 […]*.

366 […]* (doc_ID 2616).

367 See reply of Alcatel Lucent to the request for information to customers database (doc_ID 2006).

585. In this context the Commission notes that the notifying party has made statements during the procedure that can be considered as contradictory to a certain extent.

586. On the one hand the notifying party argues that the embedded segment is comparable to other markets where revenue market shares serve as a meaningful and reliable proxy for the assessment of competition. According to the notifying party the reason is that because a commercial license is required for embedding, the specificities of the assessment of competitive constraints exerted by free open source alternatives is irrelevant for the embedded segment.

587. An internal document of the notifying party […]*.[368] This illustrates that Oracle is aware of the possibility that while respecting the restrictions of the GPL, a software product can be shipped to a customer who then downloads the free software under GPL to embed it into the software product.

588. In this context the Commission also notes that the notifying party submitted together with its reply to the Statement of Objections the opinion by Prof Moglen.[369] Paragraph 21 of the opinion implies, by analogy to the findings for storage engines that qualified as separate and independent works, that MySQL under the GPL could be embedded without violating the GPL restrictions. This was also confirmed by Oracle at the oral hearing: *"[…]*"[370]*

589. For the purpose of assessing the proposed transaction, the Commission therefore takes note of Oracle's view that embedding MySQL under the GPL is in most cases possible without violating the provisions of the GPL (GPLv2).

590. As regards the competitive assessment for the embedded segment, the Commission notes that Oracle and MySQL in particular appear to meet in the sub-segment market for telecommunication vendors. MySQL appears to have a stronger market presence in the sub-segment market of embedded databases for clusters for telecommunications vendors. MySQL's product MySQL Cluster is an in-memory database and is tailored specifically to the needs of such uses, and includes a number of features to improve reliability and performance for such applications[371]. Telecommunications vendors include MySQL Cluster in their products which are then resold to the final customer.

591. Oracle is present in this sub-segment with its TimesTen database.[372] Oracle TimesTen is an in-memory database and a memory-optimized relational database targeted at applications requiring instant responsiveness and very high throughput in industries such as telecom, capital markets, and defence applications.

592. Oracle argues that TimesTen and MySQL are not close substitutes. This has not fully been confirmed by the market investigation. Alcatel Lucent, a provider of a range of telecommunication products, explained that MySQL Cluster can technically be replaced by Oracle's TimesTen, IBM's Solid or Oracle's Berkeley DB.[373] In some circumstances it can be replaced by Oracle Cluster. With the acquisition of MySQL Cluster the

368 […]* (doc_ID 2719).

369 Oracle; Annex 3 of the reply to the Statement of Objections (doc_ID 4831).

370 Comments made by […]* of Oracle, at the oral hearing on 10 December 2009, between 16h33 and 16h34.

371 See TAEUS report, p. 40 (doc_ID 3011); see also http://www.mysql.com/news-and-events/generate-article.php?id=2009_06 (doc_ID 3495).

372 Oracle, Observations on the Commission's Theory of Harm, p. 64 (doc_ID 2427).

373 It should be noted that Berkeley DG is not a relational database, unless it is used as a storage engine for MySQL.

number of suppliers in the field would be reduced to two major players, Oracle and IBM (but the latter with a product that must be used with the IBM suite). In Alcatel Lucent's view, the result would be that Oracle would have a dominant position in this particular domain[374]. However, Alcatel Lucent further states that they are starting to consider the evaluation of other open source databases for embedded use and are studying four alternatives. They stress that it is not certain whether any of these products will fit the need. In any event migration will be very costly.

593. Another company explained that MySQL Cluster has unique capabilities and that for these unique capabilities Oracle's TimesTen is currently the only serious competitor. IBM's solid DB would not be comparable. The company expects competition in price to definitely decrease after the transaction.[375]

594. In contrast to these concerns, however, Ericsson, which is also a significant player in the telecommunications equipment sector, indicated that it did not view the merging parties' database offerings as close competitors. It cited Sybase and Xeround as MySQL's competitors in those telecommunications applications requiring short response times. Consequently, Ericsson considered that the proposed transaction would not raise any competition concerns in the database market and called upon the Commission to approve the concentration without conditions as quickly as possible to end the uncertainty surrounding Sun's future[376].

595. Oracle databases and MySQL Cluster thus appear to be amongst the best available products and close competitors according to some but not all market responses in the sub-segment for telecommunications. IBM Solid seems to be present, but less significantly. Outside the sub-segment for specific telecommunications deployments, PostgreSQL appears to be an alternative.

4.3.4.3. Evidence of the dynamic nature of the constraint posed by MySQL

596. MySQL initially started as a database targeted at web developers. However, over time, MySQL also entered the general-purpose database market. The beginning of this development was marked by the availability of BerkeleyDB and InnoDB, two "transactional" storage engines for MySQL.[377] The latest release, that is to say MySQL 5.1., added further enterprise features to MySQL.

597. The first phase market investigation revealed that a large majority of customers (more than 70%) and almost all competitors would expect MySQL to continue on this trajectory and further develop so that it will be able to respond to ever higher requirements over time. Respondents to various surveys also expect/plan increased use of MySQL in the future (see section 4.4.2.1.3.).

598. Of course all databases gradually add features and increase in overall quality. However, MySQL appears to have “caught up” to a considerable extent with the incumbent market leaders over the last few years. This illustrates that MySQL’s competitors (and prospective customers) not only have to reckon with its current features but also with its likely development path. For example, in view of the expectation of ever increasing

374 See reply of Alcatel Lucent to the request for information to customers databases (doc_ID 2006).
375 Minutes of conference call (doc_ID 3272).
376 See reply of Ericsson to the request for information to customers databases (doc_ID 1902) as updated.
377 It should be noted that BerkeleyDB is not a relational database.

capabilities it makes sense for customers to deploy MySQL in areas where it is clearly sufficient not only in order to have a solution for the problems in those areas but also to gain experience and develop know-how for possible future deployments in more demanding areas.[378] At times this way of introducing MySQL for "simpler" tasks may also lead to the realisation that more expensive databases with specialised features have been used for tasks for which MySQL would already be sufficient.

599. However, MySQL's potential is not limited to its own development work. On the contrary, the dynamic potential of MySQL is enhanced by the existence of several independent storage engine providers. Their products, whether available under a proprietary license only or under a dual-licensing regime similar to the one used by MySQL itself, can be combined with MySQL to provide better performance or specific features to it. Very considerable gains compared to a standard installation of MySQL as distributed by Sun can be realised without changing any of the existing MySQL code.[379]

600. For example, Calpont is developing a pluggable storage engine to target the data warehousing segment, where MySQL is currently only marginally competitive. Calpont's solution would allow MySQL to be more competitive for data warehousing up to dozens of terabytes at a very disruptive price.[380]

601. ScaleDB is developing another pluggable storage engine that is designed to allow clustering with a shared-disk architecture. That technology enables MySQL to operate like Oracle's Real Application Cluster (RAC), a high-end database for applications that require high throughput and availability.[381] In the period between the third quarter of fiscal year 2007 and the third quarter of fiscal year 2008 Oracle's revenues for RAC were […]*[382].

602. To appreciate the importance of third-party storage engines it must be noted that the interests of Sun and storage engine providers are aligned. If a storage engine enables MySQL to better compete on a given market segment then Sun will benefit from the innovation on the storage engine level. In the other direction storage engine providers also benefit from MySQL being available (allowing them to concentrate on the storage engine but still being able to offer the well-known and wide-spread MySQL server as the database front-end) as well as continuously maintained and further developed. As third-party storage engine providers that (at least partly) engage in dual-licensing, to be commercially viable, need a commercial license from MySQL in order to be able to offer an integrated product (MySQL and the storage engine) to their prospective customers[383], Sun can, via license fees, directly participate in the financial success of each such storage engine provider.

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[378] This appears to be what is happening *de facto*, even if not all companies who deploy MySQL would describe it this way. Oracle sees the situation in this way as is witnessed by its HQ Apps material, see section 4.4.2.1.1.1.

[379] See minutes of conference call with ScaleDB, pp. 1-2 (doc_ID 3036).

[380] See minutes of conference call with Calpont (doc_ID 2896).

[381] Reply of ScaleDB to the request for information to competitors databases (doc_ID 2489). MySQL Cluster, besides being mainly an in-memory solution, is based on a shared-nothing architecture which has clear technical disadvantages compared to a shared-disk architecture.

[382] Oracle, […]* (doc_ID 1484). According to the same source this constitutes […]*. Another source indicates that RAC-related revenues have seen a much larger annual growth rate, averaging […]* over the last few years, see minutes of a conference call with ScaleDB, p.3 (doc_ID 3036).

[383] See Section 4.7.2.2. for an in-depth discussion of this topic.

603. In its reply to the Statement of Objections, Oracle contested the importance attached to the role played by storage engines. It noted that the majority of users rely either on the MySQL's default storage engine, MyISAM, or on InnoDB "*which is already controlled by Oracle and will thus not be affected by the present Transaction*"[384]. Oracle also questioned the extent to which future storage engines could, given MySQL's modular architecture, enable the database to support enterprise applications although it did acknowledge that "*the modular design of MySQL does enable a large community of multiple, uncoordinated groups to bring a new feature of function to market, which is ideal for open source*[385]:"

604. It is correct to acknowledge, as Oracle has in its reply to the Statement of Objections that Calpont's and ScaleDB's storage engine projects are still in their developmental stage. As such, it cannot be concluded with certainty at this juncture when the storage engines concerned will be commercialised and the extent to which they will enhance the functionality of MySQL and/or strengthen the competitive constraint on Oracle's database products which may also improve in terms of functionality during the same period. At the same time, however, it is still the case that after the transaction the alignment of interest between third party storage engine vendors and Sun (which can, via license fees, directly participate in the financial success of each such storage engine provider) will be removed because Oracle, as the leader on the overall database market, will be financially impacted each time a specialised storage engine allows MySQL to make further inroads in certain segments of the market. The only way for Oracle to avoid such a negative impact, short of totally disabling (certain) third-party storage engines[386], would be to either set the prices for commercial licenses to storage engine providers or to set the price of MySQL in a way that would allow it to offset any revenues lost from the sale of its own product. Both options would very likely lead to much higher prices for a combination of MySQL and a third-party storage engine than is currently available.

605. MySQL's gradual addition of features and qualities hitherto only found in much higher-priced proprietary databases as well as its pluggable storage engine architecture that allows the leveraging of third-party innovations lead to a specific type of constraint exercised by MySQL on competing database vendors. The move by Oracle, Microsoft and IBM of introducing free introductory versions of their databases can be understood as an attempt to prevent the dynamic growth of MySQL from unfolding by undermining its base, that is to say, its strong adoption among developers and new users.

4.3.4.4. Evidence of competitive constraint on other players beyond Oracle

606. MySQL appears to exert a competitive constraint on other players beyond Oracle. MySQL often appears to compete against Oracle alongside other products from proprietary competitors, as indicated by CRM and HQ Apps (see section 4.3.4.1.1). Moreover, as admitted by the notifying party in the Form CO, "*there are many competitors that lie between Oracle and MySQL on the chain of substitution, including IBM, Microsoft, Sybase and two transaction oriented open-source vendors (Postgres*

384 Reply to the Statement of Objections, p. 87.

385 Reply to the Statement of Objections, p. 73.

386 By changing the MySQL code and/or by adapting available license agreements Oracle would have the ability to do so, see Section 4.5 and 4.7.2.2.

and Ingres)".[387] It seems evident, then, that the presence of MySQL exercises competitive constraint on the "in-between" competitors, as defined by Oracle.

607. The Commission notes in this context the introduction by all players of free or low price / low end versions in recent years. Microsoft has introduced SQL Server Express Edition, a free, easy-to-use, lightweight, and embeddable version of SQL Server. IBM offers the IBM DB2 Express Edition, which it positions as the ideal entry level data server. Sybase now offers a free version of its database, the Sybase ASE Express Edition.

608. The market investigation revealed that proprietary database vendors consider MySQL as a competitor at least in some segments: IBM considers MySQL is an important player in the SMB segment, competing with Oracle, Microsoft, Sybase, Progress and Netezza[388], and Microsoft sees MySQL (and Oracle) as its strongest competitors in the database marketplace[389]. Sybase, in a conference call with the Commission services, confirmed that MySQL is exercising competitive constraints as "*MySQL would already be sufficiently feature-rich to compete effectively in the middle segment of the database market, a multi-billion market segment.*" Furthermore, Sybase observes that MySQL is continuing to move more and more towards enterprise transactional capabilities like those found in Oracle, Sybase etc.[390]

609. MySQL's website displays several "migration stories" from proprietary databases to MySQL, in the different segments[391]. Excluding migration stories from Oracle databases, Omaha Steaks migrated from DB2, Associated Press and The Phone House Telecom GmbH migrated from Informix, Sabre and Shinsei Bank migrated from Mainframe. The Platform and Ticketmaster[392] migrated from Microsoft SQL Server; Lafarge and CNET Networks migrated from Sybase.

4.3.4.5. Conclusion on the evidence of the competitive constraint

610. The conclusions resulting from the assessment of the various potential segments of the overall database market are set out in paragraphs 611 to 615.

611. In the web segment, MySQL seems to be the leading database vendor. Although Oracle databases can serve the web segment, Oracle currently has a comparatively weak presence in that segment.

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387 Form CO, p. 5.

388 IBM reply to question 5 of the request for information about Oracle's positioning of MySQL (doc_ID 2472).

389 Microsoft reply to question 9 of the request for information about Oracle's positioning of MySQL (doc_ID 2653).

390 See minutes of conference call with Sybase (doc_ID 2074).

391 See http://www.mysql.com/customers/migration/

392 "Ticketmaster Entertainment, Inc. is the world leading event ticketing company, which provides ticket sales, ticket resale services, marketing and distribution through www.ticketmaster.com. Ticketmaster.com had been […] using many of Microsoft's products. In 2001, due to the growing popularity of online sales of show and sports tickets, the demand for Ticketmaster.com began to exceed its capacity and caused stability issues. To solve the problem, Ticketmaster.com evaluated many databases and decided to move the Event database from Microsoft SQL Server to MySQL. In 2008, six years after the MySQL migration, Ticketmaster.com hosts ticket sales for 120,000 events and 24,000 venues, a 400% increase compared to pre-migration days in 2001. It is MySQL that enables Ticketmaster.com to achieve the 4x scalability, while consistently maintaining the average replication time of less than one second." From http://www.mysql.com/why-mysql/case-studies/mysql_cs_ticketmaster.php .

612. In the SME segment, MySQL, Oracle and Microsoft appear to constitute the three leading vendors. A number of alternatives exist, including the open source alternative PostgreSQL. However, most of these alternatives are currently at some distance from the leading three.

613. In the large enterprise segment, MySQL and Oracle are both present. However, the segment appears to be rather unspecific in terms of database needs. Depending on the exact database needs, a number of alternative databases serve the segment.

614. In the high-end segment, MySQL currently appears to be a poor substitute to Oracle databases, for technological and commercial reasons. Whilst MySQL is expected to make certain further inroads into the segment, it appears to have technological limitations.

615. In the embedded segment, the different sales channel to ISVs and OEMs do not appear to make the competitive situation fundamentally different. MySQL is present and appears to compete in certain areas of the embedded segment. In particular MySQL appears to be a player in the telecommunications sub-segment. However, when looking at the very differentiated embedded segment overall, the supply-side appears comparatively less concentrated and alternatives to MySQL and Oracle exist.

4.4. Competitive situation post-transaction

4.4.1. Evolution of MySQL after its acquisition by Oracle

616. As shown in section 4.3 MySQL potentially exerts an important competitive constraint on Oracle in the database market. If MySQL and Oracle competed in the same market, at least in certain segments of the database market, Oracle would have a commercial interest in stopping competition between its two products, that is to say, Oracle databases and MySQL. Thereby, competition might be significantly reduced in those segments where MySQL exerted a significant competitive constraint on Oracle prior to the merger. However, as the proposed transaction concerns an open source software product, this makes it necessary to further assess Oracle's ability and incentive to degrade or eliminate MySQL and its likely future evolution after the transaction.[393]

617. Through the proposed transaction the notifying party would acquire the copyright to all of the source code of the MySQL database products. Apart from those portions of the code that have been made available under the GPL license in the past, this would leave the notifying party in control of the decision to add to, remove from or make changes within code that is being made available under each license regime. Furthermore, the notifying party would acquire other rights such as the trademark and would at least initially become the employer of the MySQL staff currently employed by Sun.

618. After the proposed transaction Oracle could theoretically decide to simply stop offering MySQL code under the GPL. Given that Oracle would own the MySQL trademark,

[393] The Commission's Statement of Objections treated at length a number of issues related to the notifying party's ability and incentive to curtail the competitive constraint posed by MySQL post merger. However, it should be presumed, as in any horizontal case, that if two products are found to compete, once owned by a single entity, they would no longer compete post merger. The detailed analysis of certain points in the Statement of Objections was primarily done to rebut certain arguments advanced by the notifying part as to its post merger incentives regarding MySQL. The present decision treats the relevant question, in light of the specificities of the case, as to Oracle's actual ability (and related incentive) to control an open source product such as MySQL post merger.

with such a step MySQL would cease to exist as a maintained open source product and only the existing open source licenses would remain.

619. In the abstract this means that there would be no obligation or automatism for the base of existing users (and prospective future users) of MySQL to over time receive new features or bug fixes free of charge outside the scope of paid annual service subscriptions.

620. The notifying party could furthermore over time degrade the features and functionality of MySQL available under the GPL, although such degradation of the GPL version of MySQL over time might drive many current users of MySQL under the GPL to adopt other open source databases, or a proprietary database from another vendor.

621. The notifying party argues that it would not be in its commercial interest to degrade MySQL after the proposed transaction. The notifying party states that it would have a commercial interest in remaining "connected" with the MySQL community, as some MySQL users may over time want to move to a database (such as an Oracle product) that can handle different workloads. The notifying party considers that the importance of MySQL subscription and licensing revenues to the merged entity should not be underestimated. As regards its post-merger strategy, the notifying party submits that it would position MySQL to better compete against Microsoft's SQL Server, with a particular focus on the web and SME segment. Furthermore, the notifying party considers that any attempt to degrade MySQL would result in substantial harm to the notifying party's reputation.[394]

622. If a competitive constraint were identified, the Commission considers that these arguments, taken in isolation, would not be sufficient to exclude a significant impediment to effective competition after the merger.

623. It is evident that in the case of two competing products, which exert a significant competitive constraint on each other prior to a merger, the merged entity would have an incentive to reduce the overlap after the merger.

624. However, the Commission does not consider that the notifying party would have an incentive to immediately stop offering MySQL. This is primarily because MySQL's engineers and its customer base could indeed constitute valuable assets for Oracle. Furthermore, such behaviour might indeed have a substantial negative impact on the notifying party's reputation as an open source leader as well as its reputation as a software vendor overall.

625. On the other hand the Commission initially remained concerned that the notifying party may have a commercial interest in adopting a commercial and technology strategy that

[394] Oracle also advanced the argument that its stewardship of InnoDB, an open source database product that is the most-used storage engine for MySQL, which it had acquired in 2005, should be taken as an indication that Oracle would proceed in a comparable way with MySQL after the proposed transaction. The Commission has reviewed Oracle's internal documents regarding its acquisition and management of InnoDB. Based on this analysis it can certainly be said, as Oracle submits, that Oracle continued to develop InnoDB and kept it available under the GPL. However, these documents also indicate that Oracle had plans to shift its development focus to closed-source versions of InnoDB and to mostly invest in new features that would not be made available under the GPL. In addition, it is important to realise that Oracle's incentives with regard to InnoDB were not necessarily the same as those it will have after acquiring MySQL. Overall it can be said that Oracle's treatment of InnoDB, while not unrelated to the competitive analysis regarding MySQL, does not lend direct and unambiguous support to Oracle's position in these proceedings.

would degrade MySQL or position it in such a way that the competitive constraint exerted by MySQL would disappear over time.

626. However, following the notifying party's reply to the Statement of Objections and the Oral Hearing, the Commission has reassessed all the elements that at that stage together formed the case file.

627. The case file includes the public announcement Oracle made on 14 December 2009 to reassure MySQL customers, users and developers about the future evolution of MySQL after the merger.[395]

628. As explained in section 4.2, Oracle's public announcement can be differentiated into two categories: (i) points 1, 2 and 3 of Oracle's public announcement, which Oracle has immediately implemented by sending letters to eight third parties, pledging to amend the existing contractual terms upon the closing of the proposed transaction and hence making them legally binding on Oracle in respect of those parties[396]; and (ii) the remaining points of Oracle's public announcement that remain merely unilateral declarations not legally binding on Oracle.

629. The announcement as a whole, as well as its partial implementation, constitute factual elements that are part of the Commission's case file. For the purpose of the assessment in this case, the Commission must take the first category into account, as they constitute legally binding commitments insofar as they have been implemented in letters sent by Oracle to third parties. Due to the very particular specificities of the open source software industry, the Commission furthermore considers that the second category is also relevant.

630. The remainder of this section will explain how Oracle's public announcement, valid for a period of five years after closing of the proposed transaction, is relevant to the assessment of the notifying party's possibilities and incentives to degrade MySQL or steer its development into certain segments after the proposed transaction, given the specificities of open source software.

631. As part of its public announcement the notifying party declared that it would do the following for at least five years after the closing of the proposed transaction:

"*Commitment to enhance MySQL in the future under the GPL. Oracle shall continue to enhance MySQL and make subsequent versions of MySQL, including Version 6, available under the GPL. Oracle will not release any new, enhanced version of MySQL Enterprise Edition without contemporaneously releasing a new, also enhanced version of MySQL Community Edition licensed under the GPL. Oracle shall continue to make the source code of all versions of MySQL Community Edition publicly available at no charge.*"

632. In the light of the public announcement, it can be expected that the notifying party will continue to offer MySQL code under the GPL after the proposed transaction. Furthermore, by making MySQL available under the GPL, the notifying party will be extending the patent license that is implicit in the GPL to its own patent portfolio. This will at the same time remove one theoretical constraint that GPL-based forks of MySQL would have faced in the absence of the public announcement (see section 4.4.3

395 Oracle (doc_ID 5178).
396 Oracle, (doc_ID 5496).

for a detailed assessment of forks). Finally, it can be expected that the notifying party will not degrade MySQL under the GPL but will continue to enhance the GPL version contemporaneously with the proprietary version of MySQL.

633. As regards the five year period of validity of Oracle's pledges , this period is long enough to ensure the availability of an enhanced MySQL until other open source database vendors possibly including forks of MySQL have further developed their market position.

634. Sun is currently offering “subscriptions” to "MySQL Enterprise", that make MySQL available to customers under the GPL[397], but comprise paid commercial support and indemnification of customers against claims of IP infringement by third parties. Many companies that use MySQL internally require both commercial support and indemnifications which are standard features of commercial software.[398]

635. By pricing such subscriptions accordingly, the notifying party could ensure that its overall revenues are not negatively impacted by the availability of the GPL version of MySQL as regards commercial customers.

636. However, the Commission takes note of the following aspects of the notifying party's public announcement:

"Support not mandatory. Customers will not be required to purchase support services from Oracle as a condition to obtaining a commercial license to MySQL."

and

"MySQL Reference Manual. Oracle will continue to maintain, update and make available for download at no charge a MySQL Reference Manual similar in quality"

and

"Preserve Customer Choice for Support. Oracle will ensure that end-user and embedded customers paying for MySQL support subscriptions will be able to renew their subscriptions on an annual or multi-year basis, according to the customer’s preference."

637. The Commission investigation showed that for the large majority of support matters, third-party MySQL support is available. In the light of the public announcement, it will be ensured that alternative sources of MySQL support will be available. The MySQL reference manual that might be necessary for the provision of support will continue to be available as it is currently. In addition, regardless of the proposed transaction, third-party distributors of MySQL under the GPL and third-party providers of support also

397 Oracle correctly points out that *"consumers overwhelmingly use the community edition of MySQL Server. This includes consumers who license MySQL Enterprise"*, Oracle, Observations on the Commission's Theory of Harm, p. 89 (doc_ID 2427). Sun quantifies this information, estimating that less than 1% of all subscribers demand to receive MySQL Enterprise under a proprietary software license, p. 3 (doc_ID 2293).

398 Indeed, many companies have internal rules that prevent the use of any software for which commercial support and indemnification against third-party IP infringement claims are not available. This is a matter of risk containment. *"When polled, many enterprises claim that a significant fear they have, in terms of open source, is not being able to get support for the open source products they deploy"*, Oracle, Competitive Intelligence, PostgreSQL, May 2008, p. 1 (doc_ID 1488).

have the possibility to provide indemnification of customers against claims of IP infringement by third parties.

638. Consequently, it appears unlikely that the notifying party will have an incentive to increase support prices during the time period covered by the public pledges as it will probably continue to face competition from other providers of support services.

639. As regards proprietary versions of MySQL, regardless of technical considerations, the notifying party will in principle be able to control pricing and licensing conditions of MySQL under proprietary licenses after the merger.[399]

640. However, in the light of the fact that the notifying party's public pledges ensure that MySQL will continue to be available under the GPL, that the GPL version of MySQL will continue to be contemporaneously enhanced and that customers will have the possibility to choose support, the overall impact of such conduct in the light of the limited number of proprietary customers of MySQL without comparable alternatives is likely to be limited.

641. As regards the five year period of validity of Oracle's pledges, this period is long enough to limit Oracle's ability to increase prices and deteriorate licensing conditions of MySQL under proprietary licenses until other open source database vendors possibly including forks of MySQL that could potentially replace MySQL have further developed their market position.

642. MySQL also exerts a dynamic constraint on the notifying party and other proprietary database vendors. By virtue of its modular architecture and in particular the ability to accommodate different storage engines (potentially provided by different vendors) in parallel (and, since version 5.1, dynamically), MySQL has demonstrated its ability to exert a competitive constraint in various areas of the overall database market.

643. Third-party storage engine providers depend on the technical ability to couple their products with the core database server of MySQL and the commercial ability to ship their products together with MySQL under a suitable license regime.[400]

644. After the transaction Oracle would be in a position to control and contain the competitive constraint currently exercised by third-party storage engines. Firstly, it would be able to technically prevent any third-party storage engines from working with MySQL by changing the interfaces that currently allow this interaction. Secondly, Oracle may also refuse to license MySQL code to the third parties concerned and/or to allow its MySQL customers to operate MySQL with certain third-party storage engines, via the software licence.[401] Thirdly, Oracle could decline support to MySQL users who employ certain third-party storage engines.

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399 Oracle's internal documents confirm that […]*. This illustrates that Oracle is well aware of the dynamics surrounding products from different vendors that partly compete and partly are complementary in an environment with both open source and proprietary software licenses.

400 See, for example, the reply of Calpont, a storage engine provider, to questions 8 and 13 of the request for information to storage engine providers (doc_ID 3664).

401 Calpont began to explore the possibilities to work with Monty Program Ab due to the uncertainty about Oracles intentions, as explained during a phone call with the case team: *"Calpont initiated Letter of Intent discussions with Monty Program Ab (provider of a MySQL fork, MariaDB) in order to explore the possibility of combining MariaDB and the Calpont storage engine as an alternative solution to MySQL. Calpont continues to seriously consider this option because of its concern with the Sun contract and Oracle's future possible intentions with MySQL. However, being a fork limited to the GPL, Monty*

645. However, the Commission takes note of the following aspects of the notifying party's public announcement:

"Continued Availability of Storage Engine APIs. Oracle shall maintain and periodically enhance MySQL's Pluggable Storage Engine Architecture to allow users the flexibility to choose from a portfolio of native and third party supplied storage engines.

MySQL's Pluggable Storage Engine Architecture shall mean MySQL's current practice of using, publicly-available, documented application programming interfaces to allow storage engine vendors to "plug" into the MySQL database server. Documentation shall be consistent with the documentation currently provided by Sun. "

and

"Non-assertion. As copyright holder, Oracle will change Sun's current policy and shall not assert or threaten to assert against anyone that a third party vendor's implementations of storage engines must be released under the GPL because they have implemented the application programming interfaces available as part of MySQL's Pluggable Storage Engine Architecture.

A commercial license will not be required by Oracle from third party storage engine vendors in order to implement the application programming interfaces available as part of MySQL's Pluggable Storage Engine Architecture.

Oracle shall reproduce this commitment in contractual commitments to storage vendors who at present have a commercial license with Sun."

and

"License commitment. Upon termination of their current MySQL OEM Agreement, Oracle shall offer storage vendors who at present have a commercial license with Sun an extension of their Agreement on the same terms and conditions for a term not exceeding December 10, 2014.

Oracle shall reproduce this commitment in contractual commitments to storage vendors who at present have a commercial license with Sun."

646. The notifying party has thus publicly declared that for five years it would continue to support MySQL's pluggable storage engine API[402] and it would waive the copyleft[403] provision of the GPL for third-party storage engine providers who implement this API. Oracle's non-assertion pledge should not be understood to imply that all cases in which a third-party storage engine implements this API constitute violations of the GPL. It can therefore be expected that third party storage engine vendors will be allowed to provide

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Program cannot provide a commercial license to its database technology based on MySQL. The reasons why Calpont also looks at Maria DB is their fear that post-merger Oracle might impose different and even more restrictive conditions than those proposed by Sun, thereby undermining their business with Users, channel partners and industry analysts", p. 1 (doc_ID 2896).

402 API stands for "Application Programming Interface", a technical "hook" that allows software programs to be combined with each other. The explanation contained in Oracle's announcement does not make "Pluggable Storage Engine Architecture" a concept that is rigorously defined in technical terms. In the Commission's view, Oracle's announcement must be understood to cover at least the current functionality of all MySQL APIs that are currently used by any storage engine provided by a third party."

403 See footnote 191 for a definition of the term "copyleft".

to their customers a combination of MySQL under the GPL and the storage engine (including if that is under a proprietary license) as an integrated product.

647. Moreover, Oracle has also declared that it would extend all existing commercial license agreements between Sun and third party storage engine vendors on the same terms and conditions to cover a period of five years. The period covered by the public pledges will allow storage engine vendors to develop their business in order to get into a market position that will be viable even after the end of the period.

648. In addition the Commission was provided with copies of eight letters that the notifying party has sent to third parties, including four third-party storage engine vendors.[404] The letters, which are legally binding on Oracle, reproduce the relevant content of the notifying party's public pledges, and constitute a factual element showing a first step in the implementation of the public pledges.

649. These aspects of the public announcement, and their partial implementation vis-à-vis third parties, are therefore very likely to reduce the notifying party's ability to disadvantage features of products that are based on MySQL or to foreclose third-party storage engine vendors, including those products that compete in the market with Oracle databases.

650. The notifying party also declared it would create and maintain Advisory Boards for MySQL Customers and for Storage Engine Vendors:

"MySQL Customer Advisory Board. No later than six months after the anniversary of the closing, Oracle will create and fund a customer advisory board, including in particular end users and embedded customers, to provide guidance and feedback on MySQL development priorities and other issues of importance to MySQL customers."

and

MySQL Storage Engine Vendor Advisory Board. No later than six months after the anniversary of the closing, Oracle will create and fund a storage engine vendor advisory board, to provide guidance and feedback on MySQL development priorities and other issues of importance to MySQL storage engine vendors.

651. Finally, the notifying party declared it would increase spending on MySQL research and development:

"Increase spending on MySQL research and development. Oracle commits to make available appropriate funding for the MySQL continued development (GPL version and commercial version). During each of the next three years, Oracle will spend more on research and development (R&D) for the MySQL Global Business Unit than Sun spent in its most recent fiscal year (USD 24 million) preceding the closing of the transaction."

652. These parts of the public announcement, combined with the pledge to enhance MySQL in the future, can be expected to ensure to a substantial extent the further development of MySQL products, taking into account the needs and wishes of consumers and storage engine vendors.

[404] Oracle (doc_ID 5496)

653. As regards the five year period of validity of Oracle's pledges, this period is long enough to ensure the further development of MySQL products until other open source database vendors including forks of MySQL have further developed their market position.

654. Overall, the Commission therefore considers that the notifying party's public announcement and its partial implementation are factual elements to take into account for the assessment of the most likely evolution of MySQL after the proposed transaction. As explained in section 4.2., the Commission considers that the specificities of open source software and the vibrant ecosystem surrounding it provide for a self-enforcing mechanism ensuring that Oracle would not have the ability and incentives to deviate from its announced future conduct.

655. For the leader of an open source project and the centre of an open source ecosystem, reputation should be of high importance. If the leader of an open source project, who is at the centre of an open source ecosystem, damages its own reputation and loses the open source community's trust, there will be an increased risk of losing network effects due to fragmentation and reorientation of the community. The leader consequently risks losing control of a so far relatively unified community and damaging its open source project, as the ecosystem might reorient and move towards a different leader.

656. Furthermore, the specificities of the software industry, and in particular the database market, entail an even greater importance of vendor reputation compared to other sectors of the economy. In addition to the network effects prevalent in the software industry, database users and customers take deployment decisions that are forward looking and have a long term impact on their activity. A vendor's credibility and reputation at the moment of the deployment decision can hence be considered of even greater importance in the database industry and a vendor whose reputation suffers risks being at a competitive disadvantage for new deployment decisions. Damage to Oracle's reputation as a result of its poor or disruptive stewardship of MySQL would therefore be likely to also have an adverse effect on Oracle's proprietary software business.

657. Finally, through the proposed transaction the notifying party will become the "owner" of other open source products, such as Java, OpenSolaris and OpenOffice. The notifying party already offers some open source products such as Oracle Enterprise Linux and Oracle VM. It will certainly have a continued interest in the success of a number of open source products, such as in particular Java or Linux, after the merger. Consequently, the notifying party's reputation amongst the open source community overall will be of importance after the merger.

658. In view of the above considerations, it is concluded that the notifying party is, on balance, unlikely to have the ability and incentive to eliminate MySQL after the merger.

4.4.2. Extent to which other open source databases might develop to exercise a constraint on Oracle

659. As part of its assessment of the compatibility of the proposed transaction, the Commission also needs to examine the extent to which other database vendors would replace the competitive constraint which may previously have been exerted by MySQL if MySQL were to be removed after the merger.

660. The new constraint could either be exerted by another open source database that, while already competing on the market today, could expand its offering and effectively move

into the competitive position vacated by MySQL (this section) or by a fork of MySQL, that is to say, a new competitor entering the market that starts out with the currently existing MySQL product and continues to develop and support it (section 4.4.3.).

661. Due to its business model and open source nature MySQL appears to exert a specific competitive constraint which seems to be different from the constraint that can be exerted by proprietary database vendors. After the merger Oracle will of course continue to face strong competition from other proprietary database vendors such as IBM, Microsoft, Sybase and others whose database offerings were presented in section 1.2.3. However, to the extent that, as explained in section 4.3.4.4, MySQL also appears to potentially exert a particular competitive constraint not only on Oracle but also on other proprietary database vendors, the Commission's assessment focuses on the potential for another open source database vendor to replace such a competitive constraint on Oracle and other proprietary database vendors.

662. The notifying party argues that the database products Ingres and PostgreSQL are also available under open source licenses and are technically superior to MySQL, in particular with regard to higher-end enterprise usage targeting existing Oracle customers. Therefore if any open source database product were able to exercise a competitive constraint on Oracle, it would be Ingres or PostgreSQL rather than MySQL[405].

663. Some aspects of the corporate and technical history of the Ingres and PostgreSQL databases are worth noting. The University of California, Berkeley, developed database software under the name Ingres ("Interactive Graphics Retrieval System") in the 1970s, partly with public funding. The database and its source code were available at a modest price and under a BSD license, that is to say, a permissive open source license that allows the licensee to incorporate the licensed code into its own proprietary products. This database code formed the core of many of today's competitors in the database market.

664. Some people who had worked on Ingres at Berkeley developed the NonStopSQL product for Tandem Computers which, after Tandem's acquisitions by Compaq and Compaq's acquisition by HP, continues to be marketed commercially today. Other Ingres programmers formed Britton Lee, Inc. in 1979 to market a RDBMS. Britton Lee was acquired by Teradata, a leading provider of data warehousing database technology in 1990. A subset of these programmers went on to form Sybase in 1984 which also marketed RDBMS and for a long time was Oracle's main competitor in the database market. Sybase cooperated with Microsoft to create a version of its RDBMS for the new OS/2 operating system (initially a cooperation between Microsoft and IBM, later an IBM product). Microsoft later built its SQL Server on licensed Sybase Code and went on to surpass Sybase as a competitor in the database market[406].

665. Relational Technology, Inc. (RTI), later renamed *Ingres Corporation* was formed in 1980[407]. This company took the Ingres code and made it into a commercial product. Ingres Corporation was acquired and was spun off from the company Computer Associates in 2005. It released one version of its database product under the GPL in

405 Oracle, Observations on the Commission's Theory of Harm, section II.D.2. (doc_ID 2427).

406 It appears that both NonStopSQL and Sybase's product initially were (at least partly) based on Ingres code, see Microsoft reply to Additional Questions by the Commission, pp. 3 and 4 (doc_ID 3302).

407 At the same time what became Oracle Corporation was named Relational Software, Inc. (RSI).

2006 and follows a dual-licensing approach similar to the one Sun uses with MySQL, that is to say, it also provides Ingres under a commercial license.

666. Again at Berkeley, development of a "post-Ingres" database started in the mid-1980s, including people who had previously been involved with RTI. Their product was variously named Postgres and *PostgreSQL* (after addition of SQL capabilities) and, as previously with Ingres, companies were formed to develop commercial products based on its source code that was available under a BSD license. One such company, Illustra, was acquired in the 1990s by Informix, now owned by IBM. Development of PostgreSQL continues as an open source project using the BSD license.

667. EnterpriseDB was founded in 2004 and markets a product that is based on the BSD-licensed PostgreSQL code. While EnterpriseDB contributes some of its developments to the open source project that is maintaining PostgreSQL, EnterpriseDB's flag-ship commercial products actually come with proprietary licenses[408]. As EnterpriseDB's then Chief Executive Officer explained in 2007, while the GPL, by virtue of its forcing licensees to redistribute only under the GPL, allows the licensor to control its technology even when open-sourcing it and providing commercial licenses in parallel, the same is not true for software that is released under a BSD license because any licensee can make the code proprietary again under a BSD license and thus capitalise on the licensor's investments and developments[409].

668. To sum up, Ingres since 2006 has followed the same business model as MySQL. EnterpriseDB's flagship database product is actually a proprietary offering that is based on freely available code but whose most important features (for example, concerning technology for compatibility with Oracle's databases) are not freely available[410].

669. As is apparent from surveys, the parties' internal documents and analysts' reports, in particular the market position of Ingres to a considerable extent appears to be based on its existing base of customers stemming from a 25-year-long corporate history, providing the bulk of the RDBMS revenue generated by Ingres.[411]

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408 See http://www.enterprisedb.com/products/purchase.do, printed on 13 October 2009 (doc_ID 2976).

409 http://andyastor.blogspot.com/2007/05/enterprisedb-licensing-model.html, printed on 11 October 2009 (doc_ID 2963). The following is an instructive quote (emphasise added) that illustrates EnterpriseDB's commercial motives: *"We originally planned simply to take the same approach as most other open source companies, which is a dual-licensing strategy. With a dual-licensing approach, the company is protected by a GPL (or similar) license, because both competitors and potential customers who wish to embed/link with the GPL software must also GPL their own code. Since most competitors/customers don't wish to do so, they are willing instead to pay for a commercial license. This simple yet subtle point is at the heart of the success of nearly every commercial open source organization. […] [T]he subtle yet powerful truth about commercial open source is that the GPL is an excellent enforcement mechanism for creating commercial value. Now, unlike most open source projects, which are licensed under the GPL or similar license, PostgreSQL is a BSD-licensed project. As most of you know, BSD is among the most permissive licenses, allowing anyone to do anything with the code, with virtually no restrictions. In other words, the BSD license provides no commercial protection whatsoever, either from competitors or potential customers. With the BSD, anyone can take the code and do anything they wish."* The author goes on to explain that as EnterpriseDB did not originate the PostgreSQL project, it would not consider re-releasing the code under the GPL. (Ingres Corporation had taken exactly this step, however it had provided its product in a proprietary fashion for more than a decade when it did so.)

410 Indeed, EnterpriseDB has attracted IBM to take a license to this technology, http://www.enterprisedb.com/company/news_events/press_releases/2009_09.do, printed on 13 October 2009 (doc_ID 2967).

411 For 2007, Ingres is reported to have had RDBMS revenues of USD 28m, IDC, Worldwide Relational Database Management Systems 2007 Vendor Shares, p. 4 (doc_ID 2432). Gartner reports revenues for

670. As regards PostgreSQL, although it is not even mentioned in many market share studies[412] and appears considerably less often than MySQL in Oracle's HQ Apps documents, its presence in that dataset cannot be considered insignificant.[413]

671. The Commission, as part of its continuing investigation after the adoption of the Statement of Objections also obtained data from a number of database providers including MySQL and PostgreSQL concerning the number of occasions on which certain of their respective products had been downloaded[414]. The data obtained as part of this exercise relating to PostgreSQL have to be treated with some caution as they do not include all the occasions on which the database may have been downloaded (for example, as part of a bundle of software or from servers for which the data were not available). As a result, the data may understate the actual market presence of PostgreSQL. Notwithstanding the foregoing, the download figures for PostgreSQL, although considerably lower than those for MySQL for a comparable time period, cannot be considered to be insignificant[415].

672. Moreover, the market investigation has indicated that PostgreSQL, if not Ingres, could potentially replace the competitive constraint exercised by MySQL in the market place in due course.

673. Regarding PostgreSQL, a majority of respondents to the Commission's requests for information to database customers, database competitors and database integrators stressed that it has good features in particular for enterprise usage. Although some customers were concerned about the lack of a strong corporate sponsor for the PostgreSQL open source project and the ensuing (at least perceived) lack of availability of enterprise class support and services for the product, a majority expressed the view that PostgreSQL could be expected to replace MySQL as a competitive force on the database market if Oracle failed to continue developing an open source version of MySQL as a result of the proposed transaction[416]. Respondents were also asked for

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Ingres of USD 41.4m in 2007 and USD 54.8m in 2008, Gartner, Open-Source DBMS 2009; Gaining in Maturity and Use (doc_ID 2276, p. 3).

412 A recent Gartner report gives EnterpriseDB's revenues at USD 12.5m in 2008, Gartner, Open-Source DBMS 2009; Gaining in Maturity and Use, p. 3 (doc_ID 2276). Also, Netezza's data warehouse appliance product offerings appear to be built on PostgreSQL but assessing its RDBMS-only sales is not straightforward. One reported number is USD 49m in 2007, IDC, Worldwide Relational Database Management Systems 2007 Vendor Shares, p. 4 (doc_ID 2432).

413 On HQ Apps, see Section 4.3.4.1.1.1. For Ingres no such number has been computed. There is another source that corroborates this finding of relative importance of the three open source databases MySQL, PostgreSQL and Ingres. The Observatoire du Logiciel Libre has published a report on recent tendencies in training demanded for open source products across France, Tendances 2008-2009 du logiciel libre, 4ème edition, March 2009 (http://www.ob2l.com/dl/Observatoire-Logiciel-Libre-Barometre-4.pdf, printed on 14 October 2009). According to this report, 12% of all training requests recorded concern MySQL, an annual growth of more than 200%. PostgreSQL is demanded in 1.6% of all training requests recorded, an annual growth of 90%, (doc_ID 3015).

415 The figures obtained in respect of PostgreSQL (or direct download statistics for PostgreSQL installer files) show that during the 12 months ended 30 October 2009 it was downloaded approximately [1-3] million times. The Commission notes that PostgreSQL project web pages list various ways to directly access PostgreSQL software. The software does not require registration nor is it keyed in any way meaning that it is possible for any copy to be replicated many times.

416 See replies to question 61 of the request for information to customers databases of 17 September 2009. A similar position was also taken by a majority of database competitors who expressed the view that PostgreSQL could be expected to replace MySQL as a competitive force should Oracle not maintain an open source version (see replies to question 41 of the Commission's request for information to competitors databases of 18 September 2009.

estimates regarding the time that it might take for PostgreSQL to achieve a similar adoption rate to that of MySQL today. Although in some instances the estimates were as long as ten years or as short as one year, many respondents indicated that they expect such a development would take several years. EnterpriseDB, a company founded in 2004 that builds its flagship database product by using PostgreSQL thinks the relevant time frame is 2 to 4 years but points out that *"the migration of users from MySQL to PostgreSQL has been happening for years"*[417].

674. Regarding Ingres, fewer respondents were confident that Ingres would constitute a replacement for the competitive constraint exercised on Oracle by MySQL.[418] The Ingres Corporation's 2006 move to make its source code available under the GPL is not seen as being very successful. In particular, the absence of a large open source community working on and contributing to the Ingres code was noted[419].

675. Both Ingres and PostgreSQL products have been on the market for decades. Their success is limited, notably if compared to MySQL. However, it may well have been the success of MySQL itself that has prevented PostgreSQL from seeing more growth, in particular in the web segment of the database market. This suggests that an adverse handling of MySQL by Oracle may open up new market opportunities for products based on PostgreSQL or for Ingres and increase the adoption rate of these products as indeed has been acknowledged by a number of respondents to the Commission's requests for information.

676. As the notifying party itself has argued, these products already offer some enterprise-class product features that MySQL does not currently possess or at least is only slowly acquiring. Ingres Corporation and PostgreSQL have, for years, focussed their efforts on the enterprise segment, with limited success in other segments of the market. A competitive "removal" of MySQL may specifically benefit PostgreSQL in the web segment.

677. In view of the above it is concluded that PostgreSQL (or another database based on its code), in particular, may see accelerated adoption as a reaction to Oracle's adverse handling of MySQL and could even replace to a certain extent the competitive force currently exerted by MySQL on the database market.

4.4.3. Extent to which forks of MySQL might develop to exercise a constraint on Oracle

678. It is possible that many companies would become successful entrants on the database market and profitable businesses by providing support services for MySQL or a fork thereof (regardless of whether they themselves offer such a fork) after the transaction. However, this does not imply that such companies, individually or collectively, would in fact fully replace any competitive constraint potentially exerted by MySQL.

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417 See replies to question 61 of the request for information to customers databases of 17 September 2009 and question 41 of the request for information to competitors databases of 18 September 2009.

418 See replies to question 63 of the request for information to customers databases of 17 September 2009 and question 43 of the request for information to competitors databases of 18 September 2009.

419 See for example the replies to question 43 of the request for information to competitors databases of 18 September 2009 of Inuits bvba (doc_ID 1839), ScaleDB (doc_ID 1860, *"Ingres had their opportunity to compete with Oracle and was severely humbled. Going open source was seen as a desperation move."*) and Monty Program ab (doc_ID 1891, *"But still today it does not have a strong open source community, and we feel it is more likely for PostgreSQL to develop a commercial community than for Ingres to capture the open source community's attention."*).

679. Nobody contests that a fork of MySQL cannot *legally* be prevented. This means that a company could copy the source code of the version of MySQL that is currently available under the GPL and release it (with or without modifications) as a new product. Such a company could be considered a new market entrant. Several forks of MySQL have already occurred: for example, MariaDB, Percona and Drizzle.

680. The majority of customers responding to a request for information in the first phase market investigation considered that the open source nature of MySQL eliminates any potential for anti-competitive effects. The majority of customers also considered that offerings like Maria DB have the potential to grow as a competitive force in the market for databases.

681. In order to develop into a significant competitive constraint on existing market participants (including other open source databases), an entrant based on a fork of MySQL faces certain commercial barriers, technological barriers, and barriers related to intellectual property rights. These barriers and their significance are assessed in the following sub-sections.

4.4.3.1. Commercial Barriers

682. A forker of MySQL, that is to say, a company that copies the MySQL source code available under the GPL, can release a product on this technical basis. However, by merely putting a (differently named) copy of an existing database for download on a website such a company does not automatically acquire an international market presence and competitive impact comparable to the current situation of MySQL overnight[420].

683. Founded in 1995, MySQL AB had grown to almost 400 employees by the time it was acquired by Sun in February 2008. A company that wanted to become a comparable competitive force on the database market would need to grow its own brand name and technology in parallel to be recognised by market participants and by prospective customers.

684. To do so, such a company must be capable of continuing to develop the fork with its own technical expertise (since it cannot simply assume that patches and updates will come downstream from Oracle after the transaction) so that it becomes recognised as a product in its own right. It must also build a global sales and support organisation because especially advanced usage of databases, an area into which MySQL has started to penetrate, requires intensive and strong support, potentially worldwide and around the clock. Indeed, many customers would not even consider a database product for which this level of support would not be available.[421]

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[420] The same is true for existing companies that launch new products into markets on which they have not competed previously. For this reason in the following the text will not explicitly distinguish between situations in which MySQL would be forked by an existing company and situations in which a new entity would take the fork.

[421] See replies to question 57 of the request for information to customers databases of 17 September 2009. The notifying party contests this interpretation. However, its arguments are not convincing (reply to the Statement of Objections, paragraph 334). First, it asserts without quoting any evidence that *"even Sun itself only has very few customers paying for MySQL support, with MySQL support often being undertaken by other, smaller firms"*. Sun has more than 10.000 subscriptions which include support services and it is far from clear that even all other, smaller firms providing MySQL support combined have more such customers. The notifying party then attempts to support its claim by citing from Facebook's reply to the market investigation according to which *"Facebook relies on Percona, a company*

685. It appears that there is no "shortcut" for new market entrants, that is to say, no way of establishing themselves as a competitive force without actually being present and successful on the market for a few years. New entrants on the database market can only grow organically because clients want to be able to assess the capabilities of a vendor before committing significant resources to a business relationship. This is because the database market is characterised by many long-term relationships between vendors and customers as many database installations are in use for several years and customers require support over the entirety of their lifetimes.[422] Consequently, customers look for financial stability and past experience in prospective new suppliers as an important condition for entering into a significant business relationship.[423]

686. Therefore database vendors need references provided by satisfied customers and a track-record of a growing and financially stable business to be successful in acquiring new customers, especially customers with large and specialised support requirements. This need increases with the importance and mission-criticality of the continued availability and functioning of the database product in question from the customer's point of view. Even successful companies need time to build a track-record and collect references and the competitive importance of a database vendor also cannot simply be increased proportionally by hiring more engineers (or salesmen) at once.

687. As the notifying party points out, there are already several MySQL forks in existence[424]. The companies or development teams that produce and maintain these forks are currently very small: According to its homepage, Percona (which has released XtraDB, a fork of InnoDB) has at most seven developers[425]; Monty Program AB (which makes MariaDB, a fork of MySQL) has *"currently has 15 employees" of which "*[m]*ore than half* [...] *are full-time developers"*[426]; Drizzle, another MySQL fork, started in April 2008, is a hobby project led by a Sun engineer[427] whereas OurDelta.org simply provides source code builds aggregated from various sources without any development or commercialisation of its own[428].

688. Currently, all these companies and projects continue to rely on technical input in the form of software patches and updates from MySQL upstream. Pursuant to Oracle's public pledge to continue to enhance MySQL under the GPL it can be assumed that this upstream input will continue during the period of validity of Oracle's pledges. Code extensions of MySQL that would not be available from Oracle would have to be developed by the fork vendors themselves.

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having at most seven developers, for its MySQL support", forgetting to mention that Facebook in fact listed *"Percona, Sun"* as its support providers.

422 The use of databases is not independent of the use of other parts of the IT stack, for example operating systems or application software. For this reason it is more likely that a company will consider the different database options when planning for a new project than when continuing to use existing database installations.

423 For example, Alcatel-Lucent, in a conference call with the case team, has confirmed that it has started evaluating and small-scale use of PostgreSQL. However, it could only find a very small company prepared to offer commercial support for PostgreSQL and therefore would consider a quick expansion of its PostgreSQL-related activities risky (doc_ID 1843, paragraph 8).

424 Oracle, Observations on the Commission's Theory of Harm, pp.58, 59 and 91 (doc_ID 2427).

425 See http://www.percona.com/team.html, printed on 13 October 2009 (doc_ID 2981).

426 See http://askmonty.org/wiki/index.php/About_Us, printed on 13 October 2009 (doc_ID 2964).

427 See http://drizzle.org/wiki/Drizzle_History, printed on 13 October 2009 (doc_ID 2965).

428 Incidentally, despite plans for various new products and product enhancements Oracle itself had only six developers for InnoDB in December 2009, InnoDB Update – December 15, 2009, p. 26 (doc_ID 2921). And, as pointed out below (paragraph 752), Google has of course substantial in-house database development and maintenance capabilities but does not appear to consider entering the database market.

689. However, this necessity is not merger-specific. Indeed, one reason for the existence of several MySQL forks is that the respective developers were not entirely satisfied with the order and speed with which Sun added new features to the MySQL code base. Moreover, the different fork vendors may share a mutual interest in specific enhancements of the MySQL code base. Cooperation between these vendors would thus seem to be a possible way to address any shortcomings of the GPL code available from Oracle after the transaction.[429]

690. The evidence on the Commission's case file does not make it possible to reach a final conclusion as to whether those forks, or any other, new forks of MySQL would be able to overcome the limitations of being new entrants with brand names and products that are virtually unheard of on the market.

691. However, the example of EnterpriseDB is instructive in this regard. EnterpriseDB, founded in 2004, has a general-purpose database offering which is based on a fork of a well-known open source database product (PostgreSQL). Its revenues in 2008 were USD 12.5 million[430]. Even though it does not yet play a significant role in Oracle's internal CRM and HQ Apps data (which indicates that it does not exercise a significant competitive constraint today) it is relevant that EnterpriseDB has won funding from IBM and more recently from Red Hat and its product is well-regarded by certain industry analysts.

692. Building product and brand recognition[431], loyalty and reputation on a software market such as the database market, which is important for the prospects of a new entrant[432], require more than having a product that fulfils a set of technical requirements. The product's success also depends on whether the new entrant manages to create, and benefit from, the type of network effects that are common when it comes to software products.

693. A network effect is present if the growing use of a software product increases the product's value for everybody, that is to say, for both its current and its potential users, and thus in turn tends to trigger additional usage[433]. A software product such as a RDBMS is used by developers, system integrators, software vendors and end users. All these groups are concerned by network effects in the sense that the size of each group has an influence on the size of the other groups and ultimately on the use of the RDBMS.

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[429] In this context it is noteworthy that several fork vendors have already today started cooperating in the Open Database Alliance (http://odba.org).

[430] Gartner, Open-Source DBMS 2009; Gaining in Maturity and Use, p. 3 (doc_ID 2276).

[431] Prof. Moglen, in annex 3 of the reply to the Statement of Objections, paragraph 35, does not appear to see this (that is to say the need to create and make known a new name for a fork because the original name is a trademark that cannot be used by the forker) as a serious problem. However, his examples (GAIM/Pidgin and Phoenix/Firebird/Firefox/Iceweasel) are not directly comparable to the situation of MySQL. It may be true that *"trademark forms a poor way to restrict commons development"* but for a competition assessment it is less relevant whether there is any commons development and more relevant whether that will lead to a product that can exercise a competitive constraint on other market players.

[432] See (for brand loyalty) Commission Decision 98/327/EC in Case IV/M.833 – The Coca-Cola Company/Carlsberg A/S, OJ L 145, 15 June 1998, p. 41, points 72-73 and (for reputation) Commission Decision 2002/156/EC in Case COMP/M.2097 – SCA/Metsä Tissue, OJ L57, 27 February 2002, p. 1, points 83-84.

[433] A classical example of a network effect concerns the telephone network: The value that a telephone offers to a prospective new telephone user grows with the number of installed telephones, that is to say every new telephone user increases the probability that any current non-user of telephones will also adopt the technology.

694. For example, the more end users deploy a software product the more interesting it becomes for people to have expert knowledge about this product because it increases their job opportunities. The availability of a skilled workforce that is familiar with the product will drive the number of end users because prospective end users will be more comfortable investing in a product if they can be sure that sufficient know-how is available. More end user adoption and more know-how will, in turn, give system integrators and software vendors a greater incentive and ability to integrate and embed the database product into their own products given that their customers will increasingly ask for and appreciate its inclusion.

695. As can be seen from this description the process is self-reinforcing and over time builds an "ecosystem" for the technology, consisting of the various types of users as well as of derived and complementary products.

696. Different database products that compete with each other all expose such network effects. Their ecosystems will overlap to the extent that users, integrators and developers can use different RDMBS. However, the capacity (and need) of each individual end user, developer and system integrator is limited and the competing databases' ecosystems therefore automatically compete with each other. At least in a short-term view, if one product's ecosystem grows another product's system must decrease in size.

697. This implies that different forks of MySQL would be faced with a situation in which they would compete with each other (and also with MySQL as offered by Oracle after the proposed transaction) for the same scarce resources: For example, each core database developer would want to concentrate on one fork instead of dividing its time between different code bases. Each end user for each specific application can only use one fork, even if there are several to choose from. The same is true for system integrators and software vendors. Such fragmentation could only be prevented if all interested parties would coordinate to cooperate in working on just one fork or ensure that different forks continue to implement the same APIs to ensure compatibility.

698. However, there already is a certain amount of cooperation among forkers of MySQL which suggests that the different forks of MySQL may, to a large extent, succeed in sharing their respective network effects. Moreover, Oracle's public pledge to continue enhancing MySQL under the GPL for at least five years will make it possible to maintain the unity of an overall MySQL ecosystem that contains developers and users of both MySQL itself and its various forks and add-ons, whether open source or proprietary.

699. The foregoing arguments do not depend on the nature of the company forking MySQL. They therefore apply in the same way to current users of MySQL that the notifying party has identified as potential forkers. Large corporations would only engage in such an endeavour if they saw it as a profitable route and even they would need time to build up credibility and reputation among the targeted customers.

700. However, it is true that an adverse treatment of its MySQL acquisition by Oracle could considerably improve the competitive prospects for a fork of MySQL that is backed by an established software company. This reasoning suggests that either Oracle will be less likely to engage in treatment harmful to MySQL or that the ecosystem of MySQL forks is likely to be strengthened by a large entrant.

701. Overall, then, it cannot be denied that a forker of MySQL has to build a company and a business up from scratch with nothing in hand but an undifferentiated product. While the product is certainly important, ultimate business success also depends on other elements of a business, such as sufficient financing, marketing, customer service, etc.[434].

4.4.3.2. Technological Barriers

702. Forking a software development means taking a copy of its source code at a given moment in time and thereafter continuing to develop the product independently of the further development of the source from which the source code was copied[435].

703. The act of starting a fork is not technically problematic. The source code for MySQL is available under the GPL from Sun as well as from other sources on the internet for download. However, the mere copying of software source code does not translate into a successful business, let alone into a business that can exercise a competitive constraint on a world-wide market leader such as Oracle.

704. There are small companies that offer consulting and support services for database software, including for MySQL. Such services can be expected to include installation assistance if required by customers. No company that would limit itself to essentially helping people to use a database vendor's product can be regarded as a competitive constraint on the database vendor itself, even if it might technically have "forked" MySQL by creating a copy of the source code in some cases.

705. Companies that want to be viable in the database business as competitors to incumbent vendors would need to have employees with considerable technical skills as regards database technology in particular and the commercial software business in general. For example, a new company would have to be able to build and provide binary versions of its product for all major computing platforms in use at potential customers.[436]

706. Indeed, if the company would merely count on and then integrate changes/additions/corrections to its product coming from "upstream", that is to say, from the initial vendor or some other forkers, it could hardly be considered to be more than a redistributor of the original vendor's product, but clearly not a competitor on the market in question.

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[434] An analogy from the world of non-digital goods may be helpful to sum up the barriers faced by a forker: There are many physical products which are not (any more) covered by patents or other intellectual property rights that would prevent third parties from beginning to produce them (for example furniture made from wood). However, nobody would suggest that essentially perfect competition reigns on all markets on which such physical products compete because this would overlook the importance of securing suppliers and input, building up a reputation, gaining experience and technical knowledge as well as everything else that is needed to build a successful business. Not all companies that try to do so succeed.

[435] In the open source area, and particular with regard to MySQL, there is also another type of fork that does not really aim for independent development but instead provides adapted versions of the codebase as provided by the original project owner. For example, ourdelta.org provides MySQL source code including various patches and additions from third parties that MySQL/Sun have not included in the official MySQL source tree.

[436] This is no trivial requirement. Monty Program submits that *"the act of* […] *producing functional and quality released versions of* [a] *fork has proven to be an art that is practically proprietary to Sun Microsystems"*, that its own efforts have only led to beta stage releases and that the overall needed investment to ensure a technical infrastructure to support a fork *"is measured in millions of euros"*, Observations of Monty Program AB on the Statement of Objections (doc_ID 4447, p. 3).

707. However, there may be viable niche markets for forkers who take code that comes from upstream (which would be available to some extent from Oracle pursuant to its announcement to continue to enhance MySQL and make it available free of charge under the GPL for at least five years) but concentrate their own development efforts on specific features of MySQL. The period of validity of Oracle's public pledges would seem to allow such a fork vendor to sufficiently assess and engage in such business models in order to get into a market position that would be viable even after the public pledges have expired.

708. A forker that wants to viably compete on the database market must itself also have the ability to maintain the software's source code, that is to say, it must provide for a bug filing system for its customers and for technical expertise to deal with and fix bugs. Even in the short term it must also be able to further evolve the product and adapt it to emerging needs and technical innovations observed in the industry.

709. This is because without such development and innovation the product will soon become outdated and customers will cease to look at it as a viable option for new or continued deployments. This requirement further increases the amount of financing needed to get a fork vendor going on the database market. However, as demonstrated by the existing third party storage engine providers, even venture capital is readily available in a GPL context if the underlying business model is convincing.

710. The notifying party also submits that other market players, namely high-volume users of MySQL such as Google or Facebook[437], have incentives to assume responsibility for continued investment into the development of MySQL, in particular in a situation in which Oracle itself would provide less development than expected. The notifying party argues that such current large-scale users of MySQL already have all this necessary technical expertise and would thus be viable as entrants in the database business based on a fork of MySQL even though Google has stated that it is not active on the market for databases. However, Google has technically forked and further developed MySQL for in-house use and has made available its additions to MySQL as well as to third parties[438]. In its replies to requests for information as well as in a follow-up phone call Google has not confirmed any current intention to enter the database market. However, the possibility can certainly not be ruled out that Google might want to change its stance in this regard, in particular if Oracle's handling of MySQL left a part of the market underserved.

711. Finally, it must be noted that for many customers the first question concerns the applications they want to run, not the databases on which to run them. Database choice is therefore to a considerable extent dependent on application choice. Some smaller enterprise application vendors have started certifying their products for use with MySQL but the same is not true with regard to the big application vendors such as Oracle and SAP (even though between 2003 and 2007 SAP had considerably advanced a project to certify MySQL). A similar certification would de-facto automatically be granted to any fork of MySQL that maintained compatibility with regard to the core database functionality (for example with regard to the SQL syntax that can be used for database queries).

712. Thus, while application vendors might be reluctant or even unable to certify several "flavours" of MySQL at the same time and in view of this might prefer to stick to its

[437] Oracle, Observations on the Commission's Theory of Harm, section V.B.4. (doc_ID 2427).

[438] See the minutes of a conference call with the case team, p. 1 (doc_ID 2869).

"official" version, even if it is provided by Oracle and no longer very actively developed, users of these applications may nevertheless be able to rely on a compatible fork of MySQL. The same argument shows that fork vendors will have an incentive to provide for maximum compatibility between the "official" version of MySQL and various forks, thereby also benefitting the overall MySQL ecosystem.

713. Overall it can be concluded that forks of MySQL would face very similar technological barriers to entry in the database market as would any other company entering that market. However, the fact that a fork would start out with the source code for a complete product certainly has value because the creation of a similarly advanced software product would require a significant investment.

714. Moreover, in particular if Oracle's handling of MySQL left its users in need of additional features or better support or a more attractive relation between price and performance, third parties would have an incentive to become active on the database market through a fork of MySQL, perhaps in addition to already existing forks or other members of the MySQL ecosystem (such as storage engine providers). Oracle's public pledges provide a contribution to the ability of potential forkers to bring new products to market because they ensure that the GPL code base as provided by Oracle will continue to evolve at least for a few years, including upstream updates and patches.

4.4.3.3. IPR Barriers

715. The notifying party refers to what it claims are examples of successful "forks" to support its argument that there is no reason why a fork of MySQL should not become successful on the database market. The most prominent example it mentions is the Linux operating system.

716. However, if there is indeed a *fork* of the Linux kernel it is not successful as no such fork has ever been mentioned concretely in these proceedings. The situation with regard to Linux is that many different companies are acting as redistributors of different versions of the Linux kernel together with other software that is also often available under the GPL. Redistribution as such, without a change of the source code, is not the same as forking[439], among other reasons because if the code is not further developed no special technical abilities are needed.

717. Red Hat, for example, is basically a service organisation that offers a packaged product together with support and services as well as an indemnification against IP infringement claims by third parties that would make it comfortable for enterprises to use an open source product such as Linux[440].As the market investigation has confirmed, for many companies the absence of such characteristics would rule out seriously considering the adoption of open source software[441].

718. Another example is the Apache web server. This open source software is offered by the Apache Foundation, a not-for-profit organisation, under a permissive open source license, that is to say, the source code of the software is available to licensees as with

439 Oracle reply to question 18 of the request for information to Oracle of 25 September 2009 (doc_ID 2169).

440 It indeed appears, as Microsoft submits, that *"Linux is the only commercially viable software product that is distributed exclusively under the GPL"*, p. 1 (doc_ID 3302).

441 See replies to question 57 (and partly to question 62) of the request for information to customers databases of 17 September 2009.

the GPL but licensees are not as bound in their downstream use of the code as they are with the GPL.

719. For example, it is possible to incorporate Apache into a commercial product that is made available under a proprietary license. Many companies use the Apache web server and package it with their products, including IBM and Oracle itself. As they derive revenue from this use they have an incentive to make sure that the product continues to be developed. That is why a company like IBM pays some developers to work full-time on code that is subsequently made available to the Apache Foundation and thus everybody for free downstream use.

720. However, it should not be overlooked that this business model only works because the Apache web server is available under a permissive open source license (it would not work based on the GPL because IBM and others then could not use it in their proprietary products in the way they do today). Indeed, the BSD license allows everybody to engage in dual- or proprietary-only licensing whereas the GPL limits everybody but the original copyright owner to GPL-only licensing.[442]

721. Overall, contrary to what the notifying party implies[443], it appears that in fact, it is not very common that a fork of a major piece of software that is available under the GPL is developed with a view to create a commercially successful product against the wishes of the project (and copyright) owner. It is true that Professor Moglen cites the GCC and EGCS compilers, GNU Emacs and Xemacs, the content management systems Mambo and Joomla as well as Samba and Samba-TNG as examples.[444] However, as none of the forked (and also none of the forking) products in this list of examples was ever the centre of a commercial endeavour comparable to that of MySQL it remains questionable to what extent a fork in this case could grow to rival the originally forked product, Oracle's versions of MySQL after the transaction.

722. A report by the 451 group submitted by the notifying party shows that open source companies employ many different business models.[445] The impact of the strengths and weaknesses of different business models based on open source could be quite different according to the characteristics of the different specific software markets targeted by each vendor.

723. Unfortunately the report by the 451 group does not distinguish between the different types of open source products marketed by the companies that responded to the underlying survey. This information would have been interesting because, compared to other software markets, the database market has some specific properties that appear to make the ability to follow a dual licensing approach (that is to say, to offer code both under proprietary licenses and under open source licenses) more important than it is on other markets.

724. Indeed, the market investigation in both phases has indicated that many market players in the database market consider that the inability to engage in dual-licensing would be a serious inhibition of any MySQL fork. This inability would essentially prevent the fork

442 In annex 3 of the reply to the Statement of Objections, Professor Moglen points out that other factors besides the type of license also play a role in IBM's decisions to contribute to open source projects, paragraph 15.

443 Oracle, Observations on the Commission's Theory of Harm, section V.B. (doc_ID 2427).

444 Annex 3 of the reply to the Statement of Objections, paragraph 43.

445 Annex 9 to Oracle, Observations on the Commission's Theory of Harm, The 451 group, "Open Source is Not a Business Model" (doc_ID 2436).

from playing any role on the market for *embedded* databases as customers almost always require a non-GPLv2 license. This sector has provided a significant share of revenues for MySQL over the last few years, enabling it to invest in further product development.[446]

725. Moreover, several other segments of the market do not lend themselves easily to a "classical" open source business model based exclusively on GPL licenses: in the *high-end data warehousing* and *high reliability* (where Oracle offers RAC) space the number of potential customers is very limited and essentially consists of large companies. In order to be viable in this space, vendors must be able to provide a high level of support, available around the clock and potentially around the globe. Even developing products for this space can be very costly because they are not supplied by the general open source community due to their specificity. Often, therefore, venture capital is involved in financing initial developments. For these reasons vendors active in this space indicate that an open source-only business model would be unlikely to be viable because it would lack the ability to attract sufficient funding[447].

726. The notifying party nevertheless argues that it is not correct to consider that the fact that any forker of MySQL would be limited to a uniform licensing approach based on the GPLv2 would diminish the probability for such a forker to bring a product based on the GPL version of MySQL to market that could rival the original MySQL's market reach and appeal.[448] It also stresses that many successful open source companies, including MySQL, use the GPLv2.[449]

727. However, as copyright owner Sun/MySQL can also make available its product under any other license. Such *dual- or* multi-*licensing* is advisable if it better serves customers' needs and/or better protects the copyright owner's investment and innovation in its product. A market entrant based on forked MySQL code simply would not be able to employ a business model based on dual licensing[450]. The information contained in the case file indicates that this constraint may considerably diminish such entrant's incentive and ability to sufficiently develop its product and thus to develop into a

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446 The notifying party points out that MySQL only has a very small revenue-based market share in the segment for embedded databases and that it faces many competitors there (reply to the Statement of Objections, paragraph 343). However, the argument in the main text does not depend on the specific structure of that segment but rather on the fact that a dual-licensed database product has access to that segment and therefore at least the potential to derive revenues from it whereas this is not the case for a GPL-only database product.

447 See replies of Calpont and ScaleDB to the requests for information to storage engine providers and to competitors databases.

448 Oracle, Observations on the Commission's Theory of Harm, section V.B.2. (doc_ID 2427) and reply to the Statement of Objections, paragraph 342. In its internal documents, however, Oracle appears to very well appreciate the importance of dual licensing as a business model and that forkers will be shut off from an important fraction of potential customers by stating that […]* (doc_ID 2917).

449 Oracle, Observations on the Commission's Theory of Harm, section V.B.1. (doc_ID 2427).

450 This is a material difference between the original copyright owner and a GPL licensee. It is not correct, as the parties do, to liken this situation to a situation in which the relevant technology used by one company is fully available so that current or future competitors *"ha[ve] easy access to the technology"* because the assessment in case COMP/M.4091Linde/Spectra that is mentioned by the parties might have been very different if full access to this technology had been dependent on the merging parties' consent in *Linde/Spectra* granting licenses, Oracle, Observations on the Commission's Theory of Harm, p. 46 (doc_ID 2427).

competitive threat to Oracle (and other database vendors) that could replace the threat removed by Oracle's incorporation of MySQL.[451]

728. The notifying party also makes the argument that, while it is true that […]* of MySQL's revenues currently derive from proprietary licenses and subscriptions, it is important to just look at that amount of revenue *"that require[s] a non-GPL license"* because *"[o]nly Sun's embedded MySQL license bookings are immune from challenge by a fork vendor"*[452]. However, as has become clear in the market investigation, many database customers demand non-GPL licences even in situations in which it might be legally possible to use GPL-licensed software without triggering any unwanted effects[453]. Database vendors, for their part, are aware of this and therefore know that they need to be able to (also) offer such non-GPL licences to such customers in order to stay viable[454].

729. The notifying party further offers the following argument as an indication that a forked version of MySQL would not have problems in penetrating into a commercial user base. Under Sun's current subscription model for MySQL Enterprise, more than 99% of customers opt to receive the MySQL software under the GPL[455]. The notifying party argues that this indicates that a software product exclusively built on the GPL would be entirely viable.

730. However, the subscription to MySQL Enterprise as offered by Sun also provides for indemnification of the licensor from third-party IP infringement claims, if a "MySQL-certified binary version" of MySQL is used. This means that the indemnification which will be required by many commercial users for any type of software in order to reduce the risk of being found liable for infringement of IP rights does not apply if the licensee compiles the source code to MySQL itself, or changes it in any way. Only binary versions, that is to say, compiled versions of MySQL as provided by Sun, are covered by the indemnification.

731. For all practical purposes, this makes the subscription very similar to a proprietary software license agreement which would also typically rule out any indemnification in the event that the licensee "tampers" with the software product as delivered by the

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451 Professor Moglen, throughout annex 3 of the reply to the Statement of Objections, attempts to argue that MySQL would have been better served, and would be better served under Oracle's ownership post-transaction, if it employed a GPL-only business model. However, in view of MySQL's considerable commercial success with the dual-licensing approach, a success that does not seem to be rivaled by many other open source products (perhaps only by the Linux kernel), Professor Moglen's heuristic and theoretical arguments neither provide convincing evidence that a fork of MySQL would be successful nor rebut the argument that the reliance on the dual-licensing approach was in fact one of the vehicles that enabled MySQL to become successful in the first place.

452 Oracle, Observations on the Commission's Theory of Harm, paragraph 193 (doc_ID 2427).

453 See replies to questions of sections B.3 to B.6 of the request for information to customers databases.

454 Apart from forkers of code bases maintained by others but available under the GPL, there is no significant database vendor that relies on a GPL-only business model. Also see replies to questions 10 and 11 of the request for information to storage engine providers of 18 September 2009. Of 12 third-party storage engines identified by Calpont (doc_ID 1939, reply to question 12, p. 6), two are hobby projects (Fallenpegasus and the Spider project), one is a fork of InnoDB that consequently is limited to the GPL and all 9 others are either available under a dual-licensing scheme or under a commercial license only. (Note that Calpont has erroneously indicated the PBXT storage engine to be exclusively available under an open source licence. See Primebase's reply to questions 9 and 10 of the request for information to storage engine providers for the correct information (doc_ID 1837)).

455 Sun states that […]* of all subscribers demand to receive MySQL Enterprise under a proprietary software license, p. 3 (doc_ID 2293).

licensor. A fork of MySQL based on the GPL might have to offer the same type of indemnification if it wants to address the concerns of corporate clients.

732. However, there is an added complication for the situation where a third-party forker of MySQL would want to offer a comparable indemnification covering a modified version of MySQL to its customers. This indemnification would essentially also have to cover the IP rights of MySQL's owner, including patents, because licensees of the forker would not have a direct GPL-licensing relationship with MySQL's owner for the whole of the code that they receive from the forker but only for the code that stems from the original licensor.

733. This problem would not arise for simple redistributions of MySQL code under the GPL copied from MySQL (or its owner) itself. Suppose, for example, that the owner of MySQL has a patent with a claim Z covering a software feature and MySQL implements this software feature and releases the implementation under the GPL. Any licensee would indeed, as the notifying party has argued repeatedly during the proceedings, essentially receive an irrevocable patent-license comprised within the GPL. However, this implicit license would be *limited to* the use that is being made of the patent claim by the code as originally released under the GPL. If the licensee now changes the code in a way that adds another use or implementation of claim Z it may be liable for patent infringement as regards the code it has added to what it had originally received under the GPL.[456]

734. Leaving aside its public announcement, Oracle could theoretically decide never to make available MySQL under the GPL at all (essentially by ensuring that the code can no longer be acquired under that license). In such a situation the pool of IP rights that forkers of MySQL would face would also cover Oracle's own patent portfolio (which, in the database space, is guaranteed to be much larger and more diverse than Sun's).[457] This might give Oracle the ability to sue any forker of MySQL[458].

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456 This applies in the same way to any IP rights of third parties. Indeed, obviously the original creator of a software that is released under the GPL is fully responsible for the software product and may thus be subject of IP rights infringement claims brought by third parties. Professor Moglen, in annex 3 of the reply to the Statement of Objections, paragraph 37, says that he is "doubtful" from the perspective of the United States patent system as regards the main text's analysis in relation to the hypothetical claim Z. Leaving aside that he does not even express an opinion as regards the patent systems of the countries for whose territories the Commission has jurisdiction it also is worth stressing that one of the foremost experts on the GPL does not express a clear opinion on this matter. It is also worth stressing that Professor Moglen only talks about *"a literal copy of the patent-covered code duplicated from one portion of the codebase to another"* whereas the main text clearly invokes *"another use or implementation"* of the claim. As long as there is no case law on this issue, and Professor Moglen cites none, it cannot be excluded that concerned companies would want to avoid any potential legal risks and thus would see fewer incentives to engage in forking than would otherwise be the case.

457 Professor Moglen, in annex 3 of the reply to the Statement of Objections, paragraph 38, contests this point. He states that "[c]*ontrary to the conclusion of the SO* [paragraph 766], *all recipients of the code from anyone, regardless of the continued availability of that code from Oracle, receive automatically a copyright license from the copyright holder"* in view of section 6 of the GPLv2. However, that section of the GPL v2 provides that *"the recipient automatically receives a license from the original licensor"*, but not from all companies that may in the future acquire the copyright but do not themselves distribute the code under the GPL, which is exactly the scenario discussed in the main text.

458 Of course, if even a mere copy of the MySQL code could be accused of infringing on Oracle's patents, Oracle could have asserted these patents against MySQL itself already pre-transaction. However, at least after the Sun acquisition this may not have been a viable option anymore given that Sun overall also has a sizeable patent portfolio and Oracle might not have had an interest to start a round of mutual patent infringement claims. Large patent pools are understood to ensure "peace" between the big players in the industry by credible threatening the IP equivalent of "mutually assured destruction": *"*[*J]ust because the*

735. This problem may stay comparatively small as long as the fork stays very close to the source it has been developed from (because then the material that could be subject to infringement claims would be very limited) but it would tend to increase as the fork continues to diverge from its original pre-fork source through time.

736. The same reasoning applies to any and all forks of MySQL and illustrates another result of the market investigations of both first phase and second phase. Several respondents have emphasised that the mere threat of Oracle to engage in litigation against a potential future competitor, such as a forker of MySQL that might prove to have some success or a storage engine vendor that meets customer demand for disruptively priced high-end performance in specific segments, for example in the data warehousing segment, could have a severely negative effect.[459] For example, both the storage engine providers ScaleDB and Calpont have confirmed that venture capitalists that considered providing financing to them have cited the risks along these lines following the announcement of the acquisition of Sun by Oracle as justification for refraining from an investment at this stage[460].

737. In the light of Oracle's public announcement, the scenario contemplated in the previous three recitals need not be given too much weight. If Oracle were to renege on its public announcement to continue making available some versions of MySQL under the GPL for at least five years this would likely adversely affect its image throughout many software markets.

738. Forkers may also be constrained in their ability to attract former MySQL developers that leave Oracle. Even if Oracle would continue to provide a version of MySQL under the GPL, it might progressively cause it to diverge from another, proprietary version of MySQL in terms of compatibility and thus direct substitutability. This is not even implicitly ruled out by Oracle's public announcement. It would be easy for it to ensure that all the developers got to see the source code of both GPL and proprietary versions, the latter perhaps not even limited to a proprietary version of MySQL but possibly extended to the source code of Oracle's other proprietary databases.

739. It is well known that this practice would effectively "taint" the developers in question for future open source work with a MySQL forker[461]. That is because a forker of MySQL limited to using the GPL for future development of MySQL could not risk employing such developers to work on its code because it would be vulnerable to copyright infringement claims on the basis that the developers had seen source code

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big companies may never go too far with their patents with each other and worldwide technologies such as the Internet doesn't mean that smaller companies or open-source developers wont be attacked. They will be. [...] *Just the mere threat is enough to stop a company from developing or marketing a program if it doesn't have the legal protection or deep pockets needed to fight a patent battle in the courts.",* http://www.eweek.com/c/a/Linux-and-Open-Source/Software-Patents-and-Mutually-Assured-Destruction/, printed at 13 October 2009 (doc_ID 2977).) Moreover, while Sun or even MySQL in its last independent years may have had enough substance not to succumb to patent litigation the same would not necessarily be true of current (such as MariaDB) or future forkers of MySQL.

459 Professor Moglen, in annex 3 of the reply to the Statement of Objections, paragraph 36, appears to overlook this point, that is to say that Oracle would in the first place have an interest to hinder the development of a potential future competitor. Professor Moglen thinks that *"Oracle* […] *is well aware that suing one's customers is a poor business model"* but in fact the Statement of Objections has not contemplated such a scenario at all. Indeed, it would be curious to describe storage engine vendors that try to build a business without a proprietary license to MySQL, or forkers of MySQL, as "customers".

460 ScaleDB, a storage engine maker, explains in an e-mail: […]*, p. 1 (doc_ID 2764).

461 See for example http://www.mindtrek.org/2008/pdf/presentations/workshops/Keynote_Montero_Luque.pdf, printed on 13 October 2009, p. 45 (doc_ID 2996).

covering a similar/the same functionality but which was proprietary and had not been made available under an open source license.[462]

740. Moreover, it is also worth mentioning that the manual for MySQL is not released under a GPL or similar license. Sun/MySQL currently reserve all rights on the manual and only allow it to be redistributed without any changes and together with MySQL itself[463]. This means that any forker that wants to offer its fork with a manual (which would seem absolutely necessary, not only for commercial users) would have to recreate it from scratch. While certainly possible this is not an easy task, given the possibility of copyright infringement claims from MySQL's (and thus the manual's copyright's) owner.

741. However, this concern is sufficiently addressed by Oracle's public announcement that it will continue making available the manual free of charge. Moreover, past conduct may also reassure forkers who want to use the manual because, as the notifying party points out, neither Oracle nor Sun has ever sued for copyright infringement related to manuals.[464]

742. A forker of MySQL would be limited to the GPL and could not (additionally) release its product under a commercial license. This has implications for *third-party storage engines* whose providers will depend on the availability of such commercial licenses for their business model. As pointed out in paragraphs 722 to 724, in many segments of the database market a pure open source strategy is not appropriate for storage engine providers who need to protect their investments and intellectual property.

743. Third-party storage engine vendors can therefore only make available their products under a proprietary license. This in turn creates a problem when only a GPL version of MySQL is available. In some instances vendors of proprietary storage engines might be barred by the stipulations of the GPLv2 from shipping an integrated product (MySQL core server plus the proprietary storage engine) to its clients, which would significantly reduce the value of their market proposition.

744. Moreover, even as regards the mere distribution of proprietary storage engines for MySQL there does not seem to be legal certainty. While some believe both problems can be solved by creating a BSD-licensed interface between the core MySQL server

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462 Without addressing the main text's argument related to the "tainting" of developers, Oracle submits that *"keeping MySQL developers at Oracle is a significant challenge, and unless they feel that they are working for the good of MySQL, many of them will undoubtedly depart to forks like Maria DB and Oracle would lose the benefit of acquiring the asset"*, reply to the Statement of Objections, paragraph 338. However, if Oracle really saw the benefit of acquiring MySQL in becoming the employer of the MySQL developers it could be expected that it would have the financial means to retain at least a very large percentage of these developers. At least it is not sufficient to simply invoke the cliché that all open source developers are maximally unselfish which, given MySQL's corporate history, is anyway less likely to apply to MySQL employees than to other open source developers.

463 *"You shall not publish or distribute this documentation in any form or on any media, except if you distribute the documentation in a manner similar to how Sun disseminates it (that is, electronically for download on a Web site with the software) or on a CD-ROM or similar medium, provided however that the documentation is disseminated together with the software on the same medium. Any other use, such as any dissemination of printed copies or use of this documentation, in whole or in part, in another publication, requires the prior written consent from an authorized representative of Sun Microsystems, Inc. Sun Microsystems, Inc. and MySQL AB reserve any and all rights to this documentation not expressly granted above"*, http://dev.mysql.com/doc/refman/5.1/en/index.html, printed on 25 October 2009, p. 1 (doc_ID 3374).

464 Reply to the Statement of Objections, paragraph 356.

and the ScaleDB storage engine[465], other commentators question that this could be a viable workaround[466]. According to Calpont it is very difficult for a third party storage engine to be commercially viable without a proprietary license for MySQL, regardless even of the "legal" truth in interpreting the GPL[467]. This is because in GPL-related matters the market participants', and in particular customers' perceptions appear to be more important (and much more numerous) than actual applicable legal precedent.[468]

745. In view of the above, third-party vendors of storage engines for MySQL would be limited to the original owner of MySQL for the supply of proprietary licenses that allow shipment of integrated products consisting of MySQL combined with a third-party storage engine if they want to stay viable. This could pose problems of its own in the context of the transaction because Oracle, as an established market leader in the database market, will have very different incentives as regards third-party storage engines for MySQL than Sun currently has.

746. Overall, the non-availability of commercial licenses for a MySQL fork would also seriously inhibit the incentive to invest in novel and more advanced storage engine technology because storage engine vendors might be forced to adopt a business model based on the GPLv2. MySQL's modular architecture that allows independent storage engines to develop is an important aspect of MySQL's potential attractiveness across a broad spectrum of different commercial needs. The success of particular engines therefore increases the attractiveness of MySQL and vice versa and ultimately the competitive constraint exercised by MySQL (or forks thereof) on Oracle and other database vendors.

747. This concern is sufficiently addressed by Oracle's public announcement that it will renew existing agreements between Sun/MySQL and storage engine providers on proprietary licenses on the same terms and conditions for at least five years. As Oracle has already pledged to make contractual amendments to the storage engine vendors concerned there is not even a theoretical possibility that it could renege on this announcement. Other and future storage engine providers might benefit from Oracle's public pledge that it will waive the copyleft requirement of the GPL with regard to third-party storage engines that implement MySQL's pluggable storage engine API.

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465 *"It is my understanding that commercial storage engines can create an OSS glue layer that makes calls to storage engines (multiple). This same OSS glue could work with Berkeley DB, PostgreSQL and Ingres. Thus it is DB independent. Such glue could then call multiple commercial storage engines, aking it storage engine independent. This way the two pieces (MySQL and storage engine) are not considered one product. This satisfies another aspect of the buffer between GPL and commercial. With an open source glue that supports X DBMS and Y storage engines, and by making the glue OSS, you are good to go*", http://www.dbms2.com/2009/04/21/i-dont-see-why-the-gpl-would-be-a-major-barrier-to-a-useful-mysql-fork/, printed on 13 October 2009 (doc_ID 2980).

466 See the discussion entries below this article: http://www.dbms2.com/2009/05/15/mysql-fork-open-database-alliance-gpl/, printed on 13 October 2009 (doc_ID 2966). See also the minutes of a phone call of ScaleDB and the case team (doc_ID 3036).

467 See the minutes of conference call with Calpont (doc_ID 2896). Calpont was prepared to enter into such a licensing agreement with Sun even in view of *"challenging contractual restrictions imposed by Sun"* simply in order to ensure that this problem would not occur – based on Calpont's explanations it seems evident that the decision to sign this license had been boosted by fears of what might happen post-transaction to the availability of such licenses under any license terms.

468 Professor Moglen, in annex 3 of the reply to the Statement of Objections, paragraph 21, only speculates about "conceivable" business models for storage engine vendors. He neither addresses the evidence from actual storage engine providers cited in the Statement of Objections nor does he cite case law that would clarify the matter.

748. Oracle submits that recent announcements by Amazon show that the entry of a MySQL fork is possible, easy and occurring. In reality, however, Amazon is offering database services on top of its cloud computing platform, that is to say, services aimed at assisting its cloud computing customers to use MySQL. This is thus not a fork of MySQL in a technical sense, but rather a redistribution service.

749. In the Commission's view, the notifying party is correct to point out that Amazon's offering competes to a certain extent with Sun/MySQL's offering, in particular because it relies on the GPL version of MySQL and therefore does not result in any revenue for Sun/MySQL.[469] However, it is questionable to what extent Amazon would be able to maintain such a service offering if it could not rely on free GPL-based upstream updates and patches for MySQL as provided by Sun/MySQL. Nevertheless, it is certainly possible that in the event of such upstream patches not being available it would undertake to create and maintain its own fork of MySQL indefinitely.

4.4.3.4. Conclusion

750. To conclude, although it appears that forks face some commercial barriers, technological barriers, and barriers related to intellectual property rights, the Commission's investigation suggests that the possibility cannot be ruled out that forks of MySQL might also develop to exercise a constraint on Oracle to some extent.

4.5. Lock-in of customers migrating from MySQL to a proprietary database

751. Some competitors that have submitted complaints argue that Oracle would have the ability and incentive to direct the migration to Oracle databases of MySQL customers who wished to switch to another database to address their increasing functional needs. MySQL is used by many organizations as an entry-level database. As some of these organizations grow they may at some point need proprietary databases such as IBM's or Oracle's for certain operations.

752. The complaining competitors allege that using its control over MySQL, Oracle would make technological changes or create commercial ties with MySQL users in order to make it more difficult for MySQL customers to switch to a non-Oracle proprietary database. Examples of potential technological changes are in the area of available/supported data types, transaction consistency level and in particular, support of the same database administration tools. If these areas are more streamlined between Oracle's products and MySQL, the migration can be more easily accomplished.

753. The first phase market investigation showed that while competitors on balance believe that Oracle would be able to engage in such a strategy, the customer feedback on this theory of harm is not conclusive, with around half of the customers considering that Oracle would be able to engage in such a strategy and around half considering that it would not. Customers and competitors would expect such a strategy to be profitable, if Oracle was able to do so. Assuming Oracle was able to do so, it remains however unclear whether the impact on migration would rather be an efficiency for MySQL and Oracle users or a detriment to Oracle's competitors.

754. Asked more precisely about the technical ability of Oracle to prevent or hamper migration of current MySQL users to non-Oracle database, most respondents to the second phase market investigation, both customers and competitors, indicated that

[469] Reply to the Statement of Objections, paragraph 346.

Oracle would not have the ability to prevent or hamper migration to non-Oracle database.

755. It is therefore concluded that Oracle will not have the ability to prevent or hamper migration to non-Oracle databases by customers of MySQL wishing to switch to a proprietary database. If Oracle has the ability to facilitate migration of MySQL customers to Oracle databases, this can rather be considered an efficiency for MySQL and Oracle users than a harm to competition in the database market.

4.6. Conclusion

756. The Commission's in-depth investigation indicated that, prior to the merger, MySQL potentially exerts an important and growing competitive constraint on Oracle and other proprietary database vendors in the segments of the database market where it is present, in particular the web, SME and embedded segments.

757. However, it is not necessary to conclude on the significance of the competitive constraint exerted by MySQL, as in the light of all the elements in the file, notably the open source nature of MySQL, the public announcement made by Oracle on 14 December 2009 and its partial implementation, it is unlikely that Oracle would have the ability and/or incentive to remove any competitive constraint exerted by MySQL prior to the merger.

758. Moreover, although the open source database PostgreSQL currently lacks a large ecosystem (including as regards availability of support), PostgreSQL is likely to be able to replace the competitive constraint currently exerted by MySQL to a certain extent. The possibility can also not be ruled out, that forks of MySQL might also develop to exercise a constraint on Oracle to some extent.

759. It is therefore concluded that, on balance, the proposed transaction will not lead to a significant impediment to effective competition on the worldwide market for databases.

C. Middleware

1. The relevant product market

760. Both Oracle and Sun are active in the middleware sector. Middleware refers to a wide category of software products that provide infrastructure for applications to run on a server, to be accessed from a variety of clients over a network and to be able to connect a variety of information sources[470].

761. The parties' activities in the field of middleware relate in particular to: (i) application servers; (ii) web servers; (iii) identity and access management; (iv) application integration (enterprise service bus ("ESB"), event management, process automation, business process management software ("BPMS")); (v) adapters and connectors, portals; (vi) collaboration software; and (vii) virtualization software. Oracle and Sun's middleware offerings are available as stand-alone components or as part of broader middleware suites. Several of Sun's middleware offerings are open source products.

762. The notifying party considers that all types of middleware belong to a single product market. In the recent *Oracle/BEA* decision[471], the Commission left the product market

[470] See Commission decision of 29 April 2008 in Case M.5080 – *Oracle/BEA*.
[471] See Commission decision of 29 April 2008 in Case M.5080 – *Oracle/BEA*.

definition open but stated that the market investigation had confirmed that middleware could be sub-segmented according to the end use of the product.

763. In this case, the market investigation has revealed that customers purchase middleware both as part of a suite and on a standalone basis, also reflecting that fact that most middleware products are available on different relevant hardware/operating system platforms (with the exception of Microsoft's offerings that are only available for Microsoft operating systems). Most customers have indicated that a given vendor's offer of middleware is typically limited to particular fields or functions of middleware.

764. The market investigation has also shown that most customers and competitors consider that open source middleware competes with non-open source middleware products. It appears that most customers would consider both open source and proprietary solutions when purchasing middleware.

765. For the purposes of this case, the exact product market definition in relation to middleware can however be left open, as the proposed transaction does not raise serious doubts as to its compatibility with the common market under any alternative market definition.

2. The relevant geographic market

766. The notifying party considers that the middleware market has a worldwide geographic scope.

767. In *Oracle/BEA*, the Commission assessed the effects of the transaction on the overall middleware market and sub-segments thereof under a worldwide geographic scope.

768. The market investigation in this case has confirmed that the market for middleware has a worldwide geographic scope.

769. For the purposes of this Decision, the relevant geographic market for the overall middleware market and sub-segments thereof will therefore be considered to be worldwide.

3. Competitive assessment

3.1. Unilateral effects

3.1.1. Overall middleware market

770. The 2007 worldwide middleware business amounted to approximately EUR 9.7 billion and grew by 17% in the same year. Table 4 below sets out IDC's market share estimates (worldwide market shares based on revenue) for Oracle, Sun and their main competitors on the overall middleware market[472].

[472] IDC refers to the middleware market as *"Application Deployment Software"*.

Table 4: Application Deployment Software shares 2006-2007[473]

Vendors	**Market shares %**	
	2006	**2007**
IBM	[20-30]*%	[20-30]*%
Oracle	**[10-20]*%**	**[10-20]*%**
SWIFT	[0-5]*%	[0-5]*%
Microsoft	[0-5]*%	[0-5]*%
Sterling Commerce	[0-5]*%	[0-5]*%
TIBCO	[0-5]*%	[0-5]*%
Sun	**[0-5]*%**	**[0-5]*%**
Others	[30-40]*%	[30-40]*%

771. The notifying party submits that the proposed transaction will not significantly impede effective competition in middleware. In this regard, Oracle submits that the merged entity would continue to face strong competition from the market leader IBM and from Microsoft as well as from large pure middleware vendors, such as TIBCO and various open-source solutions. Moreover, Sun's market share would only marginally add to Oracle's share of the overall middleware market. The notifying party further submits that Oracle and Sun are not particularly close competitors in middleware and that their middleware products serve different needs.

772. IDC's market share figures indicate that the increment in market share resulting from the proposed transaction will be marginal and that the combined market share will be well below 25%[474]. However, several of Sun's middleware offerings are open source products (namely its application server GlassFish, the GlassFish Web Space Server, the GlassFish Web Stack and the Open SSO Enterprise, an identity management product), so that market shares based on revenues may not be fully indicative of the constraints Sun's products exercise on Oracle.

773. The market investigation has shown that Sun, while having substitutable offerings in some sub-segments, is clearly not a competitively significant player in the overall middleware segment. Most customers do not consider Oracle and Sun as close competitors in the middleware area.

774. Moreover, the market investigation has revealed that the middleware market is very competitive and that the merged entity will continue to face competition from a number of significant market players, primarily IBM and Microsoft, as well as other open source players such as Red Hat (JBoss) and the Apache open source group. Furthermore, none of the customers or competitors indicated that they expect Sun's middleware products to develop to such an extent that they will become stronger

473 Taken from Form CO, page 101, table 5 and partly based on IDC, Worldwide Application Deployment Software 2007 Vendor Shares: Growth Continues to Accelerate, August 2008.

474 See paragraph 18 of the Commission Guidelines on the assessment of horizontal mergers under the Council Regulation on the Control of Concentrations between Undertakings (Official Journal C 31, 5.2.2004).

competitors to the other players' products in the middleware sector (or in any event stronger competitors to Oracle's products).

3.1.2. Middleware sub-segments

775. As regards the different middleware sub-segments, Oracle and Sun's combined market shares exceeds 15% only in the offering of (i) application server middleware[475], (ii) enterprise portals[476], and (iii) integration and process automation middleware[477] (and more specifically ESB[478] and BPMS[479]).

3.1.2.1. Application server software

776. Table 5 below sets out IDC's worldwide market share estimates for Oracle, Sun and their main competitors in relation to application server middleware.

Table 5: Application Server Middleware shares 2006-2007[480]

Vendors	**Market shares %**	
	2006	**2007**
IBM	[40-50]*%	[40-50]*%
Oracle	**[20-30]*%**	**[20-30]*%**
Microsoft	[5-10]*%	[5-10]*%
Fujitsu	[0-5]*%	[0-5]*%
Hitachi	[0-5]*%	[0-5]*%
Sun	**[0-5]*%**	**[0-5]*%**
Others	[10-20]*%	[10-20]*%

777. IDC's definition of application server middleware includes application server software platforms as well as transaction processing monitors ("TPMs"). Those two sub-segments have closely related functionality that may make the product offerings substitutable in some instances. For 2007, the TPM-only market shares as reported by IDC were IBM [70-80]*%, Oracle [10-20]*% and Sun [0-5]*%.[481]

778. Table 6 below indicates IDC's worldwide market share estimates for Oracle, Sun and their main competitors in relation to application server software platforms.

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475 Application server middleware is software that allows multiple applications on a computer system to perform a variety of tasks: communicating with a common database, managing interactions, prioritising use of system resources.

476 Enterprise portals are web-based user interfaces allowing information, people and processes to be integrated across organisational boundaries.

477 Integration and process automation middleware are events-based middleware.

478 ESB is a piece of message-oriented middleware ("MOM") that is used to connect enterprise applications and systems together using real time messaging.

479 BPMS is a category of process automation software that models, executes and monitors processes or workflows which connect information systems, packaged applications, people and organisations with each other.

480 Form CO, page 104, table 7 based on IDC, Worldwide Application Server Middleware 2007 Vendor Shares, August 2008.

481 IDC, Worldwide Application Server Middleware 2007 Vendor Shares, August 2008, p. 14.

Table 6: Application Server Software Platform shares 2006-2007[482]

Vendors	Market shares %	
	2006	2007
Oracle	**[30-40]*%**	**[30-40]*%**
IBM	[20-30]*%	[20-30]*%
Microsoft	[10-20]*%	[10-20]*%
Fujitsu	[0-5]*%	[0-5]*%
Micro Focus	[0-5]*%	[0-5]*%
Sun	**[0-5]*%**	**[0-5]*%**
Others	[10-20]*%	[10-20]*%

779. The notifying party submits that Sun's application server software platform only marginally adds to Oracle's position and that the merged entity will remain subject to competition from a number of players, including IBM, Microsoft and open source competitors (such as JBoss and Apache Tomcat). The notifying party further submits that Oracle and Sun are not particularly close competitors for application servers and that their application servers serve different needs.

780. According to Gartner[483], application server software products are predominantly based on either .NET, which is subject to strict bundling with Microsoft's offerings, or Java Enterprise Edition, which is in use by various vendors. Solutions based on one of those two competing platforms[484] are dominant, yet still compete to some extent with older TPM and object request broker products and emerging products such as PHP, Ruby, Java advanced intelligent Networks (JAIN) and Java Service Logic Execution Environment (JSLEE).

781. Although IDC's market share figures indicate that the increment in Oracle's market share resulting from the proposed transaction will be marginal, it could be presumed that market shares based on revenues may not be fully indicative of the constraints exercised by Sun's open source products on Oracle. However, IDC's market share figures for application server software platforms do only indicate a very modest reduction for Sun following Sun's recent move to offer its application server product, Glassfish, as open source: The decline in Sun's reported market share from 2006 to 2007 was from [0-5]*% to [0-5]*%.[485] Even the higher of these two figures would only add marginally to Oracle's market share. In addition there is no indication whatsoever that the "real" market share of Sun's offering had increased more widely but was not captured due to its availability as open source.

782. The market investigation has also confirmed that from the customers' point of view, Sun's products are not the closest substitutes for Oracle's products in relation to the application server segment. In most instances when one of the parties is named as a company offering a close substitute to the other's products, other competitors are also indicated as companies offering close substitutes. In fact, the market investigation has confirmed that the market is very competitive with many active viable vendors, and that the merged entity will continue to face competition from a number of market players such as IBM, Microsoft, SAP and Fujitsu even in the (somewhat artificially narrowed)

482Form CO, page 105, table 8 based on IDC, Worldwide Application Server Middleware 2007 Vendor Shares, August 2008.

483 Gartner, Magic Quadrant for Enterprise Application servers, 2Q08, ID # G00156200, p. 2.

484 See Case COMP/M.5080 – Oracle/BEA, paragraph 11.

485 IDC, Worldwide Application Server Middleware 2007 Vendor Shares, August 2008, p. 9-10.

application server software platform segment. Significantly, the market investigation has also indicated that open source providers' products, such as Red Hat's JBoss products, exercise an important competitive constraint in the application server segment. Furthermore, none of the customers or competitors indicated that they expect Sun's middleware products to develop to such an extent that they will become stronger competitors to the other players' products in the application server segment (or in any event stronger competitors to Oracle's products).

3.1.2.2. Enterprise portals

783. Table 7 below sets out IDC's worldwide market share estimates for Oracle, Sun and their main competitors on the enterprise portal segment.

Table 7: Enterprise Portal Software shares 2006-2007[486]

Vendors	**Market shares %**	
	2006	**2007**
Oracle	**[20-30]*%**	**[20-30]*%**
IBM	[20-30]*%	[20-30]*%
Microsoft	[10-20]*%	[10-20]*%
SAP	[0-5]*%	[0-5]*%
CA	[0-5]*%	[0-5]*%
Sun	**[0-5]*%**	**[0-5]*%**
Others	[10-20]*%	[10-20]*%

784. The notifying party submits that Sun's market share in relation to enterprise portal software does not significantly strengthen Oracle's market share in this area and that the merged entity will remain subject to competition from a number of players. The notifying party further submits that Oracle and Sun are not particularly close competitors in enterprise portal products and that their enterprise portal products serve different needs.

785. Oracle's share of the enterprise portal software segment is just over [20-30]*%. Moreover, IDC's market share figures indicate that the increment in Oracle's market share resulting from the proposed transaction will be small. This finding appears robust even taking into account the fact that market shares based on revenues may not be fully indicative of the constraints exercised by Sun's open source portal product. There is no indication of any kind from the market investigation or elsewhere that Sun's enterprise portal product could be more widely deployed than indicated by IDC's market share figures. The market investigation has also indicated that Oracle's and Sun's respective portal products are not close substitutes in the enterprise portal segment. Moreover, the market investigation has confirmed that the market is very competitive, with many active viable vendors, and that the merged entity will continue to face competition from a number of significant market players, primarily IBM, Microsoft, SAP and Computer Associates, in the enterprise portal segment. Furthermore, none of the customers or competitors indicated that they expect Sun's products to develop to such an extent that they will become stronger competitors to the other players' products in the enterprise portals segment (or in any event stronger competitors to Oracle's products).

486 Form CO, page 107, table 9 based on IDC, Worldwide Enterprise Portals Software 2008-2012 Forecast Update and 2007 Vendor Shares: A New Landscape, July 2008.

3.1.2.3. ESB Software

786. Table 8 below sets out IDC's worldwide market share estimates for Oracle, Sun and their main competitors on the ESB segment.

Table 8: ESB and connectivity middleware shares 2006-2007[487]

Vendors	**Market shares %**	
	2006	**2007**
IBM	[20-30]*%	[20-30]*%
Oracle	**[10-20]*%**	**[10-20]*%**
Software AG	[10-20]*%	[10-20]*%
TIBCO	[10-20]*%	[5-10]*%
Sun	**[5-10]*%**	**[5-10]*%**
SAP	[0-5]*%	[5-10]*%
Microsoft	[5-10]*%	[5-10]*%
Others	[20-30]*%	[20-30]*%

787. The notifying party submits that the proposed transaction will not significantly impede effective competition in the ESB software segment. In particular, the notifying party submits that IBM will remain the market leader after the transaction, whilst other competitors will continue to impose competitive constraints on the merged entity. The notifying party submits that the ESB segment is experiencing growth and the open source "mule" and JBoss products by MuleSource and Red Hat have been identified by IDC as strong enough to be considered good alternatives to commercial solutions[488]. Furthermore, the notifying party submits that Oracle and Sun are not particularly close competitors in ESB software and that their ESB software serves different needs.

788. In addition to the relatively small combined share of the parties' products (even if taking into account the fact that the numbers reported for Sun's market share may not be entirely accurate due to the open source nature of some of its product offerings), the market investigation has indicated that from the customers' point of view, Sun's products are not the closest substitutes for Oracle's products in relation to the ESB segment. In most instances when one of the parties is named as a company offering a close substitute to the other's products, other competitors are also indicated as companies offering close substitutes. In fact, the market investigation confirmed that the market is very competitive, with many active viable vendors, and that the merged entity will continue to face competition from a number of significant market players such as IBM, TIBCO, Software AG, Microsoft and Progress Software in the ESB segment. The market investigation has indicated that open source providers' products, such as Red Hat's JBoss products, also exercise competitive constraints in the ESB segment. Furthermore, none of the customers or competitors indicated that they expect Sun's products to develop to such an extent that they will become stronger competitors to the other players' products in the ESB segment (or in any event stronger competitors to Oracle's products).

487 Form CO, page 109, table 10 based on IDC, Worldwide Application Deployment Software 2007 Vendor Shares: Growth Continues to Accelerate, August 2008.

488 IDC, Worldwide Enterprise ESB Software 2008-2012 Forecast Update and 2007 Vendor Shares: A New Landscape, July 2008.

3.1.2.4. Process automation middleware (BPMS)

789. Table 9 below sets out IDC's worldwide market share estimates for Oracle, Sun and their main competitors on the BPMS segment.

Table 9: Process automation middleware shares 2006-2007[489]

Vendors	**Market shares %**	
	2006	**2007**
Oracle	**[5-10]*%**	**[10-20]*%**
IBM	[10-20]*%	[10-20]*%
ACI Worldwide	[10-20]*%	[10-20]*%
TIBCO	[5-10]*%	[5-10]*%
Software AG	[5-10]*%	[5-10]*%
Adobe	[0-5]*%	[0-5]*%
Sun	**[0-5]*%**	**[0-5]*%**
Pegasystems	[0-5]*%	[0-5]*%
Microsoft	[0-5]*%	[0-5]*%
Others	[40-50]*%	[40-50]*%

790. The notifying party submits that Sun's market share in relation to BPMS products does not significantly strengthen Oracle's market share in this area and that the merged entity will remain subject to competition from a number of other market players.

791. In addition to the relatively small combined market share of the parties' products (even if taking into account the fact that the numbers reported for Sun's market share may not be entirely accurate due to the open source nature of its product offering), the market investigation has indicated that from the customers' point of view, Sun's products are not the closest substitutes for Oracle's products in relation to the BPMS segment. In most instances when one of the parties is named as a company offering a close substitute to the other's products, other competitors are also indicated as companies offering close substitutes. In fact, the market investigation confirmed that the market is very competitive, with many active viable vendors, and that the merged entity will continue to face competition from a number of market players such as IBM, TIBCO, Pegasystems, Software AG and SAP. The market investigation has indicated that open source providers' products, such as Red Hat's JBoss products, are also seen as exercising competitive constraints in the BPMS segment. Furthermore, none of the customers or competitors indicated that they expect Sun's products to develop to such an extent that they will become stronger competitors to the other players' products in the BPMS segment (or in any event stronger competitors to Oracle's products).

3.3. Conclusion

792. In the light of all the above, it is concluded that the proposed transaction will not lead to a significant impediment to effective competition in relation to the overall market for middleware or any of its possible sub-segments.

489 Form CO, page 111, table 11 based on IDC, Worldwide Process Automation Middleware 2007 Vendor Shares, September 2008.

D. Java

1. Java as an input for software applications

793. Java is a "development environment" that was created by Sun about 20 years ago. A development environment is a software platform allowing developers to build and deploy software applications. Development environments usually consist of three elements: (a) a programming language, (b) a set of standard “libraries” (implementations of common functionality that can be used by new software and thus need not be "reinvented" every time a developer writes a new application, such as the functionality for writing data to disk) and (c) other programs to write, test and run the applications. The most important of these elements are described below.

794. A major characteristic of the Java development environment is that it is "open" in the sense that it is independent of the underlying operating system or hardware on which Java-based applications run. Java's motto is "write once, run anywhere". The way Java achieves this "neutral" approach is through interface software known as the Java Virtual Machine ("JVM"). The JVM executes the Java code. Since there are JVMs for various computer and device types and architectures (for example, there are JVMs for Windows, Linux, Unix and others) Java applications themselves need not be changed (ported) to work on other platforms.

795. Although open source implementations of many parts of Java are available, Sun controls the most important related IP rights that need to be licensed by software developers, in particular by middleware and EAS developers. Sun therefore controls an important input for firms developing software with the Java language.

796. The main other development environment is .NET, Microsoft's proprietary and closed environment. .NET can only be used for the development of software working on Windows unlike Java software that can run on most operating systems.

797. There are no Commission precedents on the definition of a market for development platforms, but previous cases refer to "development tools"[490] or refer to Java and .NET as platforms for developing middleware, without considering the development environment as a separate market[491].

Competition between development platforms

798. Java's attraction for developers stems from the fact that it is "agnostic" in the sense that it can run on any operating system and hardware combination (platform) for which a JVM has been created. Developers can therefore produce a single version of their application and be confident that it will run in the same way on any platform.

799. The main alternative development environment is Microsoft's .NET which relies on the Visual C# or Visual Basic Languages. There are also other programming languages that are routinely used to create applications and for which development environments and class libraries of advanced functionality also exist, for example, C or C++, PHP, Ruby on Rails, Grails, Python or Perl.

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[490] See Commission decision in case M.5094 – *Nokia/Trolltech* of 4 June 2008.

[491] See Commission decision in case M.5080 – *Oracle/BEA* of 29 April 2008.

800. The notifying party provided the results of surveys carried out by IDC and InfoTech Research Group to evaluate the prominence of Java and .NET as development platforms. The IDC survey[492] (sponsored by Microsoft) asked participants to identify the application platforms deployed or expected to be deployed in their companies. .NET was the primary application platform deployed for mission critical applications in 22.8% of the surveyed enterprises while Java was the primary application platform deployed for mission critical applications in 20.8% of surveyed enterprises. Next were IBM mainframe platforms (for example, CICS) with 14% of deployments. Oracle application platforms were deployed in 5.8% of surveyed companies, although it is not clear whether the figure for Oracle relates to the Oracle database or to its Java-based application server, or both. For future deployments, the IDC survey indicated that .NET was expected to remain prominent (with 30.2%) compared with Java (24.8%). The InfoTech survey of 2007 collected data from about 2000 firms. They were asked to identify their preference of application development environment. Possible answers were as follows: "Exclusively .NET", "Exclusively Java", "Primarily .NET", "Primarily Java" and "Other". Half (49%) of surveyed firms focused primarily on .NET and 12% focused exclusively on .NET (compared with 20% that focused primarily on Java and 3% that focused exclusively on Java). InfoTech concluded that *"The battle between Java and .NET is becoming a holy war. IT managers that depend on these development platforms to support and extend their application environments are increasingly reticent to adopt both. They are being forced to decide: .NET or Java. But which one? Info-Tech's analysis indicates that .NET clearly has the market momentum. […] The findings indicate that .NET is clearly preferred regardless of the enterprise size or industry*".[493]

801. By contrast the market investigation has highlighted that Java is the preferred development environment for many software companies, in particular because it is a de facto standard and because Java software can be deployed on any operating systems and hardware (see paragraphs 854 and 855).

802. Given its peculiar characteristics, the Java development platform (in its widest meaning) is a unique input for the software developers. Java is also a technology which lies at the core of an open community of software developers, structured by Sun as the Java Community Process ("JCP") (see paragraphs 811 and following), and ruled by a number of agreements. The technology is available, to a limited extent, under an open source license and for free (the OpenJDK platform, the binary executable versions of the JREs, etc.), hence the input as such should not be considered as “owned” or “controlled” by Sun. However, in relation to certain uses of the Java IP rights, Sun retains ownerships and licenses its rights to a number of software developers (among which EAS and middleware producers) against payment.

803. Although Java is not the only development platform, it is an important input in the production of application software. It will be shown in paragraphs 853 to 867 that Java is a key input for a large number of companies developing middleware and enterprise application software.

2. Java IP rights are distributed on a worldwide basis

804. Almost every respondent to the market investigation confirmed that licenses for Java IP rights have no geographic limitation, and generally have a worldwide extension.

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[492] See Form CO paragraph 171.

[493] InfoTech Research Group, *It's Official, NET Roasts Java's Beans*, 2007.

805. For the purposes of this Decision, the licensing of Java IP rights can therefore be considered to take place on a worldwide basis.

3. Competitive assessment

3.1. Java – overview

3.1.1. The Java programming language for Java application software and the Java Development Kit

806. The Java programming language is freely accessible to individuals and firms, including for the development of commercial applications. Program developers can use the Java Development Kit ("JDK") to write Java application software (that is to say, software that provides a particular functionality such as Customer Relationship Management for example).

807. The JDK is a bundle of software for developers which includes the Java Runtime Environment ("JRE" – see section 3.1.2. for more details), a set of libraries with their APIs[494], a Java compiler[495], and additional files required to write and test Java applets[496] and applications (for example, WebStart[497]).

3.1.2. The Java Runtime Environment

808. The Java Runtime Environment ("JRE") is a component of the Java platform needed to run programs written in the Java language. As a practical matter, the JRE is usually what users download to "install Java" on their computers. The JRE is part of the JDK and is composed of two elements:

(a) the Java Virtual Machine ("JVM"), essentially a virtual computer running on top of the real computer with the function of executing Java byte code; and

(b) a library collection that defines the functionalities available in a certified JRE (for instance advanced mathematic formulas or functionalities to manipulate arrays and tables).

809. Firms can either directly license the JRE from Sun or develop their own version of the JRE to optimize it for use with their own Java application software. In the second case, a company needs to license from Sun a Java Compatibility Kit ("JCK"), another piece of Java based software comprising a series of tests, to certify that the firm's own version of the JRE is compliant with a Java platform specification. A company would need to obtain such certification since customers normally request it in order to be reassured

494 An API (Application Programming Interface) shows in detail how a program can make use of functionality that has already been programmed, for example functionality that is implemented in a Java library. It does so by listing all functions that can be called from the new program, defines the number and type of parameters these functions expect and describes their return value(s).

495 In the context of computer programming a compiler has the task of translating a computer program written in a high-level language (such as C++) into the machine language of the underlying technical computing platform so that it can be executed. Java compilers compile Java source code into Java byte code which is the language of the Java virtual machine, that is to say Java byte code can directly be executed on a Java virtual machine.

496 A Java applet is a Java program that can only be run in the context of a web page. Typical applets are very small programs with a clearly delimited function.

497 Java WebStart allows the execution of Java applets independently of a web browser. WebStart is also part of the JRE.

that the software they purchase is “Java compatible”[498]. Certified compliance entails automatic licensing of all IP rights that are required for an implementation of the specification of the Java platform created pursuant to the JCP and provided that the owners of these IP rights have been involved in this creation as a member of the relevant Expert Group (see paragraphs 811 and following).

810. There are three platform[499] editions of the JRE: (1) The Java Standard Edition ("JSE") which is the basic set of libraries and is the general purpose Java platform used on desktops, PCs, servers and similar devices; (2) the Java Enterprise Edition ("JEE") which adds functionalities to the JSE for high-end enterprise server applications[500] ; and (3) the Java Micro Edition ("JME") which focuses on functionalities for mobile devices and embedded systems (for example, mobile phones, set-top boxes and cameras).

3.1.3. The development of Java specifications and Java IP rights

811. Java is developed under the Java Community Process ("JCP") which is a process for developing and revising Java technology specifications. The JCP was established in 1998 and is a collection of bilateral contracts (Java Specification Participation Agreements ("JSPAs")) between Sun and the different members of the JCP (who may be individuals, corporations or other groups considered as “stakeholders” in relation to the Java development platform) and Sun. It is not an organisation, nor the steward of Java, but rather a participative process to define standards around Java. There are currently over 1 200 members. Currently, important competitors of both Sun and Oracle are represented in the JCP: IBM, SAP AG, Hewlett Packard, Oracle itself, Cisco Systems, Adobe Systems Inc., RedHat, as well as companies like Google, Motorola, Intel (a competitor of Sun for microprocessors) and Philips.[501]

812. The aim of the JCP is to ensure downstream interoperability, in particular that Java can be used by anyone to write a broad array of applications (such as databases, application servers, email clients, word processors, games…) running on multiple platforms (such as Windows, Linux, Unix). For instance, both mobile phone vendors and games developers are interested in having a common standard for Java-based games to be used in handsets. The JCP guarantees that a certain set of rules that determine how to create a certain type of game (with specific visual and audio characteristics, for instance) can be developed, implemented and be licensed (mandatorily) by all the relevant IP rights

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498 Certification of compliance is important because this is the only way to easily demonstrate that the Java implementation in question is complete and correct, that is to say is able to run Java software in the same way as all the other compliant implementations. Therefore it would be much more difficult to sell a non-certified Java implementation since prospective customers may think that there is some risk of non-compliance. Compliance is important for customers who acquire software with the ability to run Java programs because it ensures that existing programs can be reused without change on the new JRE.

499 As explained above in paragraph 793, a platform is a framework for running software: In general it consists of a programming language, a compiler and often extensive libraries of functionality that can be used in new programs. In the case of Java it also contains a runtime environment because Java programs are not compiled for the underlying computing platform (that is to say hardware plus operating system) but for the Java Virtual Machine, that is to say a computer implemented in software and identical across all supported computing platforms (that is to say there is Java Virtual Machine for Windows on Intel PCs, for Sun Solaris on SPARC hardware etc.).

500 The Reference Implementation for the JEE is Sun's GlassFish application server. GlassFish is offered under two open source licenses (under the GPL and under the Common Development and Distribution License). Sun markets GlassFish commercially (that is to say still as OSS but targeting enterprises with the aim of selling related support services such as consulting and training) under the name Sun GlassFish Enterprise Server.

501 The names of all members can be found at: http://jcp.org/en/participation/members.

holders which participate in the process. This set of rules or standard (the "JSR", see paragraph 813) will be taken as a reference by mobile phone vendors who will implement the relevant JRE[502] in the devices and by game developers who will write games in the Java language with the certainty that those games will run on devices that are certified to support games written in compliance with that specific JSR.

813. The JCP is steered by two Executive Committees one for the JSE and the JEE, and one for the JME. The Executive Committee members serve for a three-year term. The primary function of the JCP executive committees is to approve new Java standards (called Java Specification Requests ("JSRs")), to ensure that developing specifications do not overlap or conflict with one another, and to verify that the specifications meet the needs of the industry.

814. Each Executive Committee has 16 members. The current members of the SE/EE Executive Committee are as follows (by alphabetical order): Apache, Eclipse, Ericsson, Fujitsu, Google, HP, IBM, Intel, Werner Keil, Doug Lea, Nortel, Oracle, RedHat, SAP, SpringSource and Sun[503].

815. Any of the 1 200 JCP members can be selected to join one of the Executive Committees. There are two selection procedures for the members of the committees: ratification and election. Of the 16 members of a committee, 10 are ratified, 5 are elected and Sun has 1 permanent seat. The chair of each Executive Committee is a member of the Program Management Office ("PMO"), namely a Sun employee[504].

(a) Under the ratification ballot (10 members out of 16), JCP members vote on nominees proposed by the PMO and the nominee is ratified by simple majority of those who cast a vote. If nominees are not ratified by vote, the PMO proposes new nominees until the number of vacant seats is fulfilled.

(b) Under the election ballot (5 members out of 16), any member of the JCP may nominate itself for election and a general vote is held. The nominees with most votes obtain the vacant elected seats.

816. The PMO supports the members of the JCP. The PMO is in charge of the day-to-day operations of the JCP[505] and it is also responsible for chairing the JCP Executive Committees. The PMO currently comprises 6 Sun employees.

817. The main role of the Executive Committees is to approve JSRs. There have been more than 300 JSRs since the beginning of the JCP.[506] For each new JSR, there are specified steps to follow. These are described below.

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502 In this case, the reference platform would be JME. Certification of an implementation of the JME by the mobile phone vendors requires a license to a test suite. Successful certification (that is to say passing of the test suite) entails in a grant of IP rights to the licensee of the test suite. This process is described in detail below (paragraphs 835 to 837).

503 Amongst the 16 members, four are currently Java licensees competing with Oracle in middleware, EAS and/or databases (Fujitsu, HP, IBM and SAP). Note that amongst the 16 members, there are 14 firms and 2 individuals (Werner Keil is a Java EE architect and consultant and Doug Lea is a Professor of Computer Science).

504 See JCP 2 Process Document, Appendix A, A.2. http://www.jcp.org/en/procedures/jcp2#A.

505 This involves facilitating the Executive Committee meetings, working with Specification Leaders ("Spec Leads" see below, paragraph 192.b), and Expert Groups on various JSRs, maintaining membership records for the JCP and maintaining the JCP website (see also http://jcp.org/en/press/pmo/pmo_profiles/commFocusPMO-curran).

(a) The initiation stage: A new specification or a significant revision to an existing specification can be proposed by any member of the JCP. The JSR is submitted to the PMO who then posts the JSR on its website for public comments and forwards it to the relevant Executive Committee for consideration and approval.

(b) Early Draft Review: Once the JSR is approved for development, the submitter of the approved JSR becomes the Specification Leader ("Spec Lead") and JCP members nominate a group of experts (the "Expert Group") to develop the first draft of the specification. The first draft is then submitted for Early Draft Review to the JCP and the Executive Committee. Following any comments received under the review, the draft may be refined for the next stage. At this point, the Spec Lead submits the licensing terms for the Reference Implementation ("RI") and the Technology Compatibility Kit ("TCK") to the Executive Committee.[507] The obligation to provide advance notice of the business terms under which the TCK license will be granted has been clarified as part of the new JCP procedure that came into effect on 16 June 2009.[508] This early disclosure is aimed at allowing the Executive Committee to take into consideration the licensing terms when voting on the JSR.

(c) The Public Draft: The Public Draft is then posted for review by the public and anyone can comment on the draft. Any public feedback can be used to proceed to the preparation of the Proposed Final Draft. The final approval occurs through a majority vote by the Executive Committee. Once approved, the final specification is made available alongside the RI and the TCK and is published as part of the Java standard (the results of the votes are available on the JCP website).

818. The results of the Executive Committees votes are made public. JSRs are approved if a majority of those voting votes "Yes" provided a minimum of 5 "Yes" votes are cast. There are two exceptions to this rule in which a "super majority" of two-thirds is required: (a) a decision to over-rule a first-level decision on a TCK challenge (this is when the Spec Lead is asked by a TCK user to explain the appropriateness and correctness of a particular test) and (b) the approval of JSRs for new Platform Edition Specifications or JSRs proposing changes to the Java language. In the second instance, a "Yes" vote by Sun is also required. In other words, Sun has a veto right with respect to major platform updates (to the “umbrella specifications” JSE, JEE and JME).

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506 The list of all JSRs can be found on the JCP's website at the following link: http://jcp.org/en/jsr/all. The list provides a brief description of the specification and the name of the Spec Lead. Since 2007, there have been 22 JSRs (8 initiated by Sun) and two of them (JSR323 and JSR324) were rejected. The results of the votes and comments posted by voting members of the Executive Committee can be found at http://jcp.org/en/jsr/results?id=4601 and http://jcp.org/en/jsr/results?id=4516.

507 The Reference Implementation is a sample implementation of the specification. The Technology Compatibility Kit is a suite of tests that ensure that a particular implementation is compliant with the specification.

508 See http://jcp.org/en/procedures/jcp2. Paragraph 1.2.1 reads as follows: "*The Spec Lead's company or organization is responsible for the Reference Implementation (RI) and Technology Compatibility Kit (TCK) and its licensing under terms compatible with the licensing guidelines established for use within the JCP. The Spec Lead will provide the EC with the terms under which the RI and TCK will be licensed no later than the start of JSR Review. The Spec Lead must provide complete copies of the licenses that they intend to use, not simply a summary of some of the terms.*".

819. Any modification to the JCP itself or its procedures is subject to the JSR process described in paragraph 817 but with the following differences: changes to the JCP or the JSPA documents can only be initiated by Executive Committee members (and not by any JCP member). The proposal is then taken to both Executive Committees for approval according to the usual voting process.[509]

820. In Annex 1 to the Form CO[510], the notifying party provided some examples of JSR votes and Executive Committee votes since 2007 in which the outcome was contrary to Sun's vote (for example, for JSR291, Sun voted No but the ballot passed whereas for JSR225, Sun abstained and the ballot passed).

821. The recent procedural changes introduced in JCP 2.7 came about in the midst of the Apache Harmony dispute between Apache and Sun (discussed in paragraphs 845 and following) and the arrival of Patrick Curran as chair of the PMO. Mr. Curran wished to embark on a number of JCP reforms[511] (in the area of governance and transparency, amongst other). The Executive Committees had, on several occasions, expressed their unwillingness to reform the JCP prior to the Apache dispute being resolved.[512] However, a series of discussions took place in the course of 2008 which ultimately culminated in the Maintenance Review of JSR215 which introduced version 2.7 of the JCP Process Document.

822. Prior to the implementation of the new process which requires the licensing terms for RI and TCK to be fully disclosed by the Spec Lead prior to approval of a new specification, a number of Executive Committee members had publicly declared – in February 2009 – that they would closely monitor such terms when voting on the final specification approval for the new platform edition of Java EE (JSR 316 for Java EE version 6).[513] In the public review ballot, RedHat voted yes but commented *"The spec lead of the EE6 specification has confirmed that the EE6 would contain no field of use restriction […] this is a good thing. However in the absence of an explicit JSPA rule that would forbid [it] […] for any submitted JSR (by Sun Microsystems or not) we will specifically expect the spec lead to provide clear information on that aspect and take the answer in account when casting our vote"*, whilst Intel commented *"By the time EE 6 JSRs come to Final Ballot, we expect a statement that the EE 6 TCK license does not restrict field of use, does not require implementing anything other than what is required in the spec itself […] and does not require any other license that restricts field of use of JCP Specs."*

3.1.4. Java IP rights and licensing

3.1.4.1. Provisions under the JSPA

823. The JSPA signed between Sun and each of the JCP members governs the framework for licensing the IP rights relating to a particular JSR. The JSPAs are signed for one year and are automatically renewed unless either of the parties wishes to terminate the agreement (with 60 days notice). There is however a "survival clause" (Articles 10 and

509 See Annex 1 to the Form CO, reply to question 57 of the Commission's questions of 29 July 2009.

510 See annex 1 to Form CO, reply to EC questions of 29 July, reply to question 57.

511 See annexes 31B16, 31B17 and 31B18 that show that Sun was seriously thinking about promoting important reforms within the JCP.

512 See Response by the notifying party to Q30 of the Commission's Questions of 5 August 2009 on the draft Form CO of 30 July 2009.

513 See http://jcp.org/en/jsr/results?id=4821.

13 of the JSPA) for all JSRs commenced or approved for development during the period of the agreement. For such JSRs, the parties' obligations with respect to Sections 4, 5, 6, 9, 11 and 12 of the JSPA survive termination of the agreement.

824. Under Section 4 of the JSPA, each JCP member participating in the work of an Expert Group agrees to grant the Spec Lead perpetual, fully-paid up, irrevocable licenses pertaining to the copyrights, trade secrets, patents and other IP associated with such members' contributions to the specification. In other words, the Spec Lead becomes the "one-stop shop" licensor of the bundle of IP rights necessary to implement the JSR.

825. In turn, the JSPA governs the Spec Lead's obligations with respect to the way Java specifications should be licensed. In particular, the JSPA provides the terms on which the Spec Lead must license the essential IP rights to parties wishing to create an implementation based on the source code or to create an independent implementation.[514] In both cases, the compatibility test (TCK) needs to be passed by the licensee's newly created implementation in order to receive the full IP bundle from the Spec Lead. Such compatibility tests are required in order to preserve interoperability (that is to say, to ensure that each implementation is consistent with the specification). The key licensing obligations in these two cases are as follows:

(a) Independent Implementation: The framework under which IP rights flow from the Spec Lead to a licensee for independent implementations are covered by Sections 5.B and 5.C of the JSPA. The Spec Lead must license the relevant IP to anyone whose implementation satisfies the compatibility test (that is to say, obligation to license).[515] The TCK license, even when separate from the RI, is always subject to the obligation to apply fair, reasonable and non-discriminatory ("FRAND") terms, see Article 5.F.I. of the JSPA. Such license may not restrict the licensee's right to use the specification to create or distribute an Independent Implementation.[516] For the type of license connected to the Independent Implementation, see paragraph 831 of this Decision.

(b) Implementation based on the RI: The framework under which IP rights flow from the Spec Lead to a licensee for implementations based on the RI are covered by Section 5.F of the JSPA. The Spec Lead must offer the RI and TCK under FRAND conditions to any interested party (that is to say, obligation to license).[517] The Spec Lead can also not impose additional

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514 An implementation based on a RI reuses parts of the RI source code to which the licensee obtains all IP rights whereas the code of an independent implementation is written from scratch by the licensee based on the terms of specification. Independent implementations are also called “Clean-room” or “Clone” implementations.

515 JSPA – Article 5.B. states : "*For any Specification produced under a new JSR, the Spec Lead for such JSR shall offer to grant a perpetual, non-exclusive, worldwide, fully paid-up, royalty free, irrevocable license under its licensable copyrights […] to anyone who wishes to create and/or distribute an Independent Implementation of the Spec. Such license will authorize the creation and distribution of Independent Implementations provided such Implementations (a) fully implement the Spec(s) including required interfaces and functionality; (b) do not modify, subset, superset or otherwise extend the Licensor Name Space, or include any public or protected packages classes, Java interfaces, fields or methods within the Licensor Name Space other than those required/authorized by the Spec being implement; and (c) pass the TCK for such Spec*".

516 JSPA – Article 5.C.

517 JSPA – Article 5.F. Article 5.F.I states that "*The Spec Lead shall offer to any interested party licenses concerning the RI and TCK – and also the TCK separately when developed under and JSR submitted hereafter – on terms that are non-discriminatory, fair and reasonable*".

compatibility hurdles.[518] The FRAND conditions are to be understood with reference to existing comparable licenses and past licensing terms.

826. As the Spec Lead for the JSE and the JEE specifications, Sun owns the copyright in each. Regarding the Java ME platform, Sun was the Spec Lead for a large number of key specifications but other companies, such as Nokia, Vodafone, Motorola and others have also been Spec Lead for a number of key technologies that form part of Java ME.

827. In order to certify its own JRE a firm has to license a TCK from Sun. The same firm might want to obtain an additional license from a different Spec Lead to access the functionality of a particular specification.[519] The specifications developed by a Spec Lead other than Sun are appreciable add-ons, but are not strictly necessary for the development of commercial applications.

3.1.4.2. Licensing Mechanisms

828. There are four principal types of licensing mechanisms currently used by Sun to license the Java technology. .

829. First, Sun offers **open source licenses**. For example, the OpenJDK, an implementation of the JSE, is available under the GPL which stipulates that any redistribution of the covered software, modified or not, must also occur under the GPL. Hence, a user which modifies the JDK (for example, changes the source code of the Java compiler that translates Java source code into the Java bytecode that runs on the JVM in a way that leads to faster compilations and smaller bytecode) and wants to redistribute it is required to make the modified source code also available under the GPL. This condition applies to modifications brought to the JDK itself, but does not apply to programs written with the OpenJDK, that is to say, a program written in Java and compiled with the OpenJDK's Java compiler can be distributed as is, that is to say, in bytecode with or without accompanying source code, without any requirement to apply specific licenses or license terms.

830. Second, Sun offers a **commercial license** under which the licensee obtains from Sun the following: (i) the source code implementations of one or more Java specifications (namely the Spec Lead RI); (ii) the corresponding specifications themselves; (iii) the TCKs; and (iv) some level of technical support. For some Java technologies, licenses for trademarks to designate compatible implementations that is to say, the rights to brand a product as “Java Compatible”) are also included as part of the overall set of commercial agreements. Companies seeking such a license would be able to use the relevant RI as a starting point from which to modify the source code and thus create their own implementation (however, licensees can also decide to create a new implementation from scratch, that is to say, without making use of the RI's source code). Companies such as Oracle, IBM, SAP and Nokia have commercial licenses. The SE source code is available for free but the binary redistribution[520] is fee-bearing for uses other than on general purpose desktop computers or servers. There are 3 different types of commercial licenses: the Technology License and Distribution Agreement

[518] JSPA – Article 5.F.IV states : "*The Spec Lead shall not include as part of the foregoing license any additional contractual condition or covenant concerning compatibility that would limit or restrict the rights of any licensee to create or distribution products derived from the [RI]".*

[519] For example, Nokia has been the Spec Lead for the JSR 234 – Advanced Multimedia Supplements. This specification gives access to multimedia functionality of modern mobile terminals. In particular it introduces better support for camera and radio and access to advanced audio processing.

[520] See paragraph 831.

(TLDA), the Sun Community Source License (SCSL) and the Java Development License (JDL). These are different versions of Sun's commercial license, with TLDA being the first one and the JDL being the most recent one.[521] The JDL was intended to offer a license with a simplified language but it has not been widely used as Sun released the OpenJDK at around the same time.

831. Third, Sun offers a **mix of royalty-free and commercial licenses** for independent implementations. In these cases, the licensee wishes to implement Java specifications but does not wish to have to license a corresponding implementation. The specifications themselves are available for license, typically without charge but the corresponding TCKs must then be licensed on a commercial basis. Companies such as Apache, RMI and ObjectWeb are independent implementers of Java specifications.

832. Fourth, Sun offers **royalty-free licenses for binary versions** of the Java Runtime Environment (JRE) and Java Development Kit (JDK). Binary versions of both JRE and JDK are available from Sun without charge. "Binary" means that these programs are provided in their “executable” or ready-to-run form, without the need (or possibility) for any compilation or modification by the user. The binaries for the RI can be incorporated into a product but, in this case, no TCK is required because the RI is not modified.

833. Sun offers the Binary License and Redistribution Agreement (BLRA) which is the binary code OEM redistribution license for Sun Java executable programs (JRE/J2SE and certain Java ME implementations). The BLRA generally requires the Sun implementation to be used in its complete and unmodified form. The BLRA is primarily used with commercial licenses for a fee but it is also used for the free "general computing" field of use JRE/J2SE (see paragraph 831).

834. Generally, TCK licenses are granted in conjunction with broader commercial arrangements that permit the use of Sun IP and services in addition to the use of the TCK. Those agreements can either be TLDA (Technology License and Distribution Agreement) or SCSL (Sun Community Source License) agreement and are usually bundled with Sun's implementation and support ("bundled license"). For independent implementations, Sun offers "standalone" TCK licenses (that is to say, standalone because the TCK is licensed without the RI and without any other additional deliverables). The standalone TCK licenses are available for free for "not-for profit organisations" and against a fee for all other organisations.

3.1.4.3. Cases in which a TCK license is required

835. As the discussion above suggests, there are primarily two instances in which TCK licenses are required. These two situations are when a vendor wishes to (a) modify the RI or (b) create an independent (that is to say, not building on the RI source code) implementation and distribute their products branded as compliant with Java SE, Java EE or Java ME. Any company that develops applications (that is to say, any type of software that directly offers functionality to end users) in Java can freely distribute their programs without requiring a TCK license. This is because they are neither using nor modifying the source code of the RI nor creating a completely new implementation of the specification in question and hence, they do not require a TCK to ensure compatibility. These companies do not require a license to Sun's IP rights.

[521] See Response of 12 August 2009 to Commission question 9 of 10 August 2009.

836. In case of Java SE, the most popular implementation is the binary executable of the RI which is also known as the Sun HotSpot JVM. The HotSpot JVM is the foundation of the JRE which is used to run Java applications. Both the HotSpot JVM and the JRE are available royalty free to application vendors wishing to package them for distribution with their software product.[522] There are very few companies that modify the JRE for the purpose of supporting desktop programs (such as a web browser written in Java or in order to give web browsers the ability to execute Java applets) because the implementations available from Sun are generally sufficient for the purpose. Hence, there are very few Java SE TCK licensees. The reason why vendors may wish to modify the Java SE RI is to optimize the JVM for the specific processor architecture they offer (in the case of server vendors) or to adapt the JVMs for specific configurations (in the case of other vendors). Examples of server vendors that have modified the Java SE RI include IBM who built a JVM optimized for its mainframes and PowerPC processor and HP who built a JVM optimized for its PA-RISC architecture.

837. In the case of Java EE, the main use of a TCK license is for application server vendors that typically chose to modify the source code of the RI, or build a completely new implementation themselves, in order to differentiate their application server on the basis of performance, scalability, clustering, transaction management, message queuing and other parameters. The need for modifications to the Java EE RI can be explained by the fact that the RI (Sun's Glassfish) is a fully functional, commercial grade application server and not – as in the case of the Java SE JVM – a mere component of a larger product. Hence, application server vendors (like Oracle or IBM) will typically need a Java EE TCK license. A few respondents to the market investigation who are active in the middleware market confirmed that the “basic” RI provided by Sun is not sufficient for their product to be sufficiently sophisticated and differentiated.

3.1.4.4. Fields of Use Restrictions

838. Certain TCK licenses contain so-called "Field of Use Restrictions" (“FOUR”) that impose on the licensee a limit on the use they can make of the implementations whose compliance with the Java specification is tested by the TCK. For example, the license may stipulate that tested implementations of Java SE cannot be made available by the licensee for use on mobile devices. The notifying party submits that such an approach is aimed at ensuring the uniformity of the Java implementation for each distinct Java environment.[523] FOURs create boundaries between the platforms (JSE, JEE and JME). For example, such restrictions ensure that only JME is installed on Java-enabled mobile devices and therefore vendors of JME based applications can be sure that their application can be written once and run on all Java-enabled mobile devices. If Sun could not prevent the deployment of JSE implementations on mobile devices, manufacturers might begin to deploy JSE instead of JME on mobile devices. The effects would be twofold: a) Sun would lose its ability to charge for deployment of JME on mobile devices because device manufacturers would have a potentially free alternative in JSE and b) application developers could not be sure that their applications would run on all mobile devices due to the differences between JSE and JME. As a result of such a fractioning, the attractiveness of Java as an application platform for mobile devices would be greatly diminished.

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[522] In fact, the JRE is the HotSpot JVM with a set of standard class libraries that implement the Java API.

[523] See Form CO paragraph 104, page 64.

839. For Java SE, Sun has always distinguished general purpose computing from embedded computing. In practice, Java SE licensees for general purpose computing are free while a fee for the redistribution of the Java SE source code for "embedded uses" has been required. The aim of the "general computing condition" protects Sun's ability to charge royalties for Java SE embedded uses, to protect Java ME's interoperability and to charge royalties for Java ME.

840. Some respondents to the market investigation do not contest Sun's right to impose such restrictions.

841. For Java EE, a field of use restriction in the license would involve a functional description of the software product or line of software products covered. For example, a license for the Java EE TCK might specify that the TCK is only licensed to test compliance of a specific product X of the licensee that implements the Java EE standard and might also stipulate that this implementation cannot be deployed on mobile devices. In general, Java EE is licensed for application server software, web server software and similar software products which by their nature already limit their field of use.

842. Java ME covers a wide variety of applications and Sun has used fields of use restrictions to adapt its licensing conditions for the various uses of Java ME. This can allow Sun to encourage the development of new technologies while at the same time maintaining licensing revenues from established commercial uses. For example, Java ME licenses contain fields of use provisions that distinguish between PDAs, Blu-Ray DVD Players, smart phones, set-up boxes, etc.

3.2. Third party complaints – risk of input foreclosure

843. Complainants have submitted their observations to the Commission as regards the possible anticompetitive effects of the proposed transaction in respect of Java. They complain that there is a risk that, after the transaction, Oracle will engage in an input foreclosure strategy through its control of Java to the detriment of its downstream competitors in the markets for middleware and EAS. Some respondents to the market investigation raised similar concerns. The potential theories of harm discussed in the following paragraph cover the concerns raised both by the complainants and some respondents to the market investigation.

844. With respect to Java, the complainants make the following claims:

(a) Java is an important input (in particular it is the only cross-platform advanced software development technology, in contrast to .NET which is only available on Windows-based systems) for software developers;

(b) Oracle would be able to control the JCP and direct it in such a way that it would advantage itself (similar to the way Sun is claimed to have controlled the JCP to its own advantage). More specifically, through its permanent seat, the control of the PMO and the majority of the votes at either Executive Committee level, it would be able to "steer" decisions of the JCP towards outcomes favourable to itself;

(c) Oracle will have the ability to disadvantage downstream competitors by degrading the licensing of Java to its downstream competitors (by refusing to license, by imposing restrictions to the licences, changing

the requirements of its TCK licence, by delaying the availability of Java licences to competitors, by technically disadvantaging competitors, by being selective in deciding which products to certify, by delaying certification or by increasing the price of Java licences);

(d) Oracle will have the ability to favour the development of new Java specifications to the exclusive benefit of its own software, therefore making software of Oracle's downstream competitors less efficient or competitive. In particular, the JCP "stewardship" will allow the new entity to either speed up or slow down specific projects as well as decide on whom to elect to chair a committee defining the course of the standard.

(e) Oracle will have a greater incentive than Sun had to steer the JCP to its own advantage and against its downstream competitors because of its strong presence in application markets which Sun does not have, and because Sun used software as a driver to increase hardware demand, whereas Oracle is primarily a software company.

(f) As regards the impact on the market of such possible strategies, if the merged entity entered into a foreclosure strategy to the detriment of Oracle's downstream competitors, it is likely that this would result in a significant lessening of the latters' competitiveness. Ultimately, a lessening of competition in the middleware and EAS markets is likely to result in an increase in prices and a reduction of innovations brought to customers.

845. The third party complainants and respondents to the market investigation have referred to the Apache Harmony dispute as an example of Oracle's ability and incentive to engage in these various foreclosure strategies after the transaction.

846. The Apache foundation is a not-for-profit organization supporting the development of open source software. The purpose of Apache is to develop and provide free, enterprise-grade software products through a collaborative process and to offer those products to users pursuant to the “pragmatic” Apache License. Apache wishes to develop its own independent, licensable implementation of the Java SE specification called Harmony.

847. The Apache Harmony dispute concerns the field-of-use restrictions imposed by Sun in the context of the licensing of the JCK needed to achieve certification for Apache's own implementation of the J2SE.

848. In September 2008, Sun proposed standalone TCK licensing terms including the following terms: *"Licensee can only use the TCK licensed hereunder on (a) general purpose servers and (b) general purpose desktop and laptop computer to test Licensee's implementation of the Java SE 6 specification."* These conditions further required downstream products (other than general purpose servers, desktops or laptop computers) distributed by Apache licensees or sub-licensees based on or derived from Harmony to be re-tested against the applicable Java TCK.

849. The notifying party describes the dispute as a commercial negotiation between Sun (the licensor) and Apache (the licensee) on the possibility – under Sections 5.F.III and 5.B of the JSPA – for Apache to provide products built using royalty-free Java SE licenses (for which it qualifies under the JSPA as a not-for-profit organization) to its own

customers, including the backers of the Apache project such as IBM, Intel, Microsoft, Google and others, averting their need to acquire Java licenses themselves. According to the notifying party, granting the licensing terms requested by Apache (that is to say, without the field-of-use restriction) would amount (a) to destroying Java SE's revenue stream (given that only commercial licenses are granted for commercial embedded uses as opposed to the royalty-free licensing of Java SE for general computing) and (b) to destroying Java ME's revenue stream and interoperability (given that the arrangement would prompt mobile device manufacturers to migrate towards Harmony/Java SE thus leading to the fracturing of Java ME given that Java ME and SE are not compatible). Moreover, all of Sun's licensees for Java SE for embedded use pay a license fee while Apache wishes to receive a royalty-free license that would benefit its commercial backers. This would be discriminatory against the current licensees of Sun for Java SE for embedded use.

850. The Commission does not need to take a position as regards the merits of the dispute, which is still pending between the parties concerned, and involves a very specific set of circumstances. The Commission has however taken it into account, where relevant, for its assessment of the merged entity's ability and incentive to engage in input foreclosure.

3.3. Commission's assessment of the risk of input foreclosure

851. The various elements on which the vertical foreclosure theories of harm are based (points (a) to (f) in paragraph 844) have been analyzed in view of the results of the market investigation.

852. The Commission's analysis leads to the conclusion that the proposed transaction would not significantly impede effective competition in the common market in respect of the licensing of IP rights connected to the Java development environment and of the downstream overall markets for middleware and for EAS.

3.3.1. Licensing of Java IP rights as an important input

853. Through the transaction, Oracle will acquire key IP rights relating to the Java development platform (in particular, relating to Java SE, Java EE and Java ME). A number of Oracle competitors currently license IP rights (either commercial licenses or licenses for binary executable version of the relevant specification) relating to Java from Sun in order to develop their middleware and EAS applications.

854. The market investigation confirmed that Java licences are an important input for software programmers. Replies to the market investigation highlighted Java’s unique characteristics as a development platform (universally known language, platform agnosticism, industry standard, ease of deployment, easiness of programming, web-centricity). Java has fundamental differentiating characteristics that make it the only strong alternative to the proprietary Microsoft .NET platform. Other programming languages (C, C++, C#, PHP) or development platforms are considered by roughly half of the respondents as viable alternatives to Java (especially C# in combination with the .NET platform). But in general these alternatives lack either the flexibility or the ease of deployment, or the adaptability and the vibrant community support that Java has.

855. It is important to note that, in the majority of the respondents' view, Java's importance is its widespread standardized approach, which is the key factor of its strength versus the proprietary .NET platform.

856. Some respondents to the market investigation are licensees of Java IP rights but do not directly compete with Oracle at the middleware level. They are operating system vendors such as Google (Android OS for mobile devices), companies who license the JME JRE to embed it in mobile devices in order enable them to run Java applications (France Telecom, Motorola or Sony Ericsson) or EAS competitors such as Q3, Salesforce, SAGE, Infor, SAS, Avaya and QAD. Typically, an **EAS vendor** would license the binary (free) version of the JRE (see paragraph 832) to ship it with its software program in order to allow its customers to "run" the program on their system. The market investigation also showed that some EAS vendors do not license the JRE but require their customers to download it separately (for free). It seems, therefore, that any possible foreclosure strategy engaged in by Oracle would have a limited impact on downstream EAS competitors, given that their dependence on a Java commercial license is limited.

857. On the other hand, the replies from Oracle's middleware competitors show that Oracle's **competitors for middleware** products need commercial licenses (see paragraph 833) for Java Technology Compatibility Kits (TCK) - either for the modification of the source code of a Reference Implementation or for the independent implementation - in order to commercially distribute software products that are certified to comply with the Java platform specification (this is of particular importance for application server software). The need for commercial licenses is present for downstream middleware competitors who need to develop their own implementations of (or improvements of existing implementations of) the relevant Java technology because the freely available versions of the implementation of the J2EE middleware products (OpenJDK or binary executable versions) are not sufficient for their needs.

Oracle competitors that are currently Java licensees and potential victims of foreclosure

858. Oracle's main competitors that currently require licenses from Sun to develop and distribute their products are listed in the following paragraphs together with their current licensing arrangements.[524] In this respect, it is important to understand the current licensing arrangements that these companies have with Sun and the degree of their competitive interaction with Oracle. The stronger the competitive interaction between Oracle and a competitor, the stronger the incentive to foreclose this rival as such foreclosure would lead to more customers switching from the competitor's to Oracle's software offering.

859. **IBM** – IBM is the largest Java licensee and is Oracle's main competitor in middleware (both Oracle and IBM also compete on other markets). Sun and IBM are parties to a TLDA that began in October 1996 for a period of 20 years (that is to say, it is due to expire in 7 years, in October 2016). IBM is thus protected from any changes in licensing terms for another 7 years (and this includes new versions of the Java platforms). IBM has a yearly option to terminate the agreement upon adequate notice while Sun may only terminate for cause.[525] IBM needs a Java EE TCK license because it offers WebSphere, an independent ("clean room") implementation[526] of the Java EE

524 See Annex 25, Annex 1 of Annex 32 and Annex 38 of Form CO.

525 See Annex 38 of Form CO.

526 This is an implementation that is in no way based on other intellectual property rights than the specifications that are implemented.

platform specification.[527] IBM is a member of the JCP Executive Committee for Java SE/EE.

860. **SAP** is a major competitor of Oracle in enterprise applications but it is also a competitor in middleware. SAP has SCSL licenses for Java SE (in particular the JRE), Java EE and Java ME. All these licenses expire in 3 years (October 2012).[528] SAP is protected from any changes in licensing terms for another 3 years. SAP explains that it licensed the JRE in order to offer full liability for its customers (because downloading the JRE from Sun directly would not offer these customers full liability from Sun) and because Sun's JVM is only supported on 2 of 16 operating system platforms that SAP supports (Intel and Sparc). Hence, SAP decided to embed the Sun JVM code in SAP software and ported it on the 16 operating systems that SAP supports. SAP licensed the Java EE TCK in order to develop its own implementation based on Java EE specifications, in particular its application platform NetWeaver which is based on Java.[529] SAP is a member of the JCP Executive Committee for Java SE/EE.

861. **RedHat** is an open source company that competes with Oracle in middleware. It offers a complete Java EE application server called JBoss and a Java EE Development Tool. RedHat has a standalone TCK for Java EE that expires in November 2010. It also has a perpetual Operating System Distribution License for Java SE.

862. **Sybase** is a competitor of Oracle in middleware. It offers a complete Java EE application server called Jaguar and a Java EE Development Tool. Sybase's Java TLDA expires in May 2013.

863. **Tibco**, **Kabira** and **Novell** are smaller middleware competitors which license a JRE from Sun.

864. **Fujitsu** is a minor competitor of Oracle in middleware[530]. Fujitsu has a number of licenses from Sun: Java ME, Java SE and Java EE are all evergreen TLDA that renew annually and automatically. Fujitsu's application server is called Interstage. Fujitsu also needs the Java SE TCK license for products that do not currently compete with Oracle. Fujitsu is a member of the JCP Executive Committee for Java SE/EE.

865. **Siemens** (via its subsidiary Cinterion Wireless Modules) sells Product Lifecycle Management software with Java capabilities. At best, therefore, Siemens is active on a very specific sub-segment of the overall software market and its product only act as "middleware" for very specific client applications. Siemens does not compete with Oracle or IBM in the general middleware market. Siemens is a member of the JCP Executive Committee for Java ME and licenses Java ME from Sun with a TLDA expiring this September.

866. There are a few other competitors of Oracle that require a Java EE TCK license because they offer application servers. These are, according to the information submitted by the notifying party: Borland (sells Borland AppServer), Caucho Technologies (sells the Resin application server limited to servlet functionality), Hitachi (sells a complete Java EE application server called Cosminexus), IronFlare (sells a complete Java EE

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527 As well as WebSphere Community Edition and Java EE Development Tools.

528 See Annex 38 of Form CO.

529 See press release http://www.sap.com/about/newsroom/press.epx?pressid=6780

530 See paragraphs 152-153 in Form CO: market share of 2.4% in application server middleware and 3.1% in application server software platform.

application server, previously called Orion Application Server) and NEC (sells a complete Java EE application server called WebOTX).

867. The market investigation broadly confirmed that Oracle's competitors for middleware products need commercial licenses for Java Technology Compatibility Kits (TCK) in order to distribute software products that are certified to comply with the Java platform specification (in particular for application server software).

3.3.2. Control of the JCP and as a consequence, the licensing of Java IP rights by Oracle

868. The ability to engage in any foreclosing strategy crucially depends on the legal and procedural framework under which the JCP operates and to which Oracle will be bound after the transaction.

869. The complaints and the submissions from the respondents to the market investigation rest on the assumption that Oracle, once it has acquired control of Sun, would also "control" the JCP and, as a consequence, the licensing of Java-related IP rights, in particular in relation to the TCKs.

870. Those concerns are based on the following cumulative or alternative assumptions: (i) Oracle would control the PMO (see paragraph 816) and therefore would be a "gatekeeper" for any new specification of the platforms that could be proposed by its competitors; (ii) it would influence the voting system within the Executive Committees (by its permanent seat and a "majority" of the votes - see paragraph 814) to the extent that it would always obtain a majority of the votes, hence "steer" the whole process in its own favour; (iii) since the Executive Committees can only vote on new specifications, Oracle would have the possibility to develop Java to its own advantage outside the framework of the JCP to the detriment of its competitors and/or of the whole community; (iv) since it would keep its veto right on the developments of any "umbrella specification" and on any modification of the rules governing the JCP[531] (see paragraphs 818 and 819), it would be able to control and direct the whole Java community to a direction only favourable to itself; (v) it would be able to discard any motion proposed by the other members of the Executive Committee, as Sun has allegedly done in the past, and always decide as regards the JCP by itself.

3.3.2.1. Influence through the PMO

871. JCP Process Documents confirmed the submission from the notifying party that the PMO has no power to initiate, discourage, delay, inhibit or prevent the filing of a JSR. Indeed, the JCP 2 Process Document, version 2.7 of 15 May 2009[532], which prescribes which formal procedures have to be followed in the Java Specification development process, provides that *"When a JSR is received, the PMO will give it a tracking number, assign the JSR to the appropriate EC (or both ECs* [Executive Committees] *if so requested by the submitter), create its JSR Page, announce the proposed JSR to the public, and begin JSR Review. Comments on the JSR should be sent to the e-mail address listed on the JSR Page. All comments received will be made available from the JSR Page (similar comments may be consolidated) and forwarded to the EC for its consideration. Members who are interested in joining the Expert Group (should the JSR*

[531] However, the modification of the rules governing the JCP does not require a positive vote by Sun, but only involves a normal JSR process that must be initiated by an Executive Committee member.

[532] http://jcp.org/en/procedures/jcp2 . The quoted article is article 1.2 – JSR Review.

be approved) should identify themselves by submitting a nomination form to the PMO. As described by section 1.1.5 the review period will be either 2 or 4 weeks".

872. The procedural rules do not leave any discretion to the PMO as to a possible "choice" of which specifications to propose for comments to the community. Rather, the process looks rather "automatized". Furthermore, the Commission verified the submission from the notifying party that *"[W]hile the PMO may occasionally advise submitters with respect to navigating the JSR process (e.g., "if you haven't canvassed for support among Executive Committee members, and if you haven't lined up the major industry players as Expert Group members then you may not be approved"), it has no power to disapprove, delay or otherwise control the filing or progression of a JSR".*[533]

3.3.2.2. Influence through a majority of votes in the Executive Committees

873. As regards the voting system in the Executive Committees, a minority[534] of the respondents critically observed that Sun has the power to influence the decisions in the Executive Committee either through an alleged "majority" of the votes or through its permanent seat and the chair. While it is true that Sun always holds a seat in the Executive Committees and has the chair of each of them (see paragraph 815), it only holds directly one vote in each committee for normal votes on new specifications, exactly as any other member. Maintaining that all the members of the Executive Committee which have been nominated by Sun consistently vote according to Sun's indications is pure speculation. First, Sun nominates possible appointees but this does not automatically mean that they will obtain the necessary majority of the votes in order to be ratified as an Executive Committee member. Should the majority of the members of the JCP decide not to ratify a nominated Sun candidate, Sun would therefore be obliged to choose another possible candidate. This shows that the whole JCP has control over the appointment of Sun's 10 nominees, and not only through the direct vote of the other 5 members.

874. Second, there seems to be a general consensus to confirm the submission from the notifying party that *"There are certain major players within the industry whose absence from the JCP would make the JCP significantly less effective, including for Sun's own interests, which, in turn, would make Java less vibrant and, therefore, less attractive to developers. Therefore, Sun has little choice but to ensure that these companies are represented on the Executive Committees"*. Sun has appointed several members which are its direct competitors, such as IBM and HP, and also the Apache foundation, in the middle of the Apache-Harmony dispute. The current list of nominated members is (i) for SE / EE Executive Committee: Apache, Eclipse foundation, Ericsson, Fujitsu, Google, HP, IBM, Intel, Nortel, Oracle, RedHat, SAP, SpringSource and two single individuals, as well as Sun; and for (ii) ME Executive Committee: Aplix, Ericsson, IBM, Orange, Motorola, Nokia, Philips, Qisda, RIM, Samsung, Siemens, Sony Ericsson, Time Warner Cable, Vodafone and one single individual, as well as Sun[535]. It is however noteworthy that, among the third parties who complained about Sun's "veto right" or "absolute majority" at the Executive Committee level there are companies

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533 Parties' reply to Question 1 in the Request for Information sent on 20 August 2009.

534 11 out of 28 replies to the Java questionnaire. 7 of these replies came from members of either of the Executive Committees, while 3 other members – alongside Oracle – submitted the contrary, that Sun cannot influence the voting within the Executive Committees beyond its own vote.

535 See http://www.jcp.org/en/participation/committee.

which are members of the committees themselves, nominated by Sun (see footnote 534).

875. The majority rule on JSR proposals is straightforward: for example, if a specific JSR proposal submitted by another vendor (and competitor) that could lead to the enhancement or amelioration of a competitor's application server is passed by a majority vote in the EE Executive Committee, the merged entity would not be able to reject it unilaterally.

3.3.2.3. Development of Java outside the framework of the JCP

876. A few respondents submitted - in rather general terms - that Oracle would have the ability to develop new specifications or new Java developments outside the JCP to its own advantage. That complaint is only relevant for the purpose of the competitive impact of the proposed transaction in so far as such a practice would be used by Oracle in order to foreclose its downstream competitors.

877. The notifying party submitted that *"[S]ince its introduction in 1998 as an open, participative process for developing and revising the Java technology specifications and their corresponding reference implementations and test suites, the JCP has fostered the evolution of the Java platform in cooperation with the international Java developer community. Without the widespread adoption of these specifications and the widespread deployment of products that implement the specifications, Java could not compete effectively with .NET for the attention of application developers".* The purpose of the JCP is therefore to have a wide, open, industry driven standardization development process based on the Java platform: Java's essential value rests in its shared and widespread standardization. This means that, when a certain specification is adopted through the process, any implementation developed by any developer is identical with regard to the specified Java characteristics. As a result, software that works in a specific implementation of a Java standard (that is to say, in J2EE) will run in all implementations that are compliant with this standard, increasing the scope of software reuse, increasing the value of programmers' Java knowledge, diminishing the costs of switching between different Java providers, that is to say, dimishing or removing vendor lock-in and overall ultimately resulting in cost reductions. This central characteristic, "write once, run everywhere", which defines Java's fundamental value versus the .NET environment, has been widely confirmed in the replies to the market investigation. It would, therefore, run counter to Java's and thus Oracle's own interests to imagine that Oracle would want to depart from the community process in order to develop proprietary specifications outside the process.

878. One third-party respondent[536] mentioned the development of JavaFX as an example of how Sun/Oracle could "depart" from the process to develop an own "proprietary extension to Java". Nevertheless, on the basis of the notifying party's explanation in particular, the Commission concluded that the example was not relevant to illustrate how Sun/Oracle could develop an "own proprietary extension of Java". The notifying party in particular submitted that "Sun does not believe that Java FX is a proprietary, Sun-only extension to Java." It is neither a platform nor an extension within the meaning of the JCP, for it is not defined within the "controlled" or "public" namespace, as are all Java specifications, and JavaFX does not replace but rather is implemented on top of existing Java platforms. It is better to think of JavaFX as both a product –an application aimed at developers that offers rich graphical capabilities and that is able to

[536] See Microsoft's non-confidential reply to the Java questionnaire, reply to question 28.

exploit an underlying Java platform in the same way that a feature rich application developed by IBM, SAP or any of Oracle's competitors can and do develop and market such applications – and as a scripting language like JavaScript, ASP, JSP, PHP, Perl, Tcl and Python. A scripting language is a high-level programming language that commonly is used to add functionality to a Web page. "JavaFX, […], has been developed by Sun to compete with Microsoft's Silverlight and Adobe's Flash technologies. That Silverlight and Flash are substantial competitors to JavaFX eliminates any possible competitive concern over the proprietary nature of JavaFX. JavaFX has no market power and so cannot be used as a mechanism of foreclosure".

879. Furthermore, it is also true that the existence of the JCP does not, as such, prevent Sun and Oracle from developing any proprietary product based on Sun's own Java intellectual propriety rights in the future. The complainants did not provide any element on the basis of which it could be concluded that any of these potential products – which remain, in any case, unidentified – could constitute essential inputs to competitors' products. Without such a conclusion, which constitutes a fundamental prerequisite for any possible analysis of vertical anti-competitive concerns, any abstract reasoning on what Sun/Oracle "could" develop outside the JCP remains pure speculation, and should not be taken into consideration in the Commission's assessment.

3.3.2.4. Control of the developments of the "umbrella specifications" through Oracle's veto right

880. As regards the more concrete objection flowing from the fact that Sun/Oracle has a veto right with respect to major platform updates (to the “umbrella specifications” JSE, JEE and JME) - see paragraph 818– the complainants seem to suggest that this "power" is seen as a threat for competitors who might be disadvantaged by Oracle's possible decisions to steer the developments to a direction more favourable to Oracle's own downstream products.

881. It seems unlikely that Oracle would have the ability to engage in any foreclosing strategy through the veto right on any major platform updates. First, the notifying party points out that the process that leads to the development of an umbrella JSR, even if led by Sun as SpecLead, always involves the participation of other "Experts" (see paragraph 817) who grant their IP rights according to the JCP rules. As for the umbrella specifications in particular, the notifying party submitted a complete list of all the experts that also contribute their IP rights to the specification, confirming that Sun is not the only IP right holder[537]. Any possible development proposed by Sun/Oracle which could affect downstream competition could be easily detected at an early stage and the Experts can always withdraw their IP rights should they disagree with Oracle's proposed direction[538].

882. Second, even if the merged entity managed to pass an "Oracle friendly" specification for the platform edition, the rules of the JCP require that any major modification to the umbrella specifications has to be passed by a two thirds majority and has to obtain Sun's favourable vote. This means that any possible development of the umbrella specifications would have to be analyzed in the normal, transparent JCP procedure and obtain the supermajority of the votes at the relevant Executive Committee level, where many Oracle downstream competitors sit. This element, per se, can be considered

537 See Annex 1 to form CO, replies to EC Questions of 29 July, reply to question 44.
538 Section 4.II.D JSPA.

sufficient to show that Oracle could not unilaterally impose anti competitive developments of the umbrella specifications.

883. Third, the fact that Oracle would, pursuant to the current setup of the JCP, be the Spec Lead for all the umbrella specifications does not alter the fact that the licensing obligations connected to any specifications would be the same (obligation to license, FRAND terms) as those connected to any other JSR, pursuant to the JSPA.

884. Fourth, there is a "survival obligation" (Articles 10 and 13 of JSPA) for all JSRs commenced during the period of the agreement. For such JSRs, the parties' obligations with respect to Sections 4, 5, 6, 9, 11 and 12 of the JSPA survive termination of the agreement.

885. It can therefore be concluded that, even if the JCP/JSPA system grants Sun and would grant Oracle a veto right on the development of any umbrella specification, the Commission does not see how this could in any way allow any possible foreclosure strategy to the detriment of Oracle's downstream competitors.

3.3.2.5. Discarding by Oracle of motions from the other members of the Exectuive Committees/JCP to prevent any development of the process to its possible disadvantage

886. Item 7 of Annex 3 to the JCP2 process document[539] specifically attributes to the Executive Committee, among other duties and responsibilities, the duty to "provide guidance to the PMO and JCP Community to promote the efficient operations of the organization and to guide the evolution of Java platforms and technologies. Such guidance may be provided by mechanisms such as publishing white papers, reports, or comments as the EC deems appropriate to express the opinions of one or both Executive Committees".

887. The "motions" referred to in the complaints are the result of the internal consultations that take place in the normal dialectic of the JCP. The notifying party addresses the fact that a number of motions, in relation to which Sun either voted against or abstained, and in which a number of members expressed the wish that certain licensing conditions be modified (September 2007, December 2007 number 2, April 2009)[540], or called for a "vendor independent JCP" (December 2007, number 1), were simply expressing the opinion of the respective ECs and did not call for any action.

888. It is difficult to see how, in the context of the JCP, the fact that certain motions have not been implemented in any concrete modification of the JCP/JSPAs should be attributed exclusively to Sun's attitude. Any "development" of the process should materialize in a modification of the JCP or of the JSPAs in order to have a concrete effect on any member. In this respect the rules applying to the JCP confirmed the submission from the notifying party that "[…] modifying the JCP itself is subject to the JSR review process. Proposed modifications are treated just like a proposal to add or change a technical standard. These procedural changes are assigned a JSR number and subject to the same multiple levels of review, comment, and approval as are technical specifications. No individual JCP member (including Sun or Oracle) could, thus, modify the JCP in a manner that would disadvantage other members without approval,

539 http://www.jcp.org/en/procedures/jcp2#A

540 See parties' reply to question 27 of the Commission's request for information of 5 August 2009.

in this case, by both Executive Committees."[541]. In addition, "Revisions to the JCP, the JSPA […]are carried out via the adoption of a JSR using the Java Community Process with the following changes: (a) only Executive Committee members can initiate a JSR to revise one of these documents; (b) each Executive Committee must approve the JSR [with a simple majority of votes]; (c) the Expert Group consists of both Executive Committees with a member of the PMO as Specification Lead; and (d) there is no Reference Implementation or Technology Compatibility Kit to be delivered and no TCK appeals process to be defined"[542].

889. Even if all the above was not relevant, and Sun's "discarding" of a motion of a consultative nature had any concrete effect on the development of the JCP, it is still not clear how this could have an anti-competitive effect on downstream competitors. The only way in which Sun/Oracle could in theory intervene to disfavour downstream competitors is through the licensing terms it imposes on its licensees.

890. It can therefore be concluded that all the assumptions on the basis of which complainants and respondents suggested that Sun/Oracle would have the ability to control the JCP and to steer the decision-making process towards developments that would favour Oracle to the detriment of its downstream competitors do not appear founded in the facts and should be dismissed.

3.3.3. Ability of Oracle to disadvantage downstream competitors by degrading the licensing of Java

891. A number of concerns have been raised by the respondents to the market investigation and by the complainants in relation to Oracle's potential ability to disadvantage downstream competitors by degrading the licensing terms of the different elements of the Java platform.

892. It is uncontested that the merged entity will control IP rights over some proprietary features of Java, which some of Oracle's competitors at the downstream level need to license.

893. It should firstly be remembered that no TCK license is required by companies building applications (EAS) either in Java or in other computing languages, regardless of the Java platform (EE, SE or ME) that the developer is using, in order to compete with Oracle in the overall EAS market. The market investigation widely confirmed that these companies mainly either distribute their programs including the binary executable (free) version of the relevant JRE of the appropriate JSR if they wish, or they may request the customer to directly download the relevant JRE for free from Sun's website. Since they neither use nor modify the source code of the Reference Implementation, they do not need to test any implementation against a TCK in order to certify Java compliance. The notifying party[543] explained that this is the reason why EAS vendors are not TCK licensees unless they also produce Java app servers or development tools. For instance, Infor submitted that it is "not developing its own JRE as its business solutions are based on the free binary JRE provided by Sun. Infor's customers have to download Sun's JRE to be able to run Infor business solutions."[544]

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541 White Paper on Java dated 16 July 2009, Annex 32 to the Form CO, page 11; footnote 12.

542 White Paper on Java dated 16 July 2009, Annex 32 to the Form CO, page 11; footnote 12.

543 *Ibidem*, page 16.

544 See Infor's non-confidential reply to Java questionnaire, question 6.

894. The market investigation confirmed in particular that, as explained in paragraph 825, "[O]nly those vendors that modify the source code of the reference implementation or create independent implementations and who want to distribute their platform programs as Java compliant need TCK licenses"[545]. These are, essentially, only application server vendors, as they have chosen to "modify the source code of the Reference Implementation to create some measure of differentiation for their application servers based on performance, scalability, clustering, transaction management, message queuing, and other parameters. Source code modifications are required for this because the Java EE Reference Implementation, based on Sun's GlassFish application server, is a fully functional, commercial grade application server, not a component of a larger product as the Java SE JVM would be. Given the comprehensive scope of the Java EE Specification, almost anything one does in software to differentiate one's application server requires source code modifications, and thus a TCK license. This explains why application server vendors nearly always have Java EE TCK licenses—and why nearly every Java EE TCK licensee makes application servers"[546].

895. The Commission investigated two ways in which the new entity could foreclose competitors: (i) the merged entity could degrade the licensing of Java to its downstream competitors, either by refusing to renew or by imposing restrictions to existing licenses; (ii) the merged entity could degrade the licensing of Java to its downstream competitors, by refusing to license, by imposing restrictions, by delaying certification or by increasing the price of future Java licences.

3.3.3.1. Degradation of existing Java licenses

896. Oracle will inherit all the current license agreements that Sun has with Oracle's downstream competitors (described in paragraph 828 and following and 858 and following). Hence, Oracle will be bound by the terms of these agreements. With respect to the JSPAs, Oracle will be bound by its obligations with respect to licensing under FRAND conditions (see paragraph 825). Even if Oracle was to terminate such JSPAs at their renewal date, its licensing obligations would persist for any JSRs that originated prior to or during the JSPA (Articles 10 and 13 of the JSPA).

897. As can be seen from the description of Java licensees that compete with Oracle, Oracle's main competitors - IBM and SAP - have existing license agreements that cover their access to Java IP rights for at least 3 years (up to 2012 for SAP and up to 2016 for IBM). RedHat's license for JEE expires in November 2011, while its SE license are perpetual. The other companies are minor competitors of Oracle with limited market shares in the application server/middleware markets.

898. In order to affect the licensing conditions of these competitors, Oracle would have to unilaterally terminate the agreements before their expiry and hence face litigation. This seems very unlikely. Generally speaking, in addition, licensees will receive access to updates (both to the RI and TCK) so long as the annual support or license fees are paid.[547] However, such updates will depend on the terms negotiated between Sun and the licensee. In the case of IBM for example, when a new Java platform is released, there will be no need to enter into new licensing arrangements so long as the new platform fits within the parameters of a "Java environment" (that is to say, a JVM and core classes).

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545 White Paper on Java dated 16 July 2009, Annex 32 to the Form CO, page 16.

546 *Ibidem*, page 18.

547 See Response of 12 August 2009 to Commission question 6 of 10 August 2009.

899. The market investigation confirmed that, in the majority of the cases, Sun does not have the right to unilaterally terminate the current contracts, and that it is accepted that new conditions can be negotiated upon conclusion of new contracts.

900. It therefore appears that the new entity will have no ability in the short term to affect the Java licensing conditions to its competitors in EAS (for instance to SAP) and no ability in the medium to long term to affect the Java licensing conditions to its major competitors in middleware (such as IBM).

901. In view of the above, it is concluded that Oracle will not have the ability to modify current contracts for the licensing of Java related IP rights.

3.3.3.2. Degradation of future Java licenses

902. It has been submitted that, within the context of the JCP, the new entity could alter the conditions under which Java licenses are granted in the future for new JSRs, and in particular, that it could specifically alter the conditions to the detriment of its downstream competitors.

903. Once again, Oracle will inherit all the JSPAs with the 1 200 JCP members which govern its obligations with respect to the licensing conditions (obligation to license; FRAND conditions) of JSRs. In addition, in view of the new JCP 2.7 Process (in place since June 2009, see paragraph 817), additional disclosure requirements are now imposed on the Spec Lead with respect to the licensing conditions for independent implementations or implementations based on the RI. Such conditions will be evaluated and considered by the members of the Executive Committee when voting on future JSRs. A number of members of the EE/SE Executive Committee - RedHat, IBM, Intel - have already publicly declared that they will look at whether the Java EE6 TCK license will contain Field Of Use Restrictions in voting on the final specification approval.[548] In the market investigation, many respondents confirmed that all the conditions attached to the licenses within the JSR process have to be disclosed.

904. In this context, the complainants have raised the concern that Oracle could attach Field Of Use Restrictions to the TCK licenses to the disadvantage of its downstream competitors. A brief overview of obligations and rights connected to the licensing of TCKs to third parties is necessary in order to understand the context and soundness of such a claim.

905. In concrete terms, the whole JCP/JSPA framework guarantees that any software developer - who wants to develop an own independent implementation or a source code modification of the Reference Implementation and wants to claim Java compatibility for its products - can require and obtain from the Spec Lead all the relevant IP rights. The Spec Lead has the obligation to license those rights.

906. For **independent implementations** section 5.B - (a) of the JSPA requires that the independent implementation fully implement the interfaces and functionalities of the JSR: the implementation must therefore mirror all the characteristics of the specification, and perform at least all the functionalities provided for in the specification. Partial implementations, in contrast, are prohibited, since otherwise any other application which relies on the presence of certain APIs (see footnote 494) described in the JSR but absent in the implementation would not run, therefore

[548] see http://jcp.org/en/jsr/results?id=4821

compromising the interoperability and open standard vocation of the JCP. Furthermore, section 5.B - (b) prohibits deviation from the conventional names attributed by the JSRs so that "calls" from any application are directed to the correct place within the platform implementation. Finally, section 5.B - (c) requires that the implementation passes the relevant TCK to ensure that the implementations "works" as foreseen in the JSR. The TCK (see paragraph 824) must always be licensed on FRAND terms. In this context, the complainants have raised the concern that Oracle could attach Field Of Use Restrictions to the TCK licenses to the disadvantage of its downstream competitors. Finally, Section 5.C. guarantees that, beyond certain specific conditions on reciprocity and protection of patent rights, which do not seem to affect in any way the possibility for a licensee to compete, and which have not been raised as critical points by any complainant or respondent, the Spec Lead must not impose any contractual condition or covenant that would limit or restrict the right of any licensee to use the specification to create or distribute an independent implementation.

907. A developer of an independent implementation would therefore have its product tested and licensed and the product would have to perform all the functionalities foreseen by the JSR.

908. As for the Spec Lead's licensing obligations in relation to the **Reference Implementation and relative TCK**, again Section 5.F.I. of the JSPA provides that the Spec Lead must offer any interested party licenses concerning the Reference Implementation and TCK on FRAND terms. Furthermore, pursuant to Section 5.F.II, the Spec Lead must enable the downstream licensor to distribute compatible binary versions of Reference Implementation-based implementations and to distribute the Reference Implementation as part of a complete binary implementation of the corresponding Spec that satisfies the 5 (a) – (c) (see paragraph 907) compatibility standards.

909. The Spec Lead is not allowed to impose additional compatibility hurdles beyond what the Specification requires. To that end, Section 5.F.IV provides that "the Spec Lead shall not include as part of the foregoing license any additional contractual condition or covenant concerning compatibility that would limit or restrict the rights of any licensee to create or distribute products derived from the [Reference Implementation]." This provision mirrors Section 5.C of the JSPA in relation to independent implementations. Section 5.F.IV thus expressly prohibits the Spec Lead from hindering in any way the compatibility of an implementation based on the Reference Implementation. In other words, a Spec Lead cannot require that a licensee's implementation must adhere to additional requirements above and beyond those spelled out in the JSR. As a result, any FOUR that might affect any licensee's ability to confirm compatibility with a JSR, the essence of what Java is all about, would not be conceivable.

910. In other words, in the cases discussed in paragraphs 906 to 909, Oracle would not have the ability to degrade or modify selectively the conditions or technology behind the JSR when granting the TCK licenses to its competitors. The binding provisions of the JSPAs are clear on this point. Furthermore, Oracle - and any Spec Lead - is bound to grant the rights described under the conditions discussed in paragraphs 906 to 909 not only to all the parties who have signed a JSPA, but to any third party (see the JSPA, Section 5.B and 5.F.I) who so requests.

911. Given this context, while it could still be possible for Sun/Oracle to impose Field Of Use Restrictions, it could not determine which technology the licensee receives, impose compatibility hurdles or apply unfair, unreasonable and discriminatory licensing terms.

Any violation of the FRAND obligations would be immediately detected at an early stage of the specification process and could be easily opposed in the Executive Committee vote.

912. None of the complainants or respondents to the market investigation suggested concretely how a Field Of Use Restriction which respects the JCP/JSPA criteria could materialize in a way that could foreclose Oracle's downstream competitors. The fact that Oracle, as Sun is currently doing, could impose on (every) J2EE TCK licensee a restriction to the use they can make of the implementations whose compliance with the Java specification is tested by the TCK (see paragraph 842) does not per se constitute evidence of foreclosure. The reasons underlying Sun's legitimate choice to delineate separations between the way the different platform editions of Java umbrella specifications are deployed responds, in Sun's view, to the need to preserve its revenues on certain types of licenses (that is to say, charging fees for any JME license as opposed to the OpenJDK licensing possibility for general computing for the JSE) and to guarantee coherence and interoperability in the Java environment. Java's essential value rests in its open and standardized nature: guaranteeing that each specification of each platform is consistent with the platform itself and does not create overlaps with other platforms - which could lead to disruption of the standard - is a perfectly justifiable manner to preserve such value.

913. The Apache Harmony dispute which arose as a consequence of Sun's proposed FOUR attached to the TCK for Apache's implementation of the J2SE (see paragraphs 845 to 850) is an example of how the community is alert and reactive to any limitation that could hinder developments that competitors or customers of Sun/Oracle could consider important. Even if the various "motions" promoted in the context of the JCP have not been formally implemented, the most relevant result of the members' pressure on Sun's practice is the adoption of the most recent update of the JCP, in June 2009. The obligation for any Spec Lead to disclose all the terms and conditions of the licenses constitutes a major step towards an increased transparency of the JCP.

914. It is also important to evaluate the alternatives available to competitors if the new entity was to degrade the licensing conditions. The possibility cannot be ruled out, for instance, that if the new entity was to degrade the licensing conditions for Java, a licensee could have an alternative supplier as, for instance, in the case of JEE, IBM's WebSphere application server. IBM has licenses allowing it to sublicense its implementation. In that case, though, Websphere could only constitute an alternative for the application server competitors who wanted to use (and perhaps adapt) an existing implementation of JEE (in this case, Websphere), while developers who wanted to create their own Independent Implementation would still need a license for Sun/Oracle.[549]

915. As regards the possibility that the merged entity might disadvantage competitors by imposing high prices for the Java licenses, this risk is limited to licenses outside the scope of the JCP, since RI and TCK licenses must always be made available by the merged entity on FRAND terms pursuant to the JCP/JSPA. In any case, the market investigation confirmed that the percentage of the total costs for the final "software products" – in broad terms, aimed at comprising all the possible outputs of all Java licensees – constituted by Java's licensing price is minimal, in general around 1%. Therefore, even if the merged entity were to demand higher prices for these licenses that go beyond what is obligatory pursuant to the JCP/JSPA, in order to really affect the

[549] See IBM's reply via email to Commission questions on 25 August 2009.

competitors' cost structure, it would have to be able to impose substantial increases. However, this scenario does not seem realistic because prospective licensees would then simply not sign for such licenses but would rather obtain the RI and the TCK under the FRAND terms guaranteed by the JCP. With a RI and a TCK license a software company has all necessary IP rights to program and deploy Java platform software, whereas the additional elements possibly included in wider licenses (such as the one to IBM) cover aspects (such as the use of Java trademarks) which are not essential for downstream competition.

916. In view of the above, it is concluded that the merged entity will not have the ability to foreclose competitors at the downstream level by degrading the Java licensing conditions.

3.3.4. Ability of Oracle to favour the development of new Java specifications to the exclusive benefit of its software

917. The complainants also submitted that the merged entity could favour the developments of Java specifications to the exclusive benefit of its software, therefore making the software of Oracle's downstream competitors less efficient or competitive.

918. New Java specifications can be developed by any member of the JCP on its own initiative. Nevertheless these new specifications need to be validated by the governing bodies of the JCP. Any JSR goes through the process described at paragraph 818 and is subject to the votes of each of the 16 members of the relevant Executive Committee which includes some of the potential victims of foreclosure.

919. The market investigation showed that it is possible, and sometimes inevitable that certain specifications are aimed at enhancing the functionalities of certain applications rather than others, but the possibility to “tweak” a technology for the benefit of one and only one application seems rather unrealistic. In addition, a clear "bias" in favour of one specific product could be easily detected by the relevant Executive Committee, which could then, by majority, vote down the specification.

920. Furthermore, the checks and balances inherent in the JCP, and the fact that many direct competitors of Oracle are present at the Executive Committee level and could, at any time, propose as a counter-strategy a specification which might favour certain products other than Oracle's, highlight that the ability for Oracle to engage in such a strategy seems quite remote.

921. Finally, it is interesting to note that Oracle itself put forward a resolution in a JCP meeting in December 2007 which has been approved by every member of the Executive Committee, with Sun abstaining: *“It is the sense of the Executive Committee that the JCP become an open independent vendor-neutral Standards Organization where all members participate on a level playing field with the following characteristics:*

- *members fund development and management expenses;*
- *a legal entity with by-laws, governing body, membership, etc.;*
- *a new, simplified IPR Policy that permits the broadest number of implementations;*
- *stringent compatibility requirements;*

- *dedicated to promoting the Java programming model;*

Furthermore, the EC [Executive Committee] shall put a plan in place to make such transition as soon as practical with minimal disruption to the Java Community".[550]

922. This resolution supports Oracle's repeated claim according to which it is and has always been a company with a vocation for open and interoperable IT platform models.

3.3.5. Incentive of Oracle to foreclose downstream competitors

923. A number of software vendors expressed the view during the market investigation that Oracle would also have the incentive to engage in input foreclosure in the form of raising rivals' costs in access to Java. In particular, these software vendors were concerned that Oracle could worsen licensing conditions by imposing restrictions to the licences, by changing the requirements of its TCK licenses, by raising licence prices, by delaying the availability of Java licences to competitors, thus technically disadvantaging competitors, by being selective in deciding which products to certify or by delaying certification.

924. Oracle has a different product portfolio than Sun. In particular, Oracle is a leading supplier of databases, middleware and software applications, whereas Sun is active only in a limited number of the markets in which Oracle is active. At the same time, Java is an important input in a number of these products, particularly middleware and software applications, both for Oracle and a number of its competitors.

925. This means that it is possible that the transaction will change the incentives of the merged entity to engage in input foreclosure, particularly in the form of raising rivals' costs in access to Java. Such a foreclosure could potentially harm consumers, as it may result in exclusion or marginalization of some competitors, increased market power of the merged entity in related markets and finally in higher prices for some software products.

926. In the assessment of incentives for input foreclosure the Commission considered potential benefits and costs to the merged entity from such behaviour.

927. The potential benefits to the merged entity from foreclosure would arise in the form of an improved competitive position with respect to competitors, which use Java as a key input in the relevant competing applications and middleware products. The foreclosed competitors would either have to accept higher costs of a key input or engage in a costly and lengthy rewrite of their applications in order to no longer rely on Java. Alternatively, the foreclosed competitors could attempt adoption of an alternative Java-like framework, which would not be subject to intellectual property rights of the merged entity.

928. Java is an established and widely adopted framework for software systems and, as a consequence, Java compliance of software products is particularly valued by customers. In the scenario where the competitors were effectively completely foreclosed from access to Java, this could result, even for those competitors having incurred the cost to rewrite their applications in order to no longer rely on Java, in a reduction of their ability to exercise competitive constraint on the newly merged entity, because

550 http://jcp.org/aboutJava/communityprocess/summaries/2007/December07-summary.html .

customers may value less software products which are not Java compliant, regardless of their functionality.

929. On the other hand, the costs to the newly merged entity from foreclosing competitors are potentially significant.

930. With foreclosure, the new entity could suffer a loss of revenues corresponding to Java licenses currently granted to the competitors that would be foreclosed. This is not likely to be a very significant loss, as very few companies currently need and acquire Java licenses. As such, this is not the key factor on the cost side of the analysis of incentives. In strictly economic terms, Sun's license revenues related to Java amount to approximately […]*. By contrast in 2007 Oracle generated a revenue of […]* in the EAS segment (market share [5-10]*%) and […]* in the middleware segment (market share [10-20]*%). Foreclosing downstream competitors would then result in relatively limited losses in the market for the licensing of Java IP rights but could substantially reduce the attractiveness of products of Oracle's competitors in the EAS or middleware markets.

931. More importantly, the foreclosure of competitors is likely to result in a loss of support that Java currently enjoys among the customers. This industry is characterized by strong network effects and the value to customers of Java compliance of applications crucially depends on the wide adoption of Java as a software development framework. The strong network effects related to Java would be lost with the loss of community support for Java, if such foreclosing behaviour is undertaken.

932. After an effective foreclosure of competitors, it is not likely that the new entity would be able alone to preserve the status currently enjoyed by Java, which resulted from the network effects generated by the wide community of active independent developers and software vendors. This would result in a significant reduction of the value of Java compliant applications and Java as an application development framework itself. Java compliance is currently a key value proposition and a competitive factor for a number of Oracle's software products, which will at least partially be diluted if foreclosure is implemented.

933. The Java framework and the Java compliance presently represent a key competitive factor for Oracle's Java based and Java compliant solutions in relation to alternative software vendors, for example, Microsoft, which do not rely heavily on Java and Java compliance and rather base their applications on alternative frameworks (for example, .NET). Those competitors might therefore benefit from such a foreclosure.

934. As such the foreclosure and the resulting loss in terms of network effects would adversely affect the competitiveness of the software products of the new entity itself in relation to alternative software vendors, which rely on alternative frameworks. Due to these factors, the competitiveness of the merged entity against at least some significant competitors would be significantly reduced following foreclosure.

935. Moreover, following attempts to foreclose competitors, Java forks could appear, as software vendors would turn to alternatives. To some extent this would defeat the purpose of foreclosure to raise rivals' costs, as they could continue using a fork of Java as the input for their software development. But more importantly, it would result in fragmentation and the fracture of the Java standard, resulting in the loss of network effects and further reduce the value of Java compliance of applications. Among those that would be hurt most in such a scenario are likely to be the Java compliant

applications of the merged entity. The resulting fracture of the Java standard, however, would decrease the value of the Java compliant applications both of the foreclosed competitors and of the merged entity in comparison to those competitors, which do not rely on Java framework heavily and base their value proposition on proprietary alternatives.

936. On balance, it is concluded that it is very likely that the benefits of foreclosure of access to Java would not exceed the costs of such behaviour for the merged entity and that, therefore, the merged entity would have no incentive to foreclose.

3.3.6. Impact on the market

937. Given that Oracle is unlikely to have the ability and the incentive to foreclose downstream competitors, it is not necessary to examine the overall impact of the proposed transaction on effective competition. However, it is worth repeating that, by taking over Sun's position in the JCP, Oracle would have a strong interest to make sure that Java stays technically up-to-date and unified as an open, transparent and standardized process. Thus the likely impact on the market could be positive, reinvigorating Java's position and benefitting the industry and consumers alike.

3.4. Conclusion

938. In view of the foregoing it is concluded that, since Oracle would not have either the ability or the incentive to foreclose its downstream competitors, the proposed transaction would not lead to a significant impediment to effective competition in respect of the licensing of IP rights connected to the Java development environment.

E. IT stack

1. The relevant product market

939. Apart from the database and middleware market which have already been discussed in section B and C, respectively, of this Decision, Oracle and Sun are also active in the market for servers, storage solutions, operating systems and EAS.

1.1. Servers

940. The notifying party considers that the relevant market for servers should be subdivided into three segments for low-end, mid-range and high-end servers.

941. In its previous *HP/Compaq* decision, the Commission's market investigation indicated that a delineation of the relevant product market by price range would be appropriate[551]. Ultimately the definition of the product market was left open. For the purpose of this Decision the precise product market definition as regards servers can be left open.

1.2. Storage solutions

942. The notifying party considers that there is a single market for storage solutions, comprising all types of mediums used for storage.

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551 See Commission decision in case M.2609 – *HP/Compaq* of 31 January 2002.

943. As regards storage solutions, the Commission has in a previous Decision identified potential separate product markets according to the storage media used, such as disk, optical and tape[552]. For the purposes of this Decision the precise product market definition as regards storage solutions can be left open.

1.3. Operating systems

944. The notifying party considers the relevant market to be the market for server operating systems, subdivided into operating systems for three distinct types of servers, namely operating systems for entry-level or workgroup servers, mid-range and high-end servers.

945. In the Microsoft antitrust decision the Commission defined operating system markets, in particular the market for workgroup server operating systems, pursuant to a functional approach, that is to say, different server operating systems were found to be in the same market if they provided the same functionality even if they ran on different processors or belonged to different "families" of operating systems (such as Unix or Windows).[553]

946. For the purpose of this Decision the precise product market definition as regards operating systems can be left open.

1.4. EAS

947. In the decision in *Oracle/Peoplesoft* [554], the Commission defined the EAS market as a sub-category of business application software (as opposed to consumer software) which comprises "(i) enterprise applications and (ii) services related to the implementation and use of such software (these may include integration services, support and maintenance services, training services and/or hosting services)". Furthermore, the Commission found that the EAS market could be sub-divided in various categories, "having functionality with broadly similar purposes", such as Enterprise Resource Planning (ERP), Customer Relationship Management (CRM) and Supply Chain Management (SCM)"[555], but only concluded as to the existence of separate markets for two sub-categories of ERP (FMS – financial management systems and HR – human resources).

948. For the purpose of this Decision the precise product market definition as regards EAS can be left open.

2. The relevant geographic market

949. The notifying party considers that the relevant geographic markets for servers, storage solutions and operating systems are worldwide.

950. In previous cases the Commission considered that the markets for servers, storage solutions, and EAS are at least EEA-wide in scope[556]. In the Oracle/Peoplesoft decision, the Commission also considered the relevant geographic market for EAS to be at least

552 See Commission decision in case M.3866 – *Sun/Storagetek* of 26 August 2005.

553 See Commission decision in case COMP/C-3/37.792 Microsoft of 24 April 2004.

554 See Commission decision in case M.3216 – *Oracle/Peoplesoft* of 26 October 2004, para. 15.

555 See Commission decision in case M.3216 – *Oracle/Peoplesoft* of 26 October 2004, para. 18.

556 See Commission decision in case M.2609 – *HP/Compaq* of 31 January 2002 and Commission decision in case M.3866 – *Sun/Storagetek* of 26 August 2005.

EEA-wide, but ultimately left the market definition open. In its Microsoft antitrust decision the Commission found the markets for operating systems to be worldwide. For the purpose of this Decision the precise geographic scope of the markets for servers, storage solutions, EAS and operating systems can be left open.

3. Competitive assessment

3.1. Position of the parties in the technology stack

951. The estimated market shares of the merged entity in the different layers of the technology stack, based on a wide market definition, are the following.

Table 10: Market shares of Oracle and Sun in terms of revenues – 2007

	Oracle	**Sun**
Hardware/Servers	-	[10-20]*%
Operating System	-	[5-10]*% (2006)
Databases	[40-50]*% (2008)	[0-5]*% (2008)
Middleware	[10-20]*% (2007)	[0-5]*% (2007)
Enterprise Application Software	[5-10]*%	-

Source: IDC

952. According to the notifying party, the main competitors in the hardware/server market are IBM, HP and Dell, in the market for operating systems are IBM, Microsoft, Linux and HP and in the market for Enterprise Application Software are IBM, SAP and Microsoft.

953. The merged entity will be the only firm apart from IBM to offer and produce internally all the elements of the technology stack. The merged entity will be the market leader at the level of databases. However, competitors will still remain at each level of the stack.

3.2. Foreclosure of access for competing database vendors to customers using Sun's operating system Solaris

954. The Commission assessed whether acquiring Sun's Solaris operating system will enable Oracle to further strengthen its control of the market for databases. According to this theory of harm the Commission assessed whether Oracle has the ability and the incentive to degrade the interoperability of the Solaris operating system with competing databases so as to induce customers using the Solaris operating system to migrate to Oracle's database. This argument had been brought forward by one of the complaining competitors.

955. However, it appears unlikely that such practice could be of benefit to Oracle and that Oracle would thus have an incentive to revert to such a practice. The merged entity's market share in operating systems amounts to below [5-10]*% and is thus limited. If the merged entity degraded the interoperability of Solaris with databases other than its own, some customers would abandon Solaris for another operating system in order to avoid lock-in.

956. The market investigation reveals that while the majority of customers believe that it might be technically possible to degrade the interoperability of Solaris with other databases, the majority of the customers also consider that Oracle is not likely to follow this approach. The degrading of the interoperability of Solaris would have a negative impact on the merged entity and its profits due to reduced sales of Solaris. The majority of the competitors did not see any problems of potential vertical foreclosure of database vendors.

957. In addition, the technical tying of products can also be considered as an efficiency, because it will facilitate integration of various components of the technology stack, thereby reducing customers' IT systems integration costs and risks.

958. It is therefore concluded that it is unlikely that the vertical integration of the merged entity in the database market and the market for operating systems will lead to foreclosure of access for competing database vendors.

3.3. Assessment of conglomerate effects

959. The merged entity will become a fully vertically-integrated company in the hardware/software area. The complainants have submitted that the merged entity is likely to use its advantage to foreclose its competitors in the software or hardware markets. In particular, it is claimed that the merged entity could degrade the interoperability of one of its products in one layer of the technology stack with products from competitors in other layers. For example the merged entity could degrade the interoperability of its operating system Solaris with hardware or software from competitors. This would lead customers using Solaris to purchase other elements from the stack (servers, databases, software) from the merged entity, even at higher prices.

960. However it appears unlikely that such a practice could benefit the merged entity. In all layers of the technology stack but databases, the market share of the merged entity is limited and can hardly be leveraged. For instance if the merged entity degraded the interoperability of Solaris with servers other than the merged entity's, it is likely that customers would rather abandon Solaris for another operating system. Regarding databases, tying Oracle's databases to other products of the layer would risk losing more valuable database customers in the attempt to gain customers in other layers, where gross margins are lower (for instance gross margins from Sun in hardware account for approximately […]*, whereas gross margins of Oracle in the software area are around […]*).

961. The market investigation reveals that a majority of customers believes the merged entity would be unable to foreclose its competitors due to its presence in the entire stack. While the transaction is considered a significant change for the IT industry, respondents see competition from other vendors that are present in the entire stack or substantial parts of it.

962. In addition, the technical tying of products can also be considered as an efficiency, because it will facilitate integration of various components of the technology stack, thereby reducing customers' IT systems integration costs and risks. According to the market investigation customers overall share this view.

963. Thus it is unlikely that the vertical integration of the merged entity in the technology stack would give rise to any adverse effects. The market investigation also did not

reveal that on balance the proposed transaction would give rise to anti-competitive conglomerate effects.

3.4. Conclusion

964. On the basis of the preceding considerations, it is concluded that the proposed transaction would not lead to a significant impediment to effective competition due to the merged entity's presence in the IT stack,

HAS ADOPTED THIS DECISION:

Article 1

The notified operation whereby Oracle Corporation acquires sole control of Sun Microsystems, Inc. within the meaning of Article 3(1)(b) of Regulation (EC) No 139/2004 is hereby declared compatible with the common market and the functioning of the EEA Agreement.

Article 2

This Decision is addressed to:

Oracle Corporation
500 Oracle Parkway
United States of America
CA 94065
Redwood Shores

Done at Brussels, 21.01.2010

For the Commission
(signed)
Neelie KROES
Member of the Commission