EUROPEAN COMMISSION
DG Competition

Case M.7861 - DELL / EMC

Only the English text is available and authentic.

REGULATION (EC) No 139/2004
MERGER PROCEDURE

Article 6(1)(b) NON-OPPOSITION
Date: 29/02/2016

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EUROPEAN COMMISSION

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In the published version of this decision, some information has been omitted pursuant to Article 17(2) of Council Regulation (EC) No 139/2004 concerning non-disclosure of business secrets and other confidential information. The omissions are shown thus […]. Where possible the information omitted has been replaced by ranges of figures or a general description.

PUBLIC VERSION

MERGER PROCEDURE

To the notifying party:

Dear Sir/Madam,

Subject: **Case M.7861 - Dell / EMC**
Commission decision pursuant to Article 6(1)(b) of Council Regulation No 139/2004[1] and Article 57 of the Agreement on the European Economic Area[2]

(1) On 25 January 2016**,** the European Commission received notification of a proposed concentration pursuant to Article 4 of the Merger Regulation by which Denali Holding, Inc. ("Denali", USA), the owner of Dell Inc. ("Dell", USA) acquires within the meaning of Article 3(1)(b) of the EU Merger Regulation sole control of the whole of the undertaking EMC Corporation ("EMC", USA) by way of purchase of shares (the "transaction").[3] Denali/Dell is designated hereinafter as the "Notifying Party". Denali/Dell and EMC are collectively referred to as the "Parties" or "the merging parties", while the company resulting from the transaction is referred to as "the merged entity"

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1 OJ L 24, 29.1.2004, p. 1 ("the Merger Regulation"). With effect from 1 December 2009, the Treaty on the Functioning of the European Union ("TFEU") has introduced certain changes, such as the replacement of "Community" by "Union" and "common market" by "internal market". The terminology of the TFEU will be used throughout this decision.

2 OJ L 1, 3.1.1994, p.3 ("the EEA Agreement").

3 Publication in the Official Journal of the European Union No C 37, 30.1.2016, p. 4.

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1. THE PARTIES AND THE CONCENTRATION

(2) Denali is a holding company, the parent of Dell. Denali is solely controlled by Michael S. Dell, the founder and CEO of Dell. Dell is active in the development, sales, repairs, and support for computers and related products and services, including storage products. Dell was founded in 1984 and is headquartered in Round Rock, Texas.

(3) EMC is active in data storage, information security, virtualization, analytics, cloud computing, and other products and services that enable businesses to store, manage, protect and analyse data. Organised as a federation, EMC owns, inter alia, approximately 81% of VMware, Inc., a publicly-traded provider of virtualization software. It also owns […]% of VCE Company LLC, a joint venture with Cisco that sells converged infrastructure appliances, and specifically converged data centre units.[4] EMC's federation also includes businesses active in backup software, identity and access management, and cloud technologies.

(4) Pursuant to an agreement and plan of merger dated 12 October 2015, Denali is to acquire 100% of the share capital of EMC via a newly created acquisition company. Upon completion of the merger, EMC shareholders will receive shares of tracking stock that will be publicly traded and that are intended to track, in the aggregate, an approximately 53% of economic interest in the VMware business.[5] EMC will become a wholly-owned subsidiary of Denali and a sister company of Dell. The transaction therefore constitutes a concentration within the meaning of Article 3(1)(b) of the Merger Regulation.

(5) The Notifying Party submits that the transaction seeks to combine the complementary strengths of Dell (in personal computers and servers) and EMC (in storage and software) to offer large and small customers a full range of solutions, including storage, security, software, cloud, converged and virtualized environments.[6] In particular, the proposed concentration will position the combined company to capitalise on trends in the information technology ("IT") industry, such as the rapid explosion in data and the need for sophisticated data analytics, and the transition from on-premises to cloud infrastructures. Internal documents confirm that the parties seek to combine their expertise to expand and strengthen their portfolio in these areas, […].[7]

2. UNION DIMENSION

(6) The Parties concerned have a combined aggregate world-wide turnover of more than EUR 5 000 million[8] (Dell: EUR […]; EMC: EUR […]). Each of them has a

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4 Cisco has a 10% stake in VCE and VMware owns the remaining […]%. The converged data centre units are known as vBlocks, and incorporate Cisco servers and networking hardware, EMC storage systems and VMware software.

5 A tracking stock is a separate class or series of a company's common stock that is intended to reflect the economic performance of a defined set of assets and liabilities, usually consisting of a specific business or subsidiary.

6 See internal documents, for example: […].

7 See Internal documents: […].

8 Turnover calculated in accordance with Article 5 of the Merger Regulation.

Union-wide turnover in excess of EUR 250 million (Dell: EUR […]; EMC: […]), but they do not achieve more than two-thirds of their aggregate Union-wide turnover within one and the same Member State. The transaction therefore has a Union dimension under Article 1(2) of the Merger Regulation.

3. RELEVANT MARKETS

(7) The transaction combines two global providers of IT systems and IT software, resulting in a horizontal overlap mainly in relation to storage systems and, in particular, external enterprise storage systems ("external ESS").[9]

(8) In addition, the transaction gives rise to non-horizontal links since Dell is active in servers and storage systems, and VMware (owned by EMC) is a supplier of virtualization software that can be used in conjunction with servers and storage. Customers can buy their IT equipment separately and integrate the components themselves, or acquire pre-integrated "converged" systems, combining server hardware, external ESS, networking equipment, virtualization software, unified management software and/or other software applications.

(9) In light of the above, the Commission will examine the relevant market definition in relation to the following product areas: (i) storage systems; (ii) servers; (iii) virtualization software; and (iv) converged infrastructure solutions.

3.1. Storage systems and external ESS

(10) The storage resources of a business' IT infrastructure allow for information to be written to a storage solution (hard disk drive or flash drive), retained and retrieved (read).

(11) Broadly speaking, there are two types of storage: internal storage and external storage. Internal storage is the storage housed within the server enclosure: servers typically come with a limited amount of storage, dedicated to the server. External storage consists of the additional storage resources of a data centre, outside the servers: external storage systems are commonly required, due to the massive amount of data involved in modern enterprise operations.

(12) Another relevant distinction is enterprise storage as opposed to client storage. Enterprise storage is storage for use in corporate environments (such as data centres), while client storage refers to storage for lower workload environments, usually for use by individual consumers.

(13) External ESS is one component of a typical data centre, which works in conjunction with other IT components (such as servers, networking hardware such as cables and switches), security hardware (*e.g.*, firewalls), and redundant power and cooling systems to store, manage and disseminate data for an enterprise.

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9 The merging parties' activities also overlap in the supply of identity and access management software and back-up software. Based on the information provided by the Notifying Party, under any plausible relevant product and geographic market definition the combined shares are below 20%. Moreover, none of the respondents to the market investigation raised any concern arising from the combination of these activities. As a result, these overlaps will no longer be discussed in the remainder of this decision.

(14) External ESS (also referred to as "storage arrays") are composed of one or more physical controllers (each a processor and firmware) that manage and provide a common interface to multiple hard disk drives ("HDDs") or solid-state (flash) drives ("SSDs") (or a combination of both HDDs and SSDs)[10] as well as other components such as cables, housing, and host bus adapters.

(15) The array then presents its multiple component drives as one resource to the data centre servers and frequently external clients, allowing them to read and write data. Traditional storage systems can be directly attached to the server (so-called "directly attached storage" or "DAS"), or connected via a computer network, which has the additional advantage of providing a shared pool of storage accessible across multiple servers.

3.1.1. Product market definition

(16) In previous decisions, the Commission has considered several markets in the IT industry including IT services, IT software, and IT systems (comprising electronic information processing systems including servers and storage systems).[11] The Commission identified a separate product market for storage solutions in its *HP/Compaq* decision.[12]

(17) The Commission also investigated relevant storage systems markets in cases *Sun/Storagetek*[13] and *Oracle/Sun Microsystems*.[14]

(18) In *HP/Compaq*, *Sun/Storagetek* and *Oracle/Sun Microsystems*, the Commission considered whether, within the overall storage solutions market, separate markets could be identified based on the type of media used (disk, optical and tape).[15] In addition, in *HP/Compaq* and *Sun/Storagetek*, the Commission considered whether disk storage should be further segmented by the type of the installation/architecture of the storage system, into DAS, storage area networks ("SAN") and network attached storage ("NAS").[16] Finally in *Sun/Storagetek*, the Commission also examined the possibility of further segmenting tape storage solutions.[17] Ultimately, the Commission left the market definition in those cases open. Moreover, in those

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10 HDDs contain mechanical components such as spinning disks and read/write heads, while SSD technology is based on electronic interfaces and has lower power requirements. Flash memory has no moving parts and can be erased and reprogrammed in units of memory. Those units are called "blocks" and can be altered in a single command, in a "flash".

11 Commission decision of 15 December 2014 in Case M.7458 – *IBM/INF Business of Deutsche Lufthansa*, paragraphs 12 and 13.

12 Commission decision of 31 January 2002 in Case M.2609 – HP/Compaq; see also Commission decision of 26 August 2005 in Case M.3866 – Sun/Storagetek, paragraph 7.

13 Commission decision of 26 August 2005 in Case M.3866 – Sun/Storagetek.

14 Commission decision of 21 January 2010 in Case M.5529 – Oracle/Sun Microsystems.

15 Commission decision of 31 January 2002 in Case M.2609 – HP/Compaq, paragraph 24; Commission decision of 26 August 2005 in Case M.3866 – Sun/Storagetek, paragraph 7; Commission decision of 21 January 2010 in Case M.5529 – Oracle/Sun Microsystems, paragraphs 942 and 943.

16 Commission decision of 31 January 2002 in Case M.2609 – HP/Compaq, paragraph 25; Commission decision of 26 August 2005 in Case M.3866 – *Sun/Storagetek*, paragraph 10.

17 Commission decision of 26 August 2005 in Case M.3866 – *Sun/Storagetek*, paragraphs 8 to 10.

previous decisions no distinction was made between enterprise and client storage, and internal and external storage.

3.1.1.1. The Notifying Party's view

(19) According to the Notifying Party, the market for storage systems has evolved considerably over the last few years, which has rendered past Commission decisions to some extent obsolete.

(20) The Notifying Party submits that internal storage (storage contained within a server) is not part of the relevant product market. Internal storage capacity is limited by the physical size of the server enclosure and the unused internal storage capacity generally cannot be accessed by or reallocated to other server systems. External storage, however, can be either directly attached to a server or connected via a computer network, so as to create a shared pool of storage accessible simultaneously by several servers.

(21) According to the Notifying Party, internal storage systems are not substitutes for external storage systems because of the limited ability, scalability and performance of internal storage systems. As internal storage belongs to a server, without software that makes the server behave like a storage system (*i.e.*, software-defined storage or "SDS") or a hyperconverged appliance with storage, it would not be possible – according to the Notifying Party – for an internal storage system to perform as an external storage. Moreover, unlike external storage that can be shared between various servers, internal storage (without SDS) cannot be shared and is unique to a server. From a supply-side perspective, the Notifying Party notes that companies such as EMC, NetApp or Nimble Storage are focused on their external storage offering and do not offer internal storage systems at all, as opposed to companies such as Dell and HP selling servers which do offer internal storage systems. In summary, according to the Notifying Party the relevant product market is not narrower than the supply of external ESS.

(22) In addition, according to the Notifying Party the relevant product includes enterprise storage only, as opposed to consumer storage which is offered to individuals.

(23) The Notifying Party further submits that a categorization of the market for storage solutions by type of media used, *i.e.* between disk, optical and tape, is not relevant. According to the Notifying Party the main type of media used today are disks, while optical or tape are used less frequently.[18]

(24) The Notifying Party further submits that, both for demand and supply-side considerations, it is not possible to segment the market for external ESS between HDD arrays, all-flash arrays ("AFA") and hybrid flash arrays ("HFA"), which would belong to the same product market.

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18 The Notifying Party submits that optical and tape served as the media of choice for all backup, recovery, and archive functions in the past, but increasingly have been replaced by disk based systems and purpose-built backup appliances ("PBBAs"), which is a combination of a general purpose storage array, a server engine and software used for backup storage, rather than primary storage. According to the Notifying Party, optical and tape are now almost exclusively the domain of very long-lived archives and tape backups, and are not used for primary storage.

(25) Furthermore, according to the Notifying Party the distinction between storage systems directly attached to the server (so-called "directly attached storage" or "DAS"), network-attached storage ("NAS") and storage area networks ("SAN"), would no longer be relevant, both from the demand and the supply side.

(26) Finally, in support of its claim that the Parties' respective ESS portfolios are complementary, the Notifying Party has submitted market share data for different price bands of external ESS, namely (i) **entry-level** storage systems, comprising all systems with an average selling value below USD 25 000; (ii) **mid-range** enterprise storage systems, consisting of all systems with an average selling value of USD 25 000 to USD 249 999; and, (iii) the **high-end** band, covering all systems with an average selling value of USD 250 000 and above. The International Data Corporation ("IDC"), a market analyst, publishes data based on these three segments. [19]

(27) According to the Notifying Party, the prices reflect the sophistication of the storage products in terms of workload capabilities, scalability performance, reliability, data processing efficiency, data recoverability, data sharing features, data security and energy efficiency. However, none of the three segments would have niche customers with specific feature requirements. On the supply-side, the Notifying Party submits that there are no storage vendors providing external ESS with special features that no other vendor is able to replicate.

3.1.1.2. The results of the market investigation and the Commission's assessment

(28) With regard to the possible distinction between internal and external storage, the majority of respondents to the market investigation consider that within the overall storage systems sector, there are separate markets for internal and external storage.[20] Respondents pointed out that external storage has significantly different characteristics compared to internal storage and that the segmentation is common practice in the industry.[21]

(29) As to enterprise storage (storage for servers and for storage systems in high workload environments, such as corporate data centres) and client storage (storage for lower workload environments that are usually for use by individual consumers, such as personal computers and portable electronic devices) most respondents to the market investigation consider that these constitute separate markets.[22]

(30) Most respondents to the market investigation also submitted that the possible market for external ESS should be segmented based on type of media used (disk, optical and tape).[23] Respondents pointed out, among other things, differences in

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19 International Data Corporation (IDC) is a global provider of market intelligence for information technology, telecommunications and consumer technology markets.

20 See replies to Q1 – questionnaire to competitors, question 10.

21 See replies to Q1 – questionnaire to competitors, question 10.

22 See replies to Q1 – questionnaire to competitors, question 9.

23 See replies to Q1 – questionnaire to competitors, question 13.

terms of price and use, as tape (and increasingly optical) media are being used for archiving / backup.[24]

(31) With regard to a possible segmentation into HDD arrays, AFAs and HFAs (depending on the use of HDDs, SSDs or both), the majority of respondents to the market investigation disagreed with such a segmentation.[25] Respondents pointed out that – despite SSDs' lower capacity, higher price and higher speed – these types of drives can be used interchangeably in most ESS solutions and that frequently a combination of both types of drives is used.[26] The Commission notes that in previous decisions, the Commission found that SSDs and HDDs do not belong to the same relevant product markets.[27] However, the Commission notes that the present investigation concerns the market for external ESS, *i.e.*, storage arrays, rather than the market for HDDs or SSDs contained in such arrays.

(32) As to the segmentation by type of installation / architecture (DAS, NAS, SAN), the majority of respondents to the market investigation disagreed with this distinction.[28] Respondents pointed out the demand-side and supply-side substitutability among these storage topographies and the development of new technologies (network unified storage or "NUS", software-defined storage or "SDS", hyper-converged solutions).[29]

(33) As regards another possible segmentation of external ESS by price bands (in line with the segmentation included in the IDC reports),[30] most respondents agreed with this segmentation.[31] Respondents pointed out differences in terms of volume of storage offered, performance of storage and advanced features (such as replication, deduplication, compression, and manageability features). However, competitors indicated that they are typically present in two or three price bands and that it is possible to switch production from one segment,[32] though with differing degrees of difficulty (*e.g.*, it would not be easily feasible to switch production from low-end to high-end).

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24 See replies to Q1 – questionnaire to competitors, question 13.

25 See replies to Q1 – questionnaire to competitors, question 14.

26 See replies to Q1 – questionnaire to competitors, question 14.

27 Commission decision of 19 October 2011 in Case M.6214 – *Seagate Technology/The HDD Business of Samsung Electronics*, recitals 256-259; and Commission decision of 23 November 2011 in Case M.6203 – *Western Digital Ireland/Viviti Technologies*, recitals 362-365.

28 See replies to Q1 – questionnaire to competitors, question 15.

29 See replies to Q1 – questionnaire to competitors, question 15.

30 High-end (all systems with an average selling value over USD 250 000), mid-range (USD 25 000 to USD 249 999); low-end (below USD 25 000).

31 See replies to Q1 – questionnaire to competitors, question 11.

32 See replies to Q1 – questionnaire to competitors, question 12.

3.1.2. Geographic market definition

(34) In previous decisions, the Commission considered that the market for storage solutions was at least EEA-wide, if not worldwide, but ultimately left the exact geographic market definition open.[33]

3.1.2.1. The Notifying Party's view

(35) The Notifying Party submits that the relevant geographic market for ESSs should be considered as worldwide in scope, since (i) manufacturers offer the same products under the same brands to all their customers regardless of geographic location; (ii) almost all suppliers of storage have a presence (in their own name or through distributors) in all parts of the globe; (iii) transportation costs are low; (iv) technical requirements and language differences do not have any impact on cross-border trade; and (v) prices are broadly similar across geographic regions.

3.1.2.2. The results of the market investigation and the Commission's assessment

(36) Most respondents to the market investigation confirmed the Notifying Party's view indicating that the geographic scope of the market for external storage solutions is worldwide.[34]

3.1.3. Conclusion on market definition for storage systems

(37) In light of the considerations in this section, and for the purpose of this decision, the exact delineation of the relevant product and geographic market(s) for storage systems can be left open, as the transaction does not give rise to serious doubts about its compatibility with the internal market under any plausible market definition.

3.2. Servers

3.2.1. Product market definition

(38) Servers are the computing power of the data centre. Servers can be used in many ways, and in large companies usually have a single function per server, for example file servers, web servers, printer servers, application servers. Servers also have a limited amount of internal storage capacity. A server can take different forms, such as rack, blade, tower or cloud physical servers, or a cloud logical server, which is delivered through server virtualization.

(39) Dell only sells servers based on open x86 architecture (as opposed to proprietary CPU architecture designed to run proprietary operating systems). The Notifying Party notes that the virtualisation software of VMware, Red Hat, Microsoft and other competitors only works on x86 servers, and that x86 servers represent more than 80% of all servers sold by revenue and more than 90% by units sold. EMC is

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33 Commission decision of 15 December 2014 in Case M.7458 – *IBM/INF Business of Deutsche Lufthansa*, paragraph 41; Commission decision of 31 January 2002 in Case M.2609 – *HP/Compaq*, paragraph 25; Commission decision of 26 August 2005 in Case M.3866 – *Sun/Storagetek*, paragraph 13; Commission decision of 21 January 2010 in Case M.5529 – *Oracle/Sun Microsystems*, paragraph 950.

34 See replies to Q1 – questionnaire to competitors, question 18.

not active in the server business. For the purposes of this investigation, "servers" is therefore understood to refer to x86 servers.

(40) In previous decisions, the Commission considered the "IT stack", of which the first layer is hardware, including servers. In *Oracle/Sun Microsystems*, the Commission looked at the party's claim that the relevant market for servers should be sub-divided into three segments, for low-end, mid-range and high-end servers.[35] In *HP/Compaq*, the parties argued that all servers constitute one market but considered alternative market definitions based on price and platform.[36] The Commission's market investigation in *HP/Compaq* confirmed its previous approach to delineate on the basis of price bands, as proxies to reflect different functionalities by band (entry-level below USD 100 000, mid-range USD 100 000 to USD 999 999, high-end above USD 1 million). In both those decisions, the Commission ultimately left the product market for servers open.

3.2.1.1. The Notifying Party's view

(41) The Notifying Party refers to the Commission's previous decisions, in which the Commission suggested a possible segmentation of servers by price band as proxies reflecting the different functionalities, while ruling out a further segmentation by operating systems and/or applications served. The Notifying Party submits that it is ultimately not necessary to decide on the relevant product market as the transaction does not give rise to any competition (non-horizontal) concerns under any possible product market definition.

3.2.1.2. The results of the market investigation and the Commission's assessment

(42) During the market investigation in this case the possible segmentations of the server market were tested. Most respondents to the market investigation agreed with the segmentation of servers by price-band into low-end, mid-range and high-end, as a proxy for functionality or task.[37] The market investigation did not provide a clear result as to a possible segmentation of servers by operating systems or by the applications they serve.

3.2.2. Geographic market definition

3.2.2.1. The Notifying Party's view

(43) The Notifying Party refers to previous decisions by the Commission in which it has considered the server market to be at least EEA-wide, if not world-wide. It submits that, due to low transport costs, similar customer preferences, product specifications and patterns of sales of most major manufacturers, the relevant geographic market is world-wide in scope.

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35 Commission decision of 21 January 2010 in case M.5529 – *Oracle/Sun Microsystems*.

36 Commission decision of 31 January 2002 in case M.2609 – *HP/Compaq*.

37 See replies to Q1 – Questionnaire to competitors, of 27 January 2016, question 8.

3.2.2.2. The results of the market investigation and the Commission's assessment

(44) The results of the market investigation indicated that the geographic scope of the market for servers is at least EEA-wide or even worldwide, in line with previous Commission merger decisions.[38]

3.2.3. Conclusion on market definition for servers

(45) In light of the considerations in this section, the Commission considers that, for the purpose of this decision, the exact delineation of the relevant product and geographic market(s) for servers can be left open, as the transaction does not give rise to serious doubts about its compatibility with the internal market under any plausible market definition.

3.3. Virtualization software

3.3.1. Product market definition

(46) In computing, virtualization refers to the act of creating virtual versions of computer resources, like computer hardware, operating systems, storage devices, or network resources. Virtualization is, therefore, an intermediary layer between hardware and other software components, such as operating systems and applications. Virtualization software is one of the main software products marketed by VMware.[39]

(47) VMware provides x86-based[40] virtualization and management software for the entire data centre, including server, storage and network virtualization.[41]

(48) Combined with servers, virtualization software technology makes it possible to run multiple operating systems and multiple applications on the same server at the same time, by separating them in virtual machines. Virtualization software is therefore used by customers to increase the efficiency of a given physical server and, more generally, a data centre, by running multiple isolated workloads on a single server, rather than requiring multiple physical servers, as might have been the case in the absence of server virtualization technology.

(49) Server virtualization is also a key component of cloud computing, which typically depends on the ability to dynamically allocate new virtual machines, storage

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38 See replies to Q1 – Questionnaire to competitors, of 27 January 2016, question 17.

39 Customers use virtualization platforms for different (and sometimes multiple) reasons, such as: i) to facilitate decentralized IT organization, allowing different groups or business units to choose their own platform; ii) to align different application stacks; iii) to use different platforms for different IT environments.

40 The x86 architecture is an instruction set architecture (ISA) series for computer processors.

41 VMware refers to this overall approach as building software-defined data centres ("SDDCs"). Key VMware products in this space are vSphere (server virtualization for x86 servers), vSAN (storage virtualization, VMware NSX (network virtualization) and VMware Horizon (desktop virtualization). More specifically vSphere can be purchased as a stand-alone component or as part of broader virtualization suites that can include management, storage and network solutions.

resources, networking, etc. to meet changing demand, and to automate the management of those resources through software interfaces.

(50) Combined with storage, virtualization software technology aims to provide a layer of abstraction by pooling physical storage from multiple network storage devices into a single virtual storage interface. More specifically, storage virtualization software (or "SDS") maps storage space by logical location (virtual) rather than physical location (hardware), which provides more efficiency, flexibility and scalability. These features allow workloads to be deployed faster, operations to become automated, and create significant cost savings for data centres.

(51) Combined with physical network components,[42] virtualization software technology creates virtual networks which are programmatically created, provisioned and managed, with the underlying physical network serving as a simple packet-forwarding backplane. More specifically, the software allocates network and security services to each virtual machine according to its needs while the virtual machine moves among hosts in the dynamic virtualized environment.

(52) Combined with desktops, virtualization software technology separates the desktop environment and associated application software from the hardware device that is used to access it. In essence, this software is decoupling a PC desktop environment from a physical device so that the virtual machine ("VM") of the PC desktop stored in a centralised server can be accessed from a remote client device through a network.[43]

(53) In previous decisions in *Computer Sciences Corporation / iSOFT Group* [44] and *IMB / INF Business of Deutsche Lufthansa*,[45] the Commission considered a segmentation of software based on (i) the different functionalities of the software and the sector concerned, and (ii) the end uses offered by that particular software.

(54) As regards functionality, the Commission found that distinctions in the software industry are generally made between (i) infrastructure software (*i.e.*, servers and databases); (ii) middleware (*i.e.*, integration platforms); (iii) application software and office software; and (iv) operating/browser software. As regards end uses, the software industry was generally segmented between high and low-end or between high-end, mid-range and low-end. The exact product market definition was ultimately left open.

(55) In its decision *Oracle / Sun Microsystems*[46] the Commission considered a further segmentation of middleware[47] into, among other things, virtualization software. The product market definition was ultimately left open.

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42 Such as logical switches, routers, firewalls, load balancers and VPNs.

43 There are various desktop virtualization technologies targeting different use cases, such as hosted virtual desktop ("HVD"), local VM, streaming desktop and hosted shared desktop.

44 Case M.6237 – *Computer Sciences Corporation / iSoft Group*, Commission decision of 26 June 2011, paragraph 22.

45 Case M.7458 – *IBM / INF Business of Deutsche Lufthansa*, Commission decision of 15 December 2014, paragraph 42.

46 Case M.5529 – *Oracle / Sun Microsystems*, Commission decision of 21 January 2010, paragraph 769.

(56) With regard to middleware, in *Oracle/Sun Microsystems*[48] and *Oracle/BEA*, [49] the Commission investigated whether all types of middleware belonged to a single market or needed to be further segmented according to the end use of the product, including a sub-segment for virtualization software. Ultimately, the market definition was left open.

3.3.1.1. The Notifying Party's view

(57) The Notifying Party submits that the four segmentations considered in previous decisions are now out-dated, as the software industry is currently fragmented and in flux. In support of its submission, the Notifying Party provided the Commission with IDC industry report data, according to which the industry should be segmented into three "primary" segments, namely: (i) application development and deployment, (ii) applications, and (iii) system infrastructure software (including virtualization software).

(58) The Notifying Party additionally submits IDC data[50] according to which the industry is further segmented into eighteen "secondary markets", namely: (i) Application Development Software; (ii) Application Platforms; (iii) Collaborative Applications; (iv) Content Applications; (v) Customer Relationship Management (CRM) Applications; (vi) Data Access, Analysis and Delivery; (vii) Engineering Applications; (viii) Enterprise Resource Management (ERM) Applications; (ix) Integration and Orchestration middleware; (x) Network Software; (xi) Operations and Manufacturing Applications; (xii) Quality and Life-Cycle Tools; (xiii) Security Software; (xiv) Storage Software; (xv) Structured Data Management Software; (xvi) Supply Chain Management (SCM) Applications; (xvii) System Management Software and (xviii) System Software (which is the parent secondary market for virtualization software).

(59) The Notifying Party does not consider "server virtualization software" to constitute a relevant market. It submits that the relevant market in which VMware operates is likely to be broader than server virtualization software. According to the Notifying Party, VMware competes against a wide range of different software, hardware and service providers that offer customers a variety of ways to run applications and workloads within an x86 environment. Examples of such providers are: operating system vendors, traditional and software-defined storage vendors, traditional and software-defined networking vendors, application remoting/delivery vendors, management vendors, public cloud providers, containers-related technology companies, and mobile device and application management vendors. Nonetheless,

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47 Middleware refers to a wide category of software products that provide the infrastructure for applications to run on a server, be accessed from a variety of clients over a network and be able to connect a variety of information sources. This includes several products that could constitute sub-segments such as application server software, web server software, transaction processing monitors ("TPM"), application integration, enterprise portals, event management software, enterprise service bus software ("ESB") etc.

48 Case M.5529 – *Oracle / Sun Microsystems*, Commission decision of 21 January 2010, paragraphs 763 and 764.

49 Case M.5080, *Oracle/BEA*, Commission decision of April 29, 2008, paragraph 10.

50 Data based on the *IDC WW Semiannual Software Tracker 2015H1*.

the Notifying Party notes the absence of independent market research data allowing appropriate business models to be measured.

(60) In any event, the Notifying Party suggests that the relevant product market definition for virtualization software can be left open because the transaction would not significantly impede effective competition under any plausible market definition.

3.3.1.2. The results of the market investigation and the Commission's assessment

(61) The market investigation tested the possible segmentations of the software market. More specifically, it tested whether virtualization software can be considered as a separate sub-segment of middleware and whether virtualization software should be further sub-segmented based on the hardware or other components it is paired with (*e.g.*, servers, storage systems and networking).

(62) Most of the respondents to the market investigation confirmed that virtualization software should be considered as a separate market within middleware.[51]

(63) The respondents indicated that the virtualization market, though part of the overall middleware software sector, has different functions and characteristics. In particular, virtualization software is a software that converts a physical IT asset into a virtual resource and creates logical representations of all of the components that it functions on top of (*e.g.*, CPU, memory, BIOS,[52] and the Operating System) in order to deliver unique capabilities, not duplicated by other products in the middleware space. Middleware, on the other hand, traditionally focuses on application stacks, such as application servers, enterprise service bus and other SOA software technologies.[53] It has greater functionality and features, and is commonly understood as the "glue" that provides services to software applications beyond those available from the operating system.

(64) As regards a possible further segmentation of virtualization software, the responses to the market investigation were mixed.[54] Some of the respondents consider that virtualization software should be further segmented based on the hardware or other components it is paired with (*e.g.*, servers, storage systems, networking and desktop) as these are typically treated as distinct markets. In their view, virtualization market segmentation typically follows the market dynamics of each of those components. The hardware affinity of virtualization is very strong; hence, it could be categorised closer to the hardware technologies. Additionally, the different types of virtualization software may have different key players depending on the underlying hardware they virtualize.

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51 See replies to Q1 – questionnaire to competitors, question 4 and replies to Q2 – questionnaire to VMware customers, question 6.

52 BIOS refers to Basic Input/Output system: type of firmware used to perform hardware initialization during the booting process.

53 SOA refers to Service-Oriented Architecture, which is an architectural pattern in computer software design.

54 See replies to Q1 – questionnaire to competitors, question 5 and replies to Q2 – questionnaire to VMware customers, question 7.

(65) On the other hand, some respondents did not agree with a possible further segmentation of virtualization software. In their view, virtualization software products which are functional across servers, storage, networking, and desktop products all share common concepts, and may at times have overlapping capabilities.

(66) Furthermore, the market investigation tested whether technologies, such as container technology,[55] can be considered to belong to a separate product market than virtual machine-based virtualization software, by taking into account demand and supply-side substitutability, main features, strengths and weaknesses.

(67) The responses to the market investigation indicated that containers, despite providing a simplified way to deploy an application on shared infrastructure, deliver a different type of virtualization than traditional virtual machine-based virtualization software. The two technologies are not functionally interchangeable as they have different fundamental features and functionalities.[56] Therefore, containers should not be considered as belonging in the same product market.

3.3.2. Geographic market definition

(68) In previous decisions, the Commission took the view that the geographic scope of the market for software was at least EEA-wide. In relation to middleware, in *Oracle/Sun Microsystems*,[57] the Commission considered the relevant geographic market for the overall middleware market and sub-segments thereof to be worldwide.

(69) The Notifying Party agrees with this finding in relation to VMware's virtualization software and believes that the relevant geographic market is no narrower than global.

(70) From the results of the market investigation it can be inferred that the relevant geographic market for middleware and its sub-segments (including virtualization software) is global in scope. The majority of the respondents confirmed that, when considering middleware, the market could be viewed as global because (i) transportation costs are low compared to the price of the products; (ii) customers have similar preferences and requests worldwide; and (iii) product specifications and distribution patterns are similar throughout Europe and worldwide.

3.3.3. Conclusion on market definition for virtualization software

(71) In any event and in light of the outcome of the market investigation, the Commission considers that, for the purposes of this decision, as regards virtualization software, the precise product market definition can be left open, as

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55 A "container" is a virtual machine that provides OS-level virtualization and can replace hypervisors in certain contexts, thereby reducing virtual machine overheads. As is the case for server virtualization software, this alternative technology aims at increasing server efficiency and lowering IT costs.

56 See replies to Q1 – questionnaire to competitors, question 6.1 and replies to Q2 – questionnaire to VMware customers, question 8.1.

57 Case M.5529 – *Oracle / Sun Microsystems*, Commission decision of 21 January 2010, paragraph 769.

the transaction does not raise serious doubts as to its compatibility with the internal market under any plausible market definition.

3.4. Converged infrastructure systems

3.4.1. Product and geographic market definition

(72) Converged infrastructure systems ("CI" systems) refer to pre-bundled and pre-integrated data centre infrastructure which brings together products from one or more vendors across servers, storage, networking and supporting software.

(73) As an additional convenience for some end-customers, CI systems offer an alternative to the traditional mix-and-match model of integration of the various components of the data centre, also known as "best-of-breed". However, servers, storage devices, networking systems and supporting software can still be sold on a standalone basis and can be integrated by either customers, value-added resellers ("VARs")[58] or System Integration Vendors ("SIs").[59]

(74) CI systems can be assembled by VARs or SIs which procure hardware components separately, following a reference architecture supplied by any component manufacturer. Alternatively, CI systems can be pre-assembled by a single component manufacturer or in a partnership involving several vendors.

(75) Hyper-converged infrastructure systems ("HCI" systems) are physically integrated systems combining a commodity server and supporting software allowing the server to present itself as a single system that has both computing and storage capabilities. Similar to converged systems, customers may purchase a single hyper-converged system, or instead obtain similar functionality by purchasing servers and storage systems separately, or by purchasing commodity servers and developing or licensing software separately to make them hyper-converged.

(76) In the CI systems' space, neither Dell nor EMC are able to offer a converged system on their own, but each is able to partner with third party vendors on an *ad hoc* basis to make a converged offer. More specifically, EMC sells CI appliances through "VCE", a joint venture with Cisco, which incorporate Cisco servers and networking hardware, EMC storage systems, and VMware software.[60]

(77) In the HCI systems' space, Dell does not offer HCI systems by itself but has cooperative agreements with a number of vendors in order to develop and market

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58 A Value-Added Reseller (VAR) is an organization that buys equipment from a vendor at a discount, adds value (such as application software packaged and sold with underlying system software) and re-markets it.

59 A Systems Integrator (SI) is an individual or a business that builds computing systems for clients by combining hardware and software products from multiple vendors.

60 The CI system offering is named VCE VBlock Systems (see paragraph 3 above).

such appliances.[61] EMC does not have a HCI system offering either, but markets such a product based on VMware's virtualization software reference architecture.[62]

3.4.1.1. The Notifying Party's view

(78) The Notifying Party submits that most enterprises with a data centre infrastructure are sophisticated consumers with dedicated IT procurement, operations, and engineering staff. Enterprise customers leverage this in-house expertise to build their data centres and to employ various strategies to maximize and diversify their range of product and technology choices, increase their flexibility, and lower their cost of operation.

(79) Moreover, the Notifying Party notes that both sophisticated and less sophisticated enterprises further augment their IT expertise and purchasing power by buying through VARs and SIs who build and deploy complex IT systems and provide valuable services in selecting, integrating and installing IT infrastructure from different vendors.

(80) The Notifying Party further submits that, given their own sophistication and that of VARs and SIs, enterprise customers normally mix and match different IT systems and platforms from best-of-breed vendors in order to best meet their needs, instead of purchasing CI or HCI solutions. As a result, most customers have several different server, storage and networking products and platforms in their IT infrastructure, which all need to work well together. Due to this industry practice, enterprises, VARs and SIs demand a high level of interoperability from servers, storage, networking and software vendors.

(81) The Notifying Party takes the view that mixing and matching remains the preferred option for most end-customers. Given that most server, storage and networking systems are still sold on a standalone basis and are integrated by end-customers, VARs or SIs, each of these components of a CI system can be viewed as exercising a competitive constraint on the standalone products.

(82) In any event, the Notifying Party submits that CI and HCI systems do not constitute a distinct relevant product market. They are alternative modes of purchasing used by some end-customers instead of buying best-of breed hardware and integrating the components themselves. CI and HCI systems are fully interchangeable with comparable non-converged, "best-of-breed" alternatives. While some customers may choose a CI or HCI system for convenience, they can and would switch to a non-converged system in the face of a Small Significant Non-transitory Increase in Price or an attempt to foreclose them from the ability to efficiently use their chosen hardware and software. Therefore, in the Notifying Party's view, customers always have the option of obtaining similar functionality by purchasing hardware and software components separately and assembling them themselves or through a VAR or SI.

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61 Dell currently cooperates with […] for the development and marketing of HCI systems.

62 VMware's reference architecture is named EVO:RAIL. It is designed for a pre-configured, fully-integrated hyper-converged appliance based on VMware software for virtualization, storage, networking and management combined with server and disk hardware from qualified vendors.

3.4.1.2. The results of the market investigation and the Commission's assessment

(83) Most respondents to the market investigation agreed that CI and HCI systems provide an alternative approach to the traditional mix and match of different hardware and software components from best-of-breed vendors However, the market investigation was inconclusive as to whether CI and HCI systems constitute a distinct product market.[63]

(84) While the market investigation revealed that the traditional mix and match of different hardware and software components from best-of-breed vendors remains the preferred approach for end-customers, some respondents noted the increase of purchases of CI and HCI systems over the last few years. [64]

3.4.2. Conclusion on market definition for converged infrastructure systems

(85) The question whether CI and HCI systems as pre-assembled solutions bundling a number of hardware and software components (namely, servers, storage, networking and supporting software, including virtualization software) constitute a separate product market from each of their components, as well as the geographic scope of any such possible relevant market, can be left open, as the transaction does not raise serious doubts as to its compatibility with the internal market.

4. COMPETITIVE ASSESSMENT

4.1. Horizontal overlaps

(86) The Parties' activities overlap in relation to external ESS and in some of its possible segments, in particular (i) in the entry-level and mid-range price bands (based on IDC); (ii) in DAS, NAS and SAN; and (iii) in HDD arrays and HFAs.[65] EMC does not manufacture internal storage, optical and tape storage. Dell is not active in the high-end segment and in AFAs.

4.1.1. Overall external ESS and price band segments

4.1.1.1. The Notifying Party's view

(87) According to the Notifying Party, the Parties' activities overlap with respect to the supply of external ESSs, in particular in the mid-range systems, as Dell does not

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63 See replies to Q1 – questionnaire to competitors, questions 6.3 and 6.4 and replies to Q2 – questionnaire to VMware customers, questions 8.3 and 8.4.

64 Minutes of conference calls with competitors on 16 December 2015, on 18 December 2015 and on 4 February 2016 as well as with customers, on 7 December 2015 and on 17 December 2015

65 Since the competitive assessment will not change, other possible markets will not be analysed for the purpose of this decision, in particular a possible overall market for external and internal storage and a possible overall market for client and enterprise storage.

offer any high-end systems[66], while EMC does not offer any true “entry-level” systems.[67]

(88) The Notifying Party submits that the transaction would not lead to a significant impediment to effective competition in the market for the supply of external ESSs for the following reasons.

(89) First, the Parties would not be close competitors as they only compete in the sale of mid-range systems and, in that space, each of the Parties faces greater competition from other vendors.

(90) Second, the costs of switching in ESS would be low. Dell's server customers would not be locked into a Dell storage solution and could easily replace their Dell storage product with a storage product from a competitor without incurring any material additional costs.

(91) Third, competitors would increase supply if the merged entity were to restrict its output or raise its prices. It would not be profitable for the merged entity to reduce output, as competitors are not subject to capacity constraints. The growth in the storage market would be such that competitors are likely to increase supply to meet the increased demand.

(92) Fourth, the merged entity would not be able to hinder entry or expansion by competitors, many of which have recently entered the market or expanded their offerings.[68]

(93) Fifth, external ESS would be highly competitive and dynamic. The transaction would allow the merged entity to develop new products addressing important IT trends, notably the explosion in data and real-time analytics and the transition from on-premises to hybrid public/private cloud infrastructure. In addition, neither EMC nor Dell would be a "maverick" player in the market.

(94) Sixth, the merged entity would face sophisticated customers able to play the many different storage vendors off against each other to secure the most optimal and cost-effective storage solution for their IT needs.

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66 The Notifying Party notes that […]. IDC has reported negligible sales of Dell in the high-end price class. The high-end segment is therefore not further discussed for the purpose of this decision.

67 The IDC market share data presented in this decision indicate that EMC has entry-level products in its portfolio. However, the Notifying Party submits that EMC's VNXe product should be categorized as a mid-range storage solution by IDC and has submitted recalculated market shares for entry-level and mid-range. On the basis of these recalculated market shares, the Parties' activities would no longer overlap in the entry-level segment. In addition, the Parties' combined worldwide market share in the mid-range (including VNXe) would be [30-40]% by revenue (in 2014) (instead of [30-40]%). In view of this, the Commission considers that the competitive assessment of the transaction would not substantially change. The competitive assessment in this decision is therefore based on the market shares as provided by IDC.

68 The Notifying Party submits that in the last five years, several start-ups (such as Pure Storage, Nimble Storage, Nimbus Data and Kaminario) have entered the ESS market and expanded their product offerings. In addition, traditional IT suppliers have entered and expanded in ESS, notably Huawei (2009), Oracle (2010) and Sugon (2011). Furthermore, white-box manufacturers would have increased output, offering an alternative to traditional OEMs. Finally, cloud storage providers would continue to expand and better compete with external ESSs.

(95) Seventh, coordinated effects would not arise as a result of the transaction.

4.1.1.2. Competitive landscape and the Commission's assessment

(96) Tables 1 and 2 below illustrate the market shares of the Parties and their competitors in external ESS in 2014 and 1H2015.

Table 1: Market shares on the market for external ESS (2014)

		EEA		**Worldwide**	
		Volume (Units)	**Revenue**	**Volume (Units)**	**Revenue**
External ESS	Dell	[10-20%]	[5-10%]	[10-20%]	[5-10%]
	EMC	[5-10%]	[20-30%]	[10-20%]	[30-40%]
	Combined	**[20-30%]**	**[30-40%]**	**[20-30%]**	**[30-40%]**
	NetApp	[5-10%]	[10-20%]	[5-10%]	[10-20%]
	IBM	[10-20%]	[10-20%]	[5-10%]	[10-20%]
	HP	[10-20%]	[10-20%]	[10-20%]	[5-10%]
	Hitachi	[0-5%]	[5-10%]	[0-5%]	[5-10%]
	Oracle	[0-5%]	[0-5%]	[0-5%]	[0-5%]
	Fujitsu	[0-5%]	[0-5%]	[0-5%]	[0-5%]
	Huawei	[0-5%]	[0-5%]	[0-5%]	[0-5%]
	DataDirect Networks	[0-5%]	[0-5%]	[0-5%]	[0-5%]
	NEC	-	-	[0-5%]	[0-5%]
	Sugon	-	-	[0-5%]	[0-5%]
	Inspur	-	-	[0-5%]	[0-5%]
	Others	[30-40%]	[10-20%]	[30-40%]	[10-20%]

Source: Notifying Party's estimates based on third parties' reports

Table 2: Market shares on the market for external ESS (1H2015)

		EEA		**Worldwide**	
		Volume (Units)	**Revenue**	**Volume (Units)**	**Revenue**
External ESS	Dell	[10-20%]	[5-10%]	[10-20%]	[5-10%]
	EMC	[5-10%]	[20-30%]	[10-20%]	[20-30%]
	Combined	**[20-30%]**	**[30-40%]**	**[20-30%]**	**[30-40%]**
	NetApp	[10-20%]	[10-20%]	[5-10%]	[10-20%]
	IBM	[5-10%]	[10-20%]	[5-10%]	[5-10%]
	HP	[10-20%]	[10-20%]	[10-20%]	[5-10%]
	Hitachi	[0-5%]	[5-10%]	[0-5%]	[5-10%]
	Oracle	[0-5%]	[0-5%]	[0-5%]	[0-5%]
	Fujitsu	[0-5%]	[0-5%]	[0-5%]	[0-5%]
	Huawei	[0-5%]	[0-5%]	[0-5%]	[0-5%]
	DataDirect Networks	[0-5%]	[0-5%]	[0-5%]	[0-5%]
	NEC	-	-	[0-5%]	[0-5%]
	Sugon	-	-	[0-5%]	[0-5%]
	Inspur	-	-	[0-5%]	[0-5%]
	Others	[30-40%]	[10-20%]	[40-50%]	[10-20%]

Source: Notifying Party's estimates based on third parties' reports

(97) As regards a possible overall market for external ESS, Tables 1 and 2 show that the Parties' combined market share by revenue would remain below 40% worldwide and around 30% in the EEA, […]. Expressed in units, the combined market shares

would be around 25% both in the EEA and worldwide. In a possible worldwide market, the largest competitors would be NetApp, with a market share based on revenue of [10-20]% in 2014 and [10-20]% in 1H2015, followed by HP ([5-10]% / [5-10]%), IBM ([10-20]% / [5-10]%) and Hitachi ([5-10]% / [5-10]%), among others. Similarly, the largest competitor in an overall external ESS market in the EEA would be NetApp, with a market share based on revenue of [10-20]% in 2014 and [10-20]% in 1H2015, followed by HP ([10-20]% / [10-20]%), IBM ([10-20]% / [10-20]%), Hitachi ([5-10]% / [5-10]%).

(98) In possible market segments based on price bands, the Parties' activities mainly overlap in the mid-range and less in the entry-level. The Parties' activities do not overlap in high-end external ESS (which is therefore not discussed further).

Table 3: Market shares on the market for mid-range external ESS (2014)

		EEA		**Worldwide**	
		Volume (Units)	**Revenue**	**Volume (Units)**	**Revenue**
Mid-range external ESS	Dell	[5-10%]	[5-10%]	[5-10%]	[5-10%]
	EMC	[20-30%]	[20-30%]	[30-40%]	[30-40%]
	Combined	**[30-40%]**	**[30-40%]**	**[30-40%]**	**[30-40%]**
	NetApp	[10-20%]	[20-30%]	[10-20%]	[20-30%]
	HP	[10-20%]	[10-20%]	[10-20%]	[10-20%]
	IBM	[10-20%]	[10-20%]	[10-20%]	[5-10%]
	Hitachi	[0-5%]	[0-5%]	[5-10%]	[5-10%]
	Fujitsu	[0-5%]	[0-5%]	[0-5%]	[0-5%]
	Oracle	[0-5%]	[0-5%]	[0-5%]	[0-5%]
	Huawei	[0-5%]	[0-5%]	[0-5%]	[0-5%]
	NEC	-	-	[0-5%]	[0-5%]
	DataDirect Networks	[0-5%]	[0-5%]	[0-5%]	[0-5%]
	Sugon	-	-	[0-5%]	[0-5%]
	Inspur	-	-	[0-5%]	[0-5%]
	Others	[5-10%]	[5-10%]	[10-20%]	[10-20%]

Source: Notifying Party's estimates based on third parties' reports

Table 4: Market shares on the market for mid-range external ESS (1H2015)

		EEA		**Worldwide**	
		Volume (Units)	**Revenue**	**Volume (Units)**	**Revenue**
Mid-range external ESS	Dell	[5-10%]	[5-10%]	[5-10%]	[5-10%]
	EMC	[20-30%]	[20-30%]	[20-30%]	[20-30%]
	Combined	**[30-40%]**	**[20-30%]**	**[30-40%]**	**[30-40%]**
	NetApp	[10-20%]	[20-30%]	[10-20%]	[10-20%]
	HP	[10-20%]	[10-20%]	[10-20%]	[10-20%]
	IBM	[10-20%]	[5-10%]	[5-10%]	[5-10%]
	Hitachi	[0-5%]	[0-5%]	[5-10%]	[5-10%]
	Fujitsu	[0-5%]	[0-5%]	[0-5%]	[0-5%]
	Oracle	[0-5%]	[0-5%]	[0-5%]	[0-5%]
	Huawei	[0-5%]	[0-5%]	[0-5%]	[0-5%]
	NEC	-	-	[0-5%]	[0-5%]
	DataDirect Networks	[0-5%]	[0-5%]	[0-5%]	[0-5%]
	Sugon	-	-	[0-5%]	[0-5%]
	Inspur	-	-	[0-5%]	[0-5%]
	Others	[5-10%]	[10-20%]	[10-20%]	[10-20%]

Source: Notifying Party's estimates based on third parties' reports

(99) In the mid-range segment, the Parties' combined market share by revenue is similar as in a possible overall external ESS market, but the market share measured in units is higher (still well below 40% worldwide and closer to 30% in the EEA). […]. The largest competitors to the Parties would be again NetApp, with a worldwide market share based on revenue of [20-30]% in 2014 and [20-30]% in 1H2015, followed by HP ([10-20]% / [10-20]%), IBM ([5-10]% / [5-10]%) and Hitachi ([5-10]% / [5-10]%), among others. Similarly, the largest competitor in the mid-range segment in the EEA would be NetApp, with a market share based on revenue of [20-30]% in 2014 and [20-30]% in 1H2015, followed by HP ([10-20]% / [10-20]%), IBM ([10-20]% /[5-10]%), Hitachi ([0-5]% / [0-5]%).

Table 5: Market shares on the market for entry-level external ESS (2014)

		EEA		**Worldwide**	
		Volume (Units)	**Revenue**	**Volume (Units)**	**Revenue**
Entry-level external ESS	Dell	[10-20%]	[20-30%]	[10-20%]	[10-20%]
	EMC	[0-5%]	[5-10%]	[5-10%]	[5-10%]
	Combined	**[20-30%]**	**[20-30%]**	**[20-30%]**	**[20-30%]**
	HP	[10-20%]	[10-20%]	[10-20%]	[10-20%]
	NetApp	[5-10%]	[10-20%]	[5-10%]	[10-20%]
	IBM	[5-10%]	[10-20%]	[5-10%]	[5-10%]
	Huawei	[0-5%]	[0-5%]	[0-5%]	[0-5%]
	Fujitsu	[0-5%]	[0-5%]	[0-5%]	[0-5%]
	Oracle	[0-5%]	[0-5%]	[0-5%]	[0-5%]
	Inspur	-	-	[0-5%]	[0-5%]
	Hitachi	[0-5%]	[0-5%]	[0-5%]	[0-5%]
	NEC	-	-	[0-5%]	[0-5%]
	Sugon	-	-	[0-5%]	[0-5%]
	DataDirect Networks	[0-5%]	[0-5%]	[0-5%]	[0-5%]
	Others	[40-50%]	[20-30%]	[40-50%]	[30-40%]

Source: Notifying Party's estimates based on third parties' reports

Table 6: Market shares on the market for entry-level external ESS (1H2015)

		EEA		**Worldwide**	
		Volume (Units)	**Revenue**	**Volume (Units)**	**Revenue**
Entry-level external ESS	Dell	[10-20%]	[20-30%]	[10-20%]	[10-20%]
	EMC	[0-5%]	[5-10%]	[0-5%]	[5-10%]
	Combined	**[20-30%]**	**[20-30%]**	**[10-20%]**	**[20-30%]**
	HP	[10-20%]	[10-20%]	[10-20%]	[10-20%]
	NetApp	[5-10%]	[10-20%]	[5-10%]	[10-20%]
	IBM	[5-10%]	[5-10%]	[0-5%]	[5-10%]
	Huawei	[0-5%]	[0-5%]	[0-5%]	[0-5%]
	Fujitsu	[0-5%]	[0-5%]	[0-5%]	[0-5%]
	Oracle	[0-5%]	[0-5%]	[0-5%]	[0-5%]
	Inspur	-	-	[0-5%]	[0-5%]
	Hitachi	[0-5%]	[0-5%]	[0-5%]	[0-5%]
	NEC	-	-	[0-5%]	[0-5%]
	Sugon	-	-	[0-5%]	[0-5%]
	DataDirect Networks	[0-5%]	[0-5%]	[0-5%]	[0-5%]
	Others	[40-50%]	[20-30%]	[50-60%]	[30-40%]

Source: Notifying Party's estimates based on third parties' reports

(100) In a possible market for the entry-level external ESS, the Parties' combined market shares would remain below 30% worldwide and in the EEA, with a slightly higher share in the EEA ([20-30]% in 2014 and [20-30]% in 1H2015) than worldwide. The Parties' combined market share expressed in units is close to 20% in the entry-level segment, which is only [<5] points higher than the market share of the largest competitor (HP) in the EEA. In this possible entry-level market, HP is also the largest competitor worldwide, with a market share based on revenue of [10-20]% both in 2014 and in 1H2015, followed by NetApp ([10-20]% / [10-20]%), IBM ([5-10]% / [5-10]%) and Huawei ([0-5]% / [0-5]%), among others. Similarly, the largest competitor in an entry-level external ESS market in the EEA would be HP, with a market share based on revenue of [10-20]% in 2014 and [10-20]% in 1H2015, followed by NetApp ([10-20]% / [10-20]%), IBM ([10-20]% /[5-10]%) and Huawei ([0-5]% / [0-5]%).

(101) First, based on the above Parties' pre-transaction market shares, the Commission notes that the addition of market shares by Dell in the possible markets for external ESS and mid-range external ESS and of EMC in the possible entry-level external ESS market are moderate.

(102) Second, the possible markets for overall external ESS, mid-range external ESS and entry-level external ESS are characterised by the presence of a sufficient number of competitors that will remain active post-transaction ensuring effective competition.

(103) In particular, NetApp is a major vendor of storage arrays and is considered by the Notifying Party to be a "pure storage" company like EMC, focusing on storage (and not on servers). In particular, it is strong in a possible EEA market for mid-range systems, where NetApp's [20-30]% market share in 1H2015 is close to EMC's [20-30]% (pre transaction).

(104) Hewlett Packard Enterprise ("HPE" or "HP") is active in the computing and non-computing portions of the data centre. Besides being a competitor of the Parties in storage devices, HP is a competitor of Dell in a number of other IT product and service markets, namely servers, networking, software and cloud-based services. With [10-20]% market share (EEA, 2014), HP is pre-transaction the largest competitor to Dell in a possible entry-level external ESS market. HP's share in this segment increased 1.2 points in 1H2015. In the mid-range segment, HP has enjoyed a steady increase in its (worldwide) share year-on-year with a total increase of 2.8 points added between 2012 and 2014 and another 1.2 points in 1H2015. In the EEA, HP is pre-transaction the strongest player by units in a possible overall external ESS market and in the entry-level. Post-transaction, the merged entity's market share in the EEA (in units) in the possible entry-level external ESS market would only be 1.2 points higher (1H2015) than HP's share.

(105) IBM is a provider of IT infrastructure and services worldwide including servers and storage technology along with virtualization software. At entry-level external ESS, the market shares of IBM peaked at [10-20]% (EEA) in 2014.

(106) Hitachi is a strong competitor in the overall external ESS market and also in the possible mid-range external ESS market.

(107) Huawei almost tripled its worldwide market share between 2012 and 1H2015 in external ESS, as it has expanded its business beyond China and Asia into other parts of the world. In the entry-level, Huawei's worldwide market share is [0-5]%

(by revenue). In addition, Huawei has almost doubled its share in the mid-range segment since 2012, accounting for [0-5]% in 1H2015.

(108) In addition, there are many other players, such as Oracle, Fujitsu, DataDirect Networks, NEC, Sugon, Inspur, as well as other competitors which are not individually tracked by IDC. The latter category includes (i) companies such as Pure Storage, Nimbus Data, and Kaminario which have developed all-flash or hybrid-flash arrays; (ii) start-ups such as Nimble Storage, Tintri, Tegile, and Dot Hill, which offer general-purpose disk storage systems that support multiple virtual or physical servers, and multiple databases and files; and, (iii) original design manufacturers ("ODMs", also known as "white box manufacturers"), often based in Asia which focus heavily on providing entry-level ESS (such as Quanta, Wistron and Foxconn). ODMs serve cloud service providers and large owners of hyperscale data centers such as Google or Facebook directly, without any involvement from a storage original equipment manufacturer ("OEM").[69]

(109) The majority of respondents who provided a response to the market investigation also consider that post-merger there will be a sufficient number of actual competitors in the possible market for external ESS and in each price band.[70]

(110) Second, the merging firms are not particularly close competitors. Considering a possible overall market of external ESS, Dell's focus is on entry-level external ESS, which is also due to the fact that Dell is well-established as a provider of servers. [Most] of Dell's storage sales are in fact generated by Dell's server customers. EMC on the other hand derives more than [one third] of its storage revenues from solutions priced above USD 250 000 (*i.e.* the high-end segment). Dell does not offer any high-end product and EMC is not very strong in the entry-level.

(111) Even in relation to the sale of mid-range systems, Dell and EMC are not each other's closest competitors. While Dell's EqualLogic line of storage arrays line (like EMC's VNX line) qualifies as a mid-range system, EqualLogic focuses on simplicity of use over features, functions and performance and does not contain the advanced features of EMC's VNX line. In addition, in the sales of Dell's Compellent line, Dell faces greater and closer competition from HP than any other vendor, followed by NetApp and then EMC and other vendors (Huawei, Nimble Storage and Pure Storage).

(112) The respondents to the market investigation also considered that in the possible overall external ESS market and in all the possible price bands, Dell is not EMC's close competitor.[71] NetApp, followed by IBM and HP, is considered to be EMC's closest competitor in the possible overall external ESS market and the mid-range external ESS.

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69 IDC, Storage Tracker Taxonomy, […].

70 See replies to Q1 – questionnaire to competitors, question 62. See also agreed minutes of the call with a customer of 17 December 2015.

71 See replies to Q1 – questionnaire to competitors, question 61.

(113) Third, customers have the possibility to switch to one of the numerous other storage providers. While switching storage supplier may involve costs and time, respondents to the market investigation indicated that switching is technically feasible and does occur. [72]

(114) Fourth, the market investigation did not provide any indication that competitors could not increase supply. In fact, IBM confirmed that it "*could easily increase supply*" if, post-transaction, the merged entity were to increase its prices or restrict its output of external ESS. Microsoft noted that it was "*not aware of any resource constraints that would preclude it from increasing supply*". [73]

(115) Fifth, there has been entry in the storage market in the past years. Several start-ups, such as Pure Storage, Nimble Storage, Nimbus Data and Kaminario have entered the external ESS market and expanded their product offerings. Other traditional IT suppliers have also recently entered and expanded in ESS: notably Huawei (2009), Oracle (2010) and Sugon (2011). […]:

Figure 1: […]

[…]

(116) Furthermore, white box suppliers have increased their shares in the ESS market and in particular in the entry-level and mid-range.[74] The merging parties therefore do not have the ability to hinder expansion of their competitors in ESS.

(117) Finally, no significant concerns were raised with regard to the impact of the transaction on the market for external ESS due to the horizontal overlap. [75]

4.1.1.3. Conclusion on overall external ESS and price band segments

(118) In light of the considerations set out in paragraphs (96) to (117) and of the outcome of the market investigation and the information available to the Commission, and taking particular account of the moderate combined market share of the Parties as well as of the important number of competitors of varying size that will remain active post-merger, the Commission considers that the transaction does not give rise to serious doubts as to its compatibility with the internal market with respect to the possible markets for external ESS.

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72 See replies to Q1 – questionnaire to competitors, question 64.

73 See replies to Q1 – questionnaire to competitors, question 65.

74 In 2014, the category "Others" of the IDC market share figures, including white box suppliers, accounted for more than one third of the value of ESS at entry-level.

75 See replies to Q1 – questionnaire to competitors, question 67.3. See also agreed minutes of the call with a customer of 17 December 2015.

4.1.2. Other possible markets

(119) The IDC market shares of the Parties and their competitors in 2014 and 1H2015 (by revenue) in (i) DAS NAS and SAN and (ii) HDD arrays and HFAs, as submitted by the Parties, are set out below.

4.1.2.1. DAS, NAS and SAN

Table 7: DAS market shares[76]

	Worldwide 2014	Worldwide 1H2015	EEA 2014	EEA 1H2015
Dell	**[10-20%]**	**[10-20%]**	**[10-20%]**	**[20-30%]**
EMC	**[5-10%]**	**[0-5%]**	**[10-20%]**	**[5-10%]**
Combined	***[20-30%]***	***[20-30%]***	***[30-40%]***	***[30-40%]***
HP	[10-20%]	[10-20%]	[10-20%]	[10-20%]
Fujitsu	[5-10%]	[5-10%]	[0-5%]	[0-5%]
NEC	[0-5%]	[0-5%]	-	-
Hita chi	[0-5%]	[0-5%]	[0-5%]	[0-5%]
IBM	[0-5%]	[0-5%]	[5-10%]	[5-10%]
Others	*[40-50%]*	*[40-50%]*	*[40-50%]*	*[40-50%]*
Total	100.0%	100.0%	100.0%	100.0%

Source: Notifying Party's estimates based on third parties' reports

(120) The combined market shares of the Parties in a possible external ESS for DAS are moderate worldwide ([20-30]% in 2014 and [20-30]% in 1H2015). In the EEA, the shares are [30-40]% (2014) and [30-40]% (1H2015). The Parties also face strong competition from other vendors, including HP, Fujitsu, NEC and Hitachi (on a possible worldwide market), and HP, IBM and Fujitsu (in the EEA).

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76 There are two types of DAS systems, as detailed by the Parties: (i) the normal DAS system, which is Just a Bunch Of Disks without storage intelligence apart from the server; and (ii) DAS-connected SANs, which consist of directly-attached Fibre Channel, ESCON and FICON systems wired directly to the system. Dell mainly provides the former, and EMC only the latter, which is very common in high-end set-ups. According to the Parties, the DAS-connected SAN storage better fits the SAN systems classification, although is reported as DAS by IDC.

Table 8: NAS market shares

	Worldwide 2014	Worldwide 1H2015	EEA 2014	EEA 1H2015
Dell	**[0-5%]**	**[0-5%]**	**[0-5%]**	**[0-5%]**
EMC	**[40-50%]**	**[40-50%]**	**[40-50%]**	**[40-50%]**
Combined	***[50-60%]***	***[40-50%]***	***[50-60%]***	***[50-60%]***
NetApp	[20-30%]	[20-30%]	[30-40%]	[30-40%]
DataDirect Networks	[0-5%]	[0-5%]	**[0-5%]**	[0-5%]
HP	[0-5%]	[0-5%]	**[0-5%]**	[0-5%]
Oracle	[0-5%]	[0-5%]	[0-5%]	[0-5%]
Hitachi	[0-5%]	[0-5%]	[0-5%]	[0-5%]
Fujitsu	[0-5%]	[0-5%]	[0-5%]	[0-5%]
IBM	[0-5%]	[0-5%]	[0-5%]	[0-5%]
Others	*[10-20%]*	*[10-20%]*	*[10-20%]*	*[10-20%]*
Total	100.0%	100.0%	100.0%	100.0%

Source: Notifying Party's estimates based on third parties' reports

(121) The combined market shares of the Parties would be around 50% in a possible market for NAS. However, the increment brought about by the transaction would be small.

(122) The Parties also face strong competition from other vendors, including NetApp with a market share of [20-30]% (2014) and [20-30]% (1H2015) worldwide and [30-40]% (2014) and [30-40]% (1H2015) in the EEA. Other players in this possible market include HP, Oracle, Hitachi, Fujitsu and IBM.

Table 9: SAN market shares

	Worldwide 2014	Worldwide 1H2015	EEA 2014	EEA 1H2015
Dell	**[5-10%]**	**[5-10%]**	**[5-10%]**	**[5-10%]**
EMC	**[20-30%]**	**[20-30%]**	**[10-20%]**	**[10-20%]**
Combined	***[30-40%]***	***[30-40%]***	***[20-30%]***	***[20-30%]***
HP	[10-20%]	[10-20%]	[10-20%]	[10-20%]
IBM	[10-20%]	[10-20%]	[10-20%]	[10-20%]
NetApp	[5-10%]	[10-20%]	[10-20%]	[10-20%]
Hitachi	[5-10%]	[5-10%]	[5-10%]	[5-10%]
Oracle	[0-5%]	[0-5%]	[0-5%]	[0-5%]
Huawei	[0-5%]	[0-5%]	[0-5%]	[0-5%]
Fujitsu	[0-5%]	[0-5%]	[0-5%]	[0-5%]
Others	*[10-20%]*	*[10-20%]*	*[5-10%]*	*[10-20%]*
Total	100.0%	100.0%	100.0%	100.0%

Source: Notifying Party's estimates based on third parties' reports

(123) In a possible market for SAN the combined market shares of the Parties would be moderate, namely around 30% worldwide and around 25% in the EEA.

(124) The Parties also face strong competition from other vendors, including HP (the market leader in the EEA pre-transaction), IBM, NetApp, Hitachi, Oracle, Huawei and Fujitsu.

(125) Finally, no significant concerns were raised with regard to the impact of the transaction on the possible markets for DAS, NAS and SAN external ESS due to the horizontal overlap. Most respondents who provided a meaningful response to the market investigation also consider that post-transaction, there will be a sufficient number of actual competitors and potential new entrants in each possible segment. [77]

4.1.2.2. HDD arrays and HFAs

(126) The IDC market shares of the Parties and their competitors in 2014 and 1H2015 in HFAs and HDD arrays (by revenue), as submitted by the Parties, are set out below.

Table 10: HFA market shares

	Worldwide 2014	Worldwide 1H2015	EEA 2014	EEA 1H2015
Dell	**[0-5%]**	**[0-5%]**	**[0-5%]**	**[5-10%]**
EMC	**[30-40%]**	**[30-40%]**	**[20-30%]**	**[20-30%]**
Combined	***[30-40%]***	***[30-40%]***	***[30-40%]***	***[20-30%]***
NetApp	[10-20%]	[10-20%]	[10-20%]	[10-20%]
Hitachi	[10-20%]	[10-20%]	[10-20%]	[5-10%]
IBM	[10-20%]	[10-20%]	[10-20%]	[10-20%]
Oracle	[0-5%]	[5-10%]	[5-10%]	[5-10%]
HP	[0-5%]	[5-10%]	[5-10%]	[5-10%]
DataDirect Networks	[0-5%]	[0-5%]	[0-5%]	[0-5%]
Huawei	[0-5%]	[0-5%]	[0-5%]	[0-5%]
Fujitsu	[0-5%]	[0-5%]	[0-5%]	[0-5%]
Others	[5-10%]	[10-20%]	[5-10%]	[5-10%]
Total	100.0%	100.0%	100.0%	100.0%

Source: Notifying Party's estimates based on third parties' reports

(127) The combined market shares of the Parties would be [30-40]% (2014) and [30-40]% (1H2015) in a possible market for HFAs worldwide. In the EEA, the combined market share of the Parties would be lower, *i.e.* [30-40]% (2014) and [20-30]% (1H2015). The increment brought about by the transaction would be moderate (around [0-5]%).

(128) The Parties also face strong competition from other vendors, including NetApp (with a market share of around [10-20]%), IBM, Hitachi, Oracle, HP, DataDirect Networks, Huawei and Fujitsu.

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77 See replies to Q1 – questionnaire to competitors, questions 62.5 and 63.5. See also agreed minutes of the call with a customer of 17 December 2015.

Table 11: HDD arrays market shares

	Worldwide 2014	Worldwide 1H2015	EEA 2014	EEA 1H2015
Dell	**[5-10%]**	**[10-20%]**	**[10-20%]**	**[10-20%]**
EMC	**[20-30%]**	**[20-30%]**	**[20-30%]**	**[20-30%]**
Combined	***[30-40%]***	***[30-40%]***	***[30-40%]***	***[30-40%]***
HP	[10-20%]	[10-20%]	[10-20%]	[10-20%]
NetApp	[5-10%]	[5-10%]	[10-20%]	[10-20%]
IBM	[5-10%]	[5-10%]	[10-20%]	[5-10%]
Hitachi	[5-10%]	[5-10%]	[0-5%]	[0-5%]
Fujitsu	[0-5%]	[0-5%]	[0-5%]	[0-5%]
Huawei	[0-5%]	[0-5%]	[0-5%]	[0-5%]
Oracle	[0-5%]	[0-5%]	[0-5%]	[0-5%]
Others	*[10-20%]*	*[20-30%]*	*[10-20%]*	*[10-20%]*
Total	100.0%	100.0%	100.0%	100.0%

Source: Notifying Party's estimates based on third parties' reports

(129) The combined market shares of the Parties would be [30-40]% (2014) and [30-40]% (1H2015) in a possible market for HDD arrays worldwide. In the EEA, the combined market share of the Parties would be lower, *i.e.* [30-40]% (2014) and [30-40]% (1H2015).

(130) The Parties also face strong competition from other vendors, including HP, NetApp, IBM, Hitachi, Fujitsu, Huawei and Oracle.

(131) Finally, no significant concerns were raised with regard to the impact of the transaction on the possible markets for HFAs and HDD arrays due to the horizontal overlap. Most respondents who provided a meaningful response to the market investigation also consider that post-transaction, there will be a sufficient number of actual competitors and potential new entrants in each possible segment. [78]

4.1.2.3. Conclusion on other possible markets

(132) In light of above, and in particular in view of the moderate combined market share of the Parties in DAS, SAN, HFAs and HDD arrays and the small increment brought by the transaction in NAS and HFAs, as well as the important number of competitors of varying size that will remain active post-merger, the Commission considers that the transaction does not give rise to serious doubts as to its compatibility with the internal market with respect to the possible markets for DAS, NAS, SAN as well as HDD arrays and HFAs.

4.1.3. Conclusion on the horizontal assessment

(133) In light of the considerations in paragraphs (96) to (117) and (119) to (131) and of the outcome of the market investigation and the evidence available to it, the Commission considers that the transaction does not give rise to serious doubts as to

[78] See replies to Q1 – questionnaire to competitors, questions 62.4 and 63.4. See also agreed minutes of the call with a customer of 17 December 2015.

its compatibility with the internal market with respect to the horizontal overlaps of the Parties' activities under any plausible segmentation.

4.2. Non-horizontal assessment

(134) The transaction gives rise to non-horizontal links on some of the markets on which the Parties are active. In particular, VMware's virtualization software can be used in conjunction with some of Dell's hardware products, namely, servers, external ESSs, as well as CI and HCI solutions.

(135) Thus, there might be a risk that, post-transaction, the merged entity could attempt to restrict or degrade access to VMware's software to competing hardware vendors and/or to foreclose other storage virtualization software vendors by depriving them of a sufficient customer base.

(136) According to the Non-Horizontal Merger Guidelines, foreclosure occurs when actual or potential rivals' access to supplies or markets is hampered, thereby reducing those companies' ability and/or incentive to compete. Such foreclosure may discourage entry or expansion of rivals or encourage their exit.[79]

(137) The Non-Horizontal Merger Guidelines distinguish between two forms of foreclosure: input foreclosure occurs where the merger is likely to raise the costs of downstream rivals by restricting their access to an important input and customer foreclosure occurs where the merger is likely to foreclose upstream rivals by restricting their access to a sufficient customer base. [80]

(138) In order for foreclosure to be a concern, three conditions need to be met post-merger: (i) the merged entity needs to have the ability to foreclose its rivals[81]; (ii) the merged entity needs to have the incentive to foreclose its rivals[82]; and (iii) the foreclosure strategy needs to have a significant detrimental effect on the parameters of competition on the downstream market (input foreclosure)[83] or on consumers (customer foreclosure). In practice, these factors are often examined together since they are closely intertwined.[84]

(139) In this section, the Commission will thus assess whether there is a risk that the integration brought about by the transaction might lead to foreclosure with respect to the potential markets for: (i) servers and virtualization software (section 4.2.1); (ii) storage and virtualization software (section 4.2.2); and (iii) CI and HCI solutions (section 4.2.3).

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79 Guidelines on the assessment of non-horizontal mergers under the Council Regulation on the control of concentration between undertakings (the Non-Horizontal Merger Guidelines) OJ C 265/6, 18.1.0.2008, , paragraphs 29-30.

80 See Non-Horizontal Merger Guidelines, paragraph 30.

81 See Non-Horizontal Merger Guidelines, paragraphs 33 to 39 and 60 to 67.

82 See Non-Horizontal Merger Guidelines, paragraphs 40 to 46 and 68 to 71.

83 See Non-Horizontal Merger Guidelines, paragraphs 47 to 57.

84 See Non-Horizontal Merger Guidelines, paragraphs 72 to 77.

(140) The Commission will not assess any vertical links in the desktop virtualization space[85] as: (i) Dell does not offer any proprietary desktop platform[86], (ii) VMware's market shares in this type of software are very low ([10-20]% worldwide, behind Microsoft[87] with [20-30]% and Citrix with [40-50]%) and Dell's market share in desktops and notebooks combined is equally very low ([10-20]% worldwide[88], behind Apple with [10-20]%, HP with [10-20]% and Lenovo with [10-20]%).

(141) Additionally, no respondents to the market investigation raised any concerns with regard to the vertical link between desktop virtualization software and desktops.

(142) Similarly, the Commission notes the absence of any vertical links in the network virtualization space[89] as Dell does not offer a software-defined networking product.

4.2.1. Servers and virtualization software

4.2.1.1. Notifying Party's view

(143) The Notifying Party submits that the merged entity would not have the ability to foreclose.

(144) According to the Notifying Party, VMware does not have significant market power in virtualization software, given the competitive environment in which it operates. VMware virtualization software is far from unique and, to the contrary, it faces strong competition from a number of traditional server virtualization software vendors (such as Microsoft, Red Hat or Citrix), open-source solutions, public cloud providers, as well as new technologies such as containers.

(145) Customers, including major corporations with sophisticated needs, could easily switch to those alternative providers without much effort, and many have already done so in the past. Therefore, any indication of a move towards even partial foreclosure would encourage customers to seek alternative solutions, making such strategy unsuccessful.

(146) Moreover, the Notifying Party submits that VMware's vSphere is structured to function in an open ecosystem, and claims that it is both hardware and operating system-neutral. The Notifying Party explains that VMware's vSphere product is the first piece of software that sits on an x86 server, and therefore VMware needs to keep fostering relationships both with hardware companies such as Dell, HP, Lenovo, NetApp, Hitachi and IBM, and with enterprises selling operating system and enterprise applications that sit above the virtualization software layer (different operating systems). Promoting an open and non-discriminatory architecture strategy has been the basis of VMware's success. Abandoning such strategy would

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85 See definition above, under section 3.3.1.

86 Dell's desktop platform product vWorkspace is built on top of offers from other vendors.

87 Microsoft's main desktop virtualization product is called RemoteApp and Citrix's main product is called Xen Desktop.

88 According to the Notifying Party, Dell's share in desktops-only was estimated at [10-20]% and of notebooks-only was [10-20]%, worldwide.

89 See definition above, under section 3.3.1.

undermine VMware's value, risk customer backlash and cause irreparable harm not only to VMware and Dell's server business, but also to Dell's storage business, ultimately damaging Dell's brand.

(147) As to the merged entity's incentive to engage in foreclosure, the Notifying Party submits that moving away from the current VMware's hardware/software-neutral strategy would have severe consequences because it would alienate all or a significant proportion of customers, who value flexibility and freedom to choose best-of-breed hardware and software from different vendors.

(148) Moreover, from a financial point of view, it would not be plausible for the merged entity to adopt a foreclosure strategy designed to "force" prospective customers to buy a Dell server, due to the high percentage of such sales that would have to be achieved to be profitable.[90]

(149) Finally, the Notifying Party concludes that there would be no anti-competitive effects. It submits that the extent and range of effective competitors in both hardware and virtualization software means that competition is unlikely to deteriorate following the merger, that barriers to entry and expansion are low, and that new technologies pose a significant competitive constraint.

4.2.1.2. The results of the market investigation and the Commission's assessment

(150) The Commission will assess the risk of input foreclosure of VMware's server virtualization software, considering whether the transaction would change the merged entity's (i) ability and (ii) incentive to grant access to its server virtualization software and, (iii) if this were to have an impact on the servers' market.

a. Ability to engage in input foreclosure

(151) During the pre-notification phase and the market investigation,[91] some companies (competitors of Dell and EMC in server and/or storage hardware) raised the concern that the merged entity might partially foreclose VMware's software from competing server vendors, thus making their server offerings less attractive.

(152) This could be achieved in a number of ways, for example, by adopting specific software or hardware design choices favouring Dell, tying services and support offerings, engaging in bundling/discount strategies, and/or degrading or delaying access to updates/new versions, certification, application programming interfaces ("APIs"), and customer support.

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90 The Notifying Party bases its submission on a study it commissioned from Compass Lexecon.

91 See replies to Q1 – questionnaire to competitors, question 36 and replies to Q2 – questionnaire to VMware customers, question 31.

(153) According those competitors, customers would not be able to switch to competing offers, in light of the very high costs and significant length of switching and the fact that vSphere's specific advanced features make it the only suitable option especially for large corporations.

(154) Moreover, those competitors submit that the transaction would harm competition and enhance the merged entity's long-term ability to raise prices and limit choices for customers.

(155) The Commission notes that, given the proprietary nature of VMware's software vSphere, the merged entity would have the technical ability to limit or prevent access to it for competing servers' vendors.

(156) However, for input foreclosure to be a concern, the merged entity must have a significant degree of market power, and a significant influence on the conditions of competition in the upstream market.[92] In the following paragraphs the Commission will assess whether the merged entity would have such a market power.

(157) As to the most appropriate metric to be used in this regard, market intelligence firm IDC[93] as well as the majority of the respondents to the market investigation submit, in line with the Notifying Party's view, that the number of virtualization hosts is a reliable proxy for market power in the server virtualization software. In fact, some vendors (such Microsoft) do not separately charge for their software because they either bundle it with other products or because they offer open source-based software and monetize their business by charging for services. Therefore, their sales are not entirely captured by IDC data.[94]

(158) In particular, according to IDC data, VMware's share of server virtualization software in terms of volume (measured on the basis of the number of virtualizations hosts) has been declining from [50-60]% in 2010 to [40-50]% in the 1Q2015 at a worldwide level.[95]

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92 See Non-Horizontal Merger Guidelines, paragraph 35.

93 See IDC, Worldwide Virtual Machine and Cloud System Software Market Shares, 2014: Open Source Disruption in Cloud, September 2015, pages 4-5.

94 See replies to Q1 – questionnaire to competitors, question 25 and replies to Q2 – questionnaire to VMware customers, question 21.

95 At EEA level, the shares have been declining in the same period from [50-60]% to [40-50]%.

Table 12: Worldwide – Server virtualization software Shares based on Virtualized Hosts – 2008-1Q2015[96]

	2008	2009	2010	2011	2012	2013	2014	1Q2015
Citrix	[0-5%]	[5-10%]	[5-10%]	[5-10%]	[5-10%]	[5-10%]	[5-10%]	[5-10%]
HP	[0-5%]	[0-5%]	[0-5%]	[0-5%]	[0-5%]	[0-5%]	[0-5%]	[0-5%]
IBM	[0-5%]	[0-5%]	[0-5%]	[0-5%]	[0-5%]	[0-5%]	[0-5%]	[0-5%]
Microsoft	[20-30%]	[20-30%]	[20-30%]	[20-30%]	[20-30%]	[30-40%]	[30-40%]	[30-40%]
Oracle	[0-5%]	[0-5%]	[0-5%]	[0-5%]	[0-5%]	[0-5%]	[0-5%]	[0-5%]
Parallels	[0-5%]	[0-5%]	[0-5%]	[0-5%]	[0-5%]	[0-5%]	[0-5%]	[0-5%]
Red Hat	[0-5%]	[0-5%]	[0-5%]	[0-5%]	[0-5%]	[0-5%]	[0-5%]	[0-5%]
Sun Microsystems	[0-5%]	[0-5%]	[0-5%]	[0-5%]	[0-5%]	[0-5%]	[0-5%]	[0-5%]
Virtual Iron	[0-5%]	[0-5%]	[0-5%]	[0-5%]	[0-5%]	[0-5%]	[0-5%]	[0-5%]
VMware	**[60-70]%**	**[50-60]%**	**[50-60]%**	**[50-60]%**	**[50-60]%**	**[40-50]%**	**[40-50]%**	**[40-50]%**
Others	[5-10%]	[5-10%]	[5-10%]	[5-10%]	[5-10%]	[5-10%]	[10-20]%	[10-20]%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Table 13 – Worldwide – Server virtualization software Shares based on Number of Virtualization Hosts – 2008-1Q2015[97]

	2008	2009	2010	2011	2012	2013	2014	1Q2015
Citrix	[…]	[…]	[…]	[…]	[…]	[…]	[…]	[…]
HP	[…]	[…]	[…]	[…]	[…]	[…]	[…]	[…]
IBM	[…]	[…]	[…]	[…]	[…]	[…]	[…]	[…]
Microsoft	[…]	[…]	[…]	[…]	[…]	[…]	[…]	[…]
Oracle	-	-	-	[…]	[…]	[…]	[…]	[…]
Parallels	[…]	[…]	[…]	[…]	[…]	[…]	[…]	[…]
Red Hat	-	-	-	[…]	[…]	[…]	[…]	[…]
Sun Microsystems	[…]	[…]	[…]	[…]	[…]	[…]	[…]	[…]
Virtual Iron	[…]	[…]	-	-	-	-	-	-
VMware	**[…]**	**[…]**	**[…]**	**[…]**	**[…]**	**[…]**	**[…]**	**[…]**
Others	[…]	[…]	[…]	[…]	[…]	[…]	[…]	[…]
Total	**2 065 687**	**1 695 679**	**2 645 540**	**2 886 847**	**3 131 622**	**3 674 901**	**4 112 990**	**766 399**

96 IDC Server Virtualization Tracker, 1Q2015. These shares are calculated using "virtualization hosts," which refers to virtualization licenses on the host server.

97 IDC Server Virtualization Tracker, 1Q2015.

(159) Figure 2 below shows the decline in VMware's share in volume.[98]

Figure 2: Share based on number of virtualization hosts
[graphic]

(160) To the contrary, VMware's share in revenue has been relatively stable in the last few years at more than [70-80]% ([70-80]% in the 1Q2015, [70-80]% in 2014, [70-80]% in 2013, [70-80]% in 2012, [70-80]% in 2011, and [70-80]% in 2010 at worldwide level). As evidenced also by Table 13 above, the difference with the evolution of VMware's declining shares in volume can be ascribed to the fact that customers are increasingly deploying alternative options from competing vendors, including those who do not charge separately for their server virtualization software.

(161) In fact, VMware's server virtualization software is facing an increasing competitive pressure by other providers of server virtualization software.

(162) In particular, the market investigation showed that a number of alternative server virtualization vendors are active in this segment, *e.g.*, Microsoft, Citrix, Red Hat, or Oracle.

(163) According to the respondents to the market investigation,[99] there are varying degrees of maturity and features in each of those competing products, which have dynamically evolved in the last years. While most of respondents consider that vSphere is the leading virtualization software solution offering a broad set of functionalities,[100] most respondents (including major customers) consider that the features of VMware's product can be replicated by competitors.[101] According to market participants, server virtualization offerings "are largely comparable to each other,"[102] "as [of] today, all server virtualization solutions are close [to] each other in term[s] of feature"[103] and "for the core function of server virtualization, different products from different providers generally offer the same functionality," [104] while another player noted that "the maturity of virtualization products in the market are of sufficient technical and performance level."[105]

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98 IDC Worldwide Virtualization Software Tracker, 2015-1Q.

99 See replies to Q1 – questionnaire to competitors, question 31, 32 and 33 and replies to Q2 – questionnaire to VMware customers, question 12 and 14.

100 See replies to Q1 – questionnaire to competitors, question 32 and 33, and replies to Q2 – questionnaire to VMware customers, question 12 and 14.

101 Only one respondent suggested that the NSX product (network virtualization) cannot be replicated but did not provide further reasons for this claim. See replies to Q1 – questionnaire to competitors, question 32 and replies to Q2 – questionnaire to VMware customers, question 14.

102 See replies to Q1 – questionnaire to competitors, question 31.1.

103 See replies to Q1 – questionnaire to competitors, question 34.1.

104 See replies to Q1 – questionnaire to competitors, question 26.1.

105 See replies to Q1 – questionnaire to competitors, question 26.1.

(164) In particular, the overwhelming majority of respondents to the market investigation[106] submitted that the closest competitor and main alternative to VMware's vSphere is Microsoft's Hyper-V.[107] When comparing HyperV to vSphere, a major IT player explained that "there is almost feature parity between the two virtualization options" and another participant to the market investigation submitted that "Hyper-V does very well against VMware in terms of cost and in terms of integration with Windows Server."[108] In fact, as shown by Figure 2 above, the gap between VMware's and Microsoft's deployments has narrowed from more than 40% in 2008 (when Hyper-V was launched) to just under 17% in 2014.[109]

(165) Microsoft's HyperV is offered for free as a standalone downloadable product or as a feature to customers of Microsoft's Windows Server[110] and has progressively expanded its feature set over the years,[111] making it an increasingly viable option for customers, including major ones. This is evidenced also by the fact that several major clients across a variety of industries, including ones that have mission-critical needs (such large financial institutions, healthcare providers, as well as telecom and media companies), have selected Hyper-V as their virtualization software or have switched away from VMware in favour of Hyper-V.[112]

(166) In addition, Red Hat's Enterprise Virtualization product ("RHEV") uses the Linux kernel as a hypervisor with virtual machines having direct access to the hardware resources. As shown by internal documents and publicly available information,[113] VMware monitors closely RHEV, comparing it regularly against vSphere either through internal evaluations or third party studies. As with Microsoft's Hyper-V, many customers, including major banking clients, energy companies and government departments, select RHEV for new deployments or switch away from VMware. [114]

(167) Other offerings include Citrix's Xen (which has no licensing fees and is freely available, with Citrix charging customers only for support and maintenance) and open-source based software KVM, which "are very attractive because of the open

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106 All respondents with the exception of one customer (which identified RedHat as the main competitor and Microsoft as the second one). See replies to Q2 – questionnaire to VMware customers, question 12.

107 See replies to Q1 – questionnaire to competitors, question 31 and replies to Q2 – questionnaire to VMware customers, question 12.

108 See replies to Q1 – questionnaire to competitors, question 31 and replies to Q2 – questionnaire to VMware customers, question 12.

109 See also presentation at Microsoft's Ignite conference "Spark the Future", May 6-8 2015, p. 7.

110 See replies to Q1 – questionnaire to competitors, question 1.

111 See, *e.g.*, "Why Hyper-V? Competitive Advantages of Windows Server 2012 R2 Hyper-V over VMware vSphere 5.5 - October 2013 v1.0" and " Microsoft Private Cloud - A Comparative Look at Functionality, Benefits, and Economics November 2012."

112 See presentation at Microsoft's Ignite conference "Spark the Future", May 6-8 2015, p. 8 as well the several customers case studies available on Microsoft's website (https://customers.microsoft.com/Pages/Home.aspx).

113 See Annexes D.023, D.024, and D.025 to the Form CO.

114 See examples on RedHat's website (https://www.redhat.com/en/success-stories).

source nature and community associated with them [and] also do very well in terms of cost."[115] In particular, KVM "makes the most sense"[116] for cloud solutions based on OpenStack (a free and open-source software platform for cloud computing).

(168) Regarding alternatives to server virtualization software, although not in a conclusive manner, the market investigation[117] provided some indications that VMware might be facing competitive pressure from public cloud providers, such as Amazon (Amazon Web Services, "AWS"), Microsoft (Azure) or Google (Google Cloud). In fact, as research firm Gartner reports, in 2014 "the majority of new VM [virtual machines] were deployed to public cloud IaaS providers, rather than on-premise."[118]

(169) Similarly to traditional hypervisors, public cloud providers allow users to create and execute as many virtual machines are they need, the difference being that customers enjoy more flexibility as they only pay for the computing resources they actually use (converting upfront hardware and software costs into a per-minute rental) and, most importantly, they are indifferent to the underlying hardware used by the public cloud provider.

(170) Therefore, public cloud offerings might potentially affect the demand for hardware as well as traditional virtualization software, since virtual machines are increasingly created in the cloud instead of in a traditional virtualized data centre.[119] Moreover, the current largest providers of public cloud offerings (AWS, Microsoft and Google) do not need and are not major customers of VMware's products,[120] either because they rely on open source hypervisor technology or because they have their own virtualization technology.

(171) Moreover, a number of major customers in a variety of industries (*e.g.*, in automotive, energy, banking and hotel sectors) have either decided against incremental additions to their traditional data centre in favour of a public cloud solution or completely replaced their data centre with a public cloud solution.[121]

(172) In addition, although the market investigation provided mixed views on the subject,[122] the emerging technology of containers might in the future evolve to displace the need for traditional virtualization software,[123] especially for next-

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115 See replies to Q1 – questionnaire to competitors, question 31.1.

116 See replies to Q1 – questionnaire to competitors, question 28.1.

117 See replies to Q1 – questionnaire to VMware customers, question 8.1.

118 Gartner, Four Trends Changing Server Virtualization Decisions, March 5, 2015, page 2. "IaaS" is the acronym of "Infrastructure as a service", which is a form of cloud computing that provides virtualized computing resources over the Internet.

119 Gartner, Four Trends Changing Server Virtualization Decisions, March 5, 2015.

120 See replies to Q1 – questionnaire to competitors, question 1.

121 See, *e.g.*, case studies on Amazon's website (https://aws.amazon.com/solutions/case-studies/).

122 See replies to Q1 – questionnaire to competitors, questions 6, 19 and 20.1 and replies to Q2 – questionnaire to VMware customers, question 27.

123 Gartner, Four Trends Changing Server Virtualization Decisions, March 5, 2015, page 8.

generation workloads, with one respondent to the market investigation remarking that "we are watching the emergence of containers as a potential alternative to virtualization, and will continue to evaluate the maturity of containers."[124]

(173) If the merged entity were to attempt to degrade access to VMware to competing servers' vendors, a number of alternative server virtualization software options could be available to customers, depending on their needs and business models. In this respect, the market investigation showed that, although it typically involves significant time and resources, it is possible to switch to alternative solutions, also thanks to a number of *ad hoc* tools that facilitate migration.[125]

(174) Moreover, as confirmed by the market investigation,[126] clients typically multi-source with more than one server virtualization software supplier for a variety of reasons. Therefore, if the merged entity would attempt to partially foreclose its server virtualization software, customers might switch to a competing product which they already use. There is a view that switching is difficult in terms of cost and time, however, respondents to the market investigation also reported that the process of switching was technically possible and fairly straightforward.[127]

(175) Most of the end customers who participated in the market investigation considered that there would be sufficient credible alternative options post-transaction."[128]

(176) In light of the findings of this section and of the outcome of the market investigation, the Commission concludes that the effect on VMware of competition from alternative server virtualization software vendors is such that the merged entity would lack the ability to engage in input foreclosure.

b. Incentive to engage in input foreclosure

(177) The Commission notes that, according to the large majority of market participants,[129] VMware has so far adopted a hardware/software-neutral approach, fostering relationships with a very large number of vendors without limiting or degrading access to, *e.g.*, certification, support, or new updates.[130]

(178) In fact, on the basis of the market investigation,[131] the Commission considers that customers value the freedom to combine best-of-breed hardware and software offerings and typically multi-source x86 servers and server virtualization software

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124 See replies to Q1 – questionnaire to competitors, question 35.2.

125 See replies to Q1 – questionnaire to competitors, question 34.1.

126 See replies to Q1 – questionnaire to competitors, question 28 and replies to Q2 – questionnaire to VMware customers, question 33.

127 See replies to Q2 – questionnaire to VMware customers, questions 16 & 17

128 See replies to Q2 – questionnaire to VMware customers, questions 19 and 28. .

129 See replies to Q1 – questionnaire to competitors, question 24.

130 According to the Notifying Party, VMware has over […] technology partnership agreements and more than […] active service providers partners.

131 See replies to Q1 – questionnaire to competitors, question 27 and replies to Q2 – questionnaire to VMware customers, question 32.

from multiple vendors. Therefore, in order to promote a large adoption of its product, VMware had to endorse an open and non-discriminatory architecture policy.

(179) In this regard, the Commission also notes that the CEO of Dell (Michael S. Dell) has made a public commitment not to change VMware's approach and keeping it independent and open.[132]

(180) Some market players who participated in the investigation submit that changing such business strategy, by foreclosing or degrading access to vSphere, is "extremely unlikely […] as it would open up a large opportunity for competitive hypervisors to take market share."[133]

(181) The Commission considers that, if the merged entity were to engage in such a strategy, customers would likely switch to one or more of the alternative solutions available in the market (discussed in the section 4.2.1.2.*a)*), in order to avoid the risk of being locked-in into a specific solution.

(182) Furthermore, the incentive to pursue a foreclosure strategy depends on the extent to which such strategy would be profitable from a financial point of view. In particular, the cost to the merged entity in terms of lost sales of VMware's software (that – absent the strategy – would have been made to customers deploying it on non-Dell's servers) would have to be lower than the benefit coming from the increased sales of Dell's servers (*i.e.*, the sales of Dell's servers that are diverted from Dell's competitors as a result of the foreclosure strategy).

(183) In this regard, an economic paper submitted by the Notifying Party focuses on the question of how many customers would need to switch from a rival hardware vendor to the merged entity (with a view to obtaining VMware's virtualization software) for the merged entity to find it profitable to engage in a foreclosure strategy. Based on average selling prices and gross margins, the economic paper calculated the profit generated by Dell and VMware on the sale of a typical server and a licence, respectively.[134] Using these figures, it then calculated the proportion of VMware virtualization software customers that would need to divert to the merged entity's for the foreclosure strategy to be profitable.

(184) The proportion of new customers (that wished to buy VMware's virtualization software and a server) that would need to be diverted is more than […]%, which – given the alternative solutions available in the market – is considered implausibly

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132 Michael Dell has declared that "we intend for VMware to remain an independent public company […] Once the transaction closes, we plan to handle VMware the same way as EMC by keeping VMware independent, leaving VMware free to continue using its cash flow to invest in its business and to continue its committed relationships with its VMware Partner Network […] Our intent is only to continue to help it thrive, innovate and grow, as an independent company with an independent and open ecosystem." Message from Michael Dell: Committed to VMware Independence and to Open Ecosystem, October 19, 2015. Available at http://en.community.dell.com/dellblogs/direct2dell/b/direct2dell/archive/2015/10/19/message-from-michael-dell-committed-tovmwareindependence-and-to-open-ecosystem.

133 See replies to Q1 – questionnaire to competitors, question 36.2.

134 The economic paper also takes into account also the profit from potential incremental sales of ESS, bought in conjunction with the server.

high.[135] Moreover, in order to be sustainable, the foreclosure strategy would need to keep diverting such an implausibly high proportion of customers regardless of the possible future alternatives that server virtualization's competitors might develop over time in reaction to the strategy.

(185) Complainants argued that, in light of the issuance of tracking stock under the corporate structure of the transaction, Denali would have only a 28% economic interest in VMware (*i.e.*, the 35% of 81% VMware interest currently owned by EMC) and, if it were to engage in a foreclosure strategy, it would thus forego only 28% of profits for the lost sales of VMware's software. As such, the sales of incremental Dell's servers would compensate such foregone profit, making a foreclosure strategy profitable. Finally, the public shareholders who will be holding 19% of VMware's stock post-transaction would not be able to discipline such adverse conduct because they would only have limited legal protection.

(186) In this regard, the Notifying Party submits, first, that the issuance of tracking stock has a clear rationale, which is unrelated to any foreclosure strategy.[136] Second, a foreclosure strategy would run counter to Denali's tracking stock policy, which obliges it to pursue the best interests of VMware. Third, even taking into account a reduced economic interest in VMware, a foreclosure strategy would still be financially harmful and thus unlikely for the same reasons explained in paragraphs 183 and 184 above. Finally, post-transaction, the shareholders of VMware other than the Denali shareholders, would have sufficient legal protection against any attempt to favour Dell's servers to the detriment of VMware's software.

(187) Based on the results of the market investigation and on the available evidence, the Commission considers that it is unlikely that the value of foregone vSphere's sales would be more than compensated by the value of incremental sales of Dell's servers.

(188) This is also because, as discussed in section 4.2.1.2.*a*, customers would be able to switch to competing server virtualization offerings and therefore would move away from the merged entity's servers.

(189) In light of the findings of this section based on the results of the market investigation and the evidence available to it, the Commission concludes that the merged entity will lack the incentive to engage in input foreclosure.

c. Overall impact of input foreclosure

(190) Even if *arguendo* the merged entity were to have the ability and incentive to engage in input foreclosure, the impact of those attempts on effective competition would depend on the possibility of customers to source servers from alternative providers.

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135 Similar results apply in the case of customers who wished to buy VMware's virtualization software and a server together with external ESS.

136 According to the Notifying Party, tracking stocks are intended to provide EMC shareholders with the opportunity to benefit from any value creation resulting from any revenue synergies of the portion of Dell's economic interest in VMware. Additionally, the issuance of tracking stock enables the payment of a higher purchase price for EMC than it could in a transaction consisting entirely of 100% cash consideration.

(191) In this respect, as shown by Tables 13 and 14 below, Dell's worldwide market share for x86 servers is [20-30]% (in value, and [20-30]% volume) and [20-30]% at EEA-level (value, and [20-30]% volume), facing strong competition from a large number of established players such as HP (having a larger market share at [20-30]% and [40-50]% in value, at worldwide and EEA-level respectively), IBM, Cisco or Fujitsu, as well as a large number of ODMs.[137]

Table 14: Worldwide shares of x86 servers, 2014

	Value (in USD millions)	Value (in EUR millions)	Share	Units	Share
HP	[…]	[…]	[20-30]%	[…]	[20-30]%
Dell	[…]	[…]	**[20-30]%**	[…]	**[20-30]%**
ODM Direct	[…]	[…]	[10-20]%	[…]	[10-20]%
IBM	[…]	[…]	[5-10]%	[…]	[5-10]%
Cisco	[…]	[…]	[5-10]%	[…]	[0-5]%
Lenovo	[…]	[…]	[0-5]%	[…]	[5-10]%
Fujitsu	[…]	[…]	[0-5]%	[…]	[0-5]%
Oracle	[…]	[…]	[0-5]%	[…]	[0-5]%
Inspur	[…]	[…]	[0-5]%	[…]	[0-5]%
NEC	[…]	[…]	[0-5]%	[…]	[0-5]%
Huawei	[…]	[…]	[0-5]%	[…]	[0-5]%
Sugon	[…]	[…]	[0-5]%	[…]	[0-5]%
Cray Inc.	[…]	[…]	[0-5]%	[…]	[0-5]%
SGI	[…]	[…]	[0-5]%	[…]	[0-5]%
Unisys	[…]	[…]	[0-5]%	[…]	[0-5]%
Hitachi	[…]	[…]	[0-5]%	[…]	[0-5]%
Groupe Bull	[…]	[…]	[0-5]%	[…]	[0-5]%
DEPO Computers	[…]	[…]	[0-5]%	[…]	[0-5]%
Aquarius	[…]	[…]	[0-5]%	[…]	[0-5]%
Wortmann	[…]	[…]	[0-5]%	[…]	[0-5]%
Others	[…]	[…]	[0-5]%	[…]	[5-10]%
Total	**44 320.77**	**33 361.5**	**100%**	**9 137 980**	**100%**

Source: Notifying Party's estimates based on third parties' reports

137 EEA market data supplied by the Parties in the Form CO is an approximation, based on available country data. In the EEA, the market leader is HP on [40-50]% / [30-40]% (value / volume), with Dell second, followed by IBM with [5-10]% / [0-5]%. Worldwide, HP leads with [20-30]% / [20-30]%, then Dell, then Original Design Manufacturers (ODM) with [10-20]% / [10-20]%, then followed by IBM with [5-10] % / [5-10]%.

Table 15: EEA shares of x86 servers, 2014

	Value (in USD millions)	Value (in EUR millions)	Share	Units	Share
HP	[…]	[…]	[40-50]%	[…]	[30-40]%
Dell	**[…]**	**[…]**	**[20-30]%**	**[…]**	**[20-30]%**
IBM	[…]	[…]	[5-10]%	[…]	[0-5]%
Fujitsu	[…]	[…]	[5-10]%	[…]	[5-10]%
Cisco	[…]	[…]	[5-10]%	[…]	[0-5]%
ODM Direct	[…]	[…]	[0-5]%	[…]	[10-20]%
Lenovo	[…]	[…]	[0-5]%	[…]	[0-5]%
Oracle	[…]	[…]	[0-5]%	[…]	[0-5]%
Cray Inc.	[…]	[…]	[0-5]%	[…]	[0-5]%
Groupe Bull	[…]	[…]	[0-5]%	[…]	[0-5]%
SGI	[…]	[…]	[0-5]%	[…]	[0-5]%
Wortmann	[…]	[…]	[0-5]%	[…]	[0-5]%
Unisys	[…]	[…]	[0-5]%	[…]	[0-5]%
Hitachi	[…]	[…]	[0-5]%	[…]	[0-5]%
Huawei	[…]	[…]	[0-5]%	[…]	[0-5]%
Transtec	[…]	[…]	[0-5]%	[…]	[0-5]%
Action	[…]	[…]	[0-5]%	[…]	[0-5]%
NEC	[…]	[…]	[0-5]%	[…]	[0-5]%
Stratus Computer	[…]	[…]	[0-5]%	[…]	[0-5]%
E4	[…]	[…]	[0-5]%	[…]	[0-5]%
Others	[…]	[…]	[0-5]%	[…]	[5-10]%
Total	**8 595.0**	**6 470.0**	**100%**	**1 742 380**	**100%**

Source: Notifying Party's estimates based on third parties' reports

(192) Therefore, even if the merged entity had the ability and incentive to engage in the claimed input foreclosure strategy, the Commission considers it unlikely that any such conduct would result in the foreclosure or marginalisation of Dell's server competitors to such an extent that competition would be negatively affected on the server market.[138] The Commission also considers that the fact that none of the server customers who responded to the market investigation raised any concerns in relation to the possible impact of the transaction further supports this conclusion.

(193) In light of the evidence available to it and based on the result of the market investigation, the Commission concludes that an input foreclosure strategy is unlikely.

138 This conclusion applies also considering other possible sub-segmentations of the server market (addressed above in section 3.2).

4.2.2. Storage and virtualization software

4.2.2.1. The Notifying Party's view

(194) As with server virtualization software, described in section 4.2.1, the Notifying Party submits that the merged entity would not have the ability to foreclose its hardware competitors in the storage market. It submits that VMware does not have significant market power in storage virtualization software, and operates within a very competitive virtualization software environment, where it faces competition from traditional virtualization software vendors, open-source solutions, public cloud providers, new technology such as containers, and new market entrants. Customers could switch to these alternative providers.

(195) The Notifying Party refers to IDC data for 2014, showing that EMC/VMware's share in storage virtualization was [10-20]% by revenue, behind IBM, the market leader, with [30-40]%. According to IDC figures, Microsoft's share was [10-20]%, DataCore Software [5-10]% and "Others" a total of [10-20]%.

(196) The Notifying Party submits that when EMC acquired VMware in 2004, EMC did not attempt to disadvantage storage competitors by restricting access to VMware software. It argues that any attempt to change the business model by abandoning its open and non-discriminatory architecture strategy would undermine VMware's value and success in the marketplace, risk customer backlash and cause reputational damage.

(197) Regarding incentive, the Notifying Party submits that the merged entity would not have the incentive to foreclose, as any indication of a move towards foreclosure would encourage customers to seek alternative storage virtualization solutions. The Notifying Party submits that it would not be plausible for the merged entity to adopt a foreclosure strategy designed to "force" prospective customers that wished to buy VMware, to purchase a Dell server and Dell storage, due to the high percentage of such sales that would have to be achieved to be profitable.[139]

(198) The Notifying Party concludes that there would be no anti-competitive effects. It submits that the extent and range of effective competitors in both hardware and virtualization software means that competition is unlikely to deteriorate following the merger, that barriers to entry and expansion are low and that new technologies pose a significant competitive constraint.

4.2.2.2. The results of the market investigation and the Commission's assessment

(199) As a preliminary remark, the Commission notes that pre-transaction EMC is already active both upstream in the supply of virtualisation software and downstream in the provision of external ESS. As a result, the only merger-specific change resulting from the transaction is the limited increase of the merged entity's market position downstream in relation to external ESS (see section 4.1).

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139 The Notifying Party bases its submission on a study it commissioned from Compass Lexecon.

a. Ability of the merged entity to engage in a foreclosure strategy

(200) For the merged entity to be able to engage in foreclosure strategies it must enjoy market power in a market and be in a position to leverage it in another market through conditioning sales in separate markets.[140]

(201) As analysed above in section 4.2.1 and as confirmed by the market investigation, VMware is a leading player in the server virtualization sector. However, this does not seem to be the case in the storage virtualization sector, where VMware has a market share of [10-20]% by revenue worldwide, behind IBM who is the market leader with a share of [30-40]% worldwide. Other strong competitors are present in this sector including Microsoft with a share of [10-20]%, DataCore Software with [5-10]% and "Others" a total of [10-20]%.

(202) Additionally, the market investigation revealed that, despite VMware's leading position in the server virtualization sector[141], this is no longer true for its storage virtualization offering, due to other vendors' stronger presence. A number of respondents to the market investigation described VMware's storage virtualization product "vSAN" as being an immature product in terms of features and functionalities compared to other offerings on the market.[142]

(203) Furthermore, the majority of respondents to the market investigation said they would consider storage virtualization software offerings from different providers to be substitutable in terms of their characteristics, performance, price and intended end use.[143]

(204) Regarding the ability of customers to switch to an alternative storage virtualization provider, in terms of technical characteristics, time and cost of switching, the responses to the market investigation were mixed. Some respondents mentioned that switching would be difficult due to the required switching time. They also mentioned that this would depend on each particular customer's scale, performance, management, and complexity of IT implementation. However, other respondents described switching to be doable and generally easy.[144]

(205) In light of the above information and of the results of the market investigation, the Commission considers that, post-transaction the merged entity would not have the ability to foreclose other storage vendors from accessing VMware's storage virtualization software.

b. Incentives of the merged entity to engage in a foreclosure strategy

(206) Respondents to the market investigation considered that it would not be in the merged entity's interests to engage in a total foreclosure strategy as part of the merged entity. Some suggested that partial foreclosure could be achieved through

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140 Non-Horizontal Merger Guidelines, paragraph 95.

141 See above, analysis under section 4.2.1.

142 See replies to Q1 – questionnaire to competitors, question 43.

143 See replies to Q1 – questionnaire to competitors, question 38.

144 See replies to Q1 – questionnaire to competitors, question 39.

subtle delays in access to certification, interfaces, customer service and support, timely access to new versions and / or updates.[145]

(207) Moreover, the majority of respondents to the market investigation acknowledged that they had not observed any past attempts by EMC/VMware to limit the interoperability of its storage virtualization software either with (i) certain hardware,[146] or (ii) by limiting access to certification, interfaces, customer services or new versions and updates.[147] Although respondents considered this to be possible, they also considered this unlikely.[148]

(208) Since, as noted, the only merger-specific effect of the transaction in relation to storage virtualisation software and external ESS is the limited increase of the merged entity's position in external ESS, the Commission does not consider it likely that, only by virtue of this limited increase, the merged entity's incentives to engage in input foreclosure would materially differ from those of EMC/VMware pre-merger.

c. Overall impact of a foreclosure strategy on competition

(209) Even if the merged entity would have the ability and the incentive to engage in a foreclosure strategy in relation to storage systems and storage virtualization software, the Commission considers that such a strategy is unlikely to succeed.

(210) As shown in Tables 3 – 6, there are alternative providers of external storage systems in the market. In the market for storage virtualization software, VMware's share (by revenue) is less than half that of the market leader IBM, and there are other strong players as set out in (201) above.

(211) Therefore, even if the merged entity had the ability and incentive to engage in the claimed input foreclosure strategy, the Commission considers it unlikely that any such conduct would result in the foreclosure or marginalisation of the merged entity's ESS competitors or that competition would be negatively affected on the storage market. Moreover, such conclusion is supported by the fact that none of the respondents to the market investigation raised any concerns in relation to the possible impact of the transaction in relation to storage virtualization software.

(212) In light of the results of the market investigation and of all available evidence, the Commission considers that even if the merged entity were to engage in a foreclosure strategy in relation to storage virtualization software and external ESS, it is unlikely that such practices would lead to significant impediment to effective competition.

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145 See replies to Q1 – questionnaire to competitors, question 42.

146 See replies to Q1 – questionnaire to competitors, question 24.1 and replies to Q2 – questionnaire to customers, question 30.

147 See replies to Q1 – questionnaire to competitors, question 24.2.

148 See replies to Q1 – questionnaire to competitors, questions 36 and 48 and replies to Q2 – questionnaire to customers, question 31.

4.2.3. Converged infrastructure systems

(213) As described in section 3.4, CI systems are pre-assembled solutions bundling a number of hardware and software components (namely servers, storage, networking and supporting software, including virtualization software). HCI systems are physically integrated systems combining a commodity server and supporting software (including virtualization software) allowing the server to present itself as a single system that has both computing and storage capabilities.

(214) As noted above, despite the reported increase in sales of CI and HCI systems over the last few years, the market investigation revealed that the traditional mix and match of different hardware and software components from best-of-breed vendors remains the preferred approach for end-customers.[149] On the basis of the fact that the traditional mix and match approach currently reflects consumers' behaviour, for the purposes of this decision, the Commission will view CI and HCI systems in relation to each of their individual components, namely servers, storage, networking and/or supporting software, including virtualization software.

(215) On this basis, with regards to the potential components of CI and HCI systems, the Commission notes that, pre-transaction, EMC is already active both upstream in the supply of virtualisation software (through VMware) and downstream in the provision of external ESS. Dell is active in the provision of servers. Neither Dell nor EMC are active in the market for networking components for CI systems (also known as "software-defined networking products").

(216) The Commission will therefore assess whether the integration of Dell's server and external ESS portfolio with EMC's external ESS products and VMware's virtualization software could affect the merged entity's (i) ability and (ii) incentive to grant access to its virtualization software to competing providers of CI and HCI systems and, (iii) if this were to have an impact in the provision of CI and HCI systems.

4.2.3.1. Market shares

(217) The following tables set out the shares of the Parties and their competitors at worldwide and EMEA level (being the data available to the Notifying Party and a proxy for EEA-level shares) in all components of Integrated Infrastructure and Platform sales, depicting the relative weight of sales of the Parties in CI and HCI systems. For the market share tables of the Parties and their competitors in (i) servers and in (ii) external ESS, see above at sections 4.2.1 and 4.1 respectively.

149 See above, paragraph 83.

Table 16: Worldwide Sales of All Components in Integrated Infrastructure and Platforms 2012 to 1H 2015 – Revenue (in USD million

	2012		2013		2014		1H2015	
	Revenue	Share	Revenue	Share	Revenue	Share	Revenue	Share
Dell	**[…]**	**[0-5]%**	**[…]**	**[0-5]%**	**[…]**	**[0-5]%**	**[…]**	**[0-5]%**
EMC	**[…]**	**[0-5]%**	**[…]**	**[10-20]%**	**[…]**	**[10-20]%**	**[…]**	**[10-20]%**
VCE	**[…]**	**[10-20]%**	**[…]**	**[10-20]%**	**[…]**	**[10-20]%**	**[…]**	**[10-20]%**
Combined	***[…]***	***[10-20]%***	***[…]***	***[20-30]%***	***[…]***	***[30-40]%***	***[…]***	***[30-40]%***
Oracle	[…]	[20-30]%	[…]	[10-20]%	[…]	[10-20]%	[…]	[10-20]%
Cisco/NetApp	[…]	[10-20]%	[…]	[10-20]%	[…]	[10-20]%	[…]	[10-20]%
HP	[…]	[5-10]%	[…]	[5-10]%	[…]	[10-20]%	[…]	[10-20]%
Lenovo	[…]	[0-5]%	[…]	[0-5]%	[…]	[0-5]%	[…]	[0-5]%
Hitachi	[…]	[0-5]%	[…]	[0-5]%	[…]	[0-5]%	[…]	[0-5]%
IBM	[…]	[10-20]%	[…]	[10-20]%	[…]	[5-10]%	[…]	[0-5]%
Others	[…]	[20-30]%	[…]	[20-30]%	[…]	[10-20]%	[…]	[10-20]%
Total size of market (in million USD)	**4,901.5**	**100.0%**	**7,283.1**	**100.0%**	**9,411.8**	**100.0%**	**4,571.3**	**100.0%**

Source: Notifying Party's estimates based on third parties' reports

In a worldwide market comprising of all components of Integrated Infrastructure and Platforms, Dell has a market share of [0-5]% by revenue, EMC has a market share of [10-20]% and VCE[150] has a market share of [10-20]% while being the second player after Oracle with [10-20]%. Other players occupy a [10-20]% market share by revenue. Competitors to Dell include Oracle, Cisco/NetApp, HP, IBM, Hitachi and Lenovo.

150 See above, paragraph 75.

Table 17: EMEA – Sales of All Components in Integrated Infrastructure and Platforms 2012 to 1H 2015 – Revenue (in USD million)

	2012		2013		2014		1H2015	
	Revenue	Share	Revenue	Share	Revenue	Share	Revenue	Share
Dell	**[…]**	**[0-5]%**	**[…]**	**[0-5]%**	**[…]**	**[0-5]%**	**[…]**	**[0-5]%**
EMC	**[…]**	**[0-5]%**	**[…]**	**[5-10]%**	**[…]**	**[5-10]%**	**[…]**	**[5-10]%**
VCE	**[…]**	**[10-20]%**	**[…]**	**[10-20]%**	**[…]**	**[10-20]%**	**[…]**	**[10-20]%**
Combined	***[…]***	***[10-20]%***	***[…]***	***[20-30]%***	***[…]***	***[20-30]%***	***[…]***	***[20-30]%***
Oracle	[…]	[30-40]%	[…]	[20-30]%	[…]	[10-20]%	[…]	[20-30]%
HP	[…]	[5-10]%	[…]	[5-10]%	[…]	[10-20]%	[…]	[10-20]%
Cisco/NetApp	[…]	[10-20]%	[…]	[10-20]%	[…]	[10-20]%	[…]	[5-10]%
Lenovo	[…]	[0-5]%	[…]	[0-5]%	[…]	[0-5]%	[…]	[5-10]%
Hitachi	[…]	[0-5]%	[…]	[0-5]%	[…]	[0-5]%	[…]	[0-5]%
IBM	[…]	[5-10]%	[…]	[5-10]%	[…]	[5-10]%	[…]	[0-5]%
Others	[…]	[20-30]%	[…]	[10-20]%	[…]	[10-20]%	[…]	[10-20]%
Total size of market (in million USD)	1,077.6	100.0%	1,762.5	100.0%	2,547.0	100.0%	1,256.6	100.0%

Source: Notifying Party's estimates based on third parties' reports[151]

(218) At EMEA-level, for all components of Integrated Infrastructure and Platforms, Dell has a share of [0-5]% by revenue, EMC has a share of [5-10]% and VCE has a share of [10-20]%, with Oracle having a share of [10-20]%. "Other" players occupy a [10-20]% share by revenue. Competitors to Dell include Cisco/NetApp, HP, IBM, Hitachi and Lenovo.

(219) The Notifying Party submits that, for the moment, there are no third-party reports tracking the sales of HCI systems as this space is still nascent. Furthermore, the Notifying Party suggests that Nutanix, SimpliVity and Scale Computing are in all likelihood the largest providers of the software for HCI systems, at least for the time being. As HCI system offerings are still in their early stages, these leading players may well change in the near future.

4.2.3.2. The Notifying Party's view

(220) The Notifying Party submits that the transaction raises no concerns of post-merger partial or input foreclosure involving VMware in connection with CI systems and HCI systems. Any attempts to foreclose – whether partially or totally, whether limited to CI and HCI systems or applied to servers generally – would be unprofitable to the combined company under any realistic set of assumptions.

151 According to the Notifying Party, the figures provided in Tables 15 and 16 take into account the components frequently found in converged systems and accounted for in the IDC numbers (i.e. server, storage, network, system infrastructure software, application development and deployment and finally applications).

(221) In this regard, the Notifying Party points out that any foreclosure attempts would violate VMware's long-lasting commitment to hardware neutrality and irreparably destroy much of the value of VMware's business which stems from VMware's long history of close cooperation with all its hardware and software partners, regardless of ownership. Furthermore, the Notifying Party refers to the ready availability of virtualization software alternatives for both customers and OEM partners (most notably Microsoft Hyper-V and KVM-based hypervisors such as Red Hat Enterprise virtualization and Nutanix's Acropolis), making any attempted foreclosure irrational and self-destructive.

4.2.3.3. The results of the market investigation and the Commission's assessment

a. Ability of the merged entity to engage in a foreclosure strategy

(222) For the merged entity to be able to engage in foreclosure strategies it must enjoy market power in a market and be in a position to leverage it in another market through conditioning sales in separate markets.

(223) As analysed in section 4.2.1, Dell's presence in the provision of servers is relatively small with [20-30]% market share worldwide and [20-30]% EEA-wide, while HP is the leader in this market with a market share of [20-30]% worldwide and [30-40]% EEA-wide. Other strong competitors in this market include, among others, Lenovo, Cisco, Fujitsu, IBM and ODMs.

(224) Furthermore, as analysed in section 4.1, the transaction would only lead to a limited increase in the provision of external ESS. Additionally, other strong competitors are present in this space, including NetApp, HP, IBM and Hitachi. On this basis, it should be concluded that, despite the limited increase in the merged entity's shares post-transaction, the merged-entity would have limited market power in external ESS.

(225) In addition, the market shares' increment resulting from the transaction in relation to CI and HCI systems is limited. Therefore, the merged entity's position in the supply of these products will not materially change following the transaction.

(226) Based on the market investigation and as analysed above in sections 4.2.1 and 4.2.2, the Commission considers that the merged entity would not have market power neither in the market for server virtualization software nor in the market for storage virtualization software.

(227) More specifically, in relation to CI and HCI systems, the majority of the respondents to the market investigation who expressed an opinion agreed that there are alternative virtualization software products other than VMware's.[152]

(228) A small number of respondents argued that, due to VMware's strong market share in the server virtualization market, it would be difficult or impossible to make a commercially viable CI or HCI product without VMware's software. [153] However, the market investigation showed that VMware's presence in CI and HCI systems

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152 See replies to Q1 – questionnaire to competitors, questions 51 and 52.

153 See replies to Q1 – questionnaire to competitors, questions 51 and 52.

stems from its current market position in server virtualization and not from any technical features that make CI and HCI products reliant on VMware.[154]

(229) In this regard, the market investigation showed that there are currently CI and HCI system offerings in the market utilizing virtualization software from vendors other than VMware, such as Microsoft's Hyper-V, Xen, Nutanix's virtualization software, Oracle's virtualization software and IBM's virtualization software named Power VM and Power KVM. [155]

(230) As regards switching virtualization software providers of CI and HCI systems, the majority of the respondents to the market investigation agreed that switching, although involving significant resources,[156] is technically possible and relatively straightforward.[157] Some of the respondents also pointed out that the same switching costs from one virtualization technology to another would apply to CI and HCI systems as they apply to mix and match of best-of-breed solutions.[158]

(231) Additionally, the Commission concluded in sections 4.2.1 and 4.2.2 that the merged entity would not have the ability to engage in a foreclosure strategy in relation to Dell's servers, Dell's external ESS and VMware's virtualization software.

(232) Even if it were to consider a possible bundling strategy whereby the merged entity would link the sales of VMware's virtualization software together with its own servers or external ESS products when offering CI and HCI systems, the effects of such a strategy would not be substantial due to the amount of relevant alternatives to VMware's virtualization software for CI and HCI systems. In addition, the market investigation revealed that the majority of customers do not consider VMware to have any specific characteristics that make it the only real option for converged products. [159]

(233) In light of the considerations in paragraphs 223 to 231, based on the results of the market investigation and all the information available to it, the Commission considers that, post-transaction, the merged entity would not have the ability to foreclose other hardware vendors from accessing VMware's virtualization software used in CI and HCI systems.

b. Incentives of the merged entity to engage in a foreclosure strategy

(234) Most respondents to the market investigation expressed the view that it is unlikely that the merged entity would limit the availability of VMware's virtualization software to other vendors who are active in the provision of components of CI and HCI systems.

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154 See replies to Q1 – questionnaire to competitors, question 51 and replies to Q2 – questionnaire to customers, question 25.

155 See replies to Q1 – questionnaire to competitors, question 50.

156 See replies to Q1 – questionnaire to competitors, question 54.

157 See replies to Q1 – questionnaire to competitors, question 54.

158 See replies to Q1 – questionnaire to competitors, question 54.

159 See replies to Q2 – questionnaire to customers, question 25.

(235) According to those views, a strategy whereby the merged entity limits the access of VMware's virtualization software in terms of certification, interfaces, customer services, customer support, new software versions, software updates and time to market, would inevitably (i) limit the size of the merged entity's business, (ii) allow competing offerings other than VMware's to take market share and (iii) cause irreparable reputational damage to the merged entity.[160]

(236) In addition, the incentive to pursue a foreclosure strategy depends on the extent to which such a strategy would be profitable.

(237) In relation to servers and virtualization software as components of CI and HCI systems, the cost to the merged entity in terms of lost sales of VMware's software would have to be lower than the benefit coming from the increased sales of Dell's servers. As analysed above in paragraph 182, based on the available evidence, it is unlikely that the value of lost sales in VMware's server virtualization software would be more than compensated by the value of incremental sales of Dell's servers. The merged entity could, therefore, incur a loss if it were to engage in a foreclosure strategy.

(238) In relation to external ESS and virtualization software as components of CI systems, the only merger-specific effect of the transaction is the limited increase of the merged entity's position in external ESS. As indicated in paragraph 208, the Commission does not consider it likely that, only by virtue of this limited increase, the merged entity's incentives to engage in input foreclosure would materially differ from those of EMC/VMware pre-merger.

(239) Even if it were to look at CI and HCI systems space as a separate product market, EMC (including VCE) is currently a much stronger player in this space than Dell[161]. Thus, its incentives are unlikely to be affected, post-merger.

(240) On the basis of the information available as well as in light of the preceding analysis in sections 4.2.1 and 4.2.2, the Commission considers that, post-transaction, the merged entity would not have the incentive to foreclose other hardware (server and storage) vendors from accessing VMware's virtualization software used in CI and HCI systems.

c. Overall impacts of a foreclosure strategy on competition

(241) Even if the merged entity would have the ability and the incentive to engage in a foreclosure strategy in relation to other hardware providers of components of CI and HCI systems, as regards its virtualization software, the Commission considers that such a strategy is unlikely to succeed or to give rise to a significant impediment to effective competition.

(242) As analysed in sections 4.2.1 and 4.2.2, there are a number of strong competitors in both server and storage virtualization software. Should the merged entity decide to

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160 See replies to Q1 – questionnaire to competitors, question 53.

161 As can be seen in Tables 16 and 17 above, the worldwide share of EMC is [10-20]% and of VCE is [10-20]% over a share of [0-5]% of Dell. In EMEA level, EMC has a share of [5-10]% and VCE a share of [10-20]% over a share of [0-5]% of Dell.

engage in a foreclosure strategy in relation to VMware's virtualization software intended for CI and HCI systems, its hardware competitors are in a position to compete and provide CI and HCI systems in partnership with virtualization software providers other than VMware.

(243) If *arguendo* CI and HCI systems were to be seen as a separate product market, Dell's share by revenue in all components of CI systems is [0-5]% worldwide and [0-5]% in the EMEA market, with Oracle being the leading player ([10-20]% market share worldwide and [10-20]% in EMEA). Dell's shares in this sector are very low, especially when seen in relation to the shares of its competitors in this sector, namely Oracle, Cisco/NetApp, HP, IBM, and Hitachi.[162]

(244) Even if it were to consider a bundling strategy whereby the merged entity would link the sales of VMware's virtualization software together with its own servers or external ESS products when offering CI and HCI systems, as analysed in sections 4.2.1 and 4.2.2 above, a number of strong competitors to the merged entity in either servers, external ESS or virtualization software would be in a position to ensure the provision of competitive CI and HCI system offerings.

(245) Therefore, in light of the above, the Commission considers that even if the merged entity had the ability and incentive to engage in a foreclosure strategy in relation to virtualization software for CI and HCI systems, it is unlikely that any such conduct would result in the foreclosure or marginalisation of Dell’s server and storage competitors, active in the provision of CI and HCI systems. .

5. CONCLUSION

(246) For the above reasons, the European Commission has decided not to oppose the notified operation and to declare it compatible with the internal market and with the EEA Agreement. This decision is adopted in application of Article 6(1)(b) of the Merger Regulation and Article 57 of the EEA Agreement.

For the Commission

(Signed)
Margrethe VESTAGER
Member of the Commission

162 See market share tables 15 and 16.